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Holiday Effect and Stock Returns: Evidence from Stock Exchanges of Gulf Cooperation Council

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Abstract: One of the prominent types of calendar anomalies includes holiday effects, where stocks show abnormally higher mean returns on the days prior to holidays in comparison to other trading days. The current study investigates the existence of holiday effects in the stock exchanges of the Gulf Co-operation Council, namely, Kuwait, Bahrain, Qatar, Oman, Saudi Arabia, and the United Arab Emirates for the period between January 2009 and December 2020. The national holidays that are considered for the study are New Year's Day, Mawlid al-Nabi (Prophet birthday), Eid-Al-Isra Wal Miraj, Eid-Al-Fitr, National Day, Hegire Day (Islamic New Year), and Christmas Day. The study employs descriptive statistics and the non-parametric Mann–Whitney U test. The findings of the study disclosed the significant pre-holiday mean returns for ADSMI, BHSEASI, DFMGI, MSM30, TASI and FTDKUW, whereas significant post-holiday mean returns were found only in MSM30 and TASI. The study provided evidence for the presence of a calendar anomaly like holiday effects in the major indices of the Gulf Co-operation Council and proved the market was not in an efficient form during the study period.

Keywords: calendar anomalies; holiday effect; Gulf Co-operation Council (GCC); descriptive statistics; Mann–Whitney U test

JEL Classification: G10; G14; G15



Citation: Pinto, Prakash, Shakila Bolar, Iqbal Thonse Hawaldar, Aleyamma George, and Abdelrhman Meero. 2022. Holiday Effect and Stock Returns: Evidence from Stock Exchanges of Gulf Cooperation Council. *International Journal of Financial Studies* 10: 103. <https://doi.org/10.3390/ijfs10040103>

Academic Editor: Muhammad Ali Nasir

Received: 12 September 2022

Accepted: 24 October 2022

Published: 8 November 2022

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1. Introduction

Stock returns exhibiting anomalous seasonal behaviour have been documented for a long time in various stock markets across the globe. Such irregular patterns of stock returns are called calendar anomalies. Several types of calendar anomalies were reported in previous research across the globe viz day-of-the-week effect (Ziemba 1993; Shakila et al. 2013), monthly effect (Hawaldar et al. 2017b), and semi-monthly effect (Shakila and Pinto 2015; Shakila et al. 2017). Calendar anomalies are identified as challenges to market efficiency (Hawaldar et al. 2017a; Hawaldar et al. 2020). One of the prominent types of calendar anomalies includes holiday effects, where stocks show abnormally higher mean returns on the days before holidays in comparison to other trading days. Further, two types of holiday effects were identified in several countries: the pre-holiday effect, where stock returns on the days preceding the holidays are significantly high, and the post-holiday effect, when the stock returns for the days succeeding the holidays are significantly high compared to those in other days.

The evidence for the existence of holiday effects was documented in the late eighties by researchers, more specifically in US markets (Lakonishok and Smidt 1988; Pettengill 1989; Ariel 1987, 1990). The study conducted by Lakonishok and Smidt (1988) revealed that

pre-holiday returns were 23 times greater than those on other days and two to five times greater than mean returns before a weekend. Also, pre-holiday effects were documented outside the US market, e.g., in Italy ([Barone 1990](#)), Japan ([Ziemba 1993](#)), New Zealand ([Vos et al. 1993](#)), Johannesburg Stock Exchange ([Bhana 1994](#)) India ([Arumugam 1999](#)), Greece ([Coutts et al. 2000](#)), Spain ([Meneu and Pardo 2004](#)), Hong Kong ([McGuinness 2005](#)), Australia ([Marrett and Worthington 2009](#)) and Portugal ([Gama and Vieira 2013](#)).

2. Prior Research on Holiday Effect

[Merrill \(1966\)](#) conducted the first study ever on the holiday effect. By analysing the stock returns of the Dow Jones Industrial Average from 1897 to 1965, he discovered stocks exhibited greater returns on the days prior to and post-holidays. [Fosback \(1976\)](#) verified the stock returns of the S&P 500 index on the two trading days before holidays during the period between 1928 and 1975 and found an abnormal increase in returns on those two days. [Lakonishok and Smidt \(1988\)](#), [Ariel \(1990\)](#), and [Kim and Park \(1994\)](#) studied the US market and found that the average pre-holiday return was substantially greater than the return on the remaining days. Thereafter several empirical studies were conducted documenting the evidence of the holiday effect in the stock markets around the world. Contradicting earlier studies relating to the US market, [Vergin and McGinnis \(1999\)](#) empirically proved the disappearance of the holiday effect for major indices of the US for the period between 1987 and 1996.

