Market reaction for event demonetization: A case study for India

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Abstract:
The research hypothesis for this empirical study using event study model is that the announcement of demonetization will result in immediate response in the market for the stock prices of cement manufacturing companies. Based on this hypothesis the event study is conducted to study whether there was abnormal return on cement manufacturing companies' scripts immediately after the announcement of demonetization. Moreover, 15 major players in the industry based on their market capitalisation are selected as sample for the study. Three famous models, Market model, Market adjusted model and Mean adjusted model are used in the study. Average return for the selected companies over the last 6 months before the announcement of demonetisation is computed using market model. Coefficients alpha (α) and beta (β) are measured using this market model. Further actual return for event window period are calculated, using market model, market adjusted model and mean return model. Further Cumulative abnormal return and Mean cumulative abnormal return are also calculated. To test the significance of our results, in this study we have used one sample T test.

Keywords: *Demonetization; Event Study; Liquidity; Cement Industry; Negative Sentiment; CAR; Banking Sector.*

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1. Introduction

Gresham's Law argued that "bad money drives out good". Supposing the economy which is into discussion, which is running with two forms of commodity money in circulation, which are accepted by the monetary authorities as having similar face value, the more valuable commodity will gradually disappear from circulation - the bad drives out the good as time passes. The decision of demonetization by the central government was to drive away the bad money which affected the stock market accordingly. Indian stock market presumed to be efficient. The researchers across globe had an eye on Indian markets as to how they will react to the demonetization. In literature both the terms demonetization and demonetisation are used in this regards. Prima facie the impact of demonetization revealed a "force against" the development of few of the industries in India including cement manufacturing industry. Kushwaha et al. (2018) defined the demonetisation process as „withdrawing the legal tender rights of any denomination of currency". Moreover, Lahiri (2020) argued that demonetization represents a very important instrument combating crimes, tax evasion, and activities in the underground economy. On the other hand, Batool et al. (2020) pointed out that the sharing economy (SE) is a particular form of the new economic model based on the peer-to-peer exchange of goods and services in order to increase the efficiency of underutilized resources.

The majority of transactions in the construction industry use to happen on cash basis rather than through banking or digital payment system. All the investors in the cement industry were aware of this and majority percentages of the players in the sector were unorganized. The cement industry after the demonetization drastically shifted to negative growth as the non cash transactions gained momentum. Market efficiency during this event of demonetization was a keen factor to be observed. As early mentioned informed investors' reaction to this event, both, pre and post announcement is a key to check the efficiency. The paper tries to sketch out the impact of demonetization on cement manufacturing companies in India using the Event study model and the efficiency of Indian stock market. The event study is a methodology followed by researchers to find out the impact of a particular event on the securities market. In the study the event which is in consideration will be independent variable where as the market price of the stock is dependent variable. It studies the abnormal returns of the stock over a period of time, in both extremes, positive as well as negative abnormal returns. The reflection of such abnormal returns is immediate in efficient market. From the study the researcher can infer the significance of said event.

2. Literature review

As previous research, Iqbal & Mallikarjunappa (2010) have studied the adjustment of stock prices for the earnings information in semi-strong form of efficient market. The event study took quarterly earnings announcement as event day and a window of 30 days prior to and after the event was taken for study i.e. total 61 trading days for 146 companies. The study revealed that there is no significant difference between the number of positive and negative AARs for the event window. The researchers concluded that the stock price response delayed which contradicts the semi strong form of market hypothesis. Joseph et al. (2017) studied price movement and efficiency of the market taking 32 companies listed in Bahrain Bourse taking the annual earnings announcement as an event. The study was intended to test whether the semi-strong form of efficient market hypothesis holds in the Bahrain stock market. The

conclusion was that the Bahrain stock market reactions to earnings information was not a quick reaction, it was not instantaneous. Spulbar & Birau (2018) investigated the weak-form efficiency in case of certain emerging stock markets such as: Romania, India, Poland and Hungary for the sample period from January 2000 to July 2018. The empirical results revealed that efficient market hypothesis, including weak-form efficiency was invalidated by statistical tests.

