ABSTRACT

Demonetization is the act of divesting a currency unit of its status as legal tender. It is a tool to handle black money in the economy by lowering the cash circulation in the country which is directly concerned with the corruption. It directly or indirectly influences the various sectors. The effect of taking out so much money from the market is obviously affect the various sectors, which are driven by the black economy like real estate, construction, etc. But this move of government has also affected those sectors that are driven by cash because they are the first that are affected when so much money is suddenly removed from circulation. This research paper is trying to analyze the impact of demonetization on Indian Stock market. This study is using Event Study Methodology to analyze the stock of S&P BSE 100 companies. The result is being observed from the comparison of both pre and post-event window and found that there is no significant impact of demonetization on the stock market. The study also found that this short period downfall in the stock prices can be due to some other factors.

KEYWORDS: Demonetization, S & P BSE 100, Stock Market, Event Study.
effect of demonetization is temporary; it will revert once normalcy is attained. The stock market is a good indicator of how perceptions of investors have been grounded across sectors during this period. The ideal indicator to analyze the impact would be the financial performance of companies in any industry as changes in sales and profits could be interpreted regarding how sectors were impacted. However, this information of company will be available to the market only after the third quarter results are announced. Stock price movements could be quick perceptions indicator, which admittedly would be affected by various other factors such as company-specific developments, industry related issues, etc. on a real time basis. This can nonetheless be used as an indicator of how sectors are expected to be impacted on account of demonetization.

Since November, eight no major events have been taken place in the industry that could guide the stock prices. Inflation was stable, and RBI policy has remained unchanged. The rupee has declined, but this is more on account of the dollar strengthening. Foreign Portfolio Investor flows have turned negative during this period as both equity and debt segments witnessed net outflows. In this research study, the author is trying to analyse the impact of demonetization on the stock market. For the same, a study has taken S&P BSE 100 index and used event study methodology. The one major event is considered for the study, the day when demonetization is announced i.e. on 8th November 2016. And the impact of demonetization has been seen from 30th October, 2016 to 21st November, 2016.

**Literature Review**

As not much literature is available on this topic, it motivates the author to do research on this topic and contribute into the scarce literature. On 8th November 2016, PM Narendra Modi announced the cancellation of Rs. 500 and 1000 notes which resulted in 86% of the circulated money being removed from the economy overnight. As demonetization affect every sector of the economy, but here we are analyzing the impact of demonetization on the stock market.

- As per the credit rating report, 2016 demonetization affect the stock market. The study took the data period from 1st October 2016 to November 8th and than November 8th to 23rd December. The study analysed the stock prices of all the sector and found that consumer durable, healthcare, auto industry, banks and real estate affected more (Care Ratings, 2016).

- **Bhardwaz et.al. (2017)** analysed the impact of demonetization on the stock market by using efficient market hypothesis. The study took 16 companies from National Stock Exchange, India from 2012-2016. The study found a significant impact of demonetization on the stock market and also observed some fluctuations.

- **Veerakumar, K.(2017)** analysed the impact of demonetization on the public perception. The study found that gender, age, occupation and annual income have significant impact association with demonetization. The study also found that demonetization will help to destroy black money, corruption and terrorism.

- **Kaur, M.(2017)** has analysed the impact of demonetization on the cashless payment system. The study found that rising use of credit cards, debit cards, online banking and other online payment transaction was due to demonetization.

- **Bansal, C. J. (2017)** analysed the impact of demonetization on Indian economy. The study analysed the impact on manufacturing, service and agriculture sector. The result showed that only agriculture sector grows positively while manufacturing and service sectors were crashed down.

- **Mahajan, P., & Singla, A. (2017)** examined the impact of demonetization on financial inclusion in India. The study analysed demonetization effects on ordinary people, informal sectors, NBFC-MFIs, MSMEs and E-wallet companies. The findings of the study show that ordinary people were the most affected.

The above-given literature shows that impact of demonetization has been analysed in most of the sectors of India. While a little amount of literature is found over the stock market. It gives motivation to the author to evaluate the impact of demonetization over the stock market.

**Objective of the Study**

The main objective of this study is to examine the impact of demonetization announcement on market reaction.
Data and Data Sources
The sample has been drawn from Prowess IQ of 100 companies closing price which come under S&P BSE 100 Index calculated on free-float market capitalization basis from the period 30th October 2016 to 21st November, 2016. The event of interest for the study is the announcement of demonetization of all 500 and 1000 rupee notes by the Government of India on 8th November, 2016. The event window has been chosen as -7 through zero to +7, where zero represents the demonetization date and -7, and +7 are the period before and after the announcement date.

Hypothesis
To accomplish the objective of the study, the following hypotheses are formulated:

H_1: There is no significant average annual return (AAR) during the event window caused by announcement of demonetization of all 500 and 1000 rupee note

H_2: There is no significant cumulative average annual return (CAAR) during the event window caused by announcement of demonetization of all 500 and 1000 rupee note.