[Coutts and Sheikh \(2002\)](#) conducted a study on the All Gold Index, Johannesburg Stock Exchange from 1987 to 1997 and concluded the disappearance of calendar anomalies. They further suggested a probe into the reasons for the disappearance. [Marrett and Worthington \(2009\)](#) examined the holiday effect in the stock exchange of Australia for small capitalisation stocks from 1996 to 2006. The results of the study indicated the existence of a pre-holiday effect in small-cap stocks. However, the post-holiday effect was not found in any market or industry. [Cao et al. \(2009\)](#) conducted a broad study by taking a sample from the New Zealand stock market covering a period of 40 years (1967 to 2006). The results of the study provided sufficient evidence for the existence of holiday effects in the study period. They further analysed the association between the firm size and holiday effects and found an inverse association between firm size and holiday effects, with the entire effect limited only to small firms. Also, large and medium firms did not show a pre-holiday price pattern.

[Dumitriu et al. \(2011\)](#) found the presence of the holiday effect in major indices of the Romanian stock market. To provide a behavioural explanation of the pre-holiday effect, [Teng and Liu \(2013\)](#) studied the Stock Exchange of Taiwan for the period ranging from 1971 to 2011. The results of the study revealed that individual investors become optimistic due to positive emotions about upcoming holidays, and this led to higher trading activities and greater liquidity in stock markets. [Shankar and Kallarackal \(2016\)](#) examined the stock returns of Sensex prior to and post-holidays and found substantial changes in the returns on the next day of the holiday during the study period. By analysing the mean returns of the major stock exchanges of India, viz. Bombay Stock Exchange and National Stock Exchange from 2006 to 2015, [Rufael and Prabakaran \(2017\)](#) proved the existence of holiday effects for the study period. [Sasikirono and Meidiaswati \(2017\)](#) found that in the Indonesian stock market, the post-holiday average market returns were four times greater than the average stock returns of the other days of the week.

[Khanh et al. \(2020\)](#) examined the occurrence of holiday effects in the Vietnamese stock market from 2002 to 2018 and provided empirical evidence for the holiday effect on stock return. [Shakila et al. \(2020\)](#) examined the occurrence of holiday effects in the Bombay Stock Exchange by taking samples from the textile industry for the period from 2010 to 2019, and it was inferred that there was no holiday effect for the sample period. Applying a regression-based approach to stock returns in Swedish Market, [Eidinejad and Dahlem \(2021\)](#) found positive post-holiday effects for a sample period of 40 years from 1980 to 2019. However, when the sample period was divided into 10-year subsamples, the post-holiday

effect existed only in the 1990s and 2000s. Further, the findings of the study did not report the pre-holiday effect in the study period.

Thus, we find numerous studies on holiday effects with mixed results on holiday effects during the study period. The supremacy of GCC countries in the oil reservoir enabled them to withstand global financial crisis of 2008. Further, the GCC countries have acquired assent from the World Trade Organization (WTO), and the recent structural reforms and regulations have offered more access to foreign institutional investors. In this context, the current study aims at exploring the holiday effect in the Gulf Cooperation Council (GCC) Index for the period from 2009 to 2020 for 11 years.

3. Gulf Cooperation Council (GCC)

To promote regional, inter-governmental, political and economic harmony among the Arab countries, the Gulf Cooperation Council was formed on 11 November 1981. This union consists of 6 gulf countries, namely, Kuwait, Bahrain, Qatar, Oman, Saudi Arabia, and the United Arab Emirates. Hence, to analyse the holiday effect, the data is taken from the stock exchanges of six countries of the GCC.

4. Data and Methodology

Table 1 shows the list of GCC countries, names of stock exchanges and stock indices of which daily stock returns are considered for the present study:

Table 1. The List of Gulf Cooperation Council countries and the Stock Exchanges.

