

Demonetization and Stock Market Performance: Evidences from India

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ABSTRACT

The objective of this study is to investigate the impact of demonetization on the performance of Indian stock market. The study compares the performance of selected sectoral indices during pre and post demonetization period. The Indian stock market has been represented by NIFTY Index and the sample of 9 National Stock Exchange (NSE) sectoral indices representing Auto, Bank, Financial Service, FMCG, IT, Media, Metal, Pharma and Reality sectors. The daily closing price and trading volume of the 10 indices was collected for period of 10th August 2016 to 02nd February 2017 from NSE website. The comparison of closing price and trading volume of the indices in pre-demonetization and post-demonetization period was conducted using independent sample t-test. The results of the study indicated that there was negative impact of demonetization on various sectors of Indian stock market. Due to demonetization, the index values have gone down significantly. In terms of trading volume of the indices, the impact of demonetization is not very significant. The investors are trading frequently in the stock market in post demonetization period.

1. Introduction:

The stock market of any economy plays a very important role in understanding the sentiments of the investors. With every additional information, the stock market start moving in either of the direction. Based on whether the news is positive or negative for individual investors, the investors start acting on news and according making their trading decisions. Some of the price sources of such information are macroeconomic announcements, firm level forecasts, fluctuations in global markets etc. The stock market is largely driven by the sentiments of the investors which varies from investor to investor and also depend upon the information which is made available to investors in the form of newspaper and magazine articles, electronic and social media information, research reports, influence of brokers and other intermediaries etc.

According to Efficient Market Hypothesis (EMH), the stock prices in stock market should incorporate all the information available in the market at that point in time. According to Pearce and Roley (1985), the stock price should be affected by the unexpected factors as the expected

factors are already incorporated in the stock prices. The assumptions of EMH sometimes do not hold due to disconnect between the macroeconomic fundamentals and the prices of stocks (Andersen et al., 2007). The numerous existing studies conducted by Flannery and Protopapadakis (2002) and Birz and Lott (2011) have argued that the role of every macroeconomic announcement are very important but sometimes it is hard to keep track of all the macroeconomic announcements for the investors.

On 8th November 2016, one such macroeconomic announcement was made by the Honourable Prime Minister of India in the form of demonetization which basically means the end of the legal tender of Rs. 500 and Rs. 1000 currency notes. Immediately after demonetization, there was liquidity crisis in the market and the general people were struggling to have some liquidity in the form of new currency notes. Due to this, the stock market also witnessed some liquidity and crunch and as result of same, the market got affected significantly immediately after the announcement of demonetization.

2. Review of Literature:

Numerous studies have been conducted in the world market to see the impact of macroeconomic announcements on the performance of the stock market. The research conducted by Flannery and Protopapadakis (2002) have mentioned that macroeconomic announcements are having direct relevance to the stock market investors and the investors creates their sentiments on the basis of the prospective effect of that news. According to Kim (2003), due to mixed interpretations of investors towards the macroeconomic news, the stock market witnesses the volatility. There are group of investors who perceive the positive aspects of the news while others consider the negative aspects. According to the perspective generated by the investor, they make their trading decisions in the market and the volatility takes place.

Nikkinen et al. (2006) tried to find out the effects of the macroeconomic announcements on selected 35 stock markets in world market. The results of this study were clearly indicating that the G7 economies and few emerging Asian economies are have higher order of integration with US market and as result of same the effect of US macroeconomic announcements are significant for these countries. Similarly, the effects of Euro and US macroeconomic announcements on three countries Hungary, Czech Republic and Poland was assessed by Büttner et al. (2012). The results of this study were indicating that the EU and US macroeconomic announcements affects the movement of stock market of the three economies Hungary, Czech Republic and Poland.

