Calendar Effects in Fifty-five Stock Market Indices

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Abstract

This study examines the calendar effects in 55 Stock market exchange indices around the globe. The effects which are examined are the turn-of-the-Month effect, day-of-the-Week effect, Month-of the-Year effect and semi-Month effect. The methodology followed is the test hypothesis with bootstrap simulated t-statistics. A seasonality test is to investigate if there is more certain seasonality on expected returns or in volatility. The conclusion is that we reject all calendar effects in a global level, except from the turn-of-the-Month effect, which is presented in 36 stock indices. Moreover there is higher seasonality in volatility rather on expected returns, concerning the day of the week and the month of the year effects.

I. Introduction

One of the first studies about the turn-of-the month effect was the paper by Ariel (1987), who daily data for Center for Research in Security Prices (CRSP) value-weighted and equally-weighted stock index returns from 1963 through 1981 and he found that there are significant differences between the first and second half of the month stock average returns, where the average returns of the last-half of month are not different from zero, while in the first half are significant. Cadsby and Ratner (1992) obtain daily data of eleven indices from ten countries and they define the last and the first three trading days of each month as the turn-of-the month effect. Cadsby and Ratner (1992) found that there is the turn-of-the month effect is six countries. Jaffe and Westerfield (1989) obtain daily returns of stock market indices for four countries. They examined if there is significant difference between intervals [-9, -2] and [-1, +9]. The authors found that there are higher returns of the first half of the month than the returns of the last half of the month in three countries. Ziemba (1991) examines daily returns for NSA Japan during 1949-1988 for the intervals [-5, +2] and [-5, +7] and applying descriptive and *t-statistics* finds that in these intervals returns are higher than any other period. McConnell and Xu (2008) define the turn-of-the month interval as [-1, +3] and they found that the specific calendar effect exists for USA and for other 30 out of 34 countries except Argentina, Colombia, Italy, and Malaysia. Martikainen et al. (1995) examine the interval [-1,

+4] as the turn-of-the month and they apply *t-statistics* to test if the mean returns of this interval are positive and significant greater different from zero. Martikainen et al. (1995) found that these positive and significant returns are observed in the interval [-5, +5]. Kunkel et al. (2003) found that there are positive mean returns in every country in the [-1, +3] interval than any other interval. Aggarwal and Tandon (1994) tested the turn-of-the month ,who found that there are significantly higher returns in the interval previous, [-1, +3] interval in ten out of eighteen countries. Marquering, et al. (2006) examined if each calendar effect and anomaly is still present and valid after the publication of papers about them. Holiday, day-of-the week, January, time-of-the month, turn-of-the month and size effect are the calendar anomalies that authors examine in their paper. The authors found that only the turn-of-the-month effect is not disappeared. Tan and Tat (1998) conclude that all effects exist , but are diminishing through time.

Aggarwal and Tandon (1994) test the day-of-the week found that Monday returns are negative in thirteen countries, but are significant only in seven countries. Also they found that Friday returns are significantly positive in almost all countries. Agathee (2008) examined the day of the week effect, who finds positive and significant ordinary least squares regression coefficients on Mondays, Wednesdays, Thursdays and Fridays, but however Fridays returns are the highest. Mills et al. (2000) haven't found Monday effect , but a Tuesday effect similar to other papers is presented. Aggarwal and Rivoli (1989) find that Monday and Tuesday returns are lower than the overall average, while the Friday returns are higher, as also the volatility measured by the standard deviation is highest on Mondays. So in addition to the Monday effect, Aggarwal and Rivoli (1989) find a Tuesday effect in four Asian markets, which examined. Draper and Paudyal (2002) FT-All Share index and FTSE 100 Index from the beginning of 1988 until December 1997, and they found that Monday returns are negative and generally the returns of the other four days of the week are significantly higher Arsad and Coutts (1997) study the day-of-the week , the month of the year and the holiday effect using daily returns of FT 30 Index in UK from 1 July 1935 through 31 December 1994, splitting the whole sample in 12 sub-samples. Arsad and Coutts (1997) use OLS estimation and the regress daily returns on dummies corresponding on the trading days of the week.