GCC Country	Stock Exchange	Stock Index
Kuwait	Boursa Kuwait	FTSE NASDAQ Kuwait 15 (FTDKUW)
Qatar	Qatar Stock Exchange	Qatar Exchange Index (formally DSM 20 Index)
Bahrain	Bahrain Bourse	Bahrain All Share Index (BHSEASI)
Oman	Muscat Securities Market	MSM 30 Index (MSM30)
Saudi Arabia	Saudi Stock Exchange or Tadāwul	Tadawul All Share Index (TASI)
UAE (Dubai)	Dubai Financial Market	Dubai Financial Market General Index (DFMGI)
UAE(Abu Dhabi)	Abu Dhabi Securities Exchange	Abu Dhabi Securities Market General Index (ADSMI)

The sample is taken for the study period between January 2009 and December 2020. In this study, the holidays are defined as public holidays on the day the stock exchange is closed. The following holidays are considered for the current study: New Year's Day, Mawlid al-Nabi (Prophet birthday), Eid-Al-Isra Wal Miraj, Eid-Al-Fitr, National Day, Hegire Day (Islamic New Year), and Christmas Day. Further, to inspect the occurrence of holiday effect in GCC indices, the total number of trading days in each index is grouped into three categories, namely

1. The pre-holidays-one day before the holiday ($T - 1$)
2. Post-holidays-one day after the holiday ($T + 1$)
3. Remaining days-the total number of days excluding holidays, $T - 1$ and $T + 1$.

The mean returns are calculated for the complete data by applying the following formula:

$$R_t = \ln \frac{P_t}{P_{t-1}} \times 100$$

where,

R_t = daily return on the index

\ln = natural log of underlying market series

P_t = closing value of a given index on a specific trading day (t)

and

P_{t-1} = closing value of a given index on a preceding day ($t - 1$).

Further, to compare two sample means that come from the same population, the non-parametric Mann–Whitney U test is employed. Studies conducted by [Smit and Smit \(1998\)](#), [Novotná and Zeng \(2017\)](#), and [Oran et al. \(2018\)](#) employed the Mann–Whitney U test to detect the calendar anomalies like holiday effect, weekly effect etc.

$$U = n_1 n_2 + \frac{n_2(n_2 + 1)}{2} - \sum_{i=nt+1}^{n_2} R_i$$

where,

U = Mann–Whitney U test

n_1 = sample size one

n_2 = sample size two

R_i = rank of the sample size.

5. Empirical Results

Table 2 shows descriptive statistics for the indices of GCC countries for the entire sample period between 2010 and 2020. Positive returns are recorded for ADSMI (0.01953), DFMGI (0.0077), DSM 20 (0.0134), and TASI (0.0122), whereas BHSEASI (−0.00044) and MSM 30 (−0.0214) reported negative returns. DFMGI showed the highest standard deviation (1.385), indicating the market was highly volatile compared to other indices of GCC during the study period. The return distribution is negatively skewed for all the stock indices in GCC countries. The kurtosis measure for return distribution is leptokurtic for all the stock indices indicating investors could experience broader variations resulting in more prospective for extremely low or high returns.

Table 2. Descriptive Statistics of the GCC Indices Returns for the period from 1 January 2010 to 31 December 2020.

Returns	No. of Observations	Mean	Median	Std. Dev	Skewness	Kurtosis
ADSMI	2995	0.019	0.034	1.0479	−0.337	12.9
DFMGI	2995	0.007	0.010	1.3851	−0.179	8.66
BHSEASI	2617	−0.000	0	0.505	−1.119	13.19
MSM30	2720	−0.021	−0.000	0.6248	−1.072	16.35
DSM 20	2748	0.013	0.025	0.9884	−0.721	11.48
TASI	2754	0.012	0.059	1.1134	−0.998	11.97
FTDKUW	2147	0.0023	0.0012	1.16042	−3.433	56.880

As shown in Table 3, the mean returns for pre-holidays (0.3214) in Abu Dhabi Securities Market General Index (ADSMI) are 20.87 times greater than that of remaining days (0.0154), whereas the post-holidays reported negative mean returns (−0.0523) during the said period. Further, the results of the Mann–Whitney U test ($p = 0.013 < 0.05$) indicate there is a major difference between the returns of pre-holidays and remaining days, whereas the results of the test ($p = 0.789 > 0.05$) show that there is no significant difference between the mean returns of post-holidays and remaining days in ADSMI during the study period.

