Impact of Demonetization on Forex and Commodity Derivatives – An Event Study

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A B S T R A C T

Demonetization is the process of withdrawing legal validity of a currency unit. The government of India announced that this demonetization action would cut down the shadow economy and crack down on the use of illegal and dissimulated cash to fund illegal activities and terrorism. Demonetization in India and last presidential election in the US might be affected Indian foreign exchange market and commodity market simultaneously. This study examines the impact of demonetization announcement on gold futures prices and currency exchange rate of Indian rupee with various currencies. The authors employed event study methodology. The objectives of the study were (a) to measure the expected returns of the selected currencies and commodity futures, in pre and post demonetization, (b) to investigate the impact of demonetization on foreign exchange market and commodity market, (c) to propound a brief knowledge about the concept of demonetization and its consequences. This study considered four currencies to study the impact of demonetization, i.e., US Dollar, Euro, Pound, and Yen. Being the most traded commodity future, it is considered gold futures as a proxy for Indian commodity derivatives market. Finally, this paper could identify that there were not many shocks on forex markets as well as commodity derivatives market from the demonetization announcement.

1. Introduction

Demonetization is an act with the intention of economic growth. The high-denominated notes printed by RBI, ₹ 10,000 note was demonetized in January 1964 and again in January 1978. The Govt of India announced the demonetization of all ₹ 500 and ₹ 1000 banknotes on 8 November 2016. Being this was a shock to the entire economy, it is important to examine the movement of various currencies price and commodity price after demonetization. This study is an attempt to analyze the variations in movements of foreign exchange market and Indian

commodity derivatives market. The purpose of this study is to contribute to the literature by examining the probable impact of demonetization announcement. The results will be useful for various stakeholders related to foreign exchanges market as well as commodity derivatives markets while decision making.

Demonetization has been a historic movement with short-term effort and long-term benefit. Demonetization is necessary whenever there is need to change national currency. The Government of India announced the demonetization of all ₹ 500 and ₹ 1000 banknotes on 8th November 2016. Around 97% of the demonetized amount has been deposited back into banks i.e. ₹ 14.97 trillion ($ 220 billion) out of ₹ 15.4 trillion as on Dec 30, 2016. The Indian Government claimed that the demonetization of higher denomination currency is to curb financing of terrorism through the fake currency notes and use of such proceeds to finance prohibited activities such as smuggling of arms, terrorist activities etc. However, sudden nature announcement made troubles to the daily life of a

common man for a certain period. Also, new denomination notes, 2000 and ₹ 500 were introduced by Reserve Bank of India.

The authors framed objectives of this paper as (a) to measure the expected returns of the selected currencies and commodity, (b) to investigate the impact of demonetization on foreign exchange market and commodity derivatives market, (c) to propound a brief knowledge about the concept of demonetization and its consequences.

1. Literature Review

Padmavathy. S. et al., (2017), Examined the reaction of share prices towards the demonetization announcement, and they proved the absence of reactions towards such an announcement from selected stocks. Sunil and Smitha v Shenoy (2017), attempted to explore the impact of demonetization on stocks of the selected sector through an event study by considering a sample of five companies from five industries listed in BSE. They proved that the demonetization has not affected the stock market as it expected by many investors. P. Chellasamy and Anu K. M (2017), Examine the impact of demonetization on sectoral indices in NSE. The result of the study supports that demonetization announcement has a significant impact on the stock market for the Indian economy. Rajanish Kumar (2017), Examined the effect of demonetization on stocks in terms of EPS. It tested the presence of long-term impact of demonetization and has made a comment that there is no negative impact of demonetization in the long term. Narendra Nathan (2017), Studied that the effects of US presidential election and demonetization on Indian stock market and he concluded that the effect is temporary and the stock market would recover slowly.

Sweety Shah and Disha Mehta (2016), analyzed the impact of dividend announcements on Indian stock market, and it revealed that investor can take the minimal returns by capitalizing on companies announcing dividend but cannot expect speculative returns. S. Sathyanarayana and Sudhindra Gargesha (2016) examined the impact of BREXIT referendum on both the Indian indices NIFTY 50 and SENSEX. The study shows a significant impact on the event day. Shahid Mahmood et al., (2011), explored the impact of dividend paid on share prices in Karachi Stock Exchange (KSE). The results conclude that different types of market model for calculating abnormal return provide similar trends. Babitha Rohit et al., (2012), examined the share price movements of companies listed in BSE. The result of the study concludes that bonus announcement results in abnormal returns for the investors. S. Vanitha et al., (2013), studied the effect of cash reserve ratio (CRR) and reverse repo rate (RRR) announcements. It concluded that share price of banking companies listed in NSE reacts to the CRR and ARR.