Bansal (2019) investigated the implication of the demonetization on Indian banking sector and concluded that demonetization has made a significant contribution to improving liquidity, but also profitability in the case of commercial banks in India. Spulbar & Birau (2019a) suggested that the progress of the global economy is related to the foundation of a profitable and competitive banking system. Kushwaha et al. (2018) concluded that the demonetization process is a firm measure implemented by government authorities in India to limit the impact of black money and implicitly the expansion of parallel economy. Spulbar & Birau (2019b) highlighted relevant issues regarding the impact of cybercrime on the banking sector in ASEAN and concluded that considering the current global challenges, traditional cyber security measures are inefficient in providing advanced data protection and online information privacy.

Berezinets & Bulatova (2015) the study conducted on BSE actively traded shares. The stock prices of actively traded shares were taken for a period ranging from 2010 to 2012. The three kinds of announcement s were studied viz. positive announcements, negative announcements and neutral announcements and the researchers' finding is that the stock market is so effective that positive announcements resulted in positive movement of shares and vice versa. The investor's perception for a negative announcement is negative. Mehta et al. (2014) found that the announcements of stock dividend induce an increase in the wealth of shareholders. The researchers used event study technique to find the abnormal fluctuations in the stock prices. The observation was that there is a consistent pattern of positive abnormal returns during pre event window and a negative pattern post announcement window. The findings of the study also show that the announcement of stock dividends in India reduces viability of returns in the short run as well as long run. This lends/facilitates price stability in the stock market. The reasons for the findings pertaining to liquidity and risk can be an area of future research work. Spulbar et al. (2020) revealed that financial integration differs in the case of developed markets compared to emerging markets such as India, while global financial liberalization expresses a much weaker impact on emerging economies.

Hawaldar & Mallikarjunappa (2010) studied Sensex 30 stocks from BSE. A +21 and -21 trading day's data is analysed using event study method. The result of the study indicates that average abnormal return occurs throughout the sample period. The stock price adjustments to quarterly earnings announcements are delayed and it contradicted semi strong form of efficient market. The study can be taken to next level considering the transaction costs. Hannon (2016) studied the event study methodology is used to examine if cash dividend announcements affect the stock prices of companies listed on the Palestine Exchange. 62 events announced from 1/1/2006 to 31/12/2015 were studied. Statistical tests were used to examine if the cumulative abnormal return is statistically significant around the announcement day, namely, 10 days before and 10 days after the event day. The output of this study was that statistically significant differences exist between cumulative abnormal returns and zero. Statistically significant negative relationship exists between dividend announcements and abnormal returns.

Dasilas & Leventis (2011) conducted a research study entitled "Stock market reaction to dividend announcements: Evidence from the Greek stock market". This research paper examined the market reaction to cash dividend announcements for the period starting from 2000 to 2004 collecting sample data from the Athens Stock Exchange (ASE). The paper examines both the stock price and trading volume response to announcements of dividends. Using the market model abnormal returns were calculated. The trading volume behaviour displayed a positive trend. The study done gives a scope for further study for a longer period of duration for the said companies.Dsouza & Mallikarjunappa (2015) used daily data to observe abnormal returns. BSE- 500 Index companies were taken into considerations. The paper investigated the information content in security prices on the release of quarterly earnings announcement by using event study based onthe research methodology provided by Cohen et al. (1983). Based on overall results, the researcher's observation was that there is a scope for abnormal profits for the investors since the market fail to incorporate the new information in security prices. The study concluded that the Indian stock market fails to perceive information content in security prices when they are publicly available.

Mallikarjunappa & Manjinatha (2009) examined the stock price reactions to dividends, one of the publicly available information, to test the semi-strong form of EMH. The study is based on the dividend announcements of 149 companies which are part of the BSE-200 Index that announced dividends for the financial year 2002. The data on dividend declaration were obtained from the BSE websites, NSE website and the Centre for Monitoring Indian Economy (CMIE). The analysis also shows that the number of days on which positive returns are earned is more than the number of days on which negative returns are recorded. The trend of positive returns is more pronounced after the event-day. The behavior of the CAAR before the event-day exhibits some of the features of efficient market which are not sustained after the event-day. Zulfiqar et al. (2020) consider that a country governance of a high quality guarantee an effective implementation of the legal framework which contributes to improving stock market performance and investor protection.