Acceptance of the null hypothesis suggests that the announcement of demonetization of all 500 and 1000 rupee notes is confiscated in the prices of the security so instantly and precisely that the investors do not find any opportunity to get any abnormal return from the security. This indicates the presence of efficient market pricing at its semi-strong level.

Research Methodology
Event study methodology is used to capture the impact of demonetization announcement on security returns (Brown & Warner, 1980; Bowman, 1983; Brown & Warner, 1985). While doing event study, Brown & Warner (1980, 1985) states the statistical power of three different return generating models (RGM) that authors are using in this study. The principle objective of an event study is to detect whether the performance of security is statistically different from what is expected. Abnormal return for the firm i and on the event date t is given by,

\[ AR_{it} = Rit - E(R_{it} / \Omega_{t-1}) \]

where,
\[ AR_{it} = \text{abnormal return for firm } i \text{ for day } t \]
\[ Rit = \text{actual return for firm } i \text{ for day } t \]
\[ E(R_{it} / \Omega_{t-1}) = \text{normal or expected return for firm } i \text{ for day } t, \Omega \text{ is conditional information set in the period } t. \]

Note that methodology of event study assumes that security returns are generated by some RGM. Actual return of the firm (Rit) is calculated as the difference between natural log of closing price of security at day t and natural log of closing price of security at day t-1.

Abnormal return can be based on statistical relationship like OLS Market Model, Market-Adjusted Return Model and Mean-Adjusted Return Model or on theoretical economic models like Capital Asset Pricing Model and Arbitrage Pricing Model. This study uses statistical relationship models to calculate abnormal return of securities.

Model Description
• OLS Market Model
This model is also known as Risk-Adjusted Market Model (Sharp, 1964) as the model reduces the variance in the abnormal return of the security by removing the part of return that is caused by variation in market return.

\[ AR_{it} = Rit - (\alpha + \beta R_{mt}) \]

where,
\[ R_{mt} = \text{market return calculated as the difference between natural log of closing price of S&P BSE SENSEX at day } t \text{ and day } t-1. \]
\[ \alpha \text{ and } \beta \text{ are assessed over the estimation period (event window) using ordinary least square (OLS) technique by equation } 3. \]
\[ Rit = \alpha + \beta R_{mt} \]

Then, the expected return of the security i for day t of the event window is calculated by putting the values of \( \alpha \), \( \beta \) and \( R_{mt} \) in the following equation:

\[ E(R_{it} / \Omega_{t-1}) = \alpha + \beta R_{mt} \]
• **Market-Adjusted Return Model**
  This model neglects the influence caused by variance in market return in abnormal return of the security.
  \[ AR_{it} = R_{it} - R_{mt} \]  
  Variables AR, Rit and Rmt are previously defined.

• **Mean-Adjusted Return Model**
  This model neither considers the influence of market nor the variance in market return in the calculation of abnormal return of the security. It takes mean of security i as expected return.
  \[ AR_{it} = R_{it} - \bar{R}_{i} \]  
  where \( \bar{R}_{i} \) is the simple mean of security i daily return.
  The AAR is the sample mean of abnormal return for each day of the event window considering all the securities is calculated for all three models to eliminate the effect of abnormal return on any specific security.
  \[ AAR = \frac{\sum_{i=1}^{N} AR_{it}}{N} \]  
  Where N is the number of securities in the sample (100 securities in this study)
  To assess the accumulated effect of the event during the event, CAARs are calculated for each day of the event window. CAAR is calculated as the sum of daily mean abnormal return over the pre-specified period starting from k1 to k2.
  \[ CAAR_{(k_1,k_2)} = \sum_{k_1}^{k_2} AAR_{it} \]  
  **Test Statistics**
  Test statistics are used to know the significance level of AAR and CAAR during the event window caused by the announcement of demonetization of all 500 and 1000 rupee’ note. If calculated t-value of AAR or CAAR exceeds the critical t-value at one or five percent of the level of significance (99 degrees of freedom), the null hypothesis is rejected indicating the significant impact of demonetization on the securities. Hence it can be concluded that security pricing is inefficient in the market at its semi-strong form. Computation of t-statistics AARt is given below (Asquith, 1983):
  \[ t = \frac{AAR_{it} \times S.E.}{\sqrt{\sum_{t=1}^{N} (AAR_{it} - \bar{AAR}_{it})^2 / (N-1)}} \]  
  where, S.E., standard error = \( \sqrt{\sum_{t=1}^{N} (AAR_{it} - \bar{AAR}_{it})^2 / (N-1)} \)
  \[ t = \frac{CAAR_{(k_1,k_2)} \times S.E.}{\frac{\sqrt{\sum_{t=1}^{N} (CAAR_{(k_1,k_2)} - \bar{CAAR}_{(k_1,k_2)})^2 / (N-1)}}{\sqrt{N}} \]  
  where, standard error = \( \frac{\sqrt{\sum_{t=1}^{N} (CAAR_{(k_1,k_2)} - \bar{CAAR}_{(k_1,k_2)})^2 / (N-1)}}{\sqrt{N}} \)

