

## **An Empirical Study of Holiday Impact on Stock Market Returns**

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### **ABSTRACT:**

Indian equity markets are considered emerging markets globally where these markets are performing extremely well in the recent past. India is the largest democratic country with highest secular values due to this India having more number of holidays when it is compared with other countries. Our analysis of holiday impact of stock market returns has been emphasized from the period of 1994 to 2014. Bi-variate correlation has been applied to find the relationship between Market Returns, Trading days and Market Capitalization. Granger Causality test has been applied to find the impact of holidays on Market Returns. Augmented Dickey fuller (ADF) test has been applied to find the stationarity of the NIFTY average values through which volatility has been measured.

Granger Causality test has been proven the volatility of NIFTY is caused by the Market holidays during the analysis period, and the higher volatility is increasing the risk level of NIFTY. This analysis is useful for the traders, regulators, investors, Foreign Investors, Mutual Funds, and Portfolios Mangers.

**Key words: Nifty, Holidays, Trading Days, Market Capitalization, Nifty Volatility.**

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### **INTRODUCTION:**

Stock market of a country play vital role in the uplift of any economy. The Stock Prices may fluctuate due to several reasons, like any news about the budget allocation, improving of industries, some economic factors, etc and holiday may be also one of the factors among them. There are numerous studies addressing the situation that the daily stock returns are abnormally high for some specific days or periods during the year. The existence of these abnormal returns is known as anomalies. One of the dominant phenomena among the anomalies is the situation that the stock returns are abnormally high on the trading day before the market closing day. The abnormal returns could exist on the day before the holidays. Meanwhile, the existence of abnormal returns on the day before the holidays is known as holiday effect. Although many studies have investigated the existence of abnormal returns during holiday periods around the world, only a few have attempted to explain why such abnormal returns exist. This paper aims to examine the holiday impact on the stock market returns by using the different variables like Nifty returns, Nifty volatility, Nifty market capitalization, and the pre & post holiday stock price. In this analysis we have taken in consideration the trading days and found the how the stock market is behaved in normal days and after holidays.

The holiday effects are among the main calendar anomalies identified on the financial markets. Usually, on a financial market the holidays occur on the national days, in the beginning of new years, in the religious holidays, public holidays, etc. There were two Types of the holiday effects: the pre effect and post effect. When the price returns of the stock days preceding the holidays are significant different from those in other trading days; the post- effect, which consist in significant differences between the price returns from the days that follow the holidays and those from other trading days.

### **OBJECTIVES:**

1. To know the relationship between NIFTY Returns, Trading days and Market Capitalization
2. To find the relationship between Holidays, NIFTY and NIFTY Returns
3. To measure the NIFTY Returns were affected by Pre and Post Holiday Difference
4. To find the impact of Holidays on NIFTY Returns
5. To find the Holidays impact on NIFTY Volatility

## SCOPE:

The analysis has been emphasized to know the market holiday impact on NIFTY Returns. In general Economy various economic factors will have impact on Equity Markets but Non-Trading day impact also will be there or not to find this effect, data has been considered from 1994-2014 i.e., 21 years. In this analysis data has been considered from National Stock exchange (NSE). In this analysis actual working days of each year were considered instead of 252 days. (Globally 252 days will be considered as Annual Working days).

## NEED:

This analysis lays emphasis on the holiday impact on the stock market where there will be fluctuations in the stock prices due to several reasons, In this analysis we are trying to find whether the holiday impact is there on the stock market or not, if so how it is affecting considering the pre and post holidays closing prices of the NIFTY stock market, where the analysis shows the results of the affect on stock market India. Also the Market Capitalization growth during the trading days. The NIFTY Returns were calculated to find out the affect on Pre and Post holiday difference .This analysis helps the investors to analyze the fluctuations in the stock price before and after the occurrence of the Holidays. There are many Economic issues that may occur during the Holidays which lead to the Raise or fall in the stock prices. In that case this analysis helps to understand the movement of the stock market after the change in the Economic Conditions.