Kumar (2013) connects the all dimensions like efficient market hypothesis, rationality in the market and thereby empirically testing the impact of information flow and information processing ability of the market using an Event Study approach. The findings suggest that inflation, oil prices, money supply, gold prices have a significant impact on the volatility of stock market. The amount of variation shown by all of them taken together is low as observed in the combined regression equation. Thus, it leads to an opportunity for future research on what other factor accounts for the stock volatility apart from these macro-economic factors. Shah and Arora (2014) examined a sample of M&A announcements in the Asia-Pacific region during the time period of May 2013 – September 2013 to identify the post-facto effect of M&A announcements on the stock prices of the target and the bidding firms. Nbm (2017) suggested that the real estate property sales are likely to resume to normal condition. The demonetization has hit the transactions of real estate as most of the financial transactions were on cash. The sucking of top denominated currency notes from the economy badly hit the supply of money in the sector. The black money which was highly transacted in real estate got stuck and the firms in the sector felt the pinch. Kumar (2017)demonetization did hurt the sector for a while, The Real Estate (Regulation and Development) Act, 2016 (RERA) & Goods and Services Tax (GST) soon gave strength to function again in an efficient way. The

demonetization was expected to have impact on primary sales but contrary it has hit the secondary market as the benami and black money got curbed during the process of demonetization.

According to the World Bank report after demonetization the rank of India in "ease of doing business" rose from 130 to 100, which means the business didn't collapse much but gave the way for legal business transactions and hit the illegal businesses. According to official statistics, the impact of the demonetization can be seen with a 40%-plus drop in enquiries and sales across key markets of Mumbai, Delhi, Bengaluru and Pune. The big cut in rates will help in bringing the sector into a shape as well as tax concessions on home purchases. The cement industry after the demonetization drastically shifted to negative growth as the non cash transactions gained momentum. In the month of November, 2017 the growth gathered momentum and jumped to 18.4 percent from contraction of 1.3 percent in October and now it's moving at 18 percent mark. Bangur (2017) cement makers have survived the demonetization shock and recovered quickly. Sales were definitely low by 10 to 11 percent. The typical growth rate of cement sector is 5 to 6 percent yearly. The article states that North and Central regions are most impacted due to demonetization while South region is least impacted (because of fewer cash transactions in South vs. North/Central) (Karvy Stock Broking 13 January report) According to Edelweiss Capital's survey of the domestic cement sector, companies were positively surprised to see a lower-than-expected contraction in demand after the demonetization.

The impact on steel and cement industry is not huge when compare to other industries like consumer durables industry. As India is an adaptive economy and without cash in the economy there will be a long term impact on demand. Kumar (2012) argued that the event study is a methodology followed by researchers to find out the impact of a particular event on the securities market. In the study the event which is in consideration will be independent variable where as the market price of the stock is dependent variable. It studies the abnormal returns of the stock over a period of time, in both extremes, positive as well as negative abnormal returns. The reflection of such abnormal returns is immediately observed in efficient market so from the study the researcher can infer the significance of said event (Sitthipongpanich, 2011). This paper deals with event study methodology and theoretical back ground of event study. T testis the post used statistical test in event study researches. Few authors also have used sign test and run test from nonparametric test.

3. Objective of the study and research hypotheses

The objective of this study is to check whether cement industry equity investors in India have responded either positively or negatively for event demonetization. The specific hypotheses of the study are

H_0: The mean of the MCAR is equal to Zero

H_1: The mean of the MCAR using Market model is not equal to zero

H_2: The mean of the MCAR using Market adjusted model is not equal to zero

H_3: The mean of the MCAR using Mean adjusted model is not equal to zero.

4. Data and research methodology

Data for the study are taken from official website of Bombay Stock Exchange. Top 15 listed companies operating in the cement industry are taken as sample for the study; they are ACC cement, Ultratech cement, Shree cement, Ambuja cement, Ramco

cement, Heidelberg cement, Birla cement, JK Laxmi cement, Rain Industries cement, OCL cement, India cement, JK cement, Dalmia cement, Orient cement and KCP cement. These companies selection was made based on their market capitalisation. Daily closing prices from 1st April, 2016 till 30th November 2016 are downloaded from BSE website. On the other hand daily closing of Sensex is also downloaded from BSE website.Using daily closing of selected cement company stock prices, we have calculated daily return for each stock and Sensex. Normal return calculation equation is used to compute the daily return. $\left(\left(p_1 - p_0 \div p_0 \right) * 100 \right.$

Where p_1= Today's closing

p_0= Yesterday'sclosing

Further using linear regression model, we have found slope (β and Intercept (α for each stocks return. Returns of stocks are taken as dependent variable (Y) and returns of Sensex are taken as independent variable. These slope and intercepts of selected 15 stocks are the base for one of the model we have used to find abnormal return. 3 famous models are used in this paper to find out abnormal return, they are.