In the context of the effect of Japanese and US macroeconomic announcements on stock markets of Singapore, Australia and Hong Kong, Kim (2003) documented the significant impact of macroeconomic announcements of Japanese and US economies on the performance of stock market of three economies Singapore, Australia and Hong Kong. Another study conducted by Kim et al. (2004) tried to investigate the same on foreign exchange market, bond market and stock markets and found that news and information related to macroeconomic policies affects the performance of these markets significantly.

In Indian context, the study conducted by Sasidharan (2009) tried to explore the effect of monetary policy announcements on the behaviour of stock market and found that there is no significant difference in the returns of expansionary and contractionary policy announcements. Another study conducted by Agarwal (2007) also made the similar attempt after taking the NIFT

index as the sample and found that Indian stock market reacts slowly with respect to macroeconomic policy announcements. Prabhu et al. (2015) in their working paper tried to see the impact of monetary policy announcements on the performance of Indian stock market. The results of the study were indicating that the unexpected monetary policy announcements have weakly significant impact on Indian stock market. The study further found that the effect of macroeconomic announcements is very low on the banking sector index.

To investigate the role of demonetization on Indian stock market, the study conducted by Sharma et al. (2017) investigated the effect on NIFTY index. The study used the t-test to compare the performance of stock market in pre demonetization and post demonetization period and also adopted the dummy variable regression approach to investigate the effect of demonetization on Indian stock market. The results of the study were indicating that there was a significant negative impact of demonetization on the performance of Indian stock market. The closing price of benchmark indices of NSE, NIFTY has gone down in the post demonetization period.

3. Statement of the Research problem:

Immediately after the announcement of demonetization, the stock market witnessed the downfall in the closing price of majority of its benchmark and sectoral indices. Stock market have the tendency to make corrections in the stock price immediately after announcements and also lead to equilibrium condition in short span of time. In light of this, the present study tries to answer the following research questions;

1. Is there any impact of demonetization on the performance of Indian stock market?
2. Is there any difference in the performance of selected indices in pre demonetization and post demonetization period?

4. Objectives of the study:

To address the research questions listed in section 3 of the study, the objectives of the study are as follow;

- To investigate the impact of demonetization on the performance of Indian stock market.
- To compare the performance of selected indices in pre demonetization and post demonetization period.

5. Hypothesis of the study:

H₀₁: There is no significant difference in the average daily trading volume of selected sample indices in the pre-demonetization and post-demonetization period.

H₁₁: There is significant difference in the average daily trading volume of selected sample indices in the pre-demonetization and post-demonetization period.

H₀₂: There is no significant difference in the average daily closing price of selected sample indices in the pre-demonetization and post-demonetization period.

H₁₂: There is significant difference in the average daily closing price of selected sample indices in the pre-demonetization and post-demonetization period.

6. Research Methodology:

The present study considers the 9 sectoral indices representing Auto, Bank, Financial Service, FMCG, IT, Media, Metal, Pharma and Reality sectors and NIFTY index which is the bench mark index of NSE. The daily data of closing price and trading volume of these indices was collected for period of 10th August 2016 to 02nd February 2017. The total number of days considered for the study is 120 which are further divided into two sub period representing pre demonetization and post demonetization period. The demonetization was announced on 8th November 2016 so this date is taken as mid-point to divide the 120 days trading data into two periods. There are 60 trading days each which are considered for pre-demonetization period and post demonetization period. The data were collected from the website of NSE.

7. Data Analysis and Interpretation:

The following table 1 shows the descriptive statistics of the closing price and trading volume of sample indices. From table 1, the mean values of closing price of Auto, Bank, Financial Service, FMCG, IT, Media, Metal, Pharma and Reality sectors are 9646.9, 19087.0, 21376.4, 7786.2, 10215.8, 2790.9, 2705.5, 11040.3, 188.8 and 8461.1 with standard deviation of 482.3, 671.5, 915.2, 313.5, 342.4, 161.8, 161.9, 547.5, 19.4 and 276.3 respectively.

