



## **Empirical Testing of Month of the Year Effect on Selected Commercial Banks and Services Sector Companies Listed on Bahrain Bourse**

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### **ABSTRACT**

In financial literature we find numerous studies examining the presence of diverse types of calendar anomalies in different stock exchanges of the world. The current paper aims to investigate the month of the year effect in randomly selected ten companies from banking sector and service sector traded on the Bahrain Bourse for a period of 5 years commencing from 1<sup>st</sup> January 2010 to 31<sup>st</sup> December 2014. The empirical research was conducted using descriptive statistics and Kruskal–Wallis H-test. The findings of the study revealed that none of the companies selected for the study exhibited significant monthly returns for the study period except Bahrain Maritime and Mercantile International. The paper suggests that the absence of said calendar anomaly may be due to thin trading practiced in the Bahrain stock exchange.

**Keywords:** Calendar Anomalies, Month of the Year Effect, Bahrain Stock Exchange, Descriptive Statistics and Kruskal–Wallis H-Test, Thin Trading  
**JEL Classifications:** G10, G14, G15

### **1. INTRODUCTION**

Calendar anomalies are unusual deviations from smooth pattern of stock returns. The presence of calendar anomalies opposes the theory of efficient market hypothesis. In financial literature we observe numerous studies conducted on the existence of calendar anomalies in majority of stock exchanges across the globe. Some of the calendar anomalies that have attracted the attention of researchers are day of the week effect, monthly effect, semi-monthly effect, turn of the month effect and holiday effect. The current study focuses on examining the month of the year effect in Bahrain stock exchange. Month of the year effect is a kind of calendar anomaly where significant stock returns are exhibited on a specific month of the year. The earlier research work on month of the year effect confirmed the presence of January effect (Rozeff and Kinney, 1976; Keim, 1983; Gultekin and Gultekin, 1983; Berges et al., 1984; Ariel, 1987), July effect (Al-Saad and Moosa, 2005) February effect (Mitchell and Ong, 2006), April effect (Alagidede and Panagiotidiis, 2006) and June effect (Li and Liu, 2010).

The Bahrain stock exchange was started in 1987 but officially commenced its operations in 1989. Later in 2010 Bahrain stock exchange was replaced by Bahrain Bourse (BHB) which was established as a shareholding company. During the year 2017 there are 44 companies listed on BHB and operates from Sunday to Thursday. Many researches on weak form of market efficiency have been carried out in the developed and developing countries like the U.S., the U.K., Europe, Australia, India, China and Japan. However, there is almost no research on BHB except Gharaibeh and Hammadi (2013) testing the day of the week effect in Bahrain stock market, Hawaldar (2015) empirical testing of capital asset pricing on BHB, Hawaldar (2016) reaction of Bahrain to announcement of annual financial results, and Hawaldar (2016) the cross sectional variation of portfolio returns. This has motivated the researchers to undertake the present study and contribute to the existing literature on weak form of market efficiency. The findings of the study will help the stock market regulators to initiate measures to ensure market efficiency. The present study intends to examine the existence of month of the year effect in selected ten companies traded on the BHB.

## 2. LITERATURE REVIEW

Rozeff and Kinny (1976) provided the early evidence of January effect in the monthly returns of New York stock exchange (NYSE). Keim (1983) reported daily returns for January month were higher compared to remaining months of the year for NYSE and American stock exchange. Similar results were documented by Berges et al. (1984) for Canadian stock market and Nassir and Mohammad (1987) for Malaysian stock market. Later in nineties the researchers provided international supporting evidence for the occurrence of monthly effect in various stock exchanges. Boudreaux (1995) conducted comprehensive study and found confirming evidence of monthly effect for stock markets of Denmark, France, Germany, Norway, Singapore/Malaysia market, Spain and Switzerland. Dahlquist and Sellin (1996) confirmed significant higher returns in both January and July over the sample period in the Swedish stock market. Haugen and Jorion (1996) investigated monthly patterns in NYSE found January effect in the study period.

Pandey (2002) investigated the Bombay stock exchange major index "Sensex" and found that returns were statistically significant in March, July and October for the study period. Mehdiان and Perry (2002) analyzed three market indices viz. Dow Jones composite, NYSE composite and the standard and poor 500 and observed presence of January effect in all three indices. Hellstrom (2002) found significant month of the year effect in Swedish stock market during the study period. Al-Saad (2004) discovered July effect in the three indices of Kuwait stock exchange: Global general, global large cap and global small cap. Lean et al. (2007) tested calendar anomalies in the Asian Stock market by using stock returns in Hong Kong, Indonesia, Malaysia, Japan, Singapore, Taiwan and Thailand stock exchanges. The empirical results of the study supported existence of the weekday and monthly seasonality effects in some Asian markets but there was disappearance of January effect in the Asian markets. Floros (2008) examined the monthly effects and trading month effects in the Greek stock market but the study did not disclose any January effect and the results for the trading month effects showed higher (but not significant) returns over the first fortnight of the month. Mehta and Chander (2009) stated that November and December months can be important for the investors to attain abnormal returns. By using the GARCH model and exponential GARCH model, Parikh (2009) confirmed the presence of a significant "December effect" in the Indian stock market. Li and Liu (2010) found significantly positive returns in June in the four indices of New Zealand stock market. Keong et al. (2010) examined the presence of month-of-the-year effect on stock returns and volatility in eleven Asian countries and revealed positive December effect, except for Hong Kong, Japan, Korea and China. He further stated that few countries exhibited positive January, April and May effect. Silva (2010) investigated calendar regularities in the Portuguese stock market and found no evidence for January anomalies but there was significant pre-holiday effect and turn-of-the month effect.

Tangjitprom (2011) examined the existence of calendar anomalies like month-of-year effect, turn-of-month effect, and weekend effect in Thai stock market. The findings of the study strongly

confirmed the presence of calendar anomalies in Thai stock market. Marrett and Worthington (2011) examined month of the year effect in Australian stock market by considering data of 12 different stock indices, each index series starting on 9 September 1996. The study disclosed that market returns were significantly higher in April, July, and December. Mwikali (2011) examined January effect in Nairobi securities exchange and found that there was no significant January effect on the stock returns. The study conducted by Verma and Kumar (2012) rejected the presence of month of the year effect in the Bombay stock market during the study period. Guler (2013) confirmed the presence of January effect in China, Argentina and Turkey returns. However, there was no evidence of a January effect in Indian and Brazil stock markets. Deyshappriya (2014) examined both day-of-the-week effect and monthly effect in Colombo stock exchange and found the presence of both daily effect and monthly effect during the war period. However, the irregular monthly effect was found for post war period with significant positive April, September and December effect.