- Market model
- Market adjusted return model
- Mean return model.

Market model is the one where slope and intercept are used to calculate the expected return during for each day event window. The equation used to find the normal return is $Y_{t=\alpha+\beta}$)

Where Y_t = Expected return of stock for period t

α= Intercept, it is the value of dependent variablewhen value of independent variable is zero.

β= Slope, coefficient between dependent variable and independent variable.

X_t= Expected return of independent variable that is Sensex

Difference between actual return (R_i) and expected return (Y_t) is treated as abnormal return

So abnormal return $AR_t = R_i - Y_t$

Market adjusted model is the simple model where the actual return during the event window is calculated for both Sensex and individual companies. The return of Sensex is taken as benchmark return or expected return. So conceptually difference between these for each day during the event window is considered as abnormal return.

So abnormal return $AR_{t=R_t} - R_m$

Finally mean return model is also very simple model where expected return is the just mean of past 10 days return. Difference between expected mean return and actual return is the abnormal return. Abnormal return $AR_{t=R_t} - E(R_i)$

Where R_i is the actual return and $E(R_i)$ is the expected mean return.

5. Empirical analysis and results

The following Table 1 shows the computed slope and intercepts values for all selected 15 companies stock return.

Table 1. Alpha (Intercept) and Beta (Slope) for selected companies return

Company	Ramco	Heidelberg	Birla	JK Laxmi	Rain Industries
Slope	0.78	1.23	0.82	0.54	0.68
Intercept	0.27	0.30	0.49	0.25	0.40
Company	OCL	India	JK Cement	Dalmia	Orient
Slope	0.01	1.64	0.55	0.94	0.74
Intercept	0.48	0.33	0.21	0.64	0.07
Company	KCP	Shree	ACC	Ambuja	Ultratech
Slope	0.67	0.69	0.87	1.02	0.85
Intercept	0.17	0.18	-0.01	-0.04	0.10

Source: www.bseindia.com

With the help of above computed values, we have computed the expected return for 15 selected companies for all the days during the event window. Finally difference between actual return and computed expected return gave us the abnormal return using market model. The same is given in the following Table. 2 for all selected cement manufacturing companies.

Table 2. AR, CAR and MCAR using Market model

Date	Ramco		Heidelberg		Birla		JK Laxmi		Rain Industries	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	-1.54	-1.54	1.48	1.48	0.93	0.93	-2.32	-2.32	-3.27	-3.27
03-11-2016	-1.23	-2.77	-4.90	-3.42	-1.55	-0.62	-0.76	-3.09	0.22	-3.05
04-11-2016	-0.43	-3.20	-0.07	-3.49	-1.97	-2.59	-2.52	-5.61	-5.38	-8.42
07-11-2016	-0.17	-3.37	-0.73	-4.22	-0.06	-2.65	-0.43	-6.04	-1.85	-10.28
08-11-2016	0.50	-2.88	-1.54	-5.76	-0.40	-3.05	-0.69	-6.73	-0.32	-10.60
09-11-2016	-2.12	-5.00	-1.42	-7.19	-1.40	-4.46	-4.91	-11.65	-0.26	-10.86
10-11-2016	0.35	-4.64	-3.30	-10.48	-2.06	-6.52	0.50	-11.14	4.79	-6.07
11-11-2016	-6.21	-10.85	-2.77	-13.25	2.04	-4.48	-6.42	-17.56	-2.95	-9.02
15-11-2016	-5.83	-16.68	-9.02	-22.27	-4.96	-9.44	-7.22	-24.78	-6.95	-15.97
MCAR		-5.66		-7.62		-3.66		-9.88		-8.61
Date	OCL		India		JK Cement		Dalmia		Orient	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	1.33	1.33	-1.73	-1.73	-1.70	-1.70	-0.99	-0.99	-1.12	-1.12
03-11-2016	-2.12	-0.80	-2.04	-3.77	-3.05	-4.74	-1.51	-2.49	-1.12	-2.25
04-11-2016	3.01	2.22	-1.90	-5.68	-2.66	-7.40	-1.66	-4.15	-1.50	-3.74
07-11-2016	-2.78	-0.56	1.20	-4.48	4.87	-2.53	-0.21	-4.36	-0.37	-4.12
08-11-2016	-2.03	-2.59	1.38	-3.10	0.43	-2.09	-0.65	-5.01	1.12	-2.99
09-11-2016	1.10	-1.49	-3.98	-7.08	-2.94	-5.03	-1.32	-6.34	1.50	-1.50
10-11-2016	-9.65	-11.14	-4.69	-11.77	-1.29	-6.33	0.95	-5.38	-7.78	-9.28
11-11-2016	-9.63	-20.77	-3.24	-15.01	-3.75	-10.07	-8.24	-13.63	-1.28	-10.56
15-11-2016	-0.13	-20.90	-7.56	-22.58	-4.58	-14.65	-11.79	-25.41	-3.83	-14.39
MCAR		-6.08		-8.36		-6.06		-7.53		-5.55
Date	KCP		Shree		ACC		Ambuja		Ultratech	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	-2.86	-2.86	-0.70	-0.70	0.04	0.04	-0.24	-0.24	-1.06	-1.06
03-11-2016	-2.86	-5.73	-0.70	-1.40	0.04	0.08	-0.24	-0.47	-1.06	-2.11
04-11-2016	-3.35	-9.07	4.46	3.06	-0.67	-0.59	-0.35	-0.82	-1.04	-3.15
07-11-2016	-0.48	-9.55	5.16	8.23	-0.71	-1.30	-0.11	-0.93	0.02	-3.13
08-11-2016	2.86	-6.69	0.70	8.93	-0.04	-1.35	0.24	-0.70	1.06	-2.07
09-11-2016	3.35	-3.35	-4.46	4.46	0.67	-0.67	0.35	-0.35	1.04	-1.04