From the literature reviewed, we could find that that, probability of having an impact of demonetization announcement of financial markets.

2. Data and Methodology

2.1. Data

Here, in this study, it considered currency exchange rate and gold futures price to represent the Indian foreign exchange market and commodity derivatives markets. It used the forex rates of INR with the US Dollar, Euro, Pound, and Yen. Being the gold commodity futures possess the lion part of Indian commodity futures markets, it used the gold futures as a proxy for Indian commodity derivatives market. Foreign exchange data is sourced from Reserve Bank of India (RBI) website, and Gold futures price history is from Multi Commodity Exchange of India (MCX) website. Since the demonetization announcement was made a late evening of November 8, 2016, we considered November 9, 2016, as the event day. Period of study is fixed as thirty-one trading days, (Starts from 1st June 2016 to 30th November 2016) and it includes the event day, ie., (t= -15.., 0.., +15).

2.2. Methodology

This paper employed event study methodology. It is briefly explained below.

The daily actual return was calculated using the following formula for all the securities in the sample.

$$R_{j,t} = \frac{P_{j,t} - P_{j,t-1}}{P_{j,t-1}}$$

Where

$R_{j,t}$ is actual return of the firm j at time t

$P_{j,t}$ is closing price of the security j at time t

$P_{j,t-1}$ is closing price of the security j at time t-1 i.e., previous trading day

Likewise, market return also calculated by the above procedure. By using Market model, the expected return during event period was calculated as follows.

$ER_{j,t} = \alpha_j + \beta_j R_{m,t}$

Where $ER_{j,t}$ is expected return for the security j on trading day t.

$R_{m,tt}$ is the market return for security j at time t.

$\alpha_{j \& }\beta_j$ are the regression parameters (i.e., intercept and slope respectively) assessed using the market return as independent variable and company return as dependent variable from the estimation period. The abnormal return was obtained by deducting the expected return from actual return for the period of the event window.

$AR_{j,t} = R_{j,t} - ER_{j,t}$

Where $AR_{j,t}$ is the abnormal return for security j on time t.

Average abnormal return for a particular trading date was calculated for analyzing the collected data.

$$AAR_t = \frac{\sum_{j=1}^{n} AR_t}{n}$$

Where

AAR_t Indicates the average abnormal return of firms at time t. n tis the number of firms in the sample Cumulative Average Abnormal Return for the period k was calculated from.

$$CAAR_k = \sum_{t-1}^{k} AAR_t$$

Hypothesis of the test

Null hypothesis (H_0) : Demonetization announcement (event) not made any change on the commodity market $(\mu = 0)$

Alternative hypothesis (H_1) : Demonetization announcement (event) made the change on the commodity market $(\mu \neq 0)$

3. Analysis and Interpretation

Average of cumulative abnormal return of each item (Gold and currencies) was volatile in pre-event as well as post-event data. In the case of the gold futures price, till 7 days prior to the event, movements were comparatively lesser while comparing with days near to the event.

Table-1: Cumulative Average Abnormal Return (CAAR)

