Impact of Demonetisation on Industries in India – An Event Study Approach

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Abstract

This paper examines the impact of demonetisationon different industry sectors in India. The event 'demonetisation', which declared the 1000 and 500 rupee notes in India as illegal tender, was announced on 8th November, 2016. In this paper, we attempt to analyse the impact of the aforementioned event using Event Study Methodology on various industry indices in India. We analyse the stock market performance of various sectors using 19 BSE industry indices. The result indicates on average a short-term negative response to the announcement of demonetisation. Wealso find diversity in the performance of various sectors by finding abnormal returns using asset pricing models such as Market model, Capital Asset Pricing model and Fama French 3 factor model.

Keywords: *Demonetisation, Event Study, Abnormal Returns, Cumulative Abnormal Returns*

Introduction

8th November, 2016 marked the discontinuity of 500 and 1000 rupee notes as legal tender. The step was taken as a measure to fight against black money, money laundering and corruption, and restrict cash flow to terrorist groups. This announcement left everyone benumbed since the banned notes accounted for 86% of the total value of currency in circulation. A period of about 50 days was given to people to deposit these notes in banks and post offices. The banned notes were replaced by new 500 rupee notes and a new denomination of 2000 rupees was introduced. For a long period of time, people had to face issues due to limited cash available in circulation. Long queues outside ATMs to withdraw cash became an everyday thing. A major part of India's population is still not financially included and suffered the most. There are two sides of every coin; same is the case with demonetisation. It has brought its share of pros and cons.

In this research paper, we conduct an exploratory event study on this event popularly known as “Demonetisation”. We study the reaction of various sectors to the announcement of demonetisation, as reflected in the various S&P BSE sector and industry stock indices.

Our key finding is that the stock market took a period of about 3-5 days to show any major reaction to the news. The sectors where cash transactions are limited did not react much to the announcement, whereas the sectors with high cash involvement like the FMCG sector saw an immediate bearish trend.

We do understand that the immediate effects are not long term impacts. In this research paper, we have limited our study to the immediate reaction of the stock market to the announcement and do not intend to derive any long term conclusions of the

event on the economy. On the same day, results of the US elections were declared. The sectors under study are not dependent on the results of the US elections since they have limited interaction with the US economy. The IT sector however, has high interaction with the US economy, but it did not reflect any major changes in the stock prices.

We study the results on the basis of Cumulative Abnormal returns and align them to the expectations based on the sector constituents, their dependency on cash and their reaction to a measure intended to evade corruption.

Literature Review

Demonetisation and its effect on the economy has been a subject of study ever since it was introduced. Singh and Bhattacharya (2017) suggest that a limitation in the supply of high denomination currency under circulation could be an effective tool to fight corruption. Singh and Thimmaiah (2017) analyse the effects of demonetisation and propose the idea of cashless economy, which would help fight the issue of black money in India. Currency under circulation in India was estimated to be 8% of the black money. The approximate cost of demonetisation to the country was estimated at 1.28 lakh crore rupees.

Bharadwaj et.al (2017) studied the effect of demonetisation on the stock market by using Sharpe's Index Model. Their sample consists of 16 companies listed on NSE for the period 2012-2016. Their study concludes that demonetisation impacted the stock market.

Rani (2016) attempted to find the impact of demonetisation on the retail sector. The study was done by using qualitative technique. The study records the response of retailers proving that sales fell after shops stopped accepting the old currency notes. The credit period was extended and larger digital payment modes were incorporated. The FMCG transactions fell by approximately 20% and those of non-essential products like mobile phones declined by over 70%. The amount of gold sold, however, went up by almost 70% since it was seen as a way by many to dispose off the old currency notes.

Gupta (2016) studied the effect of demonetisation on the banking sector and suggested that the long term effect will be positive as a result of the move toward a cashless economy.

Gupta et.al (2017) analysed the impact of demonetisation on the quarterly performance of the top 50 companies of BSE. They concluded that 54% of the companies showed a positive change in stock prices post demonetisation. They further concluded that the oil sector outperformed whereas the FMCG sector was badly hit.

Mahajan et.al(2017) studied the impact of demonetisation on financial inclusion in India. The paper professes that demonetisation promotes cash-less economy and greater use of digital financial services. The paper compares the demonetisation of 1978 with the 2016 demonetisation and concludes that the effect has been largely upon the ordinary man than on the ones who are the main contributors to black money.

Iyengar et.al (2017) studied the impact of demonetisation on the Indian stock market for an event window of 30 days. The main focus was on the FMCG, banking and automobile sectors. Event study was used for conducting the study. The paper concludes that the government's decision of demonetisation had an impact on the capital markets and indicates that the semi-strong form of efficiency in the Indian stock market does not hold good for this particular event.

Dash (2017) explored the effect of demonetisation on social sectors and indicated that the Indian economy is moving towards being cashless, which is a major step towards curbing black money transactions. The paper concludes that demonetisation will create a positive impact on the social sector in the long run.

Syamsundar et.al (2017) analysed the effect of demonetisation and its importance on the economic development of the country in comparison with other countries. They also documented the impact of past demonetisation initiatives on exports and imports.It covers the demonetisation policy impact on other countries viz., Nigeria, Ghana, Pakistan, Zimbabwe, North Korea, Soviet Union, Myanmar and Australia. After an exhaustive and logical analysis, the paper concludes that demonetisation appears to have a different impact in comparison to the other economic reforms. The findings of the study revealed that, in the long-run, demonetisation will have a positive impact on the Indian economy and will trigger growth.

Chauhan et.al (2017) examine the impact of demonetisation on the stocks of S&P BSE100 index using the event study methodology. The study concludes that there was no significant impact on the stock prices and that the effect of demonetisation was only for a short period after which the market recovered.

Patil et.al (2018) examined the impact of demonetisation on the Indian stock market using various statistical techniques such as Graphical Analysis, Summary statistics, Unit root test and GARCH. For the purpose of the study, a time frame of 200 days before and after the occurrence of the event was taken (15th January, 2016 to 29th August, 2017). The study was conducted on 10 sectoral indices and Nifty 50 index of NSE. The results of this study indicate a significant negative impact of demonetisation on the Indian stock market. This was seen in the case of Nifty Auto Index, Nifty Financial Services Index, Nifty FMCG Index, Nifty IT Index, Nifty Media Index, Nifty Private Bank Index, and Nifty Realty Index. The Nifty Realty Index was found to be most affected.