Table 3. The Results of Descriptive Statistics for ADSMI Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	77	77	2841
Mean	0.3214	−0.0523	0.0154
Standard Deviation	0.8946	1.4227	1.0445
Minimum	−2.30	−8.68	−8.41
Maximum	2.78	2.88	8.08
Skewness	0.291	−3.202	−0.152
Kurtosis	0.839	19.527	11.983
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −2.476 $p = 0.013$ (S)	(Z value) = −0.268 $p = 0.789$ (NS)	

Table 4 reveals descriptive statistics for mean returns of pre-holiday, post-holidays and remaining days in the Bahrain All Share Index (BHSEASI) for the study period. As shown in Table 4, the positive mean returns are reported for pre-holidays (0.1741), and negative mean returns are documented for post-holidays (−0.0224) and remaining days (−0.0037) in the study period. Further, the results of the Mann–Whitney U test ($p = 0.021 > 0.05$) confirm that there is a significant difference between the returns of pre-holidays and remaining days, whereas the results of the test ($p = 0.366 > 0.05$) show that there is no significant difference between the mean returns of post-holidays and remaining days in BHSEASI during the said period.

Table 4. The Results of Descriptive Statistics for BHSEASI Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	78	78	2461
Mean	0.1741	−0.0224	−0.0037
Standard Deviation	0.55990	0.46481	0.50458
Minimum	−1.49	−1.16	−6.00
Maximum	1.95	1.21	2.75
Skewness	0.368	0.328	−1.197
Kurtosis	2.269	0.350	13.755
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −2.310 $p = 0.021$ (S)	(Z value) = −0.905 $p = 0.366$ (NS)	

As depicted in Table 5, during the study period, the Dubai Financial Market General Index (DFMGI) recorded positive mean returns for both the day before the holiday (0.2043) and the day after the holiday (0.1398), whereas negative returns (−0.0038) are reported for remaining days in the same period. Also, the results of the Mann–Whitney U test ($p = 0.013 < 0.05$) indicate there is a major difference between the returns of pre-holidays and remaining days, whereas the results of the study ($p = 0.171 > 0.05$) show that there is no significant difference between the mean returns of post-holidays and remaining days in DFMGI during the study period.

Table 5. The Results of Descriptive Statistics for DFMGI Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	77	77	2841
Mean	0.2043	0.1398	−0.0038
Standard Deviation	0.93881	1.38473	1.39265
Minimum	−2.25	−2.28	−8.66
Maximum	2.37	3.41	12.20
Skewness	0.164	0.362	−0.185
Kurtosis	−0.152	−0.551	8.831
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −1.516 $p = 0.013$ (S)	(Z value) = −1.370 $p = 0.171$ (NS)	

As per Table 6 above, positive mean returns (0.1198) are documented for pre-holidays, and negative returns are recorded for post-holidays (−0.0023) and remaining days (−0.0036) in FTSE NASDAQ Kuwait 15 (FTDKUW) during the study period. The results of the Mann–Whitney U test ($p = 0.023 < 0.05$) indicate there is a substantial difference between the returns of pre-holidays and remaining days, whereas the results of the study ($p = 0.496 > 0.05$) show that there is no significant difference between the mean returns of post-holidays and remaining days in FTDKUW during the study period.

Table 6. The Results of Descriptive Statistics for FTDKUW Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	69	69	2009
Mean	0.1198	−0.0023	−0.0036
Standard Deviation	0.8060	1.1856	1.1701
Minimum	−2.07	−3.50	−20.91
Maximum	2.49	3.01	6.96
Skewness	0.091	−0.770	−3.565
Kurtosis	1.423	2.180	58.854
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −1.180 $p = 0.023$ (S)	(Z value) = −0.682 $p = 0.496$ (NS)	

As shown in Table 7, during the study period, Muscat Securities Market MSM 30 Index showed positive mean returns for both pre-holidays (0.1533) and post-holidays (0.1076), whereas negative mean returns (−0.0272) were reported for the remaining days in the study period. Interestingly, the results of the Mann–Whitney U test indicate there is a significant difference between the returns of pre-holidays and remaining days and also between the returns of post-holidays and remaining holidays in MSM30 during the study period.