Friday and BO (2015) examined seasonality in stock returns for the Stock exchange of Thailand (SET) by considering the monthly returns of both SET composite and SET50 indices between 1975 and 2013. The two anomalies that were tested are "Halloween effect" and January effect. The researchers found "Halloween effect" in both the SET composite and SET50 indices and also significantly higher returns were found for December and January in both the indices.

## 3. DATA AND METHODOLOGY

### 3.1. Data

To examine the presence of month of the year effect the current study uses daily closing prices of 10 randomly selected companies from banking sector and service sector for a period of 5 years commencing from 1<sup>st</sup> January 2010 to 31<sup>st</sup> December 2014. The study excludes official religious holidays. The companies included in this study are Ahli United Bank (AUB), Ithmaar Bank (ITHMR), Khaleeji Commercial Bank (KHCB), National Bank of Bahrain (NBB), Al Salam Bank (SALAM), Bahrain Telecommunications Company (BATELCO), Bahrain Maritime and Mercantile International (BMMI), Nass Corporation (NASS), Seef Properties (SEEF) and General Trading and Food Processing Company (TRAFCO).

Sl. No.	Selected company	Sector
1	Ahli United Bank (AUB)	Commercial banks
2	Ithmaar Bank (ITHMR)	Commercial banks
3	Khaleeji Commercial Bank (KHCB)	Commercial banks
4	National Bank of Bahrain (NBB)	Commercial banks
5	Al Salam Bank (SALAM)	Commercial banks
6	Bahrain Telecommunications Company (BATELCO)	Services
7	Bahrain Maritime and Mercantile International (BMMI)	Services
8	Nass Corporation (NASS)	Services
9	Seef Properties (SEEF)	Services
10	General Trading and Food Processing Company (TRAFCO)	Services

3.1.1. Hypotheses

To test the month of the year effect following hypotheses are laid down.

$H_0$ : There is no significant difference in the mean returns across the months of the year for the selected companies of Bahrain stock exchange.

$H_1$ : There is significant difference in the mean returns across the months of the year for the selected companies of Bahrain stock exchange.

3.2. Methodology

In order to test the calendar anomalies, monthly logarithmic returns are calculated for the specified period of 5 years using the following formula.

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

Where,  $R_t$  = monthly return on the index

$\ln$  = Natural log of underlying market series

$P_t$  = Closing value of a given index on a specific trading month (t) and,

$P_{t-1}$  Closing value of a given index on a preceding month (t-1).

3.2.1. Descriptive statistics

Descriptive statistics is used to describe the summaries and the measures of selected sectoral indices. Measures like mean is used to describe the center of distribution, standard deviation to measure the variation of distribution, kurtosis to measure “peakedness” of the distribution and skewness to measure the deviation of the distribution from symmetry.

3.2.2. Kruskal–Wallis H-test

To test the equality of means for different months of the year, Kruskal–Wallis H-test is used. The Kruskal–Wallis H statistics is stated as follows:

$$K = \frac{12}{n(n+1)} \times \sum \frac{R_i^2}{n_i} - 3(n+1) \tag{2}$$

Where,  $n_i$  = The total number of observations in a market series for each trading day

$R_i$  = The sum of ranks of all the observations in a market series

$K$  = The number of samples

$n$  = The sum of all observations in a market series.

Kruskal–Wallis test follows  $\chi^2$  distribution with (k-1) degrees of freedom. Therefore, underlying  $\chi^2$  values are compared with Kruskal–Wallis values to examine the validity of null hypothesis for 0.05 level of significance.

4. EMPIRICAL RESULTS

4.1. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for AUB

As depicted in the Table 1 in AUB all the months except March, May, June, August and December show positive mean returns. Highest mean returns are reported in January (8.018) and the lowest mean returns were recorded in May (-2.914). The month of May showed higher standard deviation of 10.4987 (Figure 1).

Percentile analysis denotes 25% of the months out of 60 months have returns below -12.36.

75<sup>th</sup> percentile denotes 25% of the total months have returns above 13.895.

50% of the total number of months the in AUB has returns between -12.36 and 13.895.

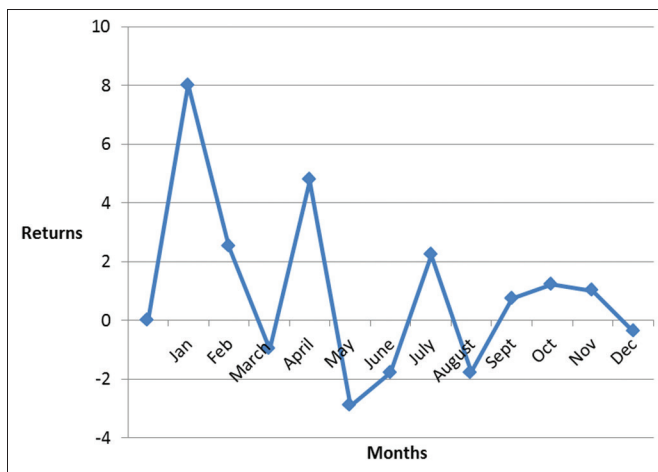
The return distribution is negatively skewed for the month of February, May, August and December whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except January and August during the study period.

The Kruskal–Wallis statistics for AUB is 12.15 which is lower than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for AUB is accepted.