10-11-2016	4.39	1.05	-4.34	0.12	-0.53	-1.20	-1.22	-1.57	0.64	-0.39
11-11-2016	-4.86	-3.81	-2.67	-2.56	-1.91	-3.11	-2.24	-3.81	-3.32	-3.71
15-11-2016	-8.05	-11.86	-4.92	-7.48	-2.03	-5.14	-2.33	-6.14	-5.83	-9.54
MCAR		-5.76		1.41		-1.47		-1.67		-2.91

Source: www.bseindia.co

In Table.2 AR is the abnormal return, CAR is the cumulative abnormal return and MCAR is the mean cumulative abnormal return. 8th November 2016 is the event day and event window is from 2nd November 2018 till 15th November 2016. We have taken event window of 9 days, that is $-t_4, -t_3, -t_2, -t_1$, 0, t_1, t_2, t_3, t_4. Specifically 4 days before the event day and 4 days after the event day.

We can see abnormal return for all the companies' stock return during 9 days of event window. From the Table it is evident that the quantum of abnormal return is high for most of the companies after the event. It is also clear that post event majority companies have given negative abnormal return; this is the indication of investor's negative perception about demonetization towards the performance of cement industry. Interestingly few companies have given positive abnormal return on the 1st and 2nd day after the event. This indicates the delay in understanding the impact of event on the performance of the company. Further the quantum of abnormal return is high in the case of low market capitalised companies. All the above discussed results strongly say that the event demonetization was not good news for cement industry investors.

Event study is with a basic assumption of efficient market. Many a times this assumption may not hold good. There for abnormal return might be because of normal variations in the market. So just referring abnormal return curve to comment on investor's response for an event is not enough. So we have introduced one more analysis that is cumulative abnormal return (CAR) to see the response of investors for event demonetization to the stock prices of cement manufacturing companies. For all the selected companies CAR is decreasing day by day, we can also observe from the Table that CAR was sTable with small variations till the event day. But post event the same is decreasing at very speed. This clearly indicates the negatives sentiment of investors for event demonetization. We have also introduces MCAR, that is mean cumulative abnormal return in the Table. Usual hypothesis is that MCAR is not equal to zero, that confirms the presence of abnormal return for the selected stocks. Even in our analysis we found MCAR not equal to zero for all selected companies stock prices. This again strengthens our hypothesis that abnormal return was there during the event window and that was because of negative sentiment of investors in the market. The next model we have brought in here is market adjusted model. The difference between actual return on selected cement companies stock and market return on daily basis is taken as abnormal return here. In Table 3 below, we have presented actual return, abnormal return (AR), cumulative abnormal return (CAR) for all selected cement manufacturing companies in India. Event was not directly cement industry specific, rather it is country or economy specific. So measuring difference between the returns on Sensex and individual companies make sense here using market adjusted model. If the quantum of difference is big, then it indicates impact of event is more relevant for the selected sector.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
MCARMM	15	-5.4820	2.72716	.70415

