

**EXPLORING DIWALI EFFECT IN
INDIAN STOCK MARKET:
EVIDENCE FROM BSE SENSEX
STOCK RETURNS**

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ABSTRACT

This research is to investigate the Diwali impact, an emerging seasonal abnormality in the Indian stock market. For the aim of this analysis, the BSE Sensex stock returns from 2002 to 2022 are analyzed. Necessary statistical tools are applied for analysis and interpretation. The empirical findings reveal no significant variations between the average stock return during Diwali and other months. The outcomes and trading activity of the financial market are essentially unaffected by the months preceding Diwali, as the results and trading activity are comparable to other months. The Diwali effect or cultural variables have no substantial impact on the performance of the Indian stock market.

Keywords: Anomaly, Diwali effect, Indian stock market

1. INTRODUCTION TO GLOBALIZATION

The concept of stock market efficiency is vital because it enables us to understand how the markets function. The concept of market efficiency describes how information and share prices interact on the stock market. Because there would not be any overpriced or undervalued stocks in an efficient market, market efficiency affects an investor's investment strategy. It suggests that the stocks will not produce higher returns than what is reasonable to expect. According to the Efficient Market Hypothesis (EMH), all securities are price relative to reflect their intrinsic worth ultimately. Any market that eliminates all excess returns through arbitrage is considered efficient. However, various seasonal impacts that provide higher or lower returns depending on the time of year are evident from the perspective of financial markets, particularly in the case of equities returns. The 'anomalies' since typical asset pricing methods cannot account for them. Investors want to create trading strategies that will allow them to capitalize on these anomalies and make extraordinary profits. Even though several pricing models have attempted to describe the behavior of the shares, the stock markets frequently exhibit seasonal anomalies, which allow investors the opportunity to generate anomalous profits. The current article uses indices from Indian stock markets to demonstrate the festival effect, one of these market anomalies. Diwali festival happens between October and November, according to the Hindu calendar. Diwali presents a distinct occasion to look into and spot any predictable market volatility and return patterns that are not readily apparent in other months of the year. In the existing literature review, the holiday effect is an anomaly that delivers a substantial favorable return before or after a holiday. This study aims to investigate whether holidays, namely the Diwali effect, impact the performance of the Indian stock market. This study assists in comprehending the impact of Diwali on Sensex 30 companies on the Indian stock exchange.

2. LITERATURE REVIEW

In order to analyze and evaluate the stock market's performance during the holiday, asset pricing is a crucial topic of research.

M.J. Fields (1934) was the first to analyze daily stock returns to examine anomalies. The observer evaluated the daily stock data to determine the effect of the pre-holiday. Ariel (1980) also examined trading days in the United States prior to holidays. According to the data, the market portfolio earned more than a third of its total return in the eight trading days prior to the holiday. Lakonishok and Smidt (1988) analyzed the Dow Jones Industrial Average over the decades that followed. Especially they discovered that Christmas and New Year's had a positive effect on returns. Wong et al., in 1990, examined the returns of six Kuala Lumpur Stock Exchange sector-based indices, which included banking, hotels, real estate, tin, and plantations. Many indications pointed to the existence

of the Chinese New Year Effect, whose effects could be noticed well before the beginning of the Chinese Lunar Calendar. The results emerge by employing the EGARCH model and measuring the volatility of stock returns. The research conducted by Aman, Natchimuthu, and Mary (2019) studied the impact of the monsoon on stock returns on Indian stock exchanges. The data supported the monsoon effect in Indian stock markets. Dash et al. (2011) studied the monthly returns on Indian stock exchanges during the market crisis for specific periods. They found no statistically significant differences in the average monthly returns from one month to another, indicating the absence of a significant impact. Chen and Huirong (2009) studied the European stock market in 1992.

The results have no noticeable difference between daily seasonal returns and stock returns over the sample period considered for the study. Cadsby and Ratner were unable to find any evidence of the abnormality.

Chan, Khanthavit, and Thomas (1996) examined the Malaysian and Singaporean stock exchanges. Before a cultural holiday, a more robust holiday anomaly has been discovered. According to Prabakaran and Rufael (2017), the Pre-Holiday period had excellent gains on the Sensex and Nifty during the research period. According to Wachtel's concept, social and religious holidays are more significant to the investing public, and trading tactics can generate extraordinary profits around holidays. Consequently, trading might be profitable around holidays and develop a greater effect than during less significant holidays.