Kumar (2018) studied the impact of demonetisation on the stock market on both the BSE Sensex and NSE Nifty Index. The study was conducted for a period of 3 months before and after the demonetisation date. The impact of the event was analysed using the run test and paired sample t test. The study finds a significant impact of demonetisation on the stock market, but for a shorter period of time as India was not affected by any other economic changes in the last two years.

Bhattacharya & Singh (2018) assessed the impact of demonetisation on currency in circulation. To assess the impact, a situational analysis of demonetisation not having taken place was done. The paper proclaims that the currency in circulation is a series that can be predicted with a fair level of accuracy. In the absence of large exogenous shocks like demonetisation, a few time-series models of currency in circulation can be specified and the weekly movements of the series using data till the period before demonetisation can be forecasted. Movements of the forecast errors are interpreted as “shocks” due to demonetisation. Time-path of these shocks was expected to reveal the strength at various points after demonetisation. The conclusion was that demonetisation led to a sharp one-time fall in the aggregate level of currency in circulation in the Indian economy. The shock had its maximum impact by mid-November, but by mid-December 2017, the shock on currency growth reduced to near-zero levels. Gradually, by mid-April 2018, the shock in currency growth reached within normal limits. Their analysis revealed that data since June 2018 displays the same pattern as any series before the demonetisation period.

Several researchers studying the impact of demonetisation have concluded that the short term effects of the move have not been positive; however, it is too early to conclude anything about the long term effects of the move. Greater certainty on the long term effects will only be revealed with the passage of time.

Research Question and Methodology

Our main research question was to assess the impact of demonetisation on various industry indices.We follow an event study methodology to assess the stock market's response to the announcement of demonetisation.

The event study methodology is designed to investigate the effect of an event on the stock price or any other dependent variable. This statistical methodology was developed by Fama, Fisher, Jensen, and Roll (1969). MacKinlay (1997) has documented the use of short run event study to study the impact of specific events on the value of the firm.

Bowman (1983) provides an overview of event study as a methodology in which he identifies four types of event studies i.e. information content, market efficiency, model evaluation and metric evaluation. The entire paper is divided into 3 sections; the first section covers the first two types of event studies. The second section discusses the model evaluation and metric evaluation types of studies. The third section covers some additional issues which are relevant to event study research; these issues are the interpretation of the excess return metric, joint test considerations and the testing of market efficiency. The paper concludes that the general class of tests which can be called event studies will continue to make important empirical contributions to our understanding of information and security prices.

Stephen et.al (1985) conducted research on the properties of daily stock returns and how the particular characteristics of these data affect the event study methodologies for assessing the share price impact of firm specific events. The paper aimed to investigate a number of potential problems such as non-normality of returns and excess returns, bias in OLS estimates of market model parameters in the presence of non-synchronous trading and estimation of variance to be used in hypothesis tests concerning the mean excess return. The results reinforced that methodologies based on the OLS market model and using standard parametric tests are well specified under a variety of conditions.

Konchitchki et.al (2011) analysed the concerns related to information systems industry using event study methodology. Based on the 50 IT event studies summarised in the paper, they find that the introduction of technology has shown to generate value to shareholders, as measured by the stock market response to technology-related news.

Bloom (2011) applied event study methodology to the lodging industry's stock prices based on merger-acquisition activity.This study reviews abnormal trading volume data for hotel stocks subject to mergers and acquisitions and clearly identifies that there were 74 unexplained abnormal volume trends in the period prior to the merger announcement date.

Iyengar et.al (2017) studied the impact of US election results on Indian stock market using the event study approach. It was conjectured that the US economy and policies will have a significant impact on growing economies like India. However, their study concludes that the US elections had no impact on the Indian stock markets. They also professed that the Indian stock markets are semi-strong form efficient using event study statistical technique.

The methodology used is*Event Study* technique by Fama, Fisher, Jensen, and Roll (1969) which is a tool that helps analysethe impact of an event over a firm's stock price. The event concerned may or may not be within the control of the firm.This technique assumes that the markets are efficient and that the effect of an event on the stock price will be reflected immediately.

Event Study consists of the following steps.

1. Definition of the event
2. Identification of the affected firms and the event date
3. Calculation of *Abnormal returns* (difference between the actual return and the expected/predicted return)
4. Hypothesis testing and evaluation where Null Hypothesis is that the event has no impact over the stock price.

The relevant dates for the above steps would be:

Estimation window: This refers to the number of days used to determine the expected return using any model such as market model,Capital Asset Pricing Model or Fama French Model. This is usually taken around 220 days prior to the main event.

To calculate the expected or predicted return, three methods have been used, which are:

1. Market Model
2. Capital Asset Pricing Model
3. Fama French 3 factor Model

Market Model is the most popular method used for the purpose of *event study* because it spells out explicitly the risk associated with the market (here, Sensex) and the returns. It is estimated by running the following regression:

$$R_i = \propto + \beta r_m + e \quad \text{..... (1)}$$

Where,
R_i is the stock's return
α represents the intercept
β is the stock's beta
r_m is the market returns

Capital Asset Pricing Model helps to calculate the expected return based on the systematic risk and return of the stock/index.

It is estimated by running the following regression:

$$R_i - rf = \propto + \beta(r_m - r_f) + e \quad \text{.....(2)}$$

Where,
r_f= Risk free rate
β= Beta of the security.
r_m = expected market return

Fama French 3 factor model is an extension of the Capital Asset Pricing Model which takes into account the risk and value factors of the stock. The model assumes that small-cap and value stocks have the ability to outperform the markets and by including these factors in estimating the predicted returns, we are adjusting for this tendency to outperform. These two extra factors were sourced from IIM Ahmedabad website where the Fama French factors for an extensive period are given. (http://faculty.iima.ac.in/~iffm/Indian-Fama-French-Momentum/)

This model has the following regression equation:

$$R_i - \text{rf} = \propto + \beta_1(r_m - r_f) + \beta_2(SMB) + \beta_3(HML) + e \quad \text{..... (3)}$$

Where,

R_i = Expected rate of return
r_f = Risk-free rate
β = Factor's coefficient (sensitivity)
(rm – rf) = Market risk premium
SMB (Small Minus Big) = *Historic excess returns of small-cap companies over large-cap companies*
HML (High Minus Low) = *Historic excess returns of value stocks (high book-to-price ratio) over growth stocks (low book-to-price ratio)*

Event Window: This refers to the number of days for which the abnormal returns would be calculated. This is usually taken as 10/20 days prior to the event to 10/20 days post the event. The *abnormal returns* are calculated by taking the difference between the actual return and the expected/predicted return.