## LITERATURE REVIEW:

1. **Debjiban Mukherjee:** The stock market noticed high activities and obtaining huge importance. In the present scenario of globalization and consecutive assimilation of the global markets captures the tendency correlation and methods of the activities and evolution of the Indian stock market in comparison to its international standards. This analysis envelopes the New York stock exchange(NYSE), Russian stock exchange(RSE), Korean stock exchange(KSE), Hong Kong stock exchange (HSE), Tokyo stock exchange(TSE), from various socio-politico-economic backgrounds. Both the Bombay stock exchange (BSE) and the National stock exchange of India limited (NSE) are used as the part of Indian stock market in this case study. This period has been isolated to test the correlation between the various exchanges to determine the Indian stock markets have become more integrated with its global correspondent and its reaction are in tandem with that are noticed globally.
2. **Paulo M. Gama, Elisabete F.S. Vieira:** This Case study determinates the further indication on the holiday effect by analyzing stock market behavior on the days of public holiday is not guided by a stock market break. Indeed, since 2003, when the trading calendar of Portuguese stock market was reconciled with the remaining Euro next national markets, on many occasions Portuguese national holidays were not weekdays on which the stock market was closed. Furthermore the bottom-up approach is adopted which allowed to search for size effects and industrial effects. The results disclosed a statistical significant negative liquidity effect and economically and statistically significant negative liquidity effect and an economically and statistically significant positive price effect during Portuguese specific national holidays proportionate to a typical trading day. Return-related impact

repercussions are driven by tiny-sized stocks and robust to recent crisis period. These results leads to the frequency of the mood effect for which those non distracted traders positive feelings translate into a buying pressure, or reluctance to sell, that drives up prices on the onset of country-specific holidays.

3. **Kathy Yuan, Lu Zheng , Qiaoqiao Zhu:** This analysis establishes the relation between lunar phases and stock market returns of 48 countries. The results deliver that the stock returns are lower on the days of full moon than on the other days of new moon. The significance of the return difference is around 3% up to 5% per annum based on the analyses of the two global portfolios: one equal weighted and the other value-weighted. The difference in the returns is not due to variations in the stock market volatility or trading volumes. The information show that the lunar effects are not explained by the macroeconomic indices or it is induced by major global shocks. More over the lunar effect Is independent of any other calendar anomalies, like January effect, the day-of-week effect, the calendar month effect, and the holiday impact (including lunar holidays)
4. **Jason D. Mitchell and Li Lian Ong:** In this study, we evaluate the results in the Chinese A and B stock markets for the proof of calendar anomalies. Both the cultural and structural (segmentation) factors play a key role in influencing the pricing of both A- and B-shares in China. There is some testimony of a February turn-of-the-year effect, partially owing of the Chinese Lunar New Year (CNY); and the holiday effect around the CNY period is stronger and more perpetual compared with the other public holidays. The segregation between the two markets in apparent in the day-of-the-week effect ,where B stock markets tend to post significant negative returns on Tuesdays, corresponding with overnight developments in the United States, while significant negative returns are found on Mondays in the A stock markets. Investment strategies based on few calendar anomalies, and grant for transaction costs, suggest that the A stock markets lead to offer more economically huge returns.
5. **Mohd Edil Abd Sukorab:** This article investigates the impact on cultural and religious festivals on the trading behavior of a sample of stocks listed on the five emerging Asian markets: Hong Kong, Asian markets: Hong Kong, Indonesia, Malaysia, Singapore and Taiwan, over the years 1991 - 2011. I examine the festivals' impact on stock returns and then inculcate the impact to firm size and the liquidity of the individual firms. These findings differ remarkably from the existing published literature. The hypothesis and the evidence confirms, that stock returns is lower before festivities, as investors tend to sell stocks, raising cash to finance their holiday expenditures, follows higher returns post-festivities with the increased trading movements. Appropriate firm size and trading qualities provide additional evidence on the relationship between festivities and the functionalities of the firm. This findings show that the outcomes of the festivities which may be stronger among smaller firms. Enthusiastically, one thing is observed that the effect remains strong even after firm size and liquidity are managed.
6. **Alex Gakhovich:** This study investigates the holiday effect in 14 emerging Central and Eastern European (CEE) markets. The holiday effect is present in the Central and Eastern European region, with a number of countries has shown the abnormal pre-holiday returns in the financial market. In addition to that, we also document abnormal post-holiday returns. The pre-holiday effect is most pronounced in the previous years of financial markets operations, and its importance is declining over time. This suggests an improvement in market efficiency in the CEE markets since the opening of stock exchanges. New Year and Christmas produce the highest returns every year. The Liquidity before holidays goes down in the financial markets.