4.2. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for Bahrain ITHMR

As depicted in the Table 2, in ITHMR the month of February, April, July and August show positive mean returns and the remaining months show negative mean returns. Highest mean returns are reported in April (13.20) and the lowest mean returns

Figure 1: Average mean returns of each month of the year for Ahli United Bank January 2010 to December 2014



**Table 1: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for AUB January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	8.018±7.295	2.531	20.47	2.747	6.805	13.895	1.758	3.327
February	5	2.495±5.825	-5.406	8.855	-3.069	2.531	8.043	-0.345	-1.328
March	5	-0.982±9.612	-12.36	14.19	-8.091	-2.230	6.750	0.938	2.238
April	5	4.751±8.484	-7.00	16.87	-1.592	4.110	11.417	0.107	1.821
May	5	-2.914±11.214	-20.62	7.811	-12.36	-3.278	6.717	-1.092	1.235
June	5	-1.770±5.607	-8.434	6.062	-6.965	-1.680	3.379	0.349	-0.450
July	5	2.229±5.569	-3.44	11.41	-1.724	0.692	6.951	1.395	2.653
August	5	-1.764±2.711	-4.948	0.611	-4.716	0.000	0.305	-0.586	-3.172
September	5	0.732±1.397	-0.611	2.837	-0.305	0.000	2.137	0.986	-0.226
October	5	1.211±3.233	-2.790	4.779	-1.764	0.611	4.487	0.003	-2.138
November	5	0.994±3.994	-2.70	6.453	-2.586	-0.0137	5.078	0.585	-1.746
December	5	-0.368±5.315	-7.942	6.169	-5.362	0.623	4.130	-0.427	0.138

Kruskal–Wallis test=2.15

P=0.352 (NS)\*

0.01&lt;P&gt;0.05 \*Not significant. AUB: Ahli United Bank, SD: Standard deviation

**Table 2: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for ITHMR January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	-3.78±9.056	-19.15	4.25	-11.59	0.000	2.127	-1.664	3.084
February	5	3.31±16.63	-8.70	32.54	-6.47	-2.985	16.271	2.037	4.332
March	5	-0.81±16.82	-25.78	21.70	-12.89	0.000	10.853	-0.362	2.070
April	5	13.20±32.87	-13.97	69.31	-8.480	0.000	41.486	1.759	3.295
May	5	-7.09±13.96	-17.15	17.52	-15.05	-11.778	3.198	2.071	4.482
June	5	-18.61±16.21	-37.43	0.000	-35.24	-15.41	-3.572	-0.168	-2.44
July	5	5.834±8.984	-6.06	16.98	-3.031	8.338	13.449	-0.236	-0.904
August	5	9.695±16.571	-9.90	31.84	-4.954	6.062	26.162	0.332	-1.188
September	5	-0.270±8.874	-13.31	11.12	-7.729	0.000	7.053	-0.437	1.326
October	5	-2.33±7.486	-14.10	6.187	-8.940	0.000	3.093	-0.981	1.761
November	5	-6.35±5.952	-12.51	0.00	-11.52	-8.701	0.000	0.379	-2.985
December	5	-0.755±8.471	-8.00	12.51	-7.707	-3.077	7.357	1.148	0.700

Kruskal–Wallis test=13.95

P=0.236 (NS)\*

0.01&lt;P&gt;0.05 \*Not significant. ITHMR: Ithmaar Bank, SD: Standard deviation

were recorded in June (-18.61). The Greater standard deviation was recorded in April (32.87) (Figure 2).

Percentile analysis denotes 25% of the months out of 60 months have returns below -35.24.

75<sup>th</sup> percentile denotes 25% of the total months have returns above 41.486.

50% of the total number of months the in ITHMR has returns between -35.24 and 41.486.

The return distribution is negatively skewed for the month of January, March, June, July, September and October whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except January, February, April and May during the study period.

The Kruskal–Wallis statistics for ITHMR is 13.95 which is lower than the table value of 19.68 at 5% level of significance

for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for ITHMR is accepted.

### 4.3. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for KHCB

As exhibited in the Table 3, in KHCB the month of February, April, September, October and December show positive mean returns and the remaining months show negative mean returns. Highest mean returns are reported in February (4.74) and the lowest mean returns were recorded in June (-8.57). The Greater standard deviation was recorded in February (19.70) (Figure 3).

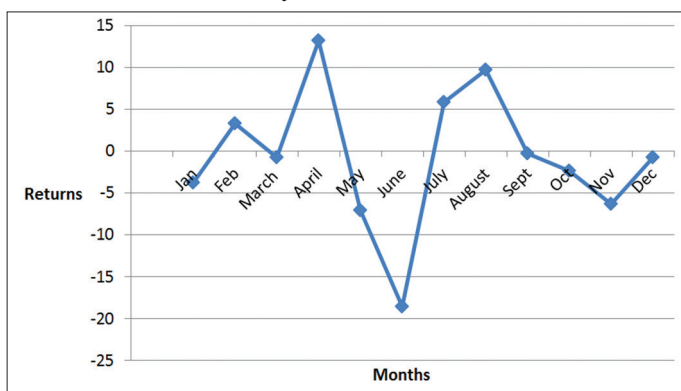
Percentile analysis denotes 25% of the months out of 60 months have returns below -17.74. 75<sup>th</sup> percentile denotes 25% of the total months have returns above 21.02

50% of the total number of months the in KHCB has returns between -17.74 and 21.02.

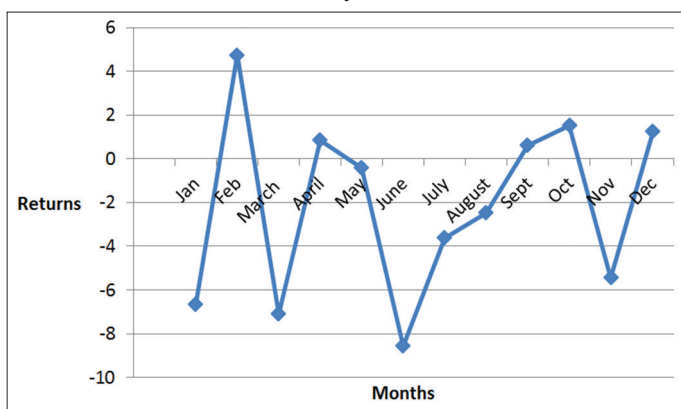
The return distribution is negatively skewed for the month of January, March, April, July, August, and October whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except January, February, May, September and December during the study period.

