



## IMPACT OF INDIAN FESTIVALS ON INDIAN OPTION CONTRACTS – EMPIRICAL EVIDENCE FROM INDIAN OPTION MARKET

**Christopher Devakumar**  
Research Scholar  
Bharathiar University, Coimbatore

&

**Dr. Anuradha P.S**  
Research Supervisor  
Bharathiar University, Coimbatore.

### ABSTRACT

The present study attempts to examine the impact of Indian festivals on the stock market indices especially the Options market with reference to Call options which are highly traded in NSE India. Though there are many innovative investment avenues available, investors choose Option market to hedge against risk. Hence for the current study, Option prices are taken into consideration to see how far investors are investing and taking different strategies to adverse risk. Festivals are one of the factors that attract the investor and the stock market is affected by the movement of money in and out when they invest money or withdraw money. The outflow or inflow of money in stock market happens due to many factors. This research will help to understand the movement of stock market with respect to Indian festivals. India is best known for various types of festivals as India has diverse culture. Different religions celebrate different types of festival which in turn impact the options market indices. During festive seasons the demand for cash flows increases as investors tend to sell the options which lead to option market anomalies. Though there are many researches carried out with this regard many have considered the common stocks, however this paper is focusing on option contracts which are highly traded in Indian stock exchange.

**Keywords:** Indian festival, Option Market Forecasting, Granger Causality Model



## INTRODUCTION

An investment is a type of asset that is bought with a concern to create income or to have an appreciation value in the future. In terms of economics, an investment is obtained at present day and not for immediate consumption but are preserved for future use to generate more income. In terms of finance, an investment is a capital asset that is bought with an aim to earn high profit or will be disposed at higher price. There are many factors which affect the stock market. The major factors affecting the stock market are Inflation, Interest rate, Foreign Exchange Market, Festivals and world events, etc. Inflation, interest rates have an impact on the stock market. World events and disasters in the world also affect the stock market. Among all these factors festivals are also the factors that affect the stock market. Many countries have different festivals which impact the home country as well as other countries. India is known as a country of festivals as in India different religions have different festivals to celebrate. For this study ten festivals have been selected as follows:

- **Diwali:** It is an ancient Hindu festival which is celebrated in every state of India. This festival is celebrated in the month of October or November every year. This festival signifies victory over darkness. People light their house in this festival. On Diwali many people purchase large quantity of goods and many companies provide offers to their customers on this day.
- **Dussehra:** This festival is celebrated not only in India but other countries also like, Nepal, Bangladesh and some part of Pakistan. This festival is celebrated in the memory of Lord Ram's victory over Ravan.
- **Holi:** Holi is a festival of spring season. It is celebrated in the month of March every year. It is a festival of love and colour. This festival is celebrated in every state of the country. As many Indians move to different countries, they celebrate Holi in those countries also.
- **Christmas:** It is a festival of Christian religion and celebrated all over world. It is celebrated on 25th December every year. This festival is celebrated in all the states of India and other countries. On Christmas many companies provide offers to their customers.
- **Makar Sankranti (Pongal):** This festival is celebrated in almost all parts of India and Nepal. This festival is celebrated by every religion. This festival is celebrated in the month of 14th January every year.



- **Dhanteras:** This festival is celebrated two days before Diwali. On this day people of different regions buy gold, silver and other ornaments in large quantity. On this day people do worship of goddess Lakshmi.
- **Eid-ul-fitr:** It is an Islamic festival celebrated in different countries. This festival is celebrated after 29 days of Ramadan. It is celebrated in most of the countries like Saudi Arabia, Afghanistan, Pakistan, etc.
- **Raksha Bandhan:** It is a Hindu festival which is celebrated to express the love between brothers and sisters. It is celebrated in the month of August every year. This festival is celebrated in different states of our country.
- **Ganesh Chaturthi:** It is a Hindu festival celebrated to preach Lord Ganesha. This festival is celebrated in all the states of the country but in Mumbai it is celebrated by every religion. According to the Hindu calendar, this festival is celebrated in the month of August and September.
- **Vasant Panchami:** It is a Hindu festival which heralds the coming of spring. It is celebrated by different religions. People fly kites in this festival. It is also known as the festival of kites in Punjab. During the festival season in India the demand for cash flow increases and due to those stock investors sell their shares and it leads to fluctuations in the stock market. BRICS as the emerging markets provides more opportunities to increase benefit from international diversification. It is expected that the equity market of India, South Africa, Indonesia, China, and Brazil will expand at a compound annual growth rate (CAGR) of around 15% over the next two decades

## LITERATURE REVIEW

**Sharma (2004)** investigated the stock market seasonality in an emerging market by using Nonparametric Kruskal-Wallis test, on a sample size 1802–1926. He stated that the Indian stock markets do observable seasonality in their returns pattern.