3. METHODOLOGY

To examine the Diwali effect and its influence on the stock returns of the BSE-30 Index stocks was conducted. The daily closing prices retrieved from the capitaline database from January 2002 to December 2022, comprising a sample period of 20 years from the Bombay Stock Exchange, were utilized to study the Diwali effect. The given formula approximates the stock return of BSE-30 Index constituents:

$$R_t = (\ln P_t - \ln P_{t-1}) * 100$$

The R_t represents the return in period t , while P_t and P_{t-1} represent the closing prices of each BSE-30 stock at time intervals t and $t-1$, respectively. Descriptive statistics were employed to measure the mean, standard deviation, and variation coefficient for the Diwali effect. October and November are designated Diwali months; the others are termed non-Diwali. The t -test and regression analysis were utilized. To evaluate the proposed hypothesis, we examined the link between independent and dependent variables using a benchmark as an intercept for evaluating market anomalies.

4. HYPOTHESIS

To investigate the Diwali effect anomaly in the

BSE-30 equities of the Indian stock market. The following hypothesis are framed.

Testable Hypotheses

H1: BSE-Sensex companies' daily closing price stock returns are statistically different in the months of October-November (Diwali month) and the rest of the year (non-Diwali month).

H0: The daily closing price of BSE-Sensex companies' stock returns is not statistically different between Diwali and other months.

Model framework for Diwali effect

To explore the presence of seasonal anomaly, that is Diwali effect in BSE Sensex 30 stocks, and the following methodology is adopted from the studies of; Harshita et al., 2018. Whereas Y_t is the underlying return series, dummy variables for October and November were modeled against the returns without using the intercept term. The dummy variable was set to zero for all other months except October and November. In contrast, dummy variable one is set for only October and November for the sample. To avoid getting caught in the "dummy variable trap," the regression analysis is done without an intercept term. The regression equation is as given below:

$$Y_t = \beta_1 \text{January} + \beta_2 \text{February} + \beta_3 \text{March} + \beta_4 \text{April} + \beta_5 \text{May} + \beta_6 \text{June} + \beta_7 \text{July} \\ + \beta_8 \text{August} + \beta_9 \text{September} + \beta_{10} \text{October} + \beta_{11} \text{November} + \beta_{12} \text{December} \\ + \epsilon_t$$

In a regression model, this study uses the ordinary least square approach to investigate the seasonal market anomaly, namely the Diwali effect. Because stock returns have nonsystematic qualities due to time-varying variation in the return series, ARCH, The GARCH (1, 1) model is employed for understanding the variability in the returns during these months.