Marquering, et al. (2006) found that Monday effect doesn't exist , but a Tuesday effect similar to other papers is presented. Holden et al. (2005) found some significant calendar anomalies , among them the Monday effect with negative returns. Tonchev and Kim (2004) find a weak evidence for the day of the week effect in Slovenia, and specifically Monday, but in the opposite direction.

Floros (2008) rejects January effect for all the three indices which examined and he finds higher returns over other months rather January, but estimating coefficients are statistically insignificant, except significant negative returns in June for all indices. Mills et al. (2000) examine the month effect and found significant higher average returns on January and February. Choudhry (2001) reports significant negative returns in March and July for UK, while significant positive returns in February, August, September and December and significant negative returns in June and October were found for Germany. Aggarwal and Rivoli (1989) investigate the month –of-the-year effect and they find that January effects exists. Arsad and Coutts (1997) use OLS estimation with dummy independent variables representing the day belonging in a specific month, who found January displays significant positive average returns for FTSE-100 after the introduction of capital gains tax in 1965. Marquering, et al. (2006) report in their results significant higher average returns in January and February. Alagidede and Panagiotidis (2006) examine the month of the year effect and they found mean monthly significant returns in February, March, April and July, with the highest returns reported in April.

Floros (2008) used the General ASE index, FTSE/ASE-20 and FTSE/ASE Mid 40 indices to test the semi-month effect and he finds that there are higher returns over the first fortnight for the General ASE index. The opposite happens for the other two indices FTSE/ASE-20 and FTSE/ASE Mid 40. Mills et al. (2000) investigate the trading month effect and they report that the average returns on days prior the stock market vacations for General index and the 90% of its constituent stocks as average returns in the first fortnight of each trading month for the General index and the 70% of its constituent stocks are significant higher. Marquering et al. (2006) found that significant higher average returns are presented during the first fortnight of the month. Balaban and Bulu (1996)

II. Methodology

We examine if there are calendar effects modelsand then we would like to examine if there is substantially higher number of statistically significant calendar effects in volatility rather than in expected returns. We apply testing hypothesis using bootstrapping proposed by Tsiakas (2005). We test the following one-sided hypotheses:

$$H_0: \theta_1 = \theta_2$$
$$H_1: \theta_1 < \theta_2 \quad (1)$$

And

$$H_0: \theta_1 = \theta_2$$
$$H_1: \theta_1 > \theta_2 \quad (2)$$

First we construct the *t-statistic*

$$T = \frac{\hat{\theta}_1 - \hat{\theta}_2}{s(\hat{\theta}_1 - \hat{\theta}_2)} \quad (3)$$

and we reject the null hypothesis for $T < k$. The standard error is defined as:

$$s(\hat{\theta}_1 - \hat{\theta}_2) = \sqrt{\frac{\hat{\sigma}_1^2}{N_1 - 1} + \frac{\hat{\sigma}_2^2}{N_2 - 1}} \quad (4)$$

,where N_1 and N_2 are two unequal sample sizes and σ_1 and σ_2 are respectively two different population variances. The critical value k is selected so that $k=q_{\alpha,}$ where q_α is the quantile of the empirical distribution of the test statistic T in significance level α, where we define α=0.05. The bootstrap test replaces q_α *with* q_α^B and the test rejects the null hypothesis of (1) if $T < q_\alpha^B$, while the test rejects the null hypothesis of (2) if $T > q_{1-\alpha}^B$. So computationally the critical value can be estimated from a bootstrap simulation

$$T = \frac{(\hat{\theta}_{1,b}^B - \hat{\theta}_{2,b}^B) - (\hat{\theta}_1 - \hat{\theta}_2)}{s(\hat{\theta}_1^B - \hat{\theta}_2^B)} \quad (5)$$

, where $\hat{\theta}_{1,b}^B$ and $\hat{\theta}_{2,b}^B$ are the sample means of θ_1 and θ_2 respectively in the b'th of a total bootstrap samples, while the standard error $s(\hat{\theta}_1^B - \hat{\theta}_2^B)$ is computed as:

$$s(\hat{\theta}_1^B - \hat{\theta}_2^B) = \sqrt{\frac{1}{B}\sum_{b=1}^{B}\{(\theta_{1,b}^{\hat{}B} - \theta_{2,b}^{\hat{}B}) - (\theta_1^{\hat{}B} - \theta_2^{\hat{}B})\}^2} \quad (6)$$