Table 1

Descriptive Statics of Closing Price and Trading Volume of Sample Indices

	N	Minimum	Maximum	Mean	Std. Deviation
Cloing_Price_Auto	120	8681.6	10458.7	9646.9	482.3
Volume_Auto	120	7104950.0	85591066.0	32140830.6	11705638.4
Cloing_Price_Bank	120	17655.6	20426.2	19087.0	671.5
Volume_Bank	120	8938951.0	239435196.0	88000094.1	40526653.7
Cloing_Price_FMCG	120	19592.9	23186.2	21376.4	915.2
Volume_FMCG	120	1578205.0	51216066.0	18226612.6	8637432.4
Cloing_Price_Financial_Services	120	7175.4	8385.9	7786.2	313.5
Volume_Financial_Services	120	6233857.0	185834887.0	65048013.6	28864319.5
Cloing_Price_IT	120	9434.6	11222.2	10215.8	342.4
Volume_IT	120	1431970.0	33852264.0	13711466.3	5369451.8
Cloing_Price_Media	120	2493.8	3127.8	2790.9	161.8
Volume_Media	120	6152379.0	44909222.0	16355997.8	6919294.1
Cloing_Price_Metal	120	2450.9	3147.5	2705.5	161.9
Volume_Metal	120	7817017.0	147356409.0	59135957.3	19989276.0
Cloing_Price_Pharma	120	9889.3	11936.7	11040.3	547.5

Volume_Pharma	120	1232823.0	31460013.0	11066479.8	5079969.9
Cloing_Price_Reality	120	153.9	214.7	188.8	19.4
Volume_Reality	120	6184249.0	160868244.0	53428381.7	25111180.6
Cloing_Price_NIFTY	120	7908.3	8952.5	8461.1	276.3
Volume_NIFTY	120	16610872.0	537110119.0	191354248.5	67706939.5

Similarly, the mean values of trading volume of Auto, Bank, Financial Service, FMCG, IT, Media, Metal, Pharma and Reality sectors are 32140830.6, 88000094.1, 18226612.6, 65048013.6, 13711466.3, 16355997.8, 59135957.3, 11066479.8, 53428381.7 and 191354248.5 with standard deviation of 11705638.4, 40526653.7, 8637432.4, 28864319.5, 5369451.8, 6919294.1, 19989276.0, 5079969.9, 25111180.6 and 67706939.5 respectively.

The sample data period of 120 days was divided into period as representative of pre demonetization period and post demonetization period. The graph of closing price (Figure 1) and trading volume (Figure 2) shows the behavior of closing price and trading volume in pre demonetization and post demonetization period.

From figure 1, it is clear that the closing price of indices Auto, FMCG, IT, Media, Metal, Pharma, Reality and NIFTY have witnessed sharp decline while Bank and Financial Services sectors witnessed the increase in the closing price of their indices immediately after the announcement of demonetization. The Metal index started showing up fast recovery after the fall due to demonetization while for other indices, the recovery was little slow in pace.