The Kruskal–Wallis statistics for KHCB is 11.385 which is lower than the table value of 19.68 at 5% level of significance

**Figure 2:** Average mean returns of each month of the year for Ithmaar Bank January 2010 to December 2014



**Figure 3:** Average mean returns of each month of the year for Khaleeji Commercial Bank January 2010 to December 2014



**Table 3: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for KHCB January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	-6.66±10.21	-24.25	0.000	-15.50	-2.33	0.000	-1.866	3.501
February	5	4.74±19.70	-12.67	38.19	-9.172	0.024	21.02	1.682	3.234
March	5	-7.11±7.376	-19.18	0.000	-13.49	-5.826	-1.369	-1.367	2.219
April	5	0.834±6.730	-9.44	8.004	-4.720	0.000	6.806	-0.832	0.720
May	5	-0.408±9.944	-9.531	16.50	-7.26	-2.020	7.253	1.685	3.409
June	5	-8.57±11.18	-20.06	6.31	-17.74	-13.720	3.158	0.584	-2.020
July	5	-3.63±8.733	-16.70	6.89	-11.53	-2.020	3.449	-0.643	0.962
August	5	-2.477±4.044	-9.309	0.00	-6.193	0.000	0.000	-1.722	2.701
September	5	0.621±4.755	-2.46	8.961	-2.265	-1.324	4.480	2.028	4.205
October	5	1.525±4.176	-4.25	7.23	-2.127	2.020	4.931	-0.054	0.972
November	5	-5.459±4.136	-9.531	0.000	-8.934	-7.232	-1.098	0.592	-2.216
December	5	1.255±10.00	-7.41	18.23	-5.978	0.000	9.116	1.684	3.224

Kruskal–Wallis test=11.385  
P=0.412 (NS)\*

0.01<P>0.05 \*Not significant. KHCB: Khaleeji Commercial Bank, SD: Standard deviation

for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for KHCB is accepted.

#### 4.4. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for NBB

As shown in the Table 4 in NBB the month of January, February, May, June, July, August, September and December show positive mean returns and the remaining months show negative mean returns. Highest mean returns are reported in January (4.837) and the lowest mean returns were recorded in March (-7.313). The highest standard deviation was recorded in July (8.798) (Figure 4).

Percentile analysis denotes 25% of the months out of 60 months have returns below -13.8. 75<sup>th</sup> percentile denotes 25% of the total months have returns above 9.776.

50% of the total number of months the in NBB has returns between -13.8 and 9.776.

The return distribution is negatively skewed for the month of March, April and August whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except January during the study period.

The Kruskal–Wallis statistics for NBB is 18.557 which is lower than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for NBB is accepted.

#### 4.5. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for SALAM

As shown in the Table 5, in SALAM the month of January, February, March, July, September October and December show positive mean returns and the remaining months show negative mean returns. Highest mean returns are reported in February (8.00) and the lowest

**Table 4: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for NBB January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	4.837±4.84	0.865	13.23	1.731	3.533	8.594	1.892	3.939
February	5	4.216±4.616	-0.865	10.30	-0.02	3.413	8.857	0.369	-1.733
March	5	-7.313±7.081	-18.8	-0.87	-13.8	-4.811	-2.04	-1.413	1.946
April	5	-1.173±5.821	-9.60	4.81	-7.04	0.985	3.620	-0.771	-0.759
May	5	2.570±8.098	-4.08	16.25	-2.88	-0.921	9.776	1.684	2.888
June	5	0.750±2.217	-1.30	4.082	-1.08	0.000	2.958	0.955	-0.263
July	5	1.032±8.798	-6.575	15.79	-5.32	-1.680	8.749	1.603	2.747
August	5	0.497±3.577	-4.598	3.809	-3.15	1.652	3.571	-0.750	-1.245
September	5	2.532±4.001	-2.84	8.134	-0.60	1.709	6.084	0.147	0.907
October	5	-0.955±3.606	-4.80	3.953	-4.41	-0.851	2.455	0.348	-1.333
November	5	-0.928±0.629	-1.72	0.000	-1.45	-0.956	-0.38	0.475	1.162
December	5	2.591±3.242	0.000	8.244	0.591	1.626	5.074	1.945	4.111

Kruskal–Wallis test=18.557

P=0.070 (NS)\*

0.01<P>0.05 \*Not significant. NBB: National Bank of Bahrain, SD: Standard deviation

**Table 5: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for SALAM January 2010 to December 2014**

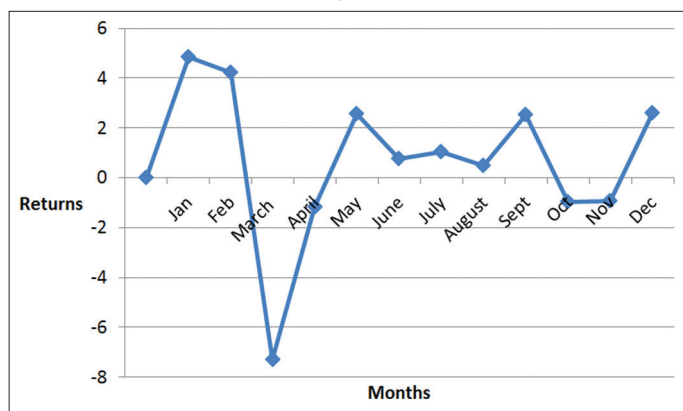
Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	6.414±25.239	-19.57	46.05	-13.43	-1.081	30.01	1.093	1.138
February	5	8.000±25.961	-21.93	44.95	-14.67	3.208	33.071	0.527	-0.420
March	5	2.454±16.775	-18.92	26.38	-11.61	0.000	17.750	0.344	0.535
April	5	-0.028±8.160	-10.6	7.082	-8.759	4.082	6.647	-0.656	-2.519
May	5	-3.851±15.661	-15.08	22.55	-14.44	-11.191	10.415	1.695	2.699
June	5	-5.211±5.127	-12.26	1.307	-9.978	-4.762	-0.668	-0.222	-0.120
July	5	0.177±6.089	-6.453	9.39	-5.213	0.000	5.656	0.757	0.427
August	5	-3.469±2.340	-7.182	-0.95	-5.591	-2.739	-1.713	-1.107	1.630
September	5	0.973±3.969	-2.92	6.713	-2.494	0.000	4.927	0.740	-0.824
October	5	0.638±7.962	-6.453	9.531	-6.289	-2.631	9.201	0.462	-3.153
November	5	-4.65±6.085	-14.10	1.324	-9.967	-4.652	0.6622	-0.985	0.875
December	5	7.208±24.964	-23.07	33.64	-14.94	0.000	32.962	0.089	-2.317

Kruskal–Wallis test=5.214

P=0.920 (NS)\*

0.01<P>0.05 \*Not significant. SALAM: Al Salam Bank, SD: Standard deviation

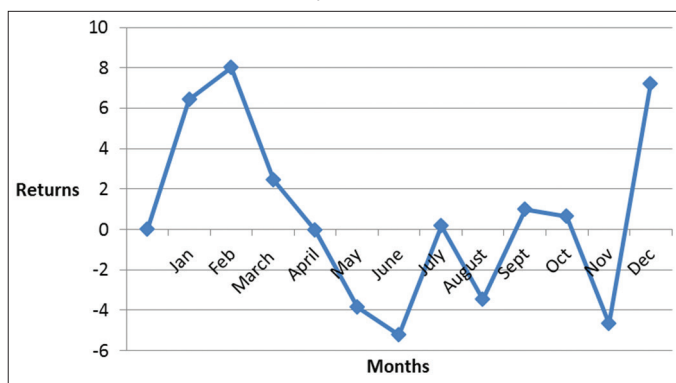
**Figure 4: Average mean returns of each month of the year for National Bank of Bahrain January 2010 to December 2014**



mean returns were recorded in June (-5.211). The highest standard deviation was recorded in February (25.96) (Figure 5).