,where

$\hat{\theta}_1^B$ and $\hat{\theta}_2^B$ are the averages of the bootstrap means across all the B bootstrap samples. We use 10,000 bootstrap samples to compute the t-statistics of (24) and then these t-statistics are sorted to find the estimated quantiles q_α^B and $q_{1-\alpha}^B$

As we mentioned we examine four calendar effects. The first is the turn-of-the month (TOM) effect, which is defined as the interval [-1, +3], where -1 is the last trading day of each month and continuing until +3, which is the third trading day of each month. The second population which is the no- turn-of-the month (NTOM) effect is defined as the intervals [-10, -2] and [+4, +10]. The second calendar effect we examine is the day-of-the-week effect, where average returns on Mondays are negative or lower than the other trading weekday returns and Friday present positive and the highest mean returns. The third calendar effect which we test is the month-of-the-year effect, where we expect to find higher average returns in January or April. The last effect we examine is the semi-month effect, which the first fortnight is defined as the interval [1, 15] and the second fortnight as the interval [16, 31]. For the turn-of-the month the first sample in hypotheses (1) and (2) includes stock returns in the interval [-1, +3], while the second sample, which is the complement includes stock returns in the intervals [-10, -2] and [+4, +10] and the opposite. So we expect to get significant positive average returns when we estimate the TOM effect, so the first sample includes the observations in the interval [-1, +3] and when we estimate the NTOM effect we expect significant negative returns, where the first sample contains the observations in the intervals [-10, -2] and [+4, +10]. Similarly for the day of the week effect, when we examine the Monday effect, the first sample includes the average stock returns on Mondays, while the second sample, which is the complement of Monday effect, contains the average returns of all the other trading weekdays, except from Monday returns and similarly for the other days and the other calendar effects. So for example if we examine Tuesdays, the first sample includes all the stock average returns on Tuesdays and he second sample the stock average returns of all the other days except

from Tuesday returns. So if we reject the null hypothesis of relation (1) we conclude that average returns on Tuesday are statistically significant positive or higher than all the other days of the week. On the other hand if we reject the null hypothesis of the relation (2), then we conclude the opposite, that statistically significant negative average returns or lower returns than the other trading weekdays. We test two cases the seasonality in expected returns and in volatility. In the first case we take the stock returns at they are , while in the second case we take the absolute returns.

III. Data

The data are daily and have been obtained from various websites. The analysis is conducted in terms of daily returns which is defined as $r = \log(P_t/P_{t-1})$. More specifically we present the countries ,the indices symbols and the sources-websites where we found the data. The final period is 31 October 2008 for all series except from the starting period, where we show it in table 1 and Zambia, in which the end sample is 31st December of 2007.

IV. Empirical results

In table 2 we present the bootstrapping results for the seasonality in expected returns and we observe that there is the turn-of-the –Month effect in 36 indices out of 55 we examine, where in all these cases where we reject the null hypothesis of relation (1), so we accept that there are higher average returns in the interval [-1, +3], simultaneously we reject the null hypothesis of relation (2), so we conclude that the average returns in the intervals [-10, -2] and [+4, +10] are lower than those in the interval [-1, +3].

For the day of the week effect and specifically the Monday effect we observe that only in 15 stock indices there are lower average returns on Monday than the other weekdays and only in three other stock indices there is the reverse Monday effect, where the average returns on Monday are higher than the other trading days of the week. In the remaining 37 stock indices the difference