Thereafter, a Cumulative Abnormal Return is found and plotted for the event window period.
In this study, the event is the declaration of demonetisation of the Indian currency and the assessment is done over its impact on all the industries aforementioned.

Central Hypothesis

We tested the impact of demonetisation on various industries to find the diversity in the response to the demonetisation announcement. The event demonetisation was a shock to the economy and markets being semi-strong form efficient responded to the new surprise. We ran a short-run event study methodology to test our hypothesis.

The Null hypothesis (H0) is that there is no impact of the event on the returns of the indices i.e. no *abnormal returns* were observed during the event window and the alternate hypothesis (Ha) is that there is an impact of the event on the returns of the indices.

This can be written as,
H0: No abnormal returns within the event window
Ha: *Abnormal returns* within the event window
We tested the hypothesis by plotting cumulative abnormal returns against the days relative to the event on a Cartesian plane.

Data

The data primarily consists of the daily returns of each of the BSE indices taken for a period of 423 days i.e. from 2nd November 2015 to 28th December 2016 from the BSE India website.
The following indices are covered under this study:

1. S&P BSE Basic Materials: The S&P BSE Basic Materials is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the basic materials sector.
2. S&P BSE Consumer Discretionary Goods and Services: The S&P BSE Consumer Discretionary Goods & Services is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the consumer discretionary goods & services sector.
3. S&P BSE Energy: The S&P BSE Energy is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the energy sector.
4. S&P BSE Fast Moving Consumer Goods: The S&P BSE Fast Moving Consumer Goods is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the fast moving consumer goods sector.
5. S&P BSE Finance: The S&P BSE Finance is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the finance sector.
6. S&P BSE Healthcare: The S&P BSE Healthcare is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the healthcare sector.

7. S&P BSE Industrials: The S&P BSE Industrials is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the industrials sector.
8. S&P BSE Information Technology: The S&P BSE Information Technology is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the information technology sector.
9. S&P BSE Telecom: The S&P BSE Telecom is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the telecom sector.
10. S&P BSE Utilities: The S&P BSE Utilities is designed to provide investors with a benchmark reflecting companies included in the S&P BSE AllCap that are classified as members of the utilities sector.
11. S&P BSE Auto: The S&P BSE Auto index comprises constituents of the S&P BSE 500 that are classified as members of the transportation equipment sector as defined by the BSE industry classification system.
12. S&P BSE Bankex: The S&P BSE Bankex index comprises constituents of the S&P BSE 500 that are classified as members of the banking sector as defined by the BSE industry classification system.
13. S&P BSE Capital Goods: The S&P BSE Capital Goods index comprises constituents of the S&P BSE 500 that are classified as members of the capital goods sector as defined by the BSE industry classification system.
14. S&P BSE Consumer Durables: The S&P BSE Consumer Durables index comprises constituents of the S&P BSE 500 that are classified as members of the consumer durables sector as defined by the BSE industry classification system.
15. S&P BSE Metal: The S&P BSE Metal index comprises constituents of the S&P BSE 500 that are classified as members of the metal, metal products and mining sectors as defined by the BSE industry classification system.
16. S&P BSE Oil & Gas: The S&P BSE Oil & Gas index comprises constituents of the S&P BSE 500 that are classified as members of the oil & gas sector as defined by the BSE industry classification system.
17. S&P BSE Power: The S&P BSE Power index comprises constituents of the S&P BSE 500 that are classified as members of the heavy electrical equipment & electric utilities sector as defined by the BSE industry classification system.
18. S&P BSE Realty: The S&P BSE Realty index comprises constituents of the S&P BSE 500 that are classified as members of the real estate sector as defined by the BSE industry classification system.
19. S&P BSE Teck: The S&P BSE TECk index comprises constituents of the S&P BSE 500 that are classified as members of the media & publishing, information technology & telecommunications sectors as defined by the BSE industry classification system.

Empirical Results

The impact of Demonetisation on the 19 Indices is shown in Figure 1. Figure 1 shows that on average, there was a negative response to the announcement of demonetisation.[3] Table 1 provides the values of abnormal and cumulative abnormal returns for the event period (-20 to +20 days relative to the event) with event (0) being the announcement of demonetisation i.e. 8th November 2016.

Figure 1: Average Impact of demonetisation on all industries[4]

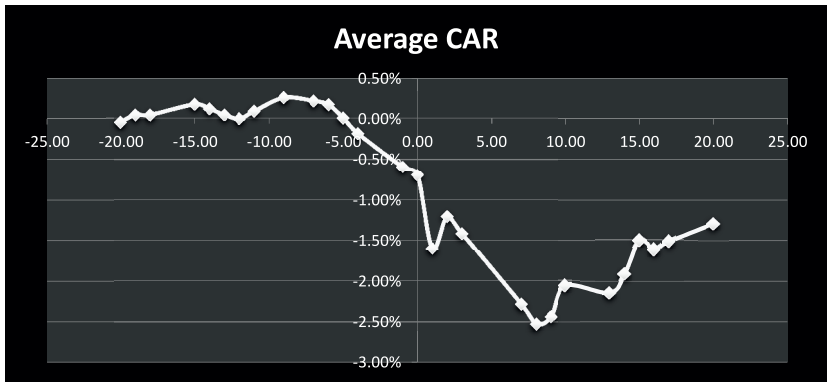

Figure1 plots the average cumulative abnormal returns for our sample data for 19 industry indices.