Event Time	GOLD	USD INR	EUR INR	GBP INR	JPY INR	Average
-15	0.00%	0.14%	0.16%	0.11%	-0.35%	0.01%
-14	-0.10%	-0.12%	0.25%	0.02%	-0.19%	-0.03%
-13	0.55%	-0.25%	0.50%	-0.10%	-0.51%	0.04%
-12	-0.02%	-0.12%	0.62%	-0.10%	-0.12%	0.05%
-11	0.36%	-0.04%	0.58%	0.28%	-0.09%	0.22%
-10	0.08%	-0.12%	0.28%	-0.39%	0.00%	-0.03%
-9	-0.41%	-0.13%	0.33%	0.17%	0.69%	0.13%
-8	-0.30%	0.04%	-0.37%	0.04%	0.21%	-0.07%
-7	0.09%	0.19%	-0.20%	-0.40%	0.40%	0.01%
-6	-0.99%	0.18%	-0.92%	-0.51%	-0.31%	-0.51%
-5	-2.21%	0.10%	-1.43%	-1.20%	-1.30%	-1.21%
-4	-1.59%	0.25%	-1.39%	-2.43%	-1.54%	-1.34%
-3	-1.79%	0.07%	-1.93%	-3.18%	-1.63%	-1.69%
-2	-0.17%	0.16%	-0.97%	-2.23%	-0.34%	-0.71%
-1	0.52%	0.93%	-0.12%	-1.41%	1.03%	0.19%
0	0.55%	0.54%	0.51%	-2.15%	1.02%	0.09%
1	0.50%	0.03%	0.11%	-3.96%	1.53%	-0.36%
2	2.25%	-1.00%	-0.62%	-5.46%	0.30%	-0.91%
3	1.56%	-1.31%	0.13%	-5.01%	1.53%	-0.62%
4	2.57%	-1.30%	0.24%	-4.83%	2.15%	-0.23%
5	2.38%	-1.60%	0.18%	-5.13%	1.69%	-0.50%
6	3.27%	-1.62%	0.73%	-5.06%	2.54%	-0.03%
7	3.97%	-1.86%	0.81%	-4.83%	2.98%	0.22%
8	3.32%	-1.90%	0.33%	-6.17%	2.76%	-0.33%
9	3.33%	-2.13%	0.08%	-5.96%	2.72%	-0.39%
10	4.43%	-2.68%	0.17%	-6.74%	3.31%	-0.30%
11	4.75%	-2.63%	0.18%	-6.92%	4.02%	-0.12%
12	5.29%	-2.27%	0.19%	-6.86%	4.09%	0.09%
13	4.84%	-2.34%	-0.19%	-6.56%	2.91%	-0.27%
14	4.78%	-2.38%	-0.60%	-7.31%	3.19%	-0.46%
15	6.13%	-2.35%	-0.02%	-7.51%	5.01%	0.25%
Average	1.55%	-0.82%	-0.08%	-3.28%	1.22%	

Source: Compiled by the Authors

After November 1 (From 7th day prior to the event) magnitude of the gold futures price movements increased. After the event, the gold futures price was showing an increasing trend. USD-INR exchange rate was almost stable up to event date (Rs.66.515). However, one day before the value of INR strengthened against USD with Rs66.246. After the event day, the value of INR devalued one by one and on 24 November 2016, it reached its peak (Rs.68.784). So, its average cumulative abnormal return had a tendency to decrease slowly. In the pre-event period value, EUR-INR was devalued and reached Rs.74.4165 on 4 November 2016. After that, INR could strengthen up to the event (Rs.72.564). However, there are no

more changes after the event date, means it was trying to stabilize. So, its average cumulative abnormal return was also stable. The rate of GBP-INR was stronger in pre-event period. Nevertheless, the day before event day onwards it was decreasing day by day. In the case of JPY-INR, it was very strong in post-event period.
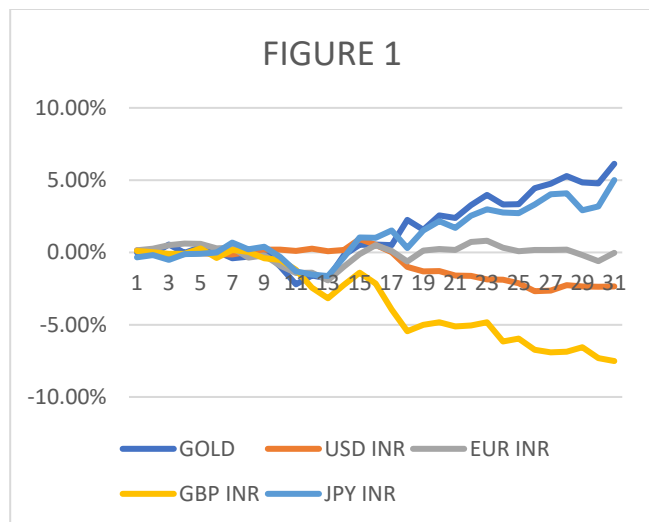

Figure-1: Cumulative Abnormal Return (CAR)