Figure 1

Closing Price Movement in Pre and Post Demonetization Period

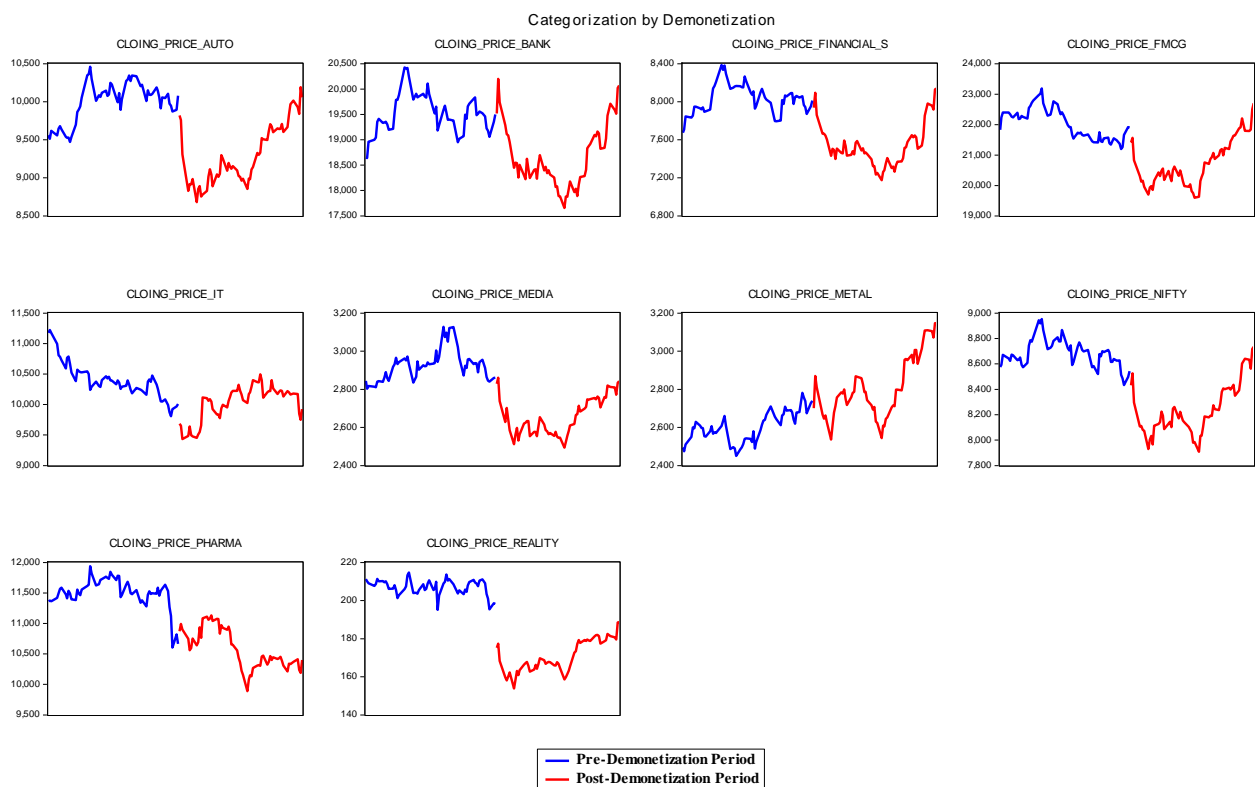
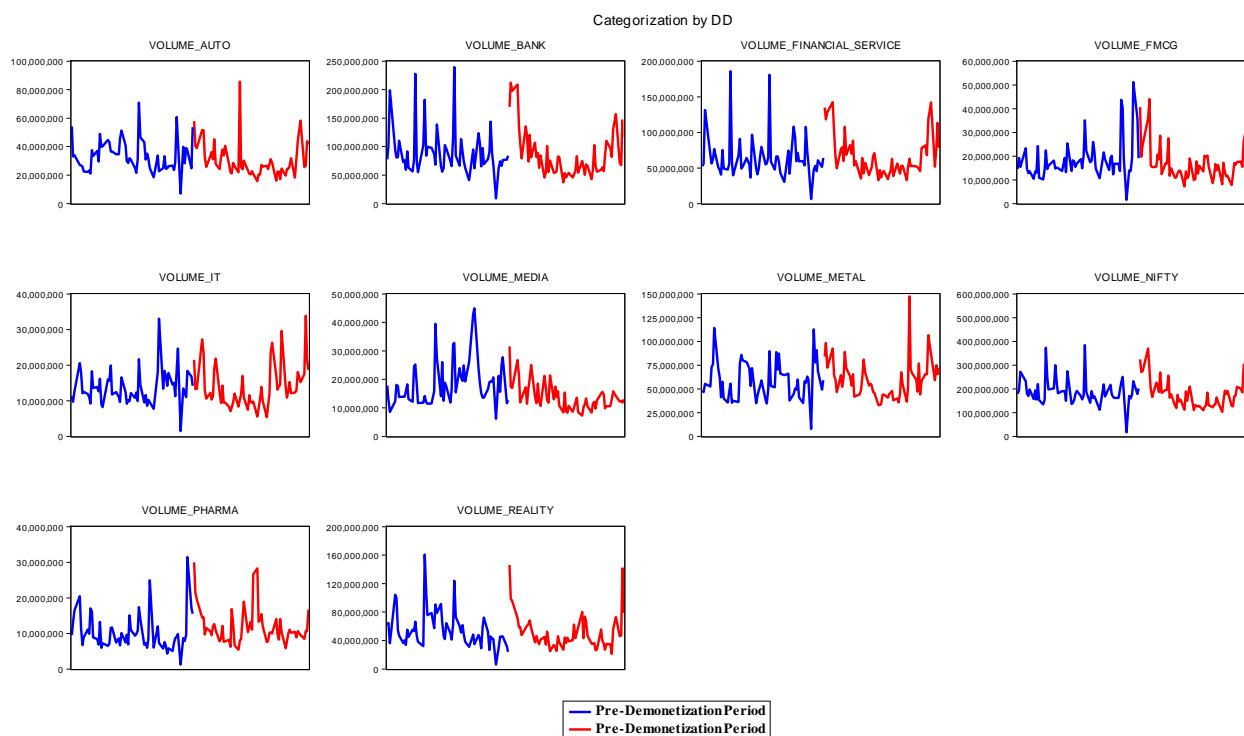


