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Impact of Demonetization and Volatility Behaviour of Broad Market Indices of Indian Stock Market

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ABSTRACT

The present study proposes to analyze the volatility behavior of Indian stock market, during pre and post demonetization period. In the period of demonetization, midcap and small cap industries, indices were mostly volatile. The study selected Small cap Index, Midcap Index, Nifty50 Index and India VIX of NSE as sample indices. The required daily prices of the sample indices were collected from official website of NSE and it was collected for the period of two years during Pre and Post Demonetization announcement. Descriptive statistics and GARCH (1, 1) Model were used for the analysis. It is interesting to note that among the sample indices, Nifty indices were highly volatile.

Keywords: Broad Market Indices, Stock Market, Demonetisation and GARCH Model.

INTRODUCTION:

The Government had introduced a major revolutionize in the economic environment by demonetizing the high value of currency notes of Rs 500 and Rs 1000 denomination, on 8th November 2016. The RBI issued two thousand rupee notes and five hundred rupee notes which were placed in circulation from 10th November 2016. It has to create long term benefits in terms of reduced corruption, greater uses of digitalization in economy, increased flows of financial savings and greater formalization of the economy, finally leading to higher GDP growth, better tax compliance and highest tax revenues. Stock market data reflect the economic development in each sector of the country. Average price represents the value of the sector under consideration. Kumar (2017) studied the impact of the demonetization announcement on analysts' forecasts of Indian firms' earnings per share and found no substantial change in these estimates after the announcement. However, the focus of Kumar (2017) was not on differences in market reactions across sectors. Jain, Shekhar and Deshpande (2017) analyzed market reactions but it was limited to the hospitality industry. In contrast, this article shares some similarities with recent studies of other "surprise" events elsewhere in the world.

REVIEW OF LITERATURE:

Michael D. Bordo et al,.(2009), examined the exchange rate depreciation and the perceived sovereign risk. When France suspended coinage of silver, the study found that the possibility that our treatment group might be different on a number of crucial dimensions, besides the exchange rate regime, from the control group. Ricardo T. Fernholz et al ,.(2017), explored the price dynamics when commodity-based money ceased to function as a

global unit of account. The study using parameterization of the model, found that the global monetary standards anchored prices. Using a new high-frequency data set on global commodity prices, John Gibson et al,. (2008), examined the changes in real living standards, during the transition period in Russia, in order to estimate of how much the official Russian CPI had overstated consumer inflation. The study used the Engel Curve Methodology and find out the which the official Russian CPI had overstated the rise in the cost of living and hence understated the real income growth during the transition period. Adrian E. Tschoegl (2010) examined how decimalization of currency diffused as a consequence of all three forms of isomorphism: normative, coercive, and mimetic. The study found that the diffusion initially followed from normative isomorphism, with decimalization appearing to be scientific and modern. Gang-Jin Wang et al,.(2016), in the paper entitled, "Extreme risk spillover effects in world gold markets and the global financial crisis", investigated the extreme risk spillover effects among four major world gold markets. ARMA-(T) GARCH-GED model and VAR Model were used to found that gold market participants were able to monitor and control extreme risk and the spillover effects of risk. Prabhsimran Singh et al,.(2017), analysed the sentiment effect of demonetization of Indian currency. 29 states and the national capital New Delhi were selected for the analysis and the results reviled that only nine states had negative sentiment. Wagner, Zeckhauser and Ziegler (2017) analyzed the stock market reactions, around the 2016 US Presidential election, for subgroups of US firms, defined by industry and other characteristics. Davies and Studnicka (2017) analysed market reactions of UK firms towards the same event and to subsequent relevant events. They found that UK firms, with stronger supply chain linkages in Europe, experienced more negative market reactions. The concept of financial depth measures the size of the formal financial sector relative to the size of the economy. This paper proposes to find out whether there was significant volatility behaviour in Indian broad market indices, during pre and post demonetization period.