Gold and currencies diverge from the event date. Point of 16 in the x-axis is denoted the event date. From the point of the event, all stocks are going through different ways. Up to November 1^{st,} 2016, almost all currency and gold were in the same way. From November 1^{st,} 2016 to event day there is a big variation in the graph. It happens only some days before of demonetization announcement. According to previous studies, these variations is happened because of information leakage before the announcement of demonetization. Because of that, cumulative average abnormal return went down for few days. Again, there had been a strengthening on event date. After the event, all are diverged in different ways, by the effect of demonetization announcement. Cumulative average abnormal return of gold and JPY-INR are moving positively. Because of withdrawal of circulating currency peoples were compelled to invest their money in gold, and they went to purchase jewelry. This decision of public increased the quantity demand and price of the gold. Currencies are variated by the decision of foreign direct investors and foreign institutional investors from foreign countries. Therefore the figure 4.1 shown that there had a big effect occurred by demonetization announcement on the cumulative average abnormal return of gold and other currencies.
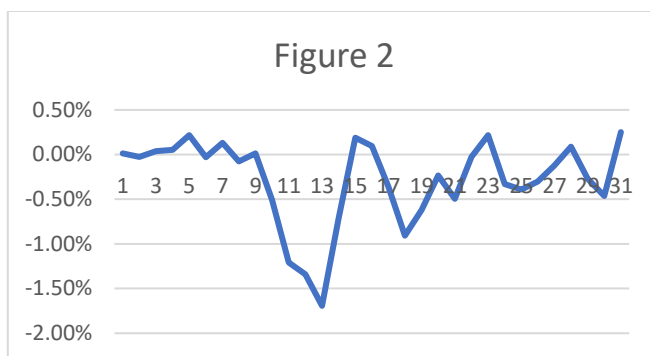

Figure-2: 30 Days Cumulative Abnormal Return of Gold (CAR)

Before seven days of the event (1st November 2016) moving of gold CAR were almost equal. From first November to event date there is a shortage of sales because of low quantity demand on gold. This problem is happened because of information leakage before the announcement of demonetization. After the announcement of the withdrawal of currencies, public used their hided money to purchase jewelry. This tendency of people increased the quantity demand of the gold and price of the gold.so this relationship between demand and price of the gold also affected the 30 days cumulative abnormal return.
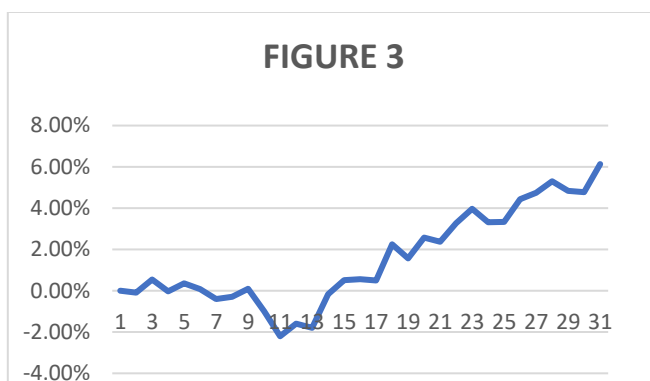

Figure 3: 30 Days Cumulative Abnormal Return of USD-INR (CAR)

The pre-event period was almost stable in the case of cumulative average abnormal return of USD-INR. A slight variation happened some days before of announcement because of information leakage. But in post-event period average abnormal return was in decreasing trend because of the devaluation of Indian currency against USD. There are some other causes for devaluation which happened domestically and internationally like, interest rates are expected to go down, Currency inflation, Non-reimbursement by Banks, Dumping of cheaper products by foreign countries, Black marketing of products and Loss of public confidence in their country's economy etc.

A tremendous variation occurred in cumulative average abnormal return in pre- and post-event period. Information leakage before the announcement of demonetization made a large impact before few days of the event. Though CAAR could

strengthen the event. Also, CAAR variated amazingly in post-event period, because lost the interest of foreign investors in Indian rupee. Then they tried to withdraw their investment from India. But domestic investors of gold thought to clear their black money through investing in gold, so the sales of gold tremendously increase after demonetization and it could maintain cumulative average abnormal return of post-event almost stable.

Table-2: Average Abnormal Return (AAR)