Figure 2

Trading Volume Movement in Pre and Post Demonetization Period



With respect to trading volume of the indices in pre demonetization and post demonetization period, the figure 2 shows that the trading volume of Bank, Financial Services, IT, NIFTY and Reality indices have increased after the announcement of demonetization while the trading volume of other indices Auto, FMCG, Media, Metal and Pharma have gone down.

To test the hypothesis of comparing the closing price of sample indices in pre demonetization and post demonetization period, the independent sample t-test is computed. The above table 2, the mean value of closing price of Auto, Bank, FMCG, Financial Services, IT, Media, Metal, Pharma, Reality and NIFTY indices in pre demonetization period are 9998.2592, 19521.89, 22025.71, 8033.11, 10400.18, 2925.66, 2603.66, 11506.49, 207.02 and 8684.92 respectively. The same in post demonetization are 9295.57, 18652.15, 20726.99, 7539.29, 10031.44, 2656.05, 2807.35, 10574.15, 170.62 and 8237.26 for Auto, Bank, FMCG, Financial Services, IT, Media, Metal, Pharma, Reality and NIFTY indices respectively.

Table 2**Group Statics of Closing Price in Pre and Post Demonetization Period of Sample Indices**

	Demonetization	N	Mean	Std. Deviation	Std. Error Mean
Closing_Price_Auto	No	60	9998.25	260.59	33.64
	Yes	60	9295.57	387.63	50.04
Closing_Price_Bank	No	60	19521.89	389.70	50.31
	Yes	60	18652.15	610.80	78.85
Closing_Price_FMCG	No	60	22025.71	505.43	65.25
	Yes	60	20726.99	759.21	98.01
Closing_Price_Financial_Services	No	60	8033.11	152.45	19.68
	Yes	60	7539.29	225.95	29.17
Closing_Price_IT	No	60	10400.18	299.36	38.64
	Yes	60	10031.44	278.80	35.99
Closing_Price_Media	No	60	2925.66	77.74	10.03
	Yes	60	2656.05	98.91	12.77
Closing_Price_Metal	No	60	2603.66	79.82	10.30
	Yes	60	2807.35	159.39	20.57
Closing_Price_Pharma	No	60	11506.49	244.05	31.50
	Yes	60	10574.15	320.82	41.41
Closing_Price_Reality	No	60	207.02	4.09	0.52
	Yes	60	170.62	8.51	1.09
Closing_Price_NIFTY	No	60	8684.92	110.33	14.24
	Yes	60	8237.26	199.86	25.80

The results of t-test statistics conducted to compare the mean values of closing prices of selected sample indices in pre demonetization and post demonetization period are presented in above table 3. For Auto index, the value of t-test statistics from table 3 is 11.653 with p-value of 0.000 which is significant at 5% level of significance as the p-value is less than the theoretical value of 0.05. So the null hypothesis of no significant difference in the closing price of Auto index in pre and post demonetization will be rejected and the alternative hypothesis of significant difference in the closing price of Auto index in pre and post demonetization will not be rejected.