STATEMENT OF THE PROBLEM:

India is a highly diversified economy. Demonetisation has been applied in many developed countries but it was never attempted on such a highly diversified country, demographically and economically. Hence the need to study the impact of such a movement on Indian economy. Stock market data reflect the economic development in each sector of the country. Average price represents the value of the under study sector. Total traded quantity gives the idea about the impact on manufacturers and the extent to which each stock could be purchased by the consumers in the economy. Total trade represents the direct quantitative result of demand and supply in the economy after the demonetisation. Due to demonetisation, the average price and the total traded quantity of Indian stock market were affected. Hence it is important to assess the changes in the economy after demonetisation to prevent any future complications. The stock market data after demonetisation, when compared to the past data would help to find the extent of impact on demand and supply in the economy as well as on consumers and manufacturers.

OBJECTIVES OF THE STUDY:

The focus of study was on the impact of demonetization on Indian sectoral indices. For analysing the main objective, the study formulated following objectives.

i) To test the normality and stationarity of daily prices of sample indices of NSE India, during Pre and Post Demonitization announcement.
ii) To analyse the volatility of daily prices of sample indices of NSE, during Pre and Post Demonitization announcement.

NULL HYPOTHESES OF THE STUDY:

NH_{01}:
Daily prices of sample indices were not normally distributed during the Pre and Post Demonetisation announcement.
NH_{02}:
Daily prices of sample indices were not stationary during the Pre and Post Demonetization announcement.
Nh_{03}:
Daily prices of sample indices prices were not significantly volatile during the Pre and Post Demonetisation announcement.

METHODOLOGY:

NSE is a one of the largest capital markets in India. During the period of demonetisation, midcap and smallcap industries were mostly affected. In this connection, for the purpose of study, the following indices, namely Smallcap index, Midcap Index, Nifty50 Index and India VIX of NSE, were selected. The study was mainly based on secondary data. The required daily prices of the sample indices were collected from official website of NSE and data were collected for a period of two years, covering Pre and Post Demonetization announcement. The study used Descriptive statistics, *Augmented Dickey–Fuller Test, GARCH (1,1)Model* for analysing the hypotheses.

RESULTS AND DISCUSSION:

The Table – 1 displays the results of Descriptive Statistics, for the sample indices, during the Pre and Post Demonetisation announcement. During the pre demonetisation announcement, all the sample indices yielded positive return. Skewness values, for daily returns of INDIA VIX, NIFTY50, were positively skewed and NIFTY MIDCAP and PRE NIFTY SMALL CAP were negatively skewed. Kurtosis values, for the sample indices showed that all the sample indices were leptokurtic. Jarque-Bera values indicated that daily returns of all the sample indices were normally distributed, during the pre demonetisation announcement. During the post Demonetisation announcement, all the sample indices recorded positive return except INDIA VIX index (-4.08E-05). NIFTY SMALL CAP Index recorded high return (0.001383). Skewness values, for daily returns of NIFTY50, NIFTY MIDCAP, NIFTY SMALLCAP, were negatively skewed and INDIA VIX index alone was positively Skewed. Kurtosis values for the sample indices showed that all the sample indices were leptokurtic. Jarque-Bera values revealed that daily returns of all the sample indices were normally distributed during the study period.

Table –2 presents the results of Augumented Dickey Fuller Test, for daily prices of sample indices, during the Pre and Post demonetisation period. The results revealed that all the sample indices were stationary at level difference because of ADF values of sample indices, during pre demonetisation - INDIA VIX (-17.07238), NIFTY_50 (-14.72539), NIFTY MIDCAP (-14.63305), NIFTY SMALL CAP (-13.49734) and during Post demonetization - INDIA VIX (-16.43345), NIFTY (-15.2217), NIFTY MIDCAP (-15.0945), NIFTY SMALL CAP (-13.50865), were less than the test critical value at 1%,5%and 10% levels. Hence reject the null hypothesis NH_{02} "Daily prices of sample indices were not stationary during the Pre and Post Demonetization period ".