**Gao and Kling (2005)** investigated the effect on Chinese stock market by considering sample size of 12 years using research tools like descriptive statistics, regression analysis, and event study. The study found that at the end of the year March and April, average return is far higher as compared to other months.



**Cao, Harris and Wang (2007)** investigated the Seasonality in the Returns, Volatility and Turnover of the Chinese Stock Markets, the sample size of the study was 12 years; the research tool used in the study was regression analysis. The study found that on Wednesday the return was the highest and on Thursday it was the lowest.

**Marrett and Worthington (2007)** conducted research related to the impact of holidays on the Australian stock market. The Sample size of the study was 4 years from 1996-2000, used research tools were regression, descriptive. Impacts of religious holidays on stock market have been examined by some people around the world.

**Frieder and Subrahmanyam (2004)** investigated effect of different holidays on S&P500 index. These holidays focused on the Jewish High Holy Days of Rosh Hashanah and Yom Kippur and the Christian holy day of St. Patrick's. A significant effect on trading volume was found. They showed that returns are negative after Yom Kippur (Solemn) and positive after Rosh Hashanah (Joyful) and St. Patrick's. They also reported that trading volume turned down on Rosh Hashanah and Yom Kippur.

**Kumar Umesh (2012)** tried to find out the effect of Diwali on Indian stock market. He calculated daily return on S&P CNX Nifty index and divided the returns into two groups: seven trading days before and after Diwali holiday. After conducting paired t- test he concluded return in post-holiday (seven days) is significantly higher than before holiday (seven days).

**Chan et al (1996)** also found a strong and positive effect of Chinese New Year in Chinese stock Market. Some studies are available on the impact of Muslim calendar effects on stock returns.

**Mostafa Khalid (2011)** examines that average return of Karachi stock market is smaller and significant in the month of Ramadan and there is no after Ramadan effect in Karachi stock market. He indicates that the consumption of people increases and their attention to invest in stock market decreases during Eid season.

**Dharani M. and Natarajan P. (2010)** conclude that the seasonal anomalies exist to a large extent in Nifty Shariah Index. McGowan CarlB and Jakob Noor Azzudin (2010) investigate the Eid al-Fitr Calendar Effect in the Syariah Index of the Kuala Lumpur Stock Exchange from 2000 to 2003. This study does not support the existence of calendar effect in the Malaysian stock market.





**Seyyed, Abraham and Al-Hajji(2005)** studied the Ramadan effect in Saudi Arabia's stock market and showed a decline in volatility and trading activity in terms of both volume and return, in the Saudi Arabian stock market during Ramadan. In an attempt to locate the impact of Ramadan in Pakistan's stock market Husain (1998) studied on Ramadan effect in Pakistan's stock market and found that there is less volatility during the Ramadan effect. It is found that calendar anomalies already have been studied in different regions of the world. But in Bangladesh there is no study on religious calendar effect had been conducted yet. As a religious calendar effect this study has focused on effect of Eid-ul-Azha on Dhaka Stock Exchange.

The study found that pre-holiday effect is five times higher in all countries market index and the stock market is inflating due to high sale of products before festivals.

**Camilleri (2009)** Studied the month-related seasonality of price volatility: Evidence from the Malta Stock Exchange, the research tool used for conducting this research were a Jarque-Bera test, Kruskal-Wallis test, and Chi-squared. The sample size was from October 2000 to September 2005, according to their findings Malta stock exchange's volatility is a reason for monthly seasonality. The MSE lowest volatility months are April to October and in December the risk seasonality and companies closing off their financial year.