[3] *Robust checks are performed using different asset pricing models like market model, CAPM, Fama French 3 factor model for the calculation of expected returns.*

[4] *The average CAR is the Y-axis and days relative to the event are X-axis. Average CAR is the average of Cumulative abnormal returns across all industries (19 industry indices).*

Table 1: The Average Abnormal Returns and Average Cumulative Abnormal Returns for all 19 industries[5]

Days Relative to the Event	Average Abnormal Returns (AAR)	Average Cumulative Abnormal Returns (ACAR)
-20.00	-0.05%	-0.05%
-19.00	0.09%	0.04%
-18.00	0.00%	0.04%
-15.00	0.13%	0.17%
-14.00	-0.05%	0.11%
-13.00	-0.07%	0.04%
-12.00	-0.05%	0.00%
-11.00	0.09%	0.08%
-9.00	0.17%	0.25%
-7.00	-0.04%	0.21%
-6.00	-0.04%	0.17%
-5.00	-0.16%	0.00%
-4.00	-0.19%	-0.19%
-1.00	-0.41%	-0.59%
0.00	-0.10%	-0.69%
1.00	-0.91%	-1.60%
2.00	0.40%	-1.21%
3.00	-0.21%	-1.42%
7.00	-0.87%	-2.29%
8.00	-0.24%	-2.52%
9.00	0.09%	-2.44%
10.00	0.38%	-2.05%
13.00	-0.09%	-2.14%
14.00	0.23%	-1.91%
15.00	0.41%	-1.50%
16.00	-0.11%	-1.61%
17.00	0.10%	-1.51%
20.00	0.22%	-1.29%

[5] *The Tables of abnormal and cumulative abnormal returns for each industry index are available with authors and can be contacted for the same.*

Table1 has calculated values of abnormal returns and cumulative abnormal returns for our sample of 19 industry indices.

The average response was negative. However, we find that there exists diversity in the response to the demonetisation announcement. The impact of the event for each industry is provided in the results below.

BSE FMCG

Figure 2: Impact of demonetisation on Fast Moving Consumer group industry.[6]

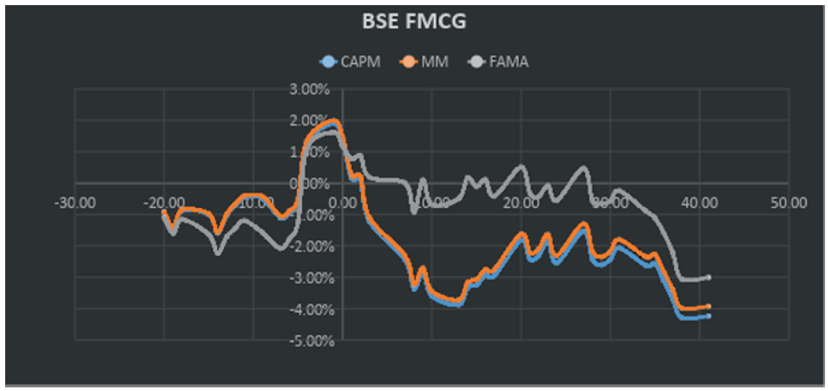

Figure 2 plots the cumulative abnormal returns during the event period and post-event period for our sample data for FMCG Industry index.

The FMCG daily abnormal returns fell by 1.18%, 0.04%, 1.32% and 1.23% on the days that followed 8th November 2016. Figure 2 shows that the Cumulative Abnormal Returns remained negative even a month after the event. The impact of the event and hence, the BSE Sensex, as we can see, was severe on the BSE FMCG Index.

BSE Basic Materials

Figure 3: Impact of demonetisation on Basic Materials industry.

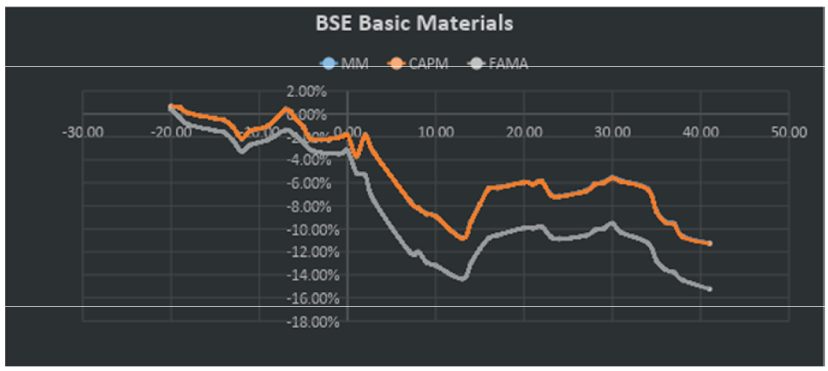

Figure 3 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Basic Materials Industry index

The Basic Materials daily abnormal returns fell by 1.81% on the day following the event. However, after going up by 1.83% the next day, it again took a free-fall of 1.55% and 4.11% in the following days. Figure 3 shows that the Cumulative Abnormal Returns remained highly negative in the following weeks. The impact of the event and hence, the BSE Sensex, was much more severe on the BSE Basic Materials Index.

[6] *All figures have Cumulative abnormal returns on the Y-axis and days relative to the event of demonetisation as X - axis*

BSE Consumer Discretionary

Figure 4: Impact of demonetisation on Consumer Discretionary industry

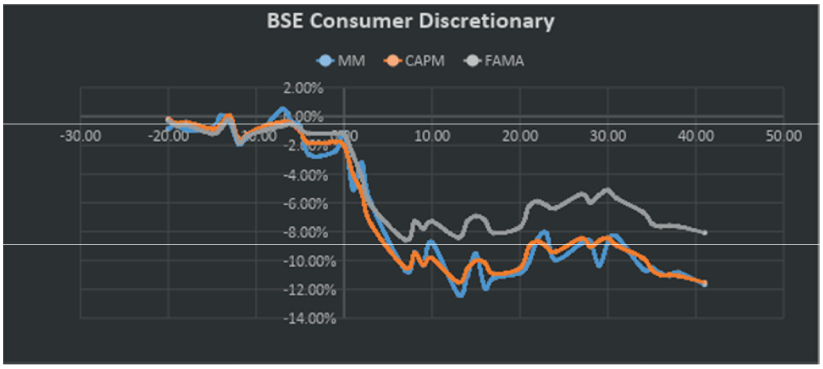

Figure 4 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Consumer Discretionary Industry index

The Consumer Discretionary daily abnormal returns fell 3.92% on the day following the event. However, after going up by 1.83%, it too took a free fall of 2.73% and 4.75% on the following days. Figure 4 shows that Cumulative Abnormal Returns remained highly negative at around -10% for the next month. The impact of the event and the BSE Sensex was severe on the BSE Consumer Discretionary Index.