Table 7. The Results of Descriptive Statistics for MSM30 Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	71	71	2578
Mean	0.1533	0.1076	−0.0272
Standard Deviation	0.49688	0.51253	0.62838
Minimum	−1.11	−2.24	−6.41
Maximum	1.85	1.10	5.37
Skewness	0.609	−1.958	−1.071
Kurtosis	2.331	8.366	16.487
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −2.334 $p = 0.019$ (S)	(Z value) = −2.530 $p = 0.011$ (S)	

The results of the Mann–Whitney U test ($p = 0.019 < 0.05$) indicate there is a substantial difference between the returns of pre-holidays and remaining days. Similar results ($p = 0.011 < 0.05$) are shown between the mean returns of post-holidays and remaining days in MSM30 during the study period.

As per Table 8, positive mean returns are reported for pre-holidays (0.1430), post-holidays (0.1161) and remaining days (0.0094) in Qatar Exchange Index (DSM 20 Index) during the study period. However, the results of the Mann–Whitney U test indicate there is no significant difference between the returns of pre-holidays and remaining days ($p = 0.522 > 0.05$) and also between the returns of post-holidays and remaining days ($p = 0.183 > 0.05$) in the DSM 20 Index during the study period.

Table 8. The Results of Descriptive Statistics for DSM 20 Index Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	61	61	2626
Mean	0.1430	0.1161	0.0094
Standard Deviation	0.84396	1.17034	0.98749
Minimum	−1.61	−3.05	−10.21
Maximum	2.84	3.51	7.31
Skewness	0.673	−0.346	−0.747
Kurtosis	1.719	1.627	11.850
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −0.640 $p = 0.522$ (NS)	(Z value) = −1.331 $p = 0.183$ (NS)	

As per Table 9, Tadawul All Share Index (TASI) exhibits diverse results as positive mean returns are reported for pre-holidays (0.3002), post-holidays (0.375) and remaining days (0.0020) in Tadawul All Share Index (TASI) during the study period. And also, the results of the Mann–Whitney U test ($p = 0.007 < 0.05$) indicate there is a significant difference between the returns of pre-holidays and remaining days and also between the returns of post-holidays and remaining days ($p = 0.002 < 0.05$) in TASI during the study period.

Table 9. The Results of Descriptive Statistics for TASI Daily Returns for Pre, Post-Holiday and Remaining days from 1 January 2010 to 31 December 2020.

	Pre-Holidays	Post-Holidays	Remaining Days
No. of Observations	68	68	2618
Mean	0.3002	0.3753	0.0020
Standard Deviation	0.7206	1.6468	1.1053
Minimum	−1.87	−6.73	−8.68
Maximum	1.33	3.48	8.55
Skewness	−1.180	−1.948	−0.963
Kurtosis	1.9888	7.716	12.196
Results of Independent Sample Test			
Sub-Sets	Pre-Holidays & Remaining Days	Post-Holidays & Remaining Days	
Results of Mann–Whitney U test	(Z value) = −2.711 $p = 0.007$ (S)	(Z value) = −3.043 $p = 0.002$ (S)	

6. Conclusions

The current study attempts to detect the holiday effect in major indices of Gulf Cooperation Council (GCC) countries for a period of 11 years between January 2010 to December 2020. The empirical results of the current study demonstrated positive pre-holiday mean returns for all the select indices of GCC, whereas positive post-holiday returns are reported for DFMGI, MSM30, DSM 20, and TASI, and negative post-holiday effects are exhibited in the case of ADSMI, BHSEASI, FTDKUW in the study period. In addition to this, non-parametric tests conducted across the indices disclosed significant pre-holiday mean returns for ADSMI, BHSEASI, DFMGI, MSM30, TASI and FTDKUW, whereas significant post-holiday mean returns were found only in MSM30 and TASI. Thus, the findings of the present study are in line with previous research on the holiday effect (Kim and Park 1994; Marrett and Worthington 2009; Dumitriu et al. 2011), which documented the existence of the holiday effect in the stock markets. Finally, the results of the study indicate that calendar anomalies like holiday effects exist in the major indices of the Gulf Cooperation Council, and the present study provides a scope to discover the other types of calendar anomalies in the indices of GCC.

Author Contributions: Conceptualization, P.P., I.T.H. and S.B.; methodology, P.P., I.T.H. and S.B.; formal analysis, A.G. and S.B.; data curation, A.G. and S.B.; writing—original draft preparation, P.P. and S.B.; writing—review & editing, P.P., S.B., I.T.H. and A.M.; visualization, I.T.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data collected from the websites of stock exchanges under study.

Conflicts of Interest: No potential conflict of interest exist with respect to the research.

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