Table 1: Descriptive results for the results of Diwali Effect

Name of Company	Non-Diwali Effect						Diwali effect					
	Mean	Max.	Min.	S.D	Skew.	Kurt.	Mean	Max.	Min.	S.D	Skew.	Kurt.
Titan	0.0006	0.12	-0.1	0.02	0.35	6.84	0.0001	0.09	-0.08	0.02	0.18	5.7
Asian Paints	0.0016	1.61	-0.18	0.04	21.34	882.6	0.0007	0.18	-0.15	0.03	0.09	9.4
Axis Bank	0.0008	2.39	-1.27	0.06	19.3	1110.26	-0.0007	1.32	-2.57	0.13	-10.75	280.32
Bajaj Auto	0.0018	0.18	-0.16	0.03	0.76	10.71	0.0005	0.18	-0.22	0.03	-0.08	14.08
Bajaj Finance	0.0011	0.18	-0.11	0.02	0.75	12.08	-0.0018	0.09	-0.22	0.02	-2.66	24.24
Bajaj Finserv	0.0009	0.16	-0.11	0.02	0.6	6.53	0.0007	0.1	-0.14	0.03	-0.31	5.73
Bharti Airtel	0.001	0.22	-0.23	0.02	0.15	19.68	0.0009	0.12	-0.1	0.02	0.49	8.24
HCL Technologies	0.001	0.22	-0.23	0.02	0.15	19.67	0.0009	0.12	-0.1	0.02	0.49	8.23
HDFC Bank	0.0006	0.16	-0.16	0.02	0.2	9.24	0.0004	0.07	-0.08	0.02	0.06	5.96
Hindustan Unilever	0.0008	0.19	-0.12	0.02	0.46	8.54	0.0006	0.16	-0.11	0.02	0.25	8.65
ICICI Bank	0.0006	0.21	-0.24	0.03	-0.24	9.83	0.0018	0.15	-0.22	0.03	-0.59	12.93
HDFC	0.0013	0.16	-0.2	0.03	-0.01	8.53	0.0004	0.15	-0.13	0.03	0.32	6.97
Indsind Bank Ltd	0.0008	0.14	-0.31	0.02	-2.08	35.93	0.0012	0.13	-0.23	0.03	-0.78	13.44
Infosys Ltd	0.0013	0.21	-0.21	0.03	0.29	10.34	0.0009	0.08	-0.18	0.02	-0.87	13.83
KotakMah. Bank	0.0009	0.24	-0.6	0.02	-3.78	113.92	0.0007	0.67	-0.7	0.04	-0.89	173.01
Larsen Toubro	0.001	0.17	-0.11	0.02	0.18	6.85	0.0008	0.21	-0.17	0.03	0.09	14.66
Maruti Suzuki	0.0007	0.11	-0.11	0.02	0.26	7.41	0.0008	0.13	-0.06	0.02	0.81	9.6
M&M	0.0009	0.12	-0.13	0.02	0.12	6.61	0.001	0.09	-0.1	0.02	-0.25	6
Nestle India	0.0002	0.13	-0.15	0.02	-0.09	10.36	0.0002	0.08	-0.1	0.02	0.1	8.56
NTPC	0.0005	0.15	-0.15	0.02	-0.04	7.68	-0.0005	0.09	-0.17	0.02	-1.15	14.29
ONGC	0.0002	0.18	-0.18	0.01	-0.27	25.86	0	0.1	-0.14	0.02	0.01	14.57
PowerGrid	0.0012	0.48	-0.34	0.02	2.01	79.4	-0.0005	0.13	-0.18	0.02	-0.87	12.03
Reliance Industries	0.0005	0.18	-0.16	0.02	0.03	7.14	0.0014	0.08	-0.08	0.02	-0.05	5.73
Ultratech Cement	0.0006	0.21	-0.24	0.03	-0.24	9.83	0.0018	0.23	-0.15	0.03	1.33	13.3
Tech Mahindra	0.0013	0.18	-0.14	0.03	0.25	7.64	-0.0017	0.11	-0.15	0.02	-0.85	11
TCS	0.0006	0.23	-0.16	0.02	0.67	16.77	-0.0001	0.12	-0.11	0.02	-0.21	10.37
Tata Steel	0.001	0.21	-0.11	0.02	1.02	17.95	-0.0004	0.12	-0.16	0.03	-1.23	12.06
Sun Pharma	0.0002	0.15	-0.14	0.02	0.1	8.06	0.0005	0.1	-0.09	0.02	0.02	5.62
SBI	0.0009	0.09	-0.16	0.02	-0.35	7.47	0.0012	0.24	-0.14	0.03	1.07	15.54

Source: Eviews output

The above table 01 offers results for the 30 stocks of the BSE Sensex Index. ICICI Bank, IndusInd Bank Ltd, Maruti Suzuki, Mahindra & Mahindra, Reliance Industries, Ultra Tech Cement, Sun Pharma, and SBI found the highest mean returns during the Diwali months (October, November), while other companies were getting negative returns volatility also varied from Diwali months to remaining months in a year. It was the highest in Diwali time compared to the remaining part of the year. Maximum returns found for Kotak Mahindra Bank for Diwali month compared to non-Diwali months. Axis Bank observes higher volatility for Diwali months (0.13%) and non –Diwali months (2.39%). These findings show the potential for this Index to generate significant returns during the months surrounding Diwali. Anomalies might be seen in both the kurtosis and the skewness. It provides some unique insights into the Sensex30 companies listed on the Bombay Stock Exchange in India.