BSE Energy

Figure 5: Impact of demonetisation on Energy industry

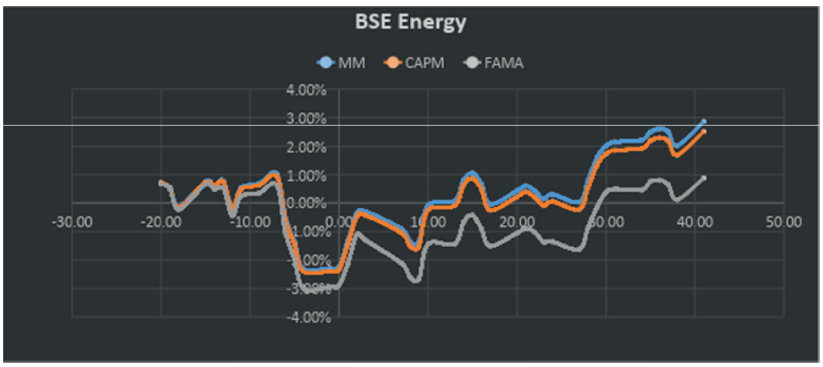

Figure 5 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Energy Industry index

The Energy daily abnormal returns remained positive on the days following the event. The daily abnormal returns were 0.89%, 0.96% and 0.06% on the days that followed the event. Figure 5 shows that Cumulative Abnormal Returns remained slightly positive for the next month. The impact of the event and the BSE Sensex was not seen as severe on the BSE Energy Index.

BSE Health Care

Figure 6: Impact of demonetisation on Healthcare industry

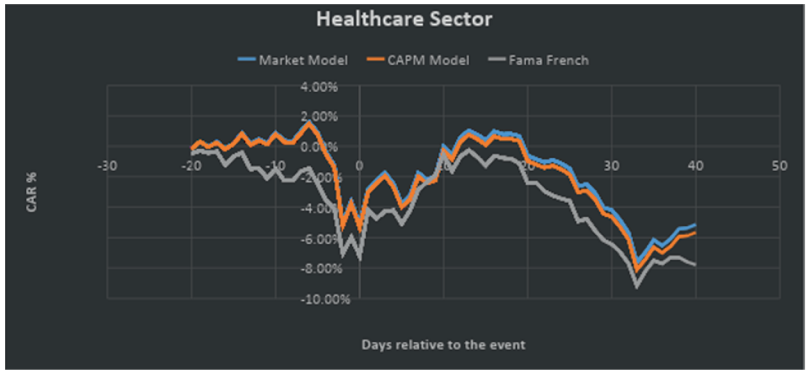

Figure 6 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Healthcare Industry index

BSE Finance

Figure 7: Impact of demonetisation on Finance industry

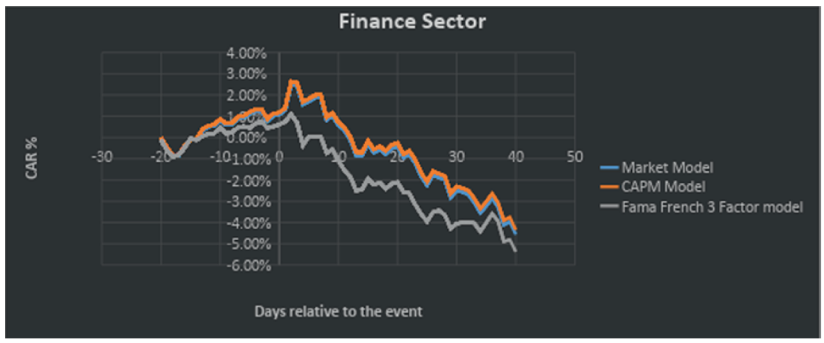

Figure 7 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Finance Industry index

The Finance daily abnormal returns remained positive on the days following the event. The daily abnormal returns were 0.22% and 1.22% on the days that followed the event. However, it became negative for the next few days and the cycle continued. Figure 7 shows that Cumulative Abnormal Returns remained slightly positive for the next few days, but remained negative for the next month. The impact of the event and the BSE Sensex was not seen as severe on the BSE Finance Index.

BSE IT

Figure 8: Impact of demonetisation on IT industry

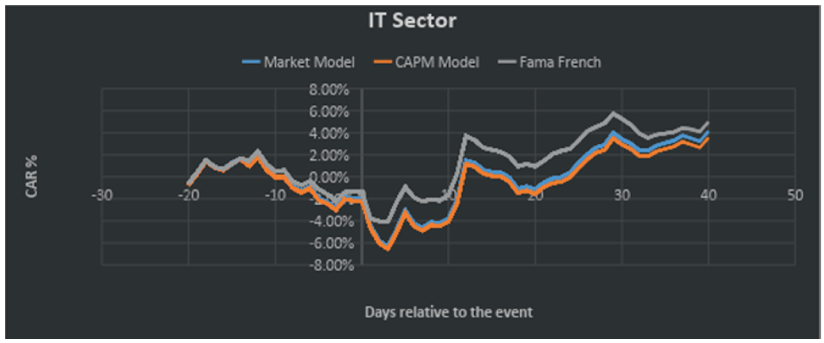

Figure 8 plots the cumulative abnormal returns during the event period and post-event period for our sample data for IT Industry index

The IT daily abnormal returns fell by 2.5%, 1.33% and 0.53% on the days that followed 8th November, 2016. Figure 8 shows that the Cumulative Abnormal Returns remained negative for a few days, but became and remained positive for a month after the event. The impact of the event and hence, the BSE Sensex, as we can see, was not severe on the BSE IT Index.

BSE Industrials

Figure 9: Impact of demonetisation on Industrials industry

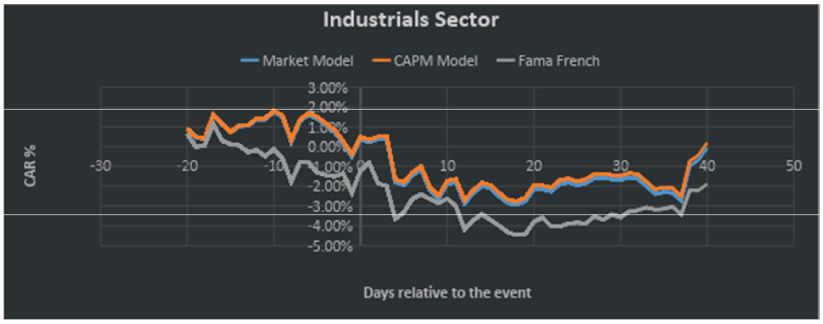

Figure 9 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Industrials Industry index

The Industrials daily abnormal returns were not affected much by the event as it fell by 0.16% and then went up 0.16% and 0.04%. Figure 9 shows that the Cumulative Abnormal Returns remained slightly negative at around -2% for around 15 days, but later recovered. The impact of the event and hence, the BSE Sensex, as we can see, was not much severe on the BSE Industrials Index.