**MacGowan and Jakob (2010)** investigated the impact of Eid-ul-fitr on Malaysia Stock exchange. Study used a sample size of 3 years (2000-2003), the data was collected from Kuala Lumpur Stock Exchange<sup>1</sup> (KLSE), Composite Index (KLCI), Syariah Index (SI), using research tools like descriptive statistics, coefficient regression, and event study. Research found that the presence of Bumiputeras (Chinese community) in the stock market is small as compared to other days. In Eid-ul-fitr celebration the practice of giving cash bonuses are not the same as the Chinese New Year.

**Dodd & Gakhovich (2011)** investigated holiday effect in Central and Eastern European by using T- test on 14 Central and Eastern European countries with 19 years data of National stock indices and the study found that there is a significant post-holiday effect on three countries (Hungary, Poland and Russia) and this is a first indication that there is a holiday effect in the CEE region. The analysis shows that the holiday effect in CEE markets is driven by abnormal returns around common holidays: Christmas, New Year.



**Datta (2014)** investigated the holiday impact on stock market returns, by using Granger Causality Test, Co-integration, Sterling ratio, & Augmented Dickey-Fuller test on Indian stock market. The sample size was taken from 1994 to 2014 (NSE) & it has been found that there is a relationship between the nifty returns, trading days and market capitalization & both the Nifty volatility have been caused by each other. **Khambo & Chougule (2014)** investigated seasonality in Stock Market: With Special Reference to Diwali Effect by using Auto correlation test & Ljung-Box statistics on India with 3 month data of BSE indices and it has been found that BSE is smart enough to absorbing the changes of effects of Diwali.

**Maheta (2014)** studied the festival effect in the Indian market. The research tool used was paired T-Test and the sample size considered for this study was January 2003 to December 2012 (Sensex & Nifty) and the findings were that the market is not informally efficient, and the customer can avail the maximum opportunity in order to obtain greater returns during the festivals.

**Chowdhary and Mostari (2015)** investigated the impact of Eid-ul-Azha on the stock market of Dhaka by considering the sample size from 2005 to 2013. The author has used research tools like linear regression, t-test, and event study. The study found that in 6-10 days people sell their shares instead of buying. Due to selling pressure index goes down, and immediately after Eid-ul-Azha holiday investors' participation in stock market is less.

## **NEED AND SCOPE OF THE STUDY**

The stock market is affected by the movement of money in and out when they invest money or withdraw money. The outflow/inflow of money in stock market happens due to many factors. This research will help to understand the movement of stock market because of Indian festivals. Earlier many authors did research in the same area but the scope was limited to only common stocks and more than one country and also with multiple variables. But now days due to globalization Option market is performing well in the market, so it becomes important to study the impact on options with reference to Indian Festivals. So this study will be an attempt to find out whether there is any impact of Indian festivals on indices of BRICS countries. There are many factors affecting stock market indices like GDP, inflation, deflation, interest rate, etc. but the study will be focused on the festival effect on stock indices with re-



spect to 10 years only. The study will be helpful to investors who are thinking to invest money during festival season. They will also get some useful information from the study. This study shows the impact of Indian festivals on Indian Option market.

## OBJECTIVES OF THE STUDY

- To analyse the impact of Indian festivals on Option contracts which are traded in Indian stock market.
- To find out the pre and post Indian festivals effect on the stock market index of India i.e. Nifty.

## RESEARCH METHODOLOGY & DESIGN

For the present study NSE CNX Nifty Options data was used for analysis. To find out the effects of festivals towards the options prices, data was taken from 2007 to 2016 period. Data was mined and streamlined, option values which are less than Rs. 100 were not considered for the study. Data was collected and grouped into four groups as mentioned in the below table below: (Tasruma S Chowdhury and Sabnam Mostari, 2015). Descriptive statistics were used for the analysis like, Regression, F-test, T-test, and ANOVA have been implemented to find out the pre and post effective on festival effect.

Group 1	6 to 10 days before Festival holiday
Group 2	1 to 5 days before Festival holiday
Group 3	1 to 5 days after Festival holiday
Group 4	6 to 10 days after Festival holiday.