Event Time	GOLD	USD INR	EUR INR	GBP INR	JPY INR	Average
-15	0.00%	0.14%	0.16%	0.11%	-0.35%	0.01%
-14	-0.09%	-0.26%	0.10%	-0.09%	0.15%	-0.04%
-13	0.64%	-0.13%	0.25%	-0.11%	-0.31%	0.07%
-12	-0.57%	0.13%	0.11%	0.00%	0.39%	0.01%
-11	0.39%	0.07%	-0.03%	0.38%	0.03%	0.17%
-10	-0.28%	-0.07%	-0.31%	-0.66%	0.09%	-0.25%
-9	-0.49%	-0.01%	0.05%	0.56%	0.69%	0.16%
-8	0.11%	0.17%	-0.70%	-0.13%	-0.47%	-0.21%
-7	0.38%	0.15%	0.16%	-0.44%	0.19%	0.09%
-6	-1.08%	0.00%	-0.72%	-0.11%	-0.71%	-0.52%
-5	-1.22%	-0.09%	-0.51%	-0.69%	-0.99%	-0.70%
-4	0.61%	0.15%	0.04%	-1.23%	-0.24%	-0.13%
-3	-0.20%	-0.18%	-0.54%	-0.75%	-0.10%	-0.35%
-2	1.62%	0.09%	0.96%	0.95%	1.30%	0.98%
-1	0.69%	0.77%	0.86%	0.82%	1.36%	0.90%
0	0.04%	-0.39%	0.63%	-0.74%	0.00%	-0.09%
1	-0.05%	-0.51%	-0.40%	-1.81%	0.51%	-0.45%
2	1.74%	-1.02%	-0.73%	-1.50%	-1.23%	-0.55%
3	-0.69%	-0.31%	0.75%	0.45%	1.23%	0.29%
4	1.01%	0.01%	0.11%	0.18%	0.63%	0.39%
5	-0.19%	-0.30%	-0.06%	-0.30%	-0.47%	-0.26%
6	0.89%	-0.02%	0.54%	0.07%	0.86%	0.47%
7	0.70%	-0.23%	0.08%	0.23%	0.44%	0.24%
8	-0.65%	-0.04%	-0.47%	-1.34%	-0.23%	-0.55%
9	0.01%	-0.23%	-0.25%	0.21%	-0.03%	-0.06%
10	1.10%	-0.55%	0.08%	-0.78%	0.59%	0.09%
11	0.32%	0.05%	0.01%	-0.18%	0.71%	0.18%
12	0.54%	0.37%	0.01%	0.06%	0.07%	0.21%
13	-0.45%	-0.07%	-0.38%	0.30%	-1.18%	-0.36%
14	-0.06%	-0.04%	-0.41%	-0.75%	0.28%	-0.20%
15	1.36%	0.04%	0.57%	-0.20%	1.82%	0.72%
Average	0.20%	-0.08%	0.00%	-0.24%	0.16%	

Marvelous changes occurred in abnormal return of gold during the pre-event period (-0.09% to 0.69%). It occurs in post-event period also (-0.05% to 1.36%). And all four currencies made variation in pre-event such as USD (0.14% to 0.77%), EURO (0.16% to 0.86%), GBP (0.11% to 0.82%), JPY (-0.35% to 1.36%). Post-event period AAR like USD (-0.39% to 0.04%), EURO (-0.40 to 0.57%), GBP (-1.81% to -0.20%), JPY (0.51% to 1.8%). Increase and decrease of abnormal return are dependable up to each item. Variation of average in event window was 0.01% to 0.72%. But there is a synergic fluctuation in all items before some days of the event. According to experts and researchers, this fluctuation is happened because of information leakage before the announcement of demonetization.
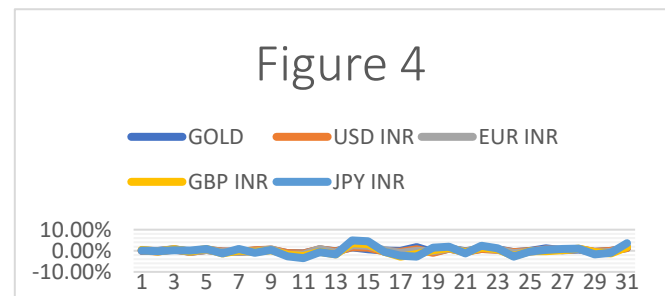

Figure-4: 30 Days Average Abnormal Return (AAR)

Abnormal returns of all items are increased together from 5th November 2016 to 8th November 2016 (-0.35% to 0.90%). It came come down when the time of the event (0.90% to -

0.09%). This fluctuation was really an unexpected one, and the reason for this fluctuation was information leakage about demonetization of high denominated circulating currency (500,100) before its announcement. Each commodity and gold variated in post-event period also.

Conclusion

Demonetization is generally made to control the money supply of the country. The study makes an attempt to understand the behavior of commodity market for the demonetization announcement. Event study methodology is used for the analysis. From the analysis, it is concluded that there is no more effective in commodity market because of demonetization announcement for circulating currencies. The price of the commodities is efficient to a very small extent, but not perfectly efficient to this announcement. The results of this study reveal that the demonetization announcement does not have any significant impact on the commodity market with reference to gold and currency commodity.

This study is made only with the daily closing prices of the gold and currencies listed in MCX and currency exchange. Further, the analysis can be done with actual sales of shares made after the announcement to know the exact impact of demonetization.

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