Percentile analysis denotes 25% of the months out of 60 months have returns below -14.94.

**Figure 5: Average mean returns of each month of the year for Al Salam Bank January 2010 to December 2014**



75<sup>th</sup> percentile denotes 25% of the total months have returns above 33.071.

50% of the total number of months the in SALAM has returns between -14.94 and 33.071.

The return distribution is negatively skewed for the month of April, June, August and November whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except October during the study period.

The Kruskal–Wallis statistics for SALAM is 5.214 which is lower than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for SALAM is accepted.

#### 4.6. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for BATELCO

As represented in the Table 6, in BATELCO the month of January, March and April show positive mean returns and the remaining nine months show negative mean returns. Highest mean returns are reported in March (3.756) and the lowest mean returns are recorded in July (−5.18). The month of February showed greater standard deviation of 9.587 (Figure 6).

Percentile analysis denotes 25% of the months out of 60 months have returns below −7.93.

75<sup>th</sup> percentile denotes 25% of the total months have returns above 7.963.

50% of the total number of months the in BATELCO has returns between −7.93 and 7.963.

The return distribution is negatively skewed for the month of January, April, May, July, September and December whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except June during the study period.

The Kruskal–Wallis statistics for BATELCO is 14.63 which is lower than the table value of 19.68 at 5% level of significance

for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for BATELCO is accepted.

#### 4.7. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for BMMI

As shown in the Table 7, in BMMI the month of January, February, April July, September, October, November and December show positive mean returns and the remaining months show negative mean returns. April (4.971) reported highest mean returns and the lowest mean returns are recorded in March (−10.12). The month of March showed greater standard deviation of 12.085 (Figure 7).

Percentile analysis denotes 25% of the months out of 60 months have returns below −21.79

75<sup>th</sup> percentile denotes 25% of the total months have returns above 10.62.

50% of the total number of months the in BMMI has returns between −21.79 and 10.62.

Figure 6: Average mean returns of each month of the year for BATELCO January 2010 to December 2014

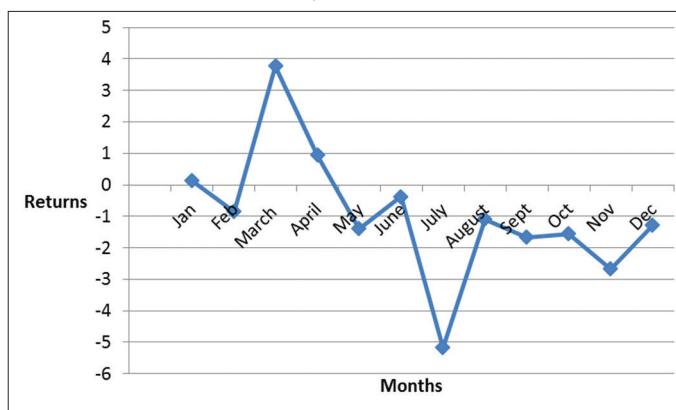


Table 6: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for BATELCO January 2010 to December 2014

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	0.113 ± 2.847	-4.000	3.883	-2.33	0.508	2.363	-0.290	1.296
February	5	-0.847 ± 9.587	-12.13	14.35	-7.93	-1.694	6.667	0.969	2.316
March	5	3.756 ± 4.626	-1.75	10.68	-0.032	2.922	7.963	0.670	0.890
April	5	0.947 ± 4.238	-5.77	4.944	-3.09	2.489	4.216	-1.217	1.096
May	5	-1.41 ± 6.104	-10.4	3.448	-7.743	2.162	3.132	-1.005	-0.914
June	5	-0.380 ± 2.842	-2.62	2.739	-2.59	-2.162	2.727	0.591	-3.310
July	5	-5.18 ± 3.021	-9.265	-2.18	-7.85	-5.818	-2.197	-0.253	-1.410
August	5	-1.09 ± 5.740	-5.68	7.480	-5.28	-4.572	4.833	1.041	-0.726
September	5	-1.66 ± 2.300	-5.556	0.000	-3.663	-0.980	0.000	-1.698	2.965
October	5	-1.56 ± 3.210	-5.55	3.390	-3.98	-1.729	0.939	0.721	2.081
November	5	-2.68 ± 2.493	-5.64	0.506	-5.012	-2.950	-0.225	0.184	-1.612
December	5	-1.28 ± 1.431	-3.27	0.496	-2.610	-1.204	-0.005	-0.289	-0.131

Kruskal–Wallis test=14.63

P=0.20 (NS)\*

0.01<P>0.05 \*Not significant. BATELCO: Bahrain Telecommunications Company, SD: Standard deviation

**Table 7: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for BMMI January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	3.245±3.461	0.000	8.183	0.000	3.226	6.501	0.561	-0.840
February	5	0.932±2.808	-2.895	3.448	-2.041	2.353	3.1950	-0.730	-2.051
March	5	-10.12±12.085	-28.76	0.000	-21.79	-7.020	0.000	-1.059	0.349
April	5	4.971±5.774	-1.694	11.00	-0.847	5.310	10.620	-0.116	-2.741
May	5	-1.320±3.487	-4.87	4.220	-4.17	-1.785	1.771	1.131	1.503
June	5	-0.021±1.909	-2.510	2.666	-1.699	0.000	1.644	0.218	0.583
July	5	4.147±3.244	0.873	8.474	1.321	3.058	7.516	0.552	-1.989
August	5	-3.85±2.405	-6.453	0.000	-5.666	-4.445	-1.739	1.145	1.966
September	5	0.638±1.963	-0.888	4.082	-0.444	0.000	2.041	2.010	4.335
October	5	0.723±2.243	-1.212	5.195	-0.894	0.0000	2.348	1.329	0.510
November	5	1.842±4.112	-3.27	11.58	-0.222	0.3154	4.182	1.555	3.180
December	5	0.927±1.447	-0.888	4.082	0.000	0.389	1.802	1.102	1.354

Kruskal–Wallis test=25.07

P=0.009 (Sig)\*

0.01>P<0.05 \*Significant. BMMI: Bahrain Maritime and Mercantile International, SD: Standard deviation

The return distribution is negatively skewed for the month of February, March, and April whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except September during the study period.