BSE Telecom

Figure 10: Impact of demonetisation on Telecom industry

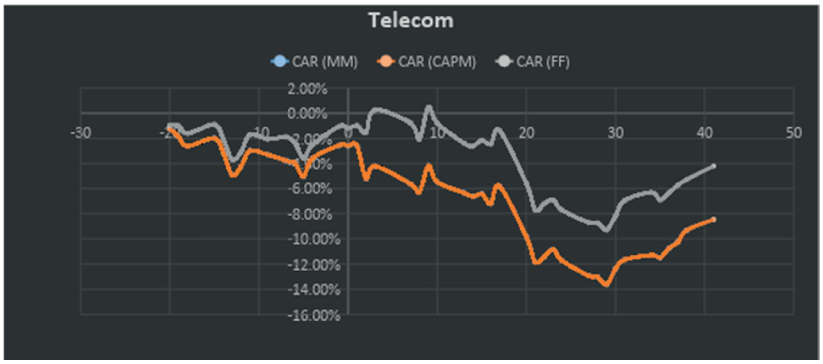

Figure 10 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Telecom Industry index

The Telecom daily abnormal returns went down by 2.6% and 1.43% on the days that followed the event. Figure 10 shows that the Cumulative Abnormal Returns also remained negative as the abnormal returns only fell during the coming weeks. The impact of the event and hence, the BSE Sensex, as we can see, was severe on the BSE Telecom Index.

BSE BANKEX

Figure 11: Impact of demonetisation on Banking industry

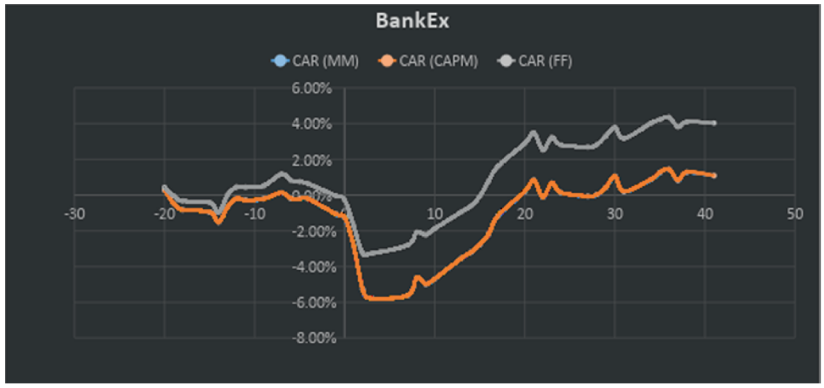

Figure 11 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Banking Industry index

The BANKEX daily abnormal returns went down for the first few days by 1.61% and 2.64% after the event, but eventually it picked up pace and gave positive abnormal returns. Figure 11 showsthat the Cumulative Abnormal Returns also went down for the first few days, but then became positive. The impact of the event and hence, the BSE Sensex, as we can see, was at first severe, but later not severe on the BSE BANKEX Index.

BSE Auto

Figure 12: Impact of demonetisation on Automobile industry

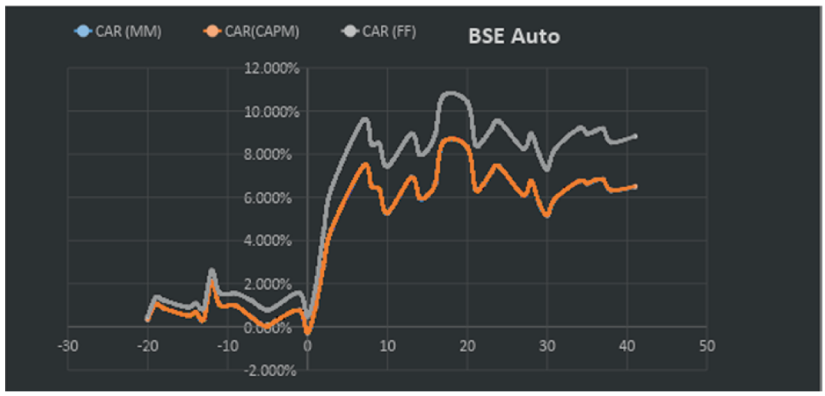

Figure 12 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Automobile Industry index

The Auto daily abnormal returns following the event were 0.345% and 0.74%. The returns more or less stood positive. Figure 12 shows that the Cumulative Abnormal Returns also stood positive for the Auto Industry. The impact of the event and hence, the BSE Sensex on BSE Auto was not at all that severe as the sector continued to grow despite the short term cash crunch in the market.

BSE Utilities

Figure 13: Impact of demonetisation on Utilities industry

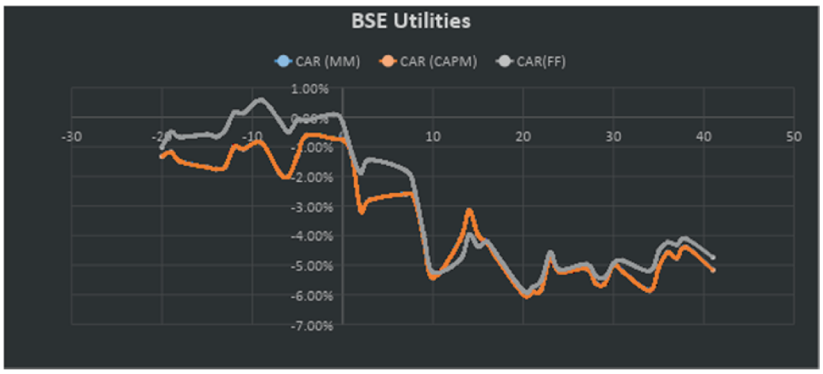

Figure 13 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Utilities Industry index

The Utilities daily abnormal returns fell by 0.5% and 1.9% on the days that followed the event. After a few days of positive abnormal returns, it again went down by 1% for a couple of days. Figure 13 shows that the Cumulative Abnormal Returns also went down and remained negative for the next month. The impact of the event and hence, the BSE Sensex, as we can see, was severe on the BSE Utilities Index.