7. **Ankur Singhal Vikram Bahure:** Stock Prices have been based on the stock returns and influenced by the day of the week. Context of the Indian stock market influencing measured daily returns. Stock prices fluctuate in the week as Monday lower and Friday higher than other days in the most of cases. Existence of this weekend effect. Holidays on daily returns and investors expectation effect getting it complex.
8. **Mihir Dash, Anirbam Dutta, Mohith Sabharaal:** Seasons show the effect in monthly returns. Seasonal effect study is to provide information about how Indian stock markets effects between the crash market effect and month of the year effect. Indian stock markets are positive November, August and December effects and negative March effect. That is month of the year effect. Seasonal effects reduced by market crash incidence.
9. **Nopphon Tangjiprom:** Stock returns are abnormally high before holidays. This paper aims to how the returns are affected by the holiday and how it effects to stock markets. Statistical tool GARCH models show the volatility of stock market. There are 3 GARCH models. In this EGARCH gives best results.
10. **Pandey, I.M.:** This study is to seasonality existence in stock market. For this return in monthly used. On monthly return data stationary tests applied. This test revealed evidences. In December, average returns are Positive. These rules out tax-loss selling hypothesis.
11. **Allan Muchemi Kuria, Dr. George Kamau Riro:** This is to week day how effects Stock exchange. Several stationary tests are applied in the study. This study is mainly for week day effect, weekend effect and monthly effect. This provides evidence of seasonal effect in stock exchange. Thus stock markets are not free from seasonal effects.

## RESEARCH METHODOLOGY:

1. **Co-integration:** Co-integration is a statistical property of time series variables. Two or more time series are co-integrated if they share a common stochastic drift. If two time series  $x$  and  $y$  are co-integrated, a liner combination of them must be stationary.
$$Y - \beta x = u$$

Where  $u$  is stationary.
2. **Granger causality test:** Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. A time series  $X$  is said to Granger-cause  $Y$  if it can be shown, usually through a series of  $t$ -tests and  $F$ -tests on lagged values of  $X$  (and with lagged values of  $Y$  also included), that those  $X$  values provide statistically significant information about future values of  $Y$ .
- i. **Null hypothesis:** The null hypothesis refers to a general statement or default position that there is No relationship between two measured phenomena. Rejecting or disproving the null hypothesis- and thus concluding that there is a relationship between two phenomena.

### ii. Alternative hypothesis

In statistical hypothesis testing, the alternative hypothesis is applicable when probability is  $> 0.5$ . Alternative hypothesis is that the quality is poorer in the second half of the record.

## 3. Volatility

Volatility is a measure for variation of price of a financial instrument over time.

Historic volatility is derived from time series of past market prices. The symbol  $\sigma$  is used for volatility, and corresponds to standard deviation.

#### 4. Mean

The sum of values divided by the number of values. It is denoted by  $\bar{x}$ .

#### 5. Sterling ratio

A ratio used mainly in the context of hedge funds. This risk-reward measure determines Which hedge funds have the highest returns while enduring the least amount of volatility?

$$= \frac{\text{Compound Annualized Rate of Return}}{\text{Maximum Drawdown (Absolute Value)}}$$

#### 6. Augmented Dickey-Fuller Test

Augmented Dickey-Fuller Test is a test for a unit root in a time series sample. It is an augmented version of the Dickey-Filler test for a larger and more complicated set of time series models.

### LIMITATIONS:

1. Globally 252 working days will be considered as Annual working days but in this analysis not all the years are considered as 252 working days because of occurrence of many holidays in particular years.
2. Generally in E-Views software we consider the Whole data with the first difference stationary but for NIFTY Data the second difference was considered.
3. The data which is collected for the analysis is considered only up to May 2014.
4. No other economic factors are considered to analyze the impact except Holidays.

### DATA ANALYSIS:

#### 1. Relationship between Nifty Return, Trading Days & Market Capital

Correlations

		Nifty Returns	Market capital	Trading days
Nifty Returns	Pearson Correlation	1	.130	.162
	Sig. (2-tailed)		.575	.484
	N	21	21	21
Market capital	Pearson Correlation	.130	1	-.387
	Sig. (2-tailed)	.575		.083
	N	21	21	21

Trading days	Pearson Correlation	.162	-.387	1
	Sig. (2-tailed)	.484	.083	
	N	21	21	21

**Interpretation:** The above table shows the relationship between key variables of the NSE. Nifty Returns and Market capital are found to be slightly correlated; trading days is slightly correlated with Nifty returns. Market capital and trading days have a slightly negative correlation.