Table 2: Results of Diwali effect using ordinary least square analysis

SL no	Company	Diwali Effect			Non-Diwali Effect		
		Co eff.	S.E	Prob.	Co eff.	S.E	Prob.
1	Asian Paints Ltd	-0.1059	0.066	0.1088	0.1215	0.0265	0
2	Axis Bank Ltd	-0.0024	0.141	0.9863	-0.1297	0.0565	0.0217
3	Bajaj Auto Ltd	-0.1689	0.5201	0.7454	0.1014	0.21	0.6295
4	Bajaj Finance Ltd	0.0806	0.1071	0.4513	-0.164	0.0429	0.0001
5	Bajaj Finserv Ltd	-0.3335	0.1929	0.0829	0.2153	0.1879	0.2518
6	Bharathi Airtel Ltd	-0.3398	0.1394	0.0148	0.2749	0.144	0.563
7	HCL Tech Ltd	0.0489	0.1171	0.6761	-0.1369	0.1137	0.2285
8	HDFC Bank Ltd	-0.0167	0.0742	0.822	-0.8813	0.0297	0.003
9	HUL	0.039	0.0677	0.5645	-0.0578	0.0271	0.0331
10	HDFC Ltd	-0.0003	0.0009	0.7679	-0.0007	0.0003	0.0335
11	ICICI Bank Ltd	-0.1098	0.1078	0.3082	-0.0616	0.0431	0.1537
12	InduInd Bank Ltd	-0.0694	0.119	0.5595	-0.0753	0.0477	0.1142
13	Infosys Ltd	-0.0009	0.0013	0.4806	0.0018	0.0013	0.1648
14	ITC Ltd	0.0462	0.07	0.5091	-0.0684	0.0281	0.0148
15	Kotak Mahindra Bank Ltd	-0.0008	0.001	0.4418	-0.001	0.004	0.012
16	L&T Ltd	0.0363	0.11	0.7412	0.0732	0.0443	0.0981
17	Mahindra & Mahindra Ltd	-0.0668	0.0893	0.9395	-0.0852	0.0358	0.0172
18	Maruti Suzuki India Ltd	-0.002	0.0852	0.981	-0.0824	0.0346	0.0172
19	Nestle India ltd	0.0077	0.0623	0.9019	-0.0757	0.025	0.0024
20	NTPC Ltd	0.0113	0.0767	0.8832	-0.0218	0.0309	0.481
21	ONGC Ltd	0.0606	0.0868	0.485	-0.0425	0.0348	0.2223
22	Power rid Corporation of India Ltd	-0.0044	0.0827	0.9572	-0.0307	0.0338	0.3648
23	Reliance Industries Ltd	-0.0016	0.001	0.0985	0.0012	0.0004	0.0021
24	State Bank of India	0.2058	0.1453	0.1568	-0.2595	0.1402	0.0659
25	Sun Pharmaceuticals Ltd	-0.0734	0.0791	0.3531	0.0996	0.0317	0.0017
26	Tata Steel Ltd	0.0204	0.1222	0.8677	-0.0352	0.0493	0.475
27	TCS	-0.1068	0.0878	0.2236	0.1121	0.0358	0.0017
28	Tech Mahindra Ltd	0.2132	0.1054	0.0431	-0.0742	0.0425	0.0803
29	Titan Company Ltd	-0.0005	0.001	0.6555	-0.0013	0.0004	0.0019
30	Ultratech Cement Ltd	0.1483	0.0827	0.0821	-0.0983	0.0337	0.0036

Source: Eviews output

From Table 2, the results support the theory that the impact of the Diwali months on the performance of Indian equity funds study using a dummy variable for the Diwali months. For this study, we have considered October and November as periods of consideration for the Diwali effect. Therefore, it is reasonable to believe that Diwali has no impact on the performance of the returns of the SENSEX30 firms except for the Bharathi Airtel Ltd having probability (0.0148).