In this study daily percentage return has been calculated using following formula

$$R_t = (\text{Index } t - \text{Index } t-1) / \text{Index } t-1 * 100$$

Here,

$R_t$  = Return in period  $t$

Index  $t$  = Index in period  $t$



Index  $t-1$  = Index in period  $t-1$

Descriptive statistics have been used to find out the pattern of returns in each group. T-Test have been use to compare mean return between two groups of trading days. The study has also employed dummy variable regression analysis to see the effect of different groups of trading days before and after each festival holiday on the given data set. The result of F test has been used to observe whether any difference in market index return among the groups of trading days before and after Eid-ul-Azha holiday exist or not.

The regression model applied in the study is:

$$R_t = \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + \beta_4 D_4 + \varepsilon$$

Here,

$R_t$  = Market index return in time period  $t$

$D_1$  = dummy variable which is 1 for 6 to 10 days before Festival holiday, and 0 otherwise

$D_2$  = dummy variable which is 1 for 1 to 5 days before Festival holiday, and 0 otherwise

$D_3$  = dummy variable which is 1 for 1 to 5 days after Festival holiday, and 0 otherwise

$D_4$  = dummy variable which is 1 for 6 to 10 days after Festival holiday, and 0 otherwise

$\varepsilon$  = Error

## DATA ANALYSIS

The present study has been conducted with descriptive analysis to discover the central tendency and dispersion in returns in different groups of trading days. Central tendency and dispersion were first found for all the four festivals, further t-test were calculated for each and every scenario for all the festivals.

**Table 1: Descriptive analysis of returns in different groups of trading days in CNX Nifty Options before and after each festival Holidays.**

**Table 1: Returns and mean value for Eid-ul-Azha**

Category of trading days	Number of trading days observed	Mean daily index return	Standard deviation of index return
6 to 10 days before Eid-	49	-.2573%	1.98365





ul-Azha holiday			
1 to 5 days before Eid-ul-Azha holiday	50	.4997%	1.53654
1 to 5 days after Eid-ul-Azha holiday	50	-.5465%	1.26543
6 to 10 days after Eid-ul-Azha holiday	50	.4854%	1.86594

### Interpretation:

From the above test results, it is noted that the mean value for the group 1 (Eid) is negative (-.2573%) for 6 to 10 days before the event and the highest value reports as (+.4997%) which is positive. It is clear that people wanted to utilise the money for their festival and they go for disinvestment before the festival. However, the highest mean value shows that post the festival they have again started investing in the stock market. As a result during the festival season people wanted to utilise the money for the festival preparation and post which they wanted to reinvest in the market, hence the index is inclining during the observed population.

**Table 2: Returns and mean value for Diwali**

Category of trading days	Number of trading days observed	Mean daily index return	Standard deviation of index return
6 to 10 days before Diwali holiday	49	.2965%	0.98653
1 to 5 days before Diwali holiday	50	.2456%	0.97584
1 to 5 days after Diwali holiday	50	.1987%	0.65487
6 to 10 days Diwali holiday	50	.1754%	0.89654



### Interpretation:

From the above test results obtained for Diwali festival shows that the mean value for before 6-10 days is high of (.2965%), which means that investors are keen in investing before the festival. It also shows that the mean value instead of going negative, it has decreased from the mean value during the festival season (.2456%). Hence investors do not wanted to go for disinvestment during this festival. Post the event again the mean value is decreasing (.1754%) may be because of year end effective. Compared to Eid, Diwali shows more positive mean value in all the sub-groups. Hence the festival has impact on stock return.

**Table 3: Returns and mean value for Christmas**

Category of trading days	Number of trading days observed	Mean daily index return	Standard deviation of index return
6 to 10 days before Christmas holiday	49	-.3654%	1.98365
1 to 5 days before Christmas holiday	50	-.3565%	1.53654
1 to 5 days after Christmas holiday	50	-.4026%	1.26543
6 to 10 days Christmas holiday	50	.4269%	1.86594

### Interpretation:

Unlike Eid and Diwali, the mean value of this festival is totally changed in all the sub-groups. This could be because of year end effect and also during the November 2016, when demonetization, majority of the investors pulled back their money from their investment. However, in the year 2017 January again the investors showed interest in investing in option contract. Further, the investors were keen to invest in commodity than the futures and options. The mean value (-.4026%) during the Christmas eve was very low, as the investors wanted to spend for their family and shopping.