## 2. Relationship between Nifty Return, Holidays & Nifty

### Correlations

		Nifty Returns	Holidays	Nifty
Nifty Returns	Pearson Correlation	1	.078	.080
	Sig. (2-tailed)		.736	.738
	N	21	21	20
Holidays	Pearson Correlation	.078	1	-.175
	Sig. (2-tailed)	.736		.462
	N	21	21	20
Nifty	Pearson Correlation	.080	-.175	1
	Sig. (2-tailed)	.738	.462	
	N	20	20	20

**Interpretation:** The above table shows the relationship between key variables of the NSE and holidays. Nifty Returns and holidays are found to be slightly correlated, nifty is slightly correlated with Nifty returns. Holidays and Nifty have a slightly negative correlation.

## 3. To measure nifty returns were affected by pre-post holiday difference

Selected (0.05 level\*) Number of Co integrating Relations by Model

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Trace	2	2	2	1	2
Max-Eig	2	2	2	0	2

\*Critical values based on MacKinnon-Haug-Michelis (1999)

Information Criteria by Rank and Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Rank or No. of CEs	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Log Likelihood by Rank (rows) and Model (columns)					
0	<b>-184.9033</b>	<b>-184.9033</b>	<b>-184.8157</b>	<b>-184.8157</b>	<b>-184.5543</b>
1	<b>-177.3716</b>	<b>-175.5182</b>	<b>-175.4364</b>	<b>-175.4363</b>	<b>-175.4358</b>
2	<b>-174.7459</b>	<b>-170.9110</b>	<b>-170.9110</b>	<b>-170.2464</b>	<b>-170.2464</b>
Akaike Information Criteria by Rank (rows) and Model (columns)					
0	19.88456	19.88456	20.08587	20.08587	20.26887
1	19.51280	19.42297*	19.51962	19.62488	19.73008
2	19.65746	19.46431	19.46431	19.60488	19.60488
Schwarz Criteria by Rank (rows) and Model (columns)					
0	20.08338	20.08338	20.38411	20.38411	20.66653
1	19.91046	19.87034*	20.01669	20.17166	20.32657
2	20.25395	20.16022	20.16022	20.40020	20.40020

**Interpretation:** The above table shows the Johansen co-integration test between pre-post holiday difference and nifty returns, there is a decreasing trend in the different models and in rank also. So there is co-integration between the pre-post holiday difference and nifty returns.

**Granger Causality Test:**

Null Hypothesis:	Obs	F-Statistic	Prob.
PREPOSTDIFF does not Granger Cause NIFTYRETURNS	19	2.01434	0.1703
NIFTYRETURNS does not Granger Cause PREPOSTDIFF		0.18865	0.8301

**Interpretation:** Table shows that there is no impact of pre-post holiday difference over nifty returns i.e.,  $p < 0.5$  so accept the null hypothesis. There is an impact of nifty returns over pre-post holiday difference i.e., accept alternative hypothesis as  $p > 0.5$ .

#### 4. Impact of Holidays on Nifty Returns

Selected (0.05 level*) Number of Co integrating Relations by Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Trace	1	0	1	0	0
Max-Eig	1	1	1	0	0

\*Critical values based on MacKinnon-Haug-Michelis (1999)

Information Criteria by Rank and Model

Data Trend:	None	None	Linear	Linear	Quadratic
Rank or No. of CEs	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
<b>Log Likelihood by Rank (rows) and Model (columns)</b>					
0	<b>-178.0159</b>	<b>-178.0159</b>	<b>-177.1548</b>	<b>-177.1548</b>	<b>-176.3738</b>
1	<b>-171.1049</b>	<b>-170.0255</b>	<b>-169.1925</b>	<b>-168.8936</b>	<b>-168.1400</b>
2	<b>-170.2689</b>	<b>-168.9572</b>	<b>-168.9572</b>	<b>-167.5757</b>	<b>-167.5757</b>
<b>Akaike Information Criteria by Rank (rows) and Model (columns)</b>					
0	19.15957	19.15957	19.27945	19.27945	19.40776
1	18.85315	18.84479*	18.86237	18.93617	18.96211
2	19.18621	19.25865	19.25865	19.32375	19.32375
<b>Schwarz Criteria by Rank (rows) and Model (columns)</b>					
0	19.35840	19.35840	19.57770	19.57770	19.80542
1	19.25081*	19.29216	19.35944	19.48295	19.55859
2	19.78269	19.95455	19.95455	20.11907	20.11907

**Interpretation:** The above table shows the Johansen co-integration test between holidays and nifty returns, there is a decreasing trend in the different models and in rank also. So there is co-integration between the Holidays and Nifty Returns.