The Kruskal–Wallis statistics for BMMI is 25.07 which is greater than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for BMMI is rejected.

**4.8. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for NASS**

As shown in the Table 8, in NASS the month of January, February, April, September, October and December show positive mean returns and the remaining months show negative mean returns. Highest mean returns are reported in February (5.595) and the lowest mean returns were recorded in March (-6.151). The highest standard deviation was recorded in February (9.531) (Figure 8).

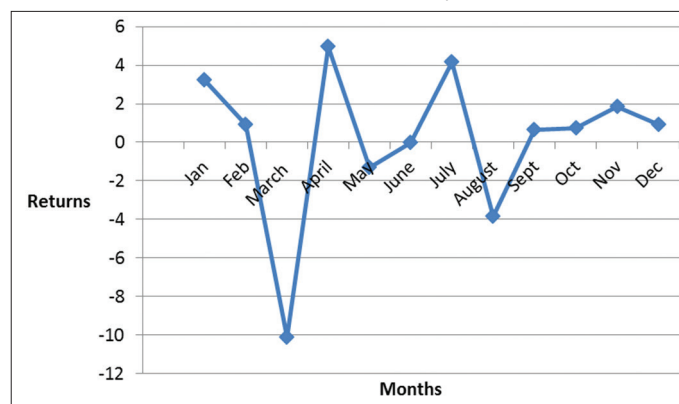
Percentile analysis denotes 25% of the months out of 60 months have returns below -10.56. 75<sup>th</sup> percentile denotes 25% of the total months have returns above 14.024.

50% of the total number of months the in NASS has returns between -10.56 and 14.024.

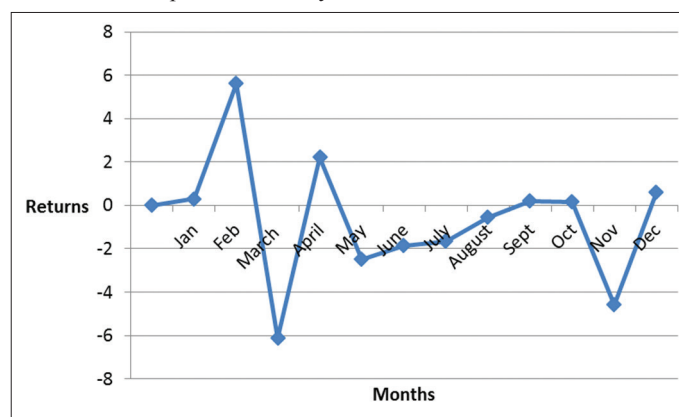
The return distribution is negatively skewed for the month of January, February, May, June, July, August, September and November whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except April and June during the study period.

The Kruskal–Wallis statistics for NASS is 13.483 which is lower than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no

**Figure 7: Average mean returns of each month of the year for Bahrain Maritime and Mercantile International January 2010 to December 2014**



**Figure 8: Average mean returns of each month of the year for NASS Corporation January 2010 to December 2014**



significant difference in the mean returns across the months of the year for NASS is accepted.

**4.9. Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for SEEF**

As shown in the Table 9, in SEEF the month of January, February, March, June, July, August, September, October and November



**Table 8: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis Test for NASS January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	0.293±7.701	-9.841	6.60	-7.976	4.580	6.419	-0.697	-2.525
February	5	5.595±9.531	-7.145	16.64	-3.947	7.825	14.024	-0.370	-1.329
March	5	-6.151±4.860	-10.73	0.664	-10.56	-7.00	-1.307	0.605	-1.295
April	5	2.207±8.987	-3.27	18.11	-2.981	-1.117	9.058	2.122	4.588
May	5	-2.502±5.044	-9.588	3.922	-7.233	-1.129	1.542	-0.314	0.238
June	5	-1.876±4.478	-9.69	1.129	-5.569	0.000	0.878	-1.992	4.056
July	5	-1.65±2.113	-4.59	0.722	-3.565	-1.869	0.361	-0.362	-0.791
August	5	-0.564±2.386	-3.84	2.325	-2.894	0.000	1.482	-0.364	-0.622
September	5	0.187±2.748	-3.322	3.135	-2.153	-0.722	2.984	-0.030	-1.889
October	5	0.137±2.105	-2.50	2.871	-1.811	0.000	2.154	0.102	-1.026
November	5	-4.59±2.755	-8.87	-1.70	-7.214	-3.636	-2.462	-1.022	0.864
December	5	0.580±3.642	-3.63	5.09	-2.396	-1.036	4.366	0.311	-2.086

Kruskal–Wallis test=13.483

P=0.263 (NS)\*

0.01<P>0.05 \*Not significant. NASS: Nass Corporation, SD: Standard deviation

**Table 9: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis Test for SEEF January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	1.037±2.943	-1.769	4.638	-1.56	0.000	4.159	0.459	-2.786
February	5	2.310±8.630	-9.352	14.55	-5.01	3.208	9.191	0.146	1.245
March	5	0.190±4.424	-4.80	7.109	-3.44	0.000	3.921	0.939	1.586
April	5	-2.914±7.527	-9.23	9.87	-8.17	-5.24	3.510	1.713	3.179
May	5	-1.77±4.734	-7.52	5.23	-5.91	-1.496	2.232	0.545	0.826
June	5	1.591±6.72	-3.17	13.35	-2.69	0.000	6.676	1.998	4.181
July	5	-0.699±4.344	-6.66	3.509	-4.90	-0.503	3.412	-0.448	-1.407
August	5	0.003±5.565	-6.22	8.55	-4.76	0.000	4.778	-0.326	-2.321
September	5	4.263±4.850	0.000	12.04	0.813	1.818	8.935	1.331	1.230
October	5	1.189±2.468	-0.947	4.16	-0.87	0.000	3.853	0.552	-3.018
November	5	0.898±2.222	-1.92	3.315	-1.36	1.342	2.945	-0.327	-2.151
December	5	-0.405±5.684	-6.51	6.453	-4.98	-3.315	5.627	0.414	-2.610

Kruskal–Wallis test=8.918

P=0.629 (NS)\*

0.01<P>0.05 \*Not significant. SEEF: Seef Properties, SD: Standard deviation

show positive mean returns and the remaining months show negative mean returns. Highest mean returns are reported in September (4.263) and the lowest mean returns were recorded in April (-2.914). The highest standard deviation was recorded in February (8.630) (Figure 9).