Table 3 shows the results of GARCH (1, 1) Model, for daily prices of sample indices, during the Pre and Post Demonetization announcement. All the sample indices were volatile, during the Pre and Post demonetisation announcement. The values of Arch (1) and Garch (1) showed that NIFTY 50 was highly volatile during pre and post demonetisation announcement and it was followed by INDIA VIXNIFTY MIDCAP, NIFTY SMALL CAP. While comparing these four sample indices, NIFTY SMALL CAP recorded the lowest volatility. Therefore, the Null Hypothesis NH_{03} "Daily prices of sample indices were not significantly volatile during the Pre and Post demonetization period", is rejected

CONCLUSION:

The demonetization effect influenced all enterprises, especially in smalcap enterprises, in the stock market. The study selected Smalcap index, Midcap Index, Nifty50 Index and India VIX of NSE as sample indices. The required daily prices of the sample indices were collected from official website of NSE and data were collected for the period of two years, covering Pre and Post Demonetization announcement. Using descriptive statistics and GARCH (1, 1) Model, the study found that all the sample broad market indices' daily returns were volatile during the demonetisation period. NIFTY 50 index recorded the highest volatility. NIFTY VIX and NIFTY Midcap indices also recorded high volatility during the pre and post demonetisation period.

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Table 1: Results of Descriptive Statistics for Sample Sectoral indices during pre and post Demonetisation Announcement

Pre Demonetisation Announcement				
	INDIA VIX	**NIFTY 50**	**NIFTY MIDCAP**	**NIFTY SMALL CAP**
Mean	0.000986	0.000333	0.000868	0.000806
Std. Dev.	0.048482	0.009224	0.013524	0.014146
Skewness	1.795892	0.022354	-0.66699	-0.972309
Kurtosis	12.86229	4.015486	5.202214	6.281165
Jarque-Bera	1120.019	10.50432	67.39735	147.9004
Post Demonetisation Announcement				
	INDIA VIX	**NIFTY 50**	**NIFTY MIDCAP**	**NIFTY SMALLCAP**
Mean	-4.08E-05	0.000851	0.001179	0.001383
Std. Dev.	0.042151	0.006541	0.011147	0.012515
Skewness	0.330881	-0.378922	-0.955452	-1.273778
Kurtosis	4.871395	4.716176	4.788139	6.065639
Jarque-Bera	40.54967	36.2224	70.48761	162.8539

Source: Data collected from www.niftyindices.com and calculated by E-Views

Table 2: Results of Stationarity Test for Sample Sectoral indices during pre Demonetisation Announcement

	Augmented Dickey-Fuller test statistic	**Test critical values**			**P Value**
		1% level	**5% level**	**10% level**	
Pre Demonetisation Announcement					
INDIA VIX	-17.07238	-3.457173	-2.87324	-2.57308	0
NIFTY50	-14.72539	-3.457173	-2.87324	-2.57308	0
NIFTY MIDCAP	-14.63305	-3.457173	-2.87324	-2.57308	0
NIFTY SMALL CAP	-13.49734	-3.457173	-2.87324	-2.57308	0

Post Demonetisation Announcement					
INDIA VIX	-16.43345	-3.45684	-2.873093	-2.573002	0
NIFTY 50	-15.22172	-3.45684	-2.873093	-2.573002	0
NIFTY MIDCAP	-15.0945	-3.45684	-2.873093	-2.573002	0
NIFTY SMALLCAP	-13.50865	-3.45695	-2.873142	-2.573028	0

Source: Data collected from www.niftyindices.com and calculated by E-Views

Table 3: Results of GARCH (1, 1) Model for Sample Sectoral indices during pre Demonetisation Announcement

Indices	Arch (1)	Garch (1)	P Value
Pre Demonetisation Announcement			
PRE INDIA VIX	0.113193	0.85807	0.7931
PRE NIFTY50	0.030145	0.95289	0.4452
PRE NIFTY MIDCAP	0.102957	0.841082	0.2384
PRE NIFTY SMALL CAP	0.403516	0.216509	0.0331
Post Demonetisation Announcement			
INDIA VIX	0.00382	0.78711	0.8927
NIFTY 50	-0.023895	0.935552	0.008
NIFTY MIDCAP	0.089681	0.720626	0.0489
NIFTY SMALLCAP	0.281354	0.513427	0.0041

Source: Data collected from www.niftyindices.com and computed by E-Views

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