average returns between Monday and the other week days are statistically insignificant. So we conclude that we reject the Monday effect, which might present in local or in national level, but we can't claim that is a global calendar effect. Tuesday average returns are statistically lower than the other days of the week, in only 5 cases, where in all the remained stock indices the difference between Tuesday and the other trading days are statistically insignificant from zero. For Wednesday we accept that there are statistically significant positive or higher average returns in 7 stock indices, negative or lower returns in 3 stock indices and statistically insignificant from zero in the remaining 45 stock indices. In the case of Thursday there are significant higher returns in 6 indices, lower returns in 2 indices and statistically insignificant in the remaining 47 stock indices. Finally we observe that in 15 stock indices Friday presents statistically significant higher average returns than the other trading week days, in 2 indices present lower returns and in the 38 remaining stock indices the difference in the average stock returns between Friday and the other weekdays is statistically insignificant from zero. In a few words we conclude that we reject the day of the week effect in global level, or any other day effect as reverse Monday effect, where there aren't persistent anomalies in the international financial markets. Also in the cases of Kuwait and Jordan neither Sunday or Saturday present significant lower or higher average returns than the other trading days of the week.

The next calendar effect we estimate is the month of the year effect, where we expect to find positive or higher average returns in January or in April. For January we accept this assumption only in 7 stock indices, while in 2 we find the reverse January effect and in the remaining 46 tock indices we found statistically insignificant estimations. For February we find significant higher returns in 4 stock indices and insignificant differences in all the other remained cases, while for March we found significant higher and lower average returns in 3 and 1 stock indices respectively. April presents significant higher average returns only in 6 stock indices, while in all the other cases the results are statistically insignificant, indicating that our results don't confirm the initial assumption, that January or April present higher returns than the other trading months, in a global financial market level .We found significant higher and lower average returns in May for 3 and 2

stock indices respectively, while for June higher and lower average returns are significant only in 2 and 1 stock indices respectively. For July we find statistically significant higher and lower average returns than the other trading months in Latvia in Estonia respectively. For August we find in 5 stock indices significant higher returns and in 2 cases lower returns. September seems to be the strongest calendar anomaly for the month of the year effect, while presents the most frequent seasonality anomaly, where in 19 stock indices there are significant lower average returns on this month than the other trading months and in 4 stock indices there are higher average returns. October presents significant higher returns in 4 cases and lower returns in 3 stock indices, while November average returns are higher and negative in 7 and 1 stock indices respectively. December is the month with the most frequent seasonality followed by September, where in 12 there is significant higher average return than the other trading months. Generally we reject this calendar effect too, while we can't claim international level that exists a particularly persistent anomaly on a specific month.

The last calendar effect we examine is the semi-month effect, where in 7 and 2 cases we accept for both fortnights that there are significant lower and higher respectively returns, while in an additional case we accept only the hypothesis that there are significant lower returns in the second fortnight in India and higher returns in the first fortnight for Canadian stock index.

In the case of the seasonality in volatility and the turn of the month effect we find only in 2 stock indices, in Yugoslavia and Sweden there are lower and higher absolute returns in TOM and NTOM interval, while we observe the opposite situation in other 2 indices in France and Ireland. Finally in the case of Pakistan higher returns are resented in the TOM interval. The main conclusion is that we reject the seasonality in volatility and so there is no need to estimate with Periodic-GARCH proposed by Bollerslev and Ghysels (1996) or the periodic stochastic volatility model (Tsiakas , 2004), while previously we accepted the seasonality in expected returns.

In the day of the week effect the seasonality in volatility is present in much more cases, concerning Monday Tuesday and Friday, than the seasonality in expected returns. Specifically Monday presents significant higher and lower absolute returns in 24 and 3 stock indices

respectively, Tuesday presents higher and lower absolute returns n 4 and 12 stock indices respectively, while Friday present the respective returns in 2 and 17 cases. So the Periodic- GARCH or the periodic stochastic volatility model might be appropriate to examine these days. For the remaining days, Wednesday and Thursday the seasonality in volatility is not presented persistently in global level, while higher and lower absolute returns are presented in 3 and 5 stock indices respectively for Wednesday and in 2 and 3 stock indices for Thursday. Furthermore in the cases of Jordan and Kuwait, only Sunday in Jordan presents statistically significant absolute returns.