**Results and Discussion**

Table 1 reports the results of the event study accompanied to inspect the impact of demonetization announcement on security prices. It shows AAR and its respective t-statistics of all three models for each day of the event window. The t-statistics values are found to be inconsistently significant before and after the event day. It indicates no influence of demonetization announcement on security prices. Although, it could be seen from the figure 1 that there is a sharp decline for the day one but t-statistics is highly insignificant for all models.

BSE SENSEX opened with massive loss of around 1300 points but later it recovered. The graphical appearance of AARs also shows that ARRs are significantly different from zero in almost all event window days.
Conversely, the t-statistics for -1 and -2 days are found to be significant for all models but cannot figure out the reasons for the same. Moreover, the victory of provocative US presidential candidate Donald Trump on the same day could have impacted the stock market but it did not.

<table>
<thead>
<tr>
<th>Day</th>
<th>OLS Market Model</th>
<th>Market-Adjusted Return Model</th>
<th>Mean-Adjusted Return Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AAR</td>
<td>t-statistics</td>
<td>AAR</td>
</tr>
<tr>
<td>-7</td>
<td>0.0051</td>
<td>6.3859***</td>
<td>-0.0014</td>
</tr>
<tr>
<td>-6</td>
<td>0.0072</td>
<td>3.8085***</td>
<td>0.0037</td>
</tr>
<tr>
<td>-5</td>
<td>-0.0069</td>
<td>-4.3586</td>
<td>-0.0073</td>
</tr>
<tr>
<td>-4</td>
<td>-0.0010</td>
<td>-0.6825</td>
<td>-0.0034</td>
</tr>
<tr>
<td>-3</td>
<td>-0.0093</td>
<td>-4.6130</td>
<td>-0.0135</td>
</tr>
<tr>
<td>-2</td>
<td>0.0146</td>
<td>8.9648***</td>
<td>0.0080</td>
</tr>
<tr>
<td>-1</td>
<td>0.0083</td>
<td>5.7879***</td>
<td>0.0034</td>
</tr>
<tr>
<td>0</td>
<td>0.0111</td>
<td>4.6448***</td>
<td>0.0283</td>
</tr>
<tr>
<td>1</td>
<td>0.0017</td>
<td>0.8615</td>
<td>-0.0268</td>
</tr>
<tr>
<td>2</td>
<td>-0.0234</td>
<td>-11.7433</td>
<td>-0.0241</td>
</tr>
<tr>
<td>3</td>
<td>-0.0140</td>
<td>-4.8486</td>
<td>-0.0100</td>
</tr>
<tr>
<td>4</td>
<td>0.0110</td>
<td>4.3873***</td>
<td>0.0112</td>
</tr>
<tr>
<td>5</td>
<td>0.0081</td>
<td>5.0608***</td>
<td>0.0065</td>
</tr>
<tr>
<td>6</td>
<td>0.0092</td>
<td>5.3168***</td>
<td>0.0046</td>
</tr>
<tr>
<td>7</td>
<td>-0.0219</td>
<td>-1.0065</td>
<td>-0.0266</td>
</tr>
</tbody>
</table>

Notes: *** indicates significance at one % level, ** indicates significance at five percent and * indicates significance at ten % level.

Source: Author’s calculation

The investor comprehends the real impact of event through CAAR as presented in table 2. It appears from the table that there is insignificant impact on before and after the event as calculated t-statistics is very less as compared to tabulated t-statistics.

![Graphical presentation of ARR in the Event Window](image)

**Figure 1: Graphical presentation of ARR in the Event Window**
Source: Author’s calculation

<table>
<thead>
<tr>
<th>Time Interval</th>
<th>OLS Market Model</th>
<th>Market-Adjusted Return Model</th>
<th>Mean-Adjusted Return Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>-7 to -1</td>
<td>0.9486</td>
<td>-0.4891</td>
<td>1.0246</td>
</tr>
<tr>
<td>1 to 7</td>
<td>-0.8591</td>
<td>-1.8776</td>
<td>-0.3061</td>
</tr>
</tbody>
</table>

Notes: *** indicates significance at one % level, ** indicates significance at five percent and * indicates significance at ten % level.

Source: Author’s calculation.
Conclusion

The study examined the impact of demonetization announcement on market reaction of S&P BSE100 index. Data analysis shows that no significant impact of demonetization is found stock market prices. The effect of demonetization was only for a shorter duration, but it recovered soon. So, this study did not find any significant impact of demonetization announcement on stock market prices.

References