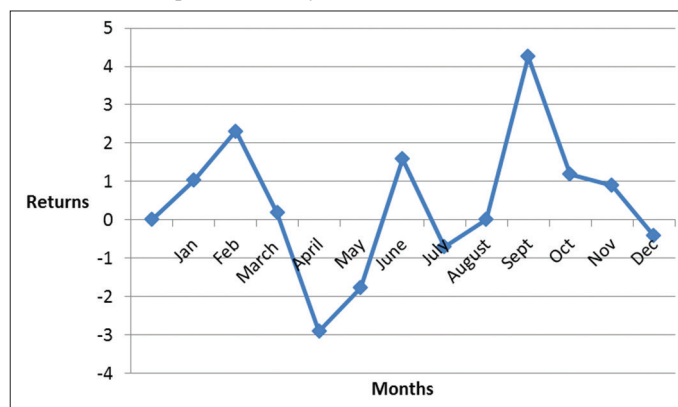
Percentile analysis denotes 25% of the months out of 60 months have returns below -8.17.

75<sup>th</sup> percentile denotes 25% of the total months have returns above 9.191.

50% of the total number of months the in SEEF has returns between -8.17 and 9.191.

The return distribution is negatively skewed for the month of July, August and November whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except April, June and October during the study period.

**Figure 9: Average mean returns of each Month of the year for Seef Properties January 2010 to December 2014**



The Kruskal–Wallis statistics for SEEF is 8.918 which is lower than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for SEEF is accepted.

**Table 10: Results descriptive statistics for various months of the year and the results of Kruskal–Wallis test for TRAFCO January 2010 to December 2014**

Months of the year	N	Mean±SD	Min.	Max	Percentiles			Skewness	Kurtosis
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>		
January	5	0.870±0.936	0.000	2.166	0.000	0.766	1.792	0.519	-1.395
February	5	0±0	0	0	0	0	0	0	0
March	5	-1.480±3.314	-7.41	0.000	-3.705	0.000	0.000	-2.236	5.000
April	5	-3.770±5.170	-9.76	0.000	-9.430	0.000	0.000	-0.618	-3.278
May	5	-0.316±6.545	-9.097	7.410	-6.589	0.000	5.797	-0.264	-1.106
June	5	0.373±1.268	-0.706	2.575	-0.353	0.000	1.287	1.890	4.040
July	5	0±0	0	0	0	0	0	0	0
August	5	0.439±0.982	0.00	2.197	0.000	0.000	1.098	2.236	5.000
September	5	0.484±2.534	-2.24	4.670	-1.123	0.000	2.335	1.347	2.997
October	5	-1.667±3.728	-8.33	0.000	-4.169	0.000	0.000	-2.236	5.000
November	5	-0.714±1.597	-3.57	0.000	-1.78	0.000	0.000	-2.236	5.000
December	5	0.146±0.327	0.000	0.732	0.000	0.000	0.366	2.236	5.000

Kruskal–Wallis test=11.352

P=0.414 (NS)\*

\* 0.01 &lt; P &gt; 0.05 TRAFCO: Trading and Food Processing Company, SD: Standard deviation

#### 4.10 Analysis of Descriptive Statistics for Various Months of the Year and Kruskal–Wallis Test Results for TRAFCO

As shown in the Table 10, in TRAFCO the month of January, June, July, August, September, and December show positive mean returns and the remaining months show negative mean returns. The month of February and July remained constant. It showed during the month of February and June there were absolutely no trading activities during the study period. Highest mean returns are reported in January (0.870) and the lowest mean returns were recorded in April (-3.770). The highest standard deviation was recorded in May (6.545) (Figure 10).

Percentile analysis denotes 25% of the months out of 60 months have returns below -9.430.

75<sup>th</sup> percentile denotes 25% of the total months have returns above 5.797.

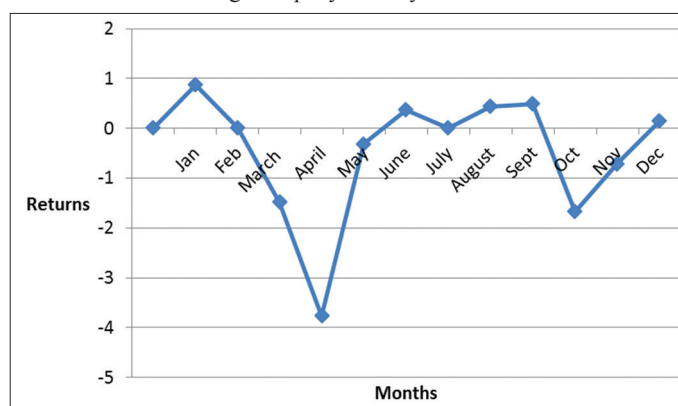
50% of the total number of months the in TRAFCO has returns between -9.430 and 5.797.

The return distribution is negatively skewed for the month of March, April, May, October and November whereas remaining months exhibited positive skewness. The kurtosis measure for return distribution was Platykurtic for all the months of the year except March, April, June August, October, November and December during the study period.

The Kruskal–Wallis statistics for TRAFCO is 11.352 which is lower than the table value of 19.68 at 5% level of significance for 11 degrees of freedom. Hence, the null hypothesis there is no significant difference in the mean returns across the months of the year for TRAFCO is accepted.

### 5. CONCLUSION

The paper examined the month of the year effect for selected ten companies traded on BHB over the period spanning from 2010

**Figure 10: Average mean returns of each month of the year for Trading and Food Processing Company January 2010 to December 2014**

to 2014. The empirical findings of the study revealed the monthly returns were greater in January for AUB, NBB and TRAFCO, in March for BATELCO, in July for BMMI, in April for ITHMR, in February for KHCB, SALAM and NASS, and in September for SEEF. This results showed inconsistency in the behavior of monthly returns of the selected companies.