In the case of the month of the year effect we conclude that there is a strong evidence of seasonality in volatility rather in expected returns. Specifically the month presenting the most frequent cases of seasonality in volatility is October, where there are significant higher and lower average returns, than the other trading months, in 5 and 36 cases, so in total of 41 stock indices. Then June and December follow with significant differences in absolute returns in 27 cases, where in June there are higher and lower average returns in 3 and 24 stock indices respectively and in 2 and 25 cases respectively for December. Then September follows, where in all 23 cases there are higher absolute returns, and then May and April follow, where in the most cases there are lower absolute returns in the specific months and more particularly for May 21 and 4 cases present statistically significant higher and lower respectively average returns and in 18 and 4 cases for April. Generally as in the case of the seasonality in volatility for the day of the week effect Periodic- GARCH model or the periodic stochastic volatility model might be appropriate.

Finally for the last calendar effect we examine, the semi-month effect, only in 5 cases there are higher absolute returns and in 1 index lower absolute returns.

Conclusions

The general conclusion is that the calendar effects we examined can't be found in our analysis, except from the turn-of-the-month effect, which have been fond in 36 out of 55 stock indices and seems to be the strongest and statistically the most significant calendar anomaly among them we examine. Specifically we didn't find Monday effect, where there are negative returns on Monday, while is reported in a few cases. On the contrary, we do not find a reverse Monday effect in the majority of the cases. Abraham and Ikenberry (1994) suggest that individuals are more aggressive sellers in the early of the trading week and that individuals postpone their sell-related decisions to the weekend and so there is a sell-oriented order flow early in the trading week. On the other hand institutional investors use Mondays to pan strategy, so the investment orders are reduced. The first studies in the day-of-the week effect as Lakonishok and Smidt (1988), Jaffe and Westerfield (1985), and others studies, report significant negative average returns on Monday. But more recent studies found a shift in the weekday pattern, where average returns on Monday were not longer negative, but researchers found significant higher average returns on Monday than for other days. The day-of-the week effect as other calendar effects arise from data mining ,as Sullivan, Timmermann, and White (2001) argue in their paper that calendar effects results from data mining problem and they conclude that the y reject calendar effects for the data they examine. So generally we reject the day of the week effect or any other daily seasonality persistence as negative returns on Tuesdays or positive and highest returns on Fridays. An explanation we reject the day of the week effect can be the methodology that is followed. Specifically more studies in the past used OLS , parametric and non parametric tests, as the *t-statistic, the F-statistics,* Kruskal-Wallis and others, while we used bootstrapping simulation method. For the day-of the-week effect Marquering et al. (2006) found that the Monday effect still exists, but it has diminished substantially. However , Monday effect has disappeared recently according to Marquering et al. (2006). For the month-of-the year effect Marquering et al. (2006) found that the average January returns are not higher than the market's average returns. Marquering et al. (2006) found that after the publication of Rozeff and Kinney

(1976), the strength of the effect dropped dramatically. For the semi-month effect Marquering et al. (2006) found that there is evidence that the trend of this seasonal anomaly is substantially diminished, while this anomaly has started to decline earlier than the year when the article was published by Ariel (1987). Finally for the last effect we examine, the turn-of-the-month effect, which is the only significant calendar anomaly we found, Marquering et al. (2006) found that there is a downward sloping in the trend line of the specific anomaly, but generally they found that this anomaly hasn't disappeared. One reason might explain the persistence of turn-of-the-month effect that Marquering et al. (2006) suggest in their paper is the transaction cost, which are too high for the investors to profit from this calendar anomaly, as the investors cannot exploit the pattern.

Generally, we must mention that various methodologies were applied among the studies and researchers , who examined calendar anomalies in stock returns. Most of them apply descriptive statistics and OLS, while few of them examine the calendar effects with GARCH estimations and bootstrapping approach. We rejected all calendar anomalies we examined, except from the turn-of-the-month effect and we confirm the results of Marquering et al. (2006) , who found that these calendar anomalies have diminished or disappeared , after the date that they were published, except from the turn-of-the-month which is still persistent.

But in the case of the seasonality in volatility we reject once again the cases of the turn of the month and semi-month effect, while we don't in the cases of the day of the week and the month of the year effect, where we concluded that Periodic- GARCH model or the periodic stochastic volatility model might be appropriate, suitable and capable of fining efficiently the persistence in seasonality than other regression models do.