One-Sample Test					
	Test Value = 0				
				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
MCARMM	-7.785	14	.000	-5.48200	-6.9923	-3.9717

Figure 1. One sample T test for market model

Above tables show the result of one sample T test for market model. Our sample size was 15; mean cumulative abnormal return was taken as variable for test. As there was only one variable or sample, one sample T test statistic was used. The mean of MCAR for 15 companies using market model is -5.48. Further t value and $\wp$ value are -7.785 and 0.000. As $\wp$ value is less than 0.005 with 95% confidence level null has been rejected. The evidence to reject the null hypotheses was, the sample is not taken from that population where mean population is equal to zero. So the alternative Hypotheses H_1: The mean of the MCAR using Market model is not equal to zero is accepted.

Table 3: Ri, AR, CAR, MCAR using Market adjusted Model

Date	Ramco		Heidelberg		Birla		JK Laxmi		Rain Industries	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	-1.00	-1.00	1.50	1.50	1.63	1.63	-1.50	-1.50	-2.48	-2.48
03-11-2016	-0.88	-1.88	-4.69	-3.19	-1.00	0.62	-0.35	-1.85	0.73	-1.75
04-11-2016	-0.03	-1.91	0.10	-3.10	-1.38	-0.76	-2.01	-3.86	-4.80	-6.55
07-11-2016	1.48	-0.43	-0.28	-3.37	0.30	-0.45	-0.50	-4.36	-1.67	-8.23
08-11-2016	-0.42	-0.85	-1.14	-4.51	0.01	-0.45	-0.66	-5.02	-0.08	-8.31
09-11-2016	-0.29	-1.14	-1.41	-5.92	-0.70	-1.15	-4.10	-9.12	0.53	-7.78
10-11-2016	0.90	-0.24	-2.78	-8.69	-1.75	-2.90	0.31	-8.81	4.88	-2.90
11-11-2016	-3.07	-3.31	-3.05	-11.75	2.97	0.07	-5.00	-13.81	-1.75	-4.65
15-11-2016	-4.83	-8.13	-9.16	-20.90	-4.14	-4.07	-6.08	-19.90	-5.95	-10.60
MCAR		-2.10		-6.66		-0.83		-7.58		-5.92
Date	OCL		India		JK Cement		Dalmia		Orient	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	1.80	1.80	-3.46	-3.46	-2.17	-2.17	-1.53	-1.53	-1.98	-1.98
03-11-2016	-1.64	0.16	-2.29	-5.75	-3.03	-5.20	-1.20	-2.73	1.47	-0.52
04-11-2016	3.49	3.65	-2.51	-8.25	-2.76	-7.96	-1.56	-4.29	-1.85	-2.37
07-11-2016	-2.29	1.36	2.64	-5.61	5.46	-2.50	1.06	-3.23	0.59	-1.78
08-11-2016	-1.54	-0.18	2.51	-3.11	0.91	-1.58	0.43	-2.79	-0.29	-2.07
09-11-2016	1.58	1.39	-5.66	-8.77	-3.40	-4.98	-1.84	-4.64	-5.11	-7.18
10-11-2016	-9.16	-7.77	-2.76	-11.53	-0.54	-5.53	2.50	-2.13	-6.99	-14.17
11-11-2016	-9.16	-16.94	-7.09	-18.62	-4.92	-10.45	-9.99	-12.13	-3.09	-17.26
15-11-2016	0.33	-16.60	-10.38	-29.00	-5.42	-15.87	-12.96	-25.08	-5.18	-22.44
MCAR		-3.68		-10.45		-6.25		-6.51		-7.75
Date	KCP		Shree		ACC		Ambuja		Ultratech	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	-3.53	-3.53	-1.39	-1.39	-1.06	-1.06	-1.55	-1.55	-2.02	-2.02
03-11-2016	-2.30	-5.84	-2.25	-3.64	1.21	0.16	1.08	-0.47	0.32	-1.70
04-11-2016	-3.56	-9.39	4.25	0.61	-1.18	-1.02	-0.97	-1.44	-1.42	-3.12
07-11-2016	3.04	-6.35	-2.68	-2.08	-0.32	-1.34	0.33	-1.11	1.48	-1.65
08-11-2016	0.19	-6.16	4.01	1.94	1.16	-0.17	1.03	-0.07	1.26	-0.38
09-11-2016	-3.72	-9.88	-3.75	-1.81	-3.30	-3.47	-5.26	-5.34	-4.45	-4.84