BSE Power

Figure 14: Impact of demonetisation on Power industry

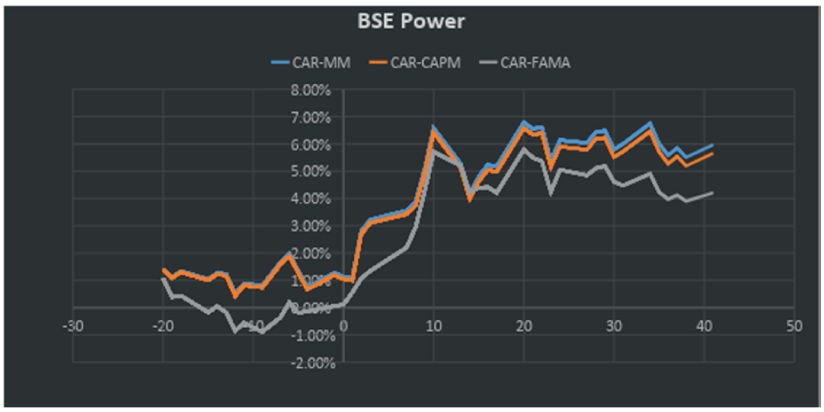

Figure 14 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Power Industry index

The Power daily abnormal returns were positive on the days that followed the event. Figure 14 shows that the Cumulative Abnormal Returns also became positive. The impact of the event and hence, the BSE Sensex, as we can see, was not severe on the BSE Power Index.

BSE Teck

Figure 15: Impact of demonetisation on Technology, Media and Telecom industry

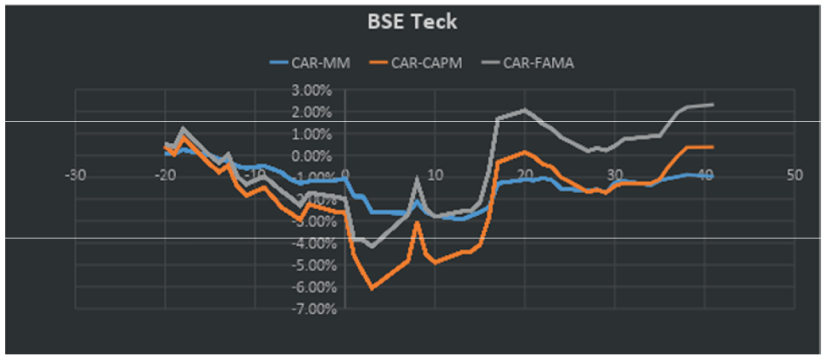

Figure 15 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Technology, Media and Telecom Industry index

The Teck daily *abnormal returns* went down for the first few days by 0.83%, 0.02% and 0.72% after the event, but eventually it picked up pace and gave positive *abnormal returns*. Figure 15 shows that the Cumulative *Abnormal Returns* also went down for the first few days and then became positive. The impact of the event and hence, the BSE Sensex, as we can see, was not severe on the BSE Teck Index.

BSE Realty

Figure 16: Impact of demonetisation on Realty industry

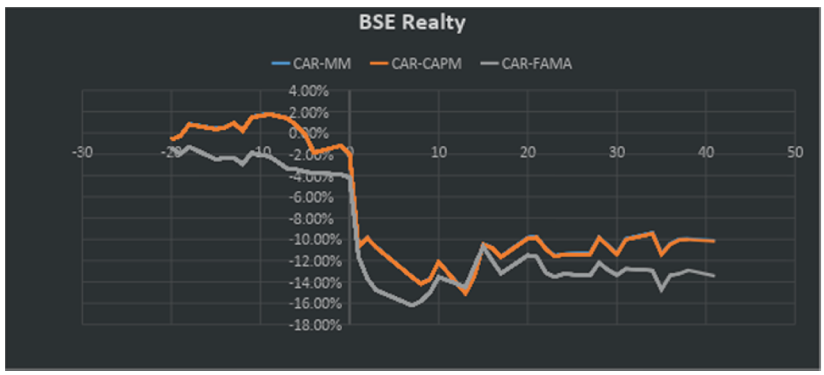

Figure 16 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Realty Industry index

The Realty daily *abnormal returns* went down sharply by 8.72% on the following day. It remained negative for the coming month. Figure 16 shows that the Cumulative *Abnormal Returns* also fell sharply and remained negative at around 14%. The impact of the event and hence, the BSE Sensex, as we can see, was severe on the BSE Realty Index.

BSE Metals

Figure 17: Impact of demonetisation on Metals industry

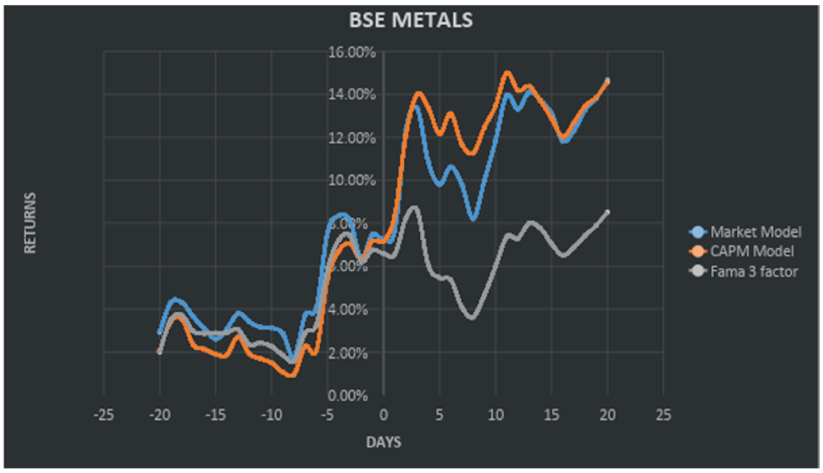

Figure 17 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Metals Industry index

The Metals daily *abnormal returns* were positive at 0.41%, 4.69% and 1% on the days that followed the event. After turning negative for a few days after the positive run, it again gave positive returns and hence, Figure 17 shows that the Cumulative *Abnormal Returns* remained highly positive for the Metals Sector. The impact of the event and hence, the BSE Sensex, as we can see, was not at all severe on the BSE Metals Index.