Table 3: Results of Diwali effect using GARCH (1, 1) model

SN	Company	Diwali Effect			Non-Diwali Effect		
		Co eff.	S.E	Prob.	Co eff.	S.E	Prob.
1	Asian Paints Ltd	0.7267	0.0147	0.0001	0.4113	0.0317	0.0001
2	Axis Bank Ltd	0.4691	0.0421	0.0001	5.0508	0.3683	0.0001
3	Bajaj Auto Ltd	0.1303	0.3327	0.6953	0.2361	0.157	0.0089
4	Bajaj Finance Ltd	0.794	0.0088	0	0.4346	0.0313	0
5	Bajaj Finserv Ltd	0.7158	0.0169	0	0.5609	0.0487	0
6	Bharathi Airtel Ltd	0.9218	0.0047	0	0.1023	0.0095	0
7	HCL Tech Ltd	0.9036	0.0056	0	0.0352	0.0041	0
8	HDFC Bank Ltd	0.9038	0.0056	0	0.3517	0.0041	0
9	HUL	0.6742	0.0108	0	0.3521	0.0189	0
10	HDFC Ltd	0.887	0.0067	0	0	0	0
11	ICICI Bank Ltd	0.8894	0.0093	0	0.2149	0.0265	0
12	InduInd Bank Ltd	0.8974	0.0053	0	0.0614	0.0098	0
13	Infosys Ltd	0.7083	0.007	0	0	0	0
14	ITC Ltd	0.7303	0.0166	0	0.3606	0.0297	0
15	Kotak Mahindra Bank Ltd	0.8825	0.0056	0	0	0	0
16	L&T Ltd	0.887	0.0265	0	0.0189	0.3521	0
17	Mahindra & Mahindra Ltd	0.9097	0.0064	0	0.0833	0.0109	0
18	Maruti Suzuki India Ltd	0.8717	0.0095	0	0.1755	0.0163	0
19	Nestle India ltd	0.873	0.008	0	0.0996	0.01	0
20	NTPC Ltd	0.8579	0.0091	0	0.0137	0.0138	0
21	ONGC Ltd	0.8542	0.0078	0	0.1412	0.0164	0
22	Power grid corporation Of India Ltd	0.8433	0.9303	0	0.0103	0.0118	0
23	Reliance Industries Ltd	0.6681	0.0193	0	0.0001	0	0
24	State Bank of India	0.8516	0.0122	0	0.2783	0.0343	0
25	Sun Pharmaceuticals Ltd	0.7843	0.0147	0	0.4165	0.0376	0
26	Tata Steel Ltd	0.9153	0.0077	0	0.1367	0.0233	0
27	TCS	0.8369	0.1583	0	0.2425	0.0293	0
28	Tech Mahindra Ltd	0.8785	0.0083	0	0.1994	0.0207	0
29	Titan Company Ltd	0.7535	0.0121	0	0.0001	0	0
30	Ultra Tech Cement Ltd	0.8256	0.0128	0	0.0238	0.0263	0

Source: Eviews output

The results of equations (1) and (2) for the Diwali effect on the stock yields of SENSEX30 Companies are shown in the above table. For SENSEX 30 firms, returns during the Diwali months were positive and statistically significant at the 5% level of Significance. However, all other months' returns are also noteworthy and favorable. The results show that the Diwali effect exists for all the stocks of BSE Sensex 30 except Bajaj Auto Ltd. The results are similar to that of non-Diwali effect months. This data indicates no particular Diwali effect as the results have no difference between the Diwali and non-Diwali month effect.

5. CONCLUSION

This study investigates the impact of religious experience on Indian financial markets and explores the applicability of well-established asset pricing models for estimating these effects. The empirical results of this study reveal significant findings that contradict prior research; for instance, there are no noticeable differences between the average stock return during Diwali and other months of the year. The results from descriptive statistics shows that during the Diwali months, only ICICI Bank, IndusInd Bank Ltd, Maruti Suzuki, Mahindra & Mahindra, Reliance Industries, Ultra Tech Cement, Sun Pharma, and SBI had the highest mean returns, while other companies had negative returns. In addition, volatility varied between the Diwali months and the year's remaining months.

It was the greatest during Diwali compared to the rest of the year. The months surrounding Diwali have little impact on the trading activity of the financial market because the results are comparable to other months. The Diwali effect or cultural factors have no significant impact on the returns of the Indian stock market.

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