Similarly, the values of t-test statistics in case of other 9 indices Bank, FMCG, FinancialServices, IT, Media, Metal, Pharma, Reality and NIFTY are 9.298, 11.03, 14.033, 6.982, 16.599, -8.851, 15.189, 17.916 and 29.848 which are also significant at 5% level of significance. Thus it can be concluded that the mean values of closing price of all the indices Auto, Bank, FMCG, FinancialServices, IT, Media, Metal, Pharma, Reality and NIFTY in pre demonetization period were significantly different from the mean value of post demonetization period. The mean values of closing price for all the indices have gone down in post demonetization period except for Metal index where it was higher in post demonetization period during the sample period of the study.

Table 3**Independent Samples Test Statistics of Comparing Closing Price in Pre and Post Demonetization Period of Sample Indices**

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Cloing_Price_Auto	Equal variances assumed	15.687	0.000	11.653	118	0.000
Cloing_Price_Bank	Equal variances assumed	13.919	0.000	9.298	118	0.000
Cloing_Price_FMCG	Equal variances assumed	9.714	0.002	11.03	118	0.000
Cloing_Price_Financial_Services	Equal variances assumed	4.714	0.032	14.033	118	0.000
Cloing_Price_IT	Equal variances assumed	0.134	0.715	6.982	118	0.000
Cloing_Price_Media	Equal variances assumed	10.151	0.002	16.599	118	0.000
Cloing_Price_Metal	Equal variances assumed	22.747	0.000	-8.851	118	0.000
Cloing_Price_NIFTY	Equal variances assumed	18.254	0.000	15.189	118	0.000
Cloing_Price_Pharma	Equal variances assumed	14.453	0.000	17.916	118	0.000
Cloing_Price_Reality	Equal variances assumed	51.957	0.000	29.848	118	0.000

To test the hypothesis of comparing the trading volume of sample indices in pre demonetization and post demonetization period, the independent sample t-test is computed. The above table 4, the mean value of trading volume of Auto, Bank, FMCG, FinancialServices, IT, Media, Metal, Pharma, Reality and NIFTY indices in pre demonetization period are 33811415.9, 90100146.6, 18518735.7, 64405207.9, 13605437.6, 18851308.2, 58624152.9, 1.90E+08, 10207719.4 and 55798601.6 respectively. The same in post demonetization are 30470245.3, 85900041.7, 17934489.5, 65690819.3, 13817495, 13860687.5, 59647761.8, 1.93E+08, 11925240.1 and 51058161.9 for Auto, Bank, FMCG, FinancialServices, IT, Media, Metal, Pharma, Reality and NIFTY indices respectively.

Table 4**Group Statics of Trading Volume in Pre and Post Demonetization Period of Sample Indices**