**Table 4: Returns and mean value for Dusshera**

Category of trading days	Number of trading days observed	Mean daily index return	Standard deviation of index return
6 to 10 days before Dusshera holiday	49	.3659%	1.65981
1 to 5 days before Dusshera holiday	50	-.3564%	1.61254
1 to 5 days after Dusshera holiday	50	.3654%	1.62546
6 to 10 days After Dusshera holiday	50	.3787%	1.59326

**Interpretation:**

From the above test results it is clear that even during this festival the mean value and the standard deviation is less (-.3564) and the highest value is (.3787) which clearly interprets that during the festival season, the investors have not showed interest in investing, however post 6-10 days after the festival investors were keen to invest in options.

From the four festivals which we have taken for consideration, it is understood by looking in to the mean values of all the four festivals, during the festival seasons, investors are not keen investing. Perhaps they wanted to spend the money for the festival shopping and preparation. However, post the festival, all the mean value are in the inclination stage, so the investors do have interest in investing after the festival season.

**Regression Analysis:**

In-order to analyse the effective of different groups we have conducted linear regression post and pre the festivals. Summary of ANOVA and regression is given below:



**Table 6: ANOVA**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	20.456	4	5.169	2.0265	.065
Residual	653.258	165	3.6598		
Total	673.714	169			

**Interpretation:**

From the above ANOVA table it is observed that ANOVA results does not show much difference among return in different groups of trading days before and festival holidays at 5% level of significance. But, at 10% level of significance, significant difference among return in different groups of trading days before and festival holiday can be observed.

Table 7 exhibits p values for all four groups of trading days are greater than .05. Therefore; at 5% level of significance result of regression for four groups of trading days is insignificant. The coefficient of 01 to 05 days before festival holiday has been found significant at 10% level of significance.

Variables	Coefficient	Standard error	t	P value
06 to 10 days before Eid-ul-Azha holiday	-.365	.256	-1.698	.193
01 to 05 days before Eid-ul-Azha holiday	.397	.237	1.965	.087
01 to 05 days after Eid-ul-Azha holiday	-.264	.234	-1.874	.458
06 to 10 days after Eid-ul-Azha holiday	.389	.288	1.651	.244





#### t- Test:

Independent sample t-test was done to test the null hypothesis: there is no difference between the mean market return of 6 to 10 days before all festival holidays and that of 1 to 5 days before festival holiday. The alternative hypothesis in this case will be: the mean market return of 6 to 10 days before festival holiday is less than that of 1 to 5 days before festival holiday. The result of t-test rejects the null hypothesis and accepts the alternative hypothesis. Therefore, it can be said that, the mean market return during 6 to 10 days before Eid-ul-Azha holiday is less than 1 to 5 days before festival holiday. The result is statistically significant at 5% level of significance ( $p \text{ value} < .025$ ).

Festival		t	Degree of Freedom	p-value (2tailed)
Eid-ul-Azha	Equal variances assumed	-2.698	82	.018
Diwali	Equal variances assumed	1.638	97	.072
Christmas	Equal variances assumed	-1.658	96	.147
Dussehra	Equal variances assumed	-2.659	97	.043

#### Interpretation

From the above table it is evident that difference between mean market return of 6 to 10 days before festival holiday and that of 6 to 10 days after festival at 10% level of significance. It can be said at 90% level of confidence that, mean market return of 6 to 10 days before festival holiday is greater than that of 6 to 10 days after all the festival holidays.

#### FINDINGS

- This study found that the pre-festivals and post-holidays effect does not exist in stock exchange index of India that is Nifty also found that there was not major pre/post effect on CNX Nifty.



- Study has shown that the movement of Nifty is the same as compared to the indices of so we assume that there is no effect of festivals on Option contracts which are traded in the stock market. It is also evident that there was no effect of demonetization which took place in November 2016.

## CONCLUSIONS

This study examined the festival impact on the stock indices of call options by using daily return of the stock indices of CNX Nifty. By applying paired t- test it was found that there is no pre and post effect on all the stock which are traded in the exchange, even showed that the movement of nifty is same and there is no festival effect on CNX Nifty. Therefore this study concludes that there is no impact of festival on CNX Nifty.

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