10-11-2016	5.22	-4.66	-3.49	-5.30	0.31	-3.16	-0.26	-5.60	1.57	-3.27
11-11-2016	-6.39	-11.05	-4.25	-9.56	-4.13	-7.29	-4.88	-10.47	-5.38	-8.64
15-11-2016	-9.16	-20.21	-6.07	-15.62	-3.71	-11.00	-4.33	-14.80	-7.36	-16.00
MCAR		-8.56		-4.10		-3.15		-4.54		-4.63

Actual return was showing mixed response till the date of event, later the same is decreasing in a very speed rate. Except few selected companies all companies have given negative return for all the post event days. Demonetization is such an event, which has given impact for almost all the sectors in the economy. There for we could see the impact of this event on bench mark indices also like Sensex and Nifty. Still we can see huge gap between the negative returns on Sensex and selected individual companies stock returns. Even though the event was not industry specific (it is country specific), abnormal returns are not negligible. This gives clarity on negative sentiment of investors for the event demonetization. From Table 3 when we look at column 2 (AR) for each company it shows the same situation like in Table 2. That is the size of abnormal return was not very high till the event date, but post event the quantum of abnormal return is very high for many companies. Secondly even this case post event abnormal return of few companies was positive for one or two days. Even for the second model we have shown CAR, again there is no much difference in the pattern of CAR and MCAR. For any selected company MCAR is not equal to zero, this again supports our hypothesis that the presence of abnormal return post event day. It is also true that the sentiment of investors in the market was not positive for the event.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
MCARMAM	15	-5.5140	2.56625	.66260

One-Sample Test						
	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
MCARMAM	-8.322	14	.000	-5.51400	-6.9351	-4.0929

Figure 2. One sample T test for Market adjusted model

This one sample T test was made to test the significance of second hypothesis that is the mean of MCAR using market adjusted model is not equal to zero. Even here the mean of MCAR for 15 selected companies is negative that is -5.5140. SPSS output Table shows t value and μ value are -8.322 and 0.000. As the μ value is not more than 0.005, a null hypothesis is rejected. Alternatively real hypotheses, H_2: The mean of the MCAR using Market adjusted model is not equal to zero so is accepted.