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Table 1. Stock Market Indices and estimating periods

Countries	Period	Countries	Period
Argentina (MERVAL INDEX)[1]	9 October 1996	Indonesia (JKSE Composite Index)[1]	2 July 1997
Australia (All ordinaries Index)[2]	9 January 2001	Ireland (GENERAL INDEX) www.ise.ie	4 January 1983
Austria (ATX INDEX)[1]	12 November 1992	Israel (TA-100 INDEX)[1]	2 July 1997
Belgium (BFX INDEX)[1]	14 February 2005	Italy (MIBTEL INDEX)[1]	4 January 2000
Brazil (IBOVESPA INDEX)[1]	28 April 1993	Japan(Nikkei 225)[1]	5 January 1984
Canada (S&P/TSX Composite index)[1]	4 January 2000	Jordan (Weighted General Index) www.ase.com.jo	4 January 1992
Chile (IPSA INDEX)[2]	23 September 2003	Kuwait (All Share Index)[2]	19 June 2001
China (Shanghai composite Index)[2]	4 July 1997	Latvia (OMX Riga) www.baltic.omxnordicexchange.com	4 January 2000
Croatia (CROBEX INDEX) www.zse.hr	3 January 1997	Lithuania (OMX Vilnius) www.baltic.omxnordicexchange.com	4 January 2000
Denmark (KFX INDEX)[2]	6 January 2000	Luxemburg (LuxX INDEX) www.bourse.lu	10 May 1988
Egypt (CCSI INDEX)[1]	3 July 1997	Malaysia (KLSE INDEX)[1]	6 December 1993
Estonia (OMX Tallinn)[6]	3 January 2000	Mexico (IPC INDEX)[1]	11 November 1991
Finland (Helsinki General Index)[2]	4 July 1997	Netherlands (AEX INDEX)[1]	13 October 1990
France (CAC 40 INDEX)[1]	2 March 1990	New Zealand (New Zealand Stock Exchange 50 Index)[2]	5 May 2004
Germany (DAX INDEX)[1]	27 November 1990	Norway (OSEAX INDEX)[1]	8 February 2001
Greece (GENERAL INDEX) www.enet.gr	5 January 1998	Pakistan (Karachi 100 Index)[2]	8 July 1997
Hong Kong (HANG SENG INDEX)[1]	2 January 1987	Peru (Lima General Index)[2]	4 May 1998
India (BSE SENSEX)[1]	2 January 1997	Philippine (PSE Composite Index)[2]	7 July 1997

1.Source www.yahoofinance.com, 2. Source www.econstats.com

Table 1. (cont.) Stock Market Indices and estimating periods

Countries	Period	Countries	Period
Portugal (PSI GERAL INDEX) www.euronext.com	14 February 2005	Turkey (ISTANBUL NAT-100)[2]	4 July 1997
Russia Federation (RTSI INDEX) www.rts.ru,	4 September 1995	UK (FTSE-100)[2]	3 April 1984
Singapore (STI INDEX)[1]	7 July 1997	UK (FTSE-250)[2]	6 January 2000
South Korea (KOSPI Composite Index)[1]	2 July 1997	USA (Dow Jones composite)[1]	24 December 1980
Spain (IBEX 35)[2]	9 January 2002	USA (Nasdaq 100)[1]	8 February 1971
Sri Lanka (CSE All share Index)[2]	4 July 1997	USA (NY composite)[1]	3 January 1966
Sweden (SAX ALL SHARE INDEX)[2]	9 January 2001	USA (S&P 500)[1]	4 January 1950
Swiss (SSMI INDEX)[1]	12 November 1990	Yugoslavia (BELEX 15) www.belex.co.yu	5 October 2005
Taiwan (TSEC weighted index)[1]	3 July 1997	Zambia (LASI INDEX) www.luse.co.zm	2 January 20022
Thailand (SET INDEX)[2 *]	3 July 1997		

1.Source www.yahoofinance.com, 2. Source www.econstats.com

Table 2. Seasonality in expected returns

	ARGENTINA	AUSTRALIA	AUSTRIA