### Granger Causality Test:

Null Hypothesis:	Obs	F-Statistic	Prob.
NIFTYRETURNS does not Granger Cause HOLIDAYS	19	0.02064	0.9796
HOLIDAYS does not Granger Cause NIFTYRETURNS		0.83996	0.4524

**Interpretation:** Table shows that there is an impact of nifty returns over holidays i.e.,  $p > 0.5$  so accept the alternative hypothesis. There is no impact of holidays over nifty returns i.e., accept null hypothesis as  $p < 0.5$ .

### 5. Holidays and Nifty Volatility

Selected (0.05 level\*) Number of Co integrating Relations by Model

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Trace	0	0	0	0	0
Max-Eig	0	0	0	0	0

\*Critical values based on MacKinnon-Haug-Michelis (1999)

Information Criteria by Rank and Model

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Data Trend:	None	None	Linear	Linear	Quadratic
Rank or No. of CEs	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
<b>Log Likelihood by Rank (rows) and Model (columns)</b>					
<b>0</b>	<b>-80.60528</b>	<b>-80.60528</b>	<b>-79.56381</b>	<b>-79.56381</b>	<b>-79.05196</b>
<b>1</b>	<b>-79.07563</b>	<b>-78.40656</b>	<b>-77.36827</b>	<b>-74.44974</b>	<b>-74.32196</b>
<b>2</b>	<b>-78.58175</b>	<b>-76.99261</b>	<b>-76.99261</b>	<b>-72.26296</b>	<b>-72.26296</b>
<b>Akaike Information Criteria by Rank (rows) and Model (columns)</b>					
0	8.905819*	8.905819*	9.006717	9.006717	9.163365
1	9.165856	9.200691	9.196660	8.994709	9.086523
2	9.534921	9.578170	9.578170	9.290838	9.290838
<b>Schwarz Criteria by Rank (rows) and Model (columns)</b>					
0	9.104648*	9.104648*	9.304961	9.304961	9.561023
1	9.563514	9.648057	9.693734	9.541490	9.683010
2	10.13141	10.27407	10.27407	10.08615	10.08615

The above table shows the Johansen co-integration test between Holidays and Nifty Volatility there is a decreasing trend in the different models and in rank also. So there is co-integration between Holidays and Nifty Volatility

### Granger Causality Test:

Null Hypothesis:	Obs	F-Statistic	Prob.
NIFTYVOLATILITY does not Granger Cause HOLIDAYS	19	0.40543	0.6743
HOLIDAYS does not Granger Cause NIFTYVOLATILITY		0.36370	0.7015

**Interpretation:** Table shows that there is an impact of Nifty volatility over holidays i.e.,  $p > 0.5$  so accept the alternative hypothesis. There is an impact of holidays over Nifty volatility i.e., accept alternative hypothesis as  $p > 0.5$ .

### FINDINGS:

1. There is a relationship between the Nifty returns, trading days and market capitalization.
2. There is a relationship between the Holidays, Nifty and Nifty Returns.
3. The Nifty Returns has been caused by the Pre-post holiday difference.
4. Nifty Returns have been influenced by the Holidays
5. Both the Nifty Volatility and holiday have been caused by each other.

### CONCLUSION:

We conclude that the analysis of Holiday impact on stock market Returns where in this study NIFTY returns, Market Capitalization Trading days have been considered. Normally market will react further the various reasons due to different factors will impact the economy. Trading holidays are also having significant role in decision making for the investor with this analysis it has been observed that there is a relation between NIFTY Returns, Market Capitalization and Trading days.

Trading patterns of the Investors had been observed by pre-post Holiday which was causing the NIFTY Returns. In the analysis it has been proven that the market Returns are influenced by the Market holidays. Risk in the Market has been influenced by the NIFTY Volatility, the volatility itself indicates the standard deviation of the market where the Investor need to be cautious who want to protect the portfolio from high risk, Hence there is a further scope to do research in this area to find the exact impact on the market returns by the less number of trading days. Further researchers need to consider other economic factors which were not considered by us through which they can further have the analysis for the benefit of Investors by Fraternity.

## REFERENCES:

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2. [http://www.nseindia.com/global/content/market\\_timings\\_holidays/market\\_timings\\_holidays.htm](http://www.nseindia.com/global/content/market_timings_holidays/market_timings_holidays.htm) (Holidays List)
3. [http://nseindia.com/products/content/equities/equities/historical\\_equity\\_businessgrowth.htm](http://nseindia.com/products/content/equities/equities/historical_equity_businessgrowth.htm) (Market Capitalization)

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