BSE Consumer Durables

Figure 18: Impact of demonetisation on Consumer Durables Industry

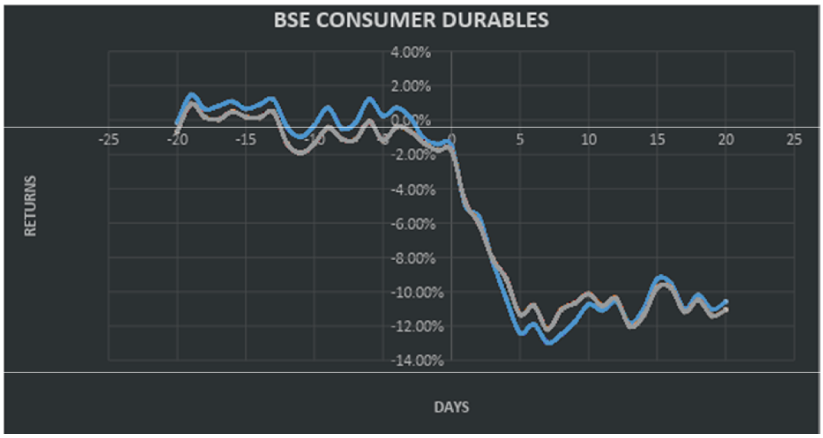

Figure 18 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Consumer Durables Industry index

The Consumer Durables daily *abnormal returns* went down sharply by 2.5%, 2.25% and 2% on the days that followed the event. In the following month, it remained negative and as a result, the Cumulative *Abnormal Returns* as shown in Figure 18 remained highly negative at around -13%. The impact of the event and hence, the BSE Sensex, as we can see, was severe on the BSE Consumer Durables Index.

BSE Oil and Gas

Figure 19: Impact of demonetisation on Oil and Gas Industry

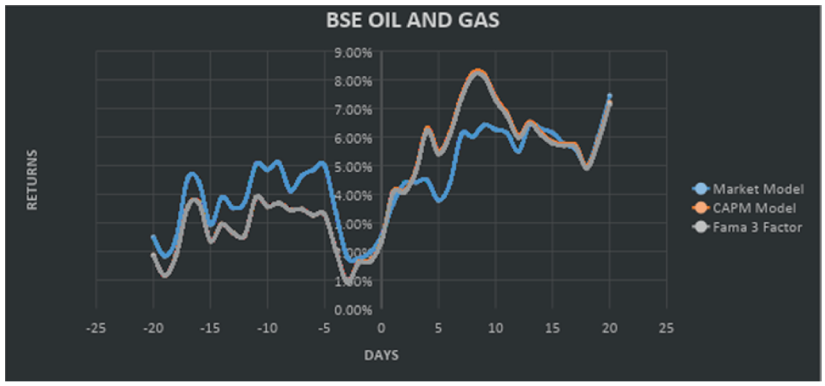

Figure 19 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Oil & Gas Industry index

The Oil and Gas daily *abnormal returns* were positive at 1.12%, 0.73% and 0.03% on the days that followed the event. It hardly gave negative *abnormal returns* and hence, the Cumulative *Abnormal Returns* as shown in Figure 19 remained highly positive for the Oil and Gas Sector. The impact of the event and hence, the BSE Sensex, as we can see, was not at all severe on the BSE Oil and Gas Index.

BSE Capital Goods

Figure 20: Impact of demonetisation on Capital Goods Industry

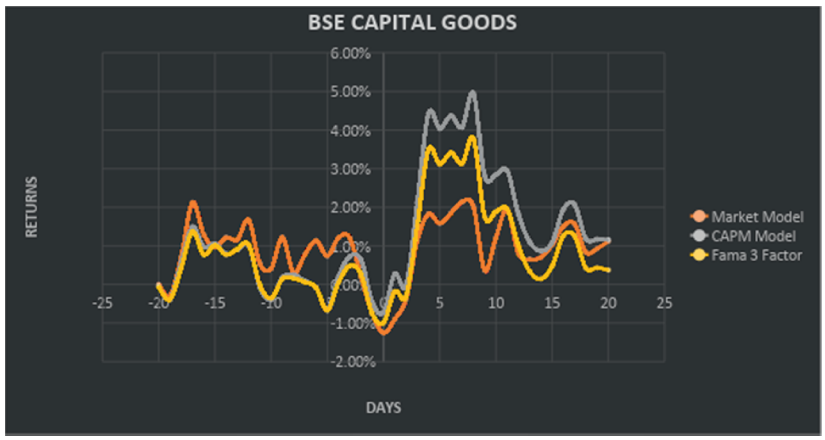

Figure 20 plots the cumulative abnormal returns during the event period and post-event period for our sample data for Capital Goods Industry index

The Capital Goods daily *abnormal returns* were positive at 0.36%, 0.52% and 1.51% on the days that followed the event. It occasionally gave negative *abnormal returns* and hence, the Cumulative *Abnormal Returns* as shown in Figure 20 remained moderately positive for the Capital Goods Sector. The impact of the event and hence, the BSE Sensex, as we can see, was not at all severe on the BSE Capital Goods Index.

Conclusion

The objective of the paper was to study the impact of demonetisation on various indices using *Event Study* Methodology. The results from *event study* methodology, using a 40-day event window indicate that various industries show significant negative cumulative *abnormal returns* (CARs) such as FMCG, Material, Telecom, Utilities, Consumer Discretionary, Realty and Consumer Durables sector. However, there were exceptions such as Energy, Health Care, Auto, Power, Oil and Gas, and Capital Goods industry which remained positive on the days following the event. There were some fluctuations throughout the month in the indices of industries such as Finance, Banking, Technology and Metals industry. Overall, the results suggest that in the short run, announcement of demonetisation had on average, a negative impact across various sectors.

This study can be helpful for emerging economies to predict the probable effect of demonetisation on their economy. They can be well prepared for such exigencies in case they follow a semi-strong market efficiency model, i.e. the same as that of the Indian market. The study also leads us to the fact that the "shocks" produced by demonetisation are short-term in nature and investors need not resort to any panic buy or sell decisions. The market gradually settles down in the long term.

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