Nevertheless, the study confirmed that the monthly returns were not statistically significant except for BMMI. Contradicting to the previous studies carried on monthly effects in other stock exchanges across the globe, the results of the paper did not indicate the presence of month of the year effect in the returns of select companies. The findings of the study favour weak form of efficiency in Bahrain Stock market. Due to thin trading activities carried on across the companies, it is difficult to arrive at a suitable conclusion regarding the presence of calendar anomalies in BHB.

### REFERENCES

- Alagidede, P., Panagiotidiis, T. (2006), Calendar Anomalies in Ghana Stock Exchange. Discussion Paper Series, Loughborough University, Department of Economics.
- Ariel, R.A. (1987), A monthly effect in stock returns. Journal of Financial

- Economics, 18(1), 161-174.
- Berges, A., McConnell, J.J., Schlarbaun, G.G. (1984), The turn of the year in Canada. *Journal of Finance*, 39, 185-192.
- Boudreaux, D.O. (1995), The monthly effect in international stock markets: Evidence and implications. *Journal of Financial and Strategic Decisions*, 8(1), 15-20.
- Dahlquist, M., Sellin, P.P. (1996), Stochastic dominance, tax loss selling and seasonalities in Sweden. *European Journal of Finance*, 52(1), 1-19.
- Deyshappriya, R. (2014), An empirical investigation on stock market anomalies: The evidence from Colombo stock exchange in Sri Lanka. *International Journal of Economics and Finance*, 6(3), 17-187.
- Floros, C. (2008), The monthly and trading month effects in Greek stock market returns 1996-2002. *Managerial Finance*, 34, 453-464.
- Friday, S., Bo, N. (2015), Seasonality in the Thai stock index. *Global Economy and Finance Journal*, 8(1), 112-110.
- Gharaibeh, A., Hammadi, F. (2013), The day of the week anomaly in Bahrain's Stock Market. *International Management Review*, 9(2), 60-69.
- Guler, S. (2013), January effect in stock returns: Evidence from emerging markets. *Interdisciplinary Journal of Contemporary Research in Business*, 5(4), 641-648.
- Gultekin, M., Gultekin, N. (1983), Stock market seasonality: International evidence. *Journal of Financial Economics*, 12(4), 469-481.
- Haugen, R.A., Jorion, P. (1996), The January effect: Still there after all these years. *Financial Analyst Journal*, 52(1), 27-31.
- Hawalдар, T.I. (2016), The cross-sectional variation in portfolio returns: Evidence from Bahrain Bourse. *British Journal of Economics, Finance and Management Sciences*, 12(2), 1-10.
- Hawalдар, T.I. (2016), The reaction of Bahrain bourse to announcement of annual financial results. *International Review of Business Research Papers*, 12(1), 64-75.
- Hawalдар, T.I. (2015), Empirical testing of capital asset pricing model on Bahrain Bourse. *Asian Journal of Finance and Accounting*, 7(2), 107-119.
- Hellstrom, T. (2002), Trends and calendar effects in stock returns. Umea, Sweden: Umea University, Computing Science.
- Keim, D.B. (1983), Size-related anomalies and stock return seasonality: further empirical evidence. *Journal of Financial Economics*, 12, 13-32.
- Keong, I., Yat, D., Ling, C. (2010), Month of the year effects in Asian countries: A 20 year study (1990-2009). *African Journal of Business Management*, 4(7), 1351-1362.
- Lean, H.H., Smyth, R., Wong, W.K. (2007), Revisiting calendar anomalies in Asian stock markets using a stochastic dominance approach. *Journal of Multinational Financial Management*, 17(2), 125-141.
- Li, B., Liu, B. (2010), Monthly seasonality in the New Zealand stock market. *International Journal of Business Management and Economics Research*, 1(1), 9-14.
- Marret, G., Worthington, A. (2011), The month-of-the-year effect in the Australian stock market: A short technical note on the market, industry and the firm size impacts. *Australian Accounting Business and Finance*, 5(1), 117-123.
- Mehdian, S., Perry, M.J. (2002), Anomalies in US equity markets: A reexamination of the January effect. *Applied Financial Economics*, 12, 141-145.
- Mehta, K., Chander, R. (2009), Seasonality in Indian Stock Market: A Re-examination of January Effect. Available from: <http://www.abr.sagepub.com/content/5/4/28.abstract>.
- Mitchell, J.D., Ong, L.L. (2006), Seasonalities in China's Stock Markets: Cultural or Structural? International Monetary Fund, Working Paper.
- Mwikali, J.M. (2011), January Effect on Stock Returns: Evidence from Nairobi Securities Exchange. Available from: [http://www.erepository.uonbi.ac.ke:8080/bitstream/handle/11295/12636/John\\_Evidence%20from%20Nairobi%20Securities%20Exchange.pdf?sequence=1&isAllowed=y](http://www.erepository.uonbi.ac.ke:8080/bitstream/handle/11295/12636/John_Evidence%20from%20Nairobi%20Securities%20Exchange.pdf?sequence=1&isAllowed=y).
- Nasir, A., Mohammed, S. (1987), The January effect of stock traded on the Kaula Lumpur stock exchange: An empirical analysis. *Hong Kong Journal of Business Management*, 5, 33-50.
- Pandey, I.M. (2002), Is there Seasonality in the Sensex Monthly Returns? Working Paper. Ahmedabad: Indian Institute of Management.
- Parikh, A. (2009), The December Phenomenon Month of the Year Effect in the Indian Stock Market. Available from: <http://www.nseindia.org>.
- Rozeff, M.S., Kinney, W.R. (1976), Capital market seasonality: The case of stock returns. *Journal of Financial Economics*, 3, 379-402.
- Saad, A., Moosa, I.A. (2005), Seasonality in stock returns: Evidence from an emerging market. *Applied Financial Economics*, 15, 63-71.
- Silva, P.M. (2010), Calendar "anomalies" in Portuguese stock market. *Investment Analyst Journal*, 71, 37-50.
- Tangjitpoom, N. (2011), The calendar anomalies in stock return in Thailand. *Journal of Modern Accounting and Auditing*, 6(1), 565-577.
- Verma, A., Kumar, V. (2012), Month Effect in the Bombay Stock Market Verma, Ashutosh; Kumar, Vijaya; 2012. Available from: <http://www.connection.ebscohost.com>.