Table: 4 AR, CAR, MCAR using Mean Return model

DATE	Ramco		Heidelberg		Birla		JK Laxmi		Rain Industries	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	-2.14	-2.14	-0.19	-0.19	-0.13	-0.13	-2.91	-2.91	-3.91	-3.91
03-11-2016	-0.77	-2.91	-5.30	-5.49	-1.95	-2.08	-0.68	-3.59	0.74	-3.17
04-11-2016	-0.18	-3.10	0.10	-5.38	-2.48	-4.56	-2.05	-5.64	-5.29	-8.46
07-11-2016	2.52	-0.58	0.79	-4.59	0.56	-4.00	0.83	-4.81	-0.51	-8.97
08-11-2016	0.16	-0.41	-0.30	-4.89	0.13	-3.88	0.58	-4.23	1.12	-7.85
09-11-2016	-1.29	-1.70	-2.22	-7.10	-2.35	-6.22	-4.62	-8.85	-0.13	-7.98
10-11-2016	2.12	0.41	-1.16	-8.26	-1.03	-7.26	2.29	-6.56	6.65	-1.34
11-11-2016	-5.63	-5.22	-4.68	-12.93	0.39	-6.86	-6.86	-13.42	-4.39	-5.73
15-11-2016	-6.27	-11.49	-9.41	-22.34	-5.79	-12.66	-6.38	-19.80	-7.55	-13.27
MCAR		-3.02		-7.91		-5.29		-7.76		-6.74
DATE	OCL		India		JK Cement		Dalmia		Orient	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	1.53	1.53	-3.70	-3.70	-2.03	-2.03	-2.28	-2.28	-1.43	-1.43
03-11-2016	-2.25	-0.72	-2.22	-5.92	-2.66	-4.69	-1.80	-4.09	2.10	0.67
04-11-2016	3.12	2.40	-2.18	-8.10	-2.28	-6.98	-2.06	-6.15	-1.41	-0.74
07-11-2016	-3.09	-0.70	3.09	-5.01	6.47	-0.50	0.73	-5.42	1.05	0.30
08-11-2016	-2.04	-2.74	2.82	-2.20	1.27	0.76	0.29	-5.13	0.07	0.38
09-11-2016	1.54	-1.20	-5.49	-7.68	-3.18	-2.41	-2.00	-7.13	-4.85	-4.47
10-11-2016	-9.30	-10.49	-2.16	-9.84	-0.07	-2.48	2.61	-4.52	-6.27	-10.74
11-11-2016	-8.29	-18.78	-6.33	-16.17	-4.38	-6.86	-10.07	-14.60	-2.16	-12.90
15-11-2016	2.25	-16.53	-8.74	-24.91	-4.19	-11.06	-11.88	-26.47	-3.44	-16.35
MCAR		-5.25		-9.28		-4.03		-8.42		-5.03
DATE	KCP		Shree		ACC		Ambuja		Ultratech	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR	AR	CAR
02-11-2016	-3.42	-3.42	-0.88	-0.88	-0.34	-0.34	-1.28	-1.28	-1.92	-1.92
03-11-2016	-1.88	-5.29	-1.77	-2.65	1.97	1.63	1.49	0.21	0.66	-1.27
04-11-2016	-2.64	-7.93	4.95	2.30	-0.52	1.11	-0.60	-0.39	-1.17	-2.44
07-11-2016	4.17	-3.77	-2.46	-0.16	0.15	1.25	0.61	0.22	1.80	-0.64
08-11-2016	1.09	-2.68	4.50	4.34	1.69	2.94	1.23	1.44	1.43	0.79
09-11-2016	-2.95	-5.63	-3.63	0.71	-2.99	-0.05	-5.11	-3.67	-4.31	-3.52
10-11-2016	6.19	0.56	-3.23	-2.51	0.90	0.86	0.42	-3.26	1.96	-1.56
11-11-2016	-6.05	-5.49	-3.70	-6.21	-3.68	-2.82	-4.33	-7.59	-5.12	-6.68
15-11-2016	-8.21	-13.70	-5.13	-11.34	-2.90	-5.72	-3.39	-10.97	-6.50	-13.18
MCAR		-5.26		-1.82		-0.13		-2.81		-3.38

Source: www.bseindia.com

The last model we have applied here in this study is mean return model. Here simple average method is used to find the expected return. Difference between the expected return and actual return is taken as abnormal return. The results of this model are again almost similar to other two models we have used in this study. For majority of selected companies, AR was negative for many days during the event window. CAR was also decreasing day by day, which shows negative sentiment of investors for the event demonetization. Even in this model MCAR is not equal to zero specifically for all selected companies it is negative, this again supports our hypothesis that negative sentiment of investors for the event.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
MCARAAM	15	-5.0751	2.61017	.67394

One-Sample Test						
	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
MCARAAM	-7.531	14	.000	-5.07513	-6.5206	-3.6297

Figure 3. One sample T test for Mean return model

Finally the one sample T test for MCAR using mean return model also gave the same output. Even here a null hypothesis is rejected and the alternative hypotheses i.e. : The mean of the MCAR using mean return model is not equal to zero so is accepted. The mean value of MCAR using mean return model is -5.0751, t and   values are -7.531 and 0.000. As   is less than 0.000 there is enough evidence to reject the null hypotheses.

6. Conclusions

Demonetization was good news for majority of common people, salaried people and poor people in the country. This particular event has made lots of noise even in the media through discussions about positive and negative impact on economy. Our interest was to study the immediate impact of this event on the equity stock prices of manufacturing companies. One sample t test is used to test the significance of hypothesis. All three models shows negative abnormal returns and mean cumulative abnormal returns which clearly indicate the negative sentiment of investors for the event. Implications of the study were that reaction for the event was not very quick and semi strong form of EMH was found. However study was conducted with special reference to cement industry, there is scope for further studies with respect to other industries.

Lahiri (2020) argued that demonetization is more statistically presumably to be successful and to achieve its main objectives in combating and eradicating crimes and tax evasion if larger denomination bills are demonetized, considering that the 500 Indian rupee bills were used in the majority of cases for daily transactions.

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