	Demonetization	N	Mean	Std. Deviation	Std. Error Mean
Volume_Auto	No	60	33811415.9	11018339.7	1422461.54
	Yes	60	30470245.3	12218274	1577372.39
Volume_Bank	No	60	90100146.6	40114135.7	5178712.65
	Yes	60	85900041.7	41164826.6	5314356.26
Volume_FMCG	No	60	18518735.7	8229592.61	1062435.84
	Yes	60	17934489.5	9087090.51	1173138.34
Volume_Financial_Services	No	60	64405207.9	29663233.5	3829506.98
	Yes	60	65690819.3	28278458.7	3650733.31
Volume_IT	No	60	13605437.6	4753455.08	613668.411
	Yes	60	13817495	5960913.1	769550.572
Volume_Media	No	60	18851308.2	7856158.96	1014225.76
	Yes	60	13860687.5	4709700.36	608019.702
Volume_Metal	No	60	58624152.9	19765805.8	2551754.55
	Yes	60	59647761.8	20364058.1	2628988.59
Volume_NIFTY	No	60	1.90E+08	54897445	7087229.68
	Yes	60	1.93E+08	78905147.7	10186610.8
Volume_Pharma	No	60	10207719.4	5038771.28	650502.575
	Yes	60	11925240.1	5016016.91	647564.999
Volume_Reality	No	60	55798601.6	25954111.8	3350661.42
	Yes	60	51058161.9	24223711.4	3127267.7

The results of t-test statistics conducted to compare the mean values of trading volumes of selected sample indices in pre demonetization and post demonetization period are presented in above table 5. The values of t-test statistics from table 5 for Auto, Bank, FMCG, Financial Services, IT, Metal, Pharma, Reality and NIFTY are 1.573, 0.566, 0.369, -0.243, -0.215, -0.279, -0.286, -1.871 and 1.034 with p-values of 0.118, 0.572, 0.713, 0.808, 0.83, 0.78, 0.775, 0.064 and 0.303 respectively. The value of t-test is not significant at 5% level of significance as the p-value is higher than the theoretical value of 0.05. So the null hypothesis of no significant difference in the trading volume of Auto index in pre and post demonetization will not be rejected and the alternative hypothesis of significant difference in the trading volume of Auto index in pre and post demonetization will be rejected.

On the contrary, the value of t-test statistics in case of Media index is 4.22 with p-value of 0.00 which is significant at 5% level of significance as the p-value is lower than 0.05. Thus it can be concluded that the mean values of trading volume of Media indices in pre demonetization period was significantly different from the mean value in post demonetization period. From this analysis, the study finds that there is no significant difference in the trading volume of all the indices in pre

and post demonetization period except for the Media index.

Table 5

Independent Samples Test Statistics of Comparing Trading Volume in Pre and Post Demonetization Period of Sample Indices

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Cloing_Price_Auto	Equal variances assumed	0.052	0.82	1.573	118	0.118
Cloing_Price_Bank	Equal variances assumed	0.84	0.361	0.566	118	0.572
Cloing_Price_FMCG	Equal variances assumed	0.532	0.467	0.369	118	0.713
Cloing_Price_Financial_Services	Equal variances assumed	0.685	0.41	-0.243	118	0.808
Cloing_Price_IT	Equal variances assumed	2.000	0.16	-0.215	118	0.83
Cloing_Price_Media	Equal variances assumed	8.205	0.005	4.22	118	0.000
Cloing_Price_Metal	Equal variances assumed	0.019	0.891	-0.279	118	0.78
Cloing_Price_NIFTY	Equal variances assumed	5.476	0.021	-0.286	118	0.775
Cloing_Price_Pharma	Equal variances assumed	0.022	0.883	-1.871	118	0.064
Cloing_Price_Reality	Equal variances assumed	0.205	0.652	1.034	118	0.303

9. Conclusions:

The results of the study indicate that due to demonetization, the closing price of majority of indices have gone down in the post demonetization period. The differences between the closing prices of sectoral indices in pre demonetization and post demonetization period were statistically significant. The impact of demonetization on the trading volume of Auto, Bank, FMCG, Financial Services, IT, Metal, Pharma, Reality and NIFTY indices was not statistically significant except in case of Media index where due to demonetization the trading volume of index has gone down significantly. Thus the study concludes that there was negative impact of demonetization on various sectors of Indian stock market. Due to demonetization, the index values have gone down significantly. In terms of trading volume of the indices, the impact of demonetization is not very significant. The investors are trading frequently in the stock market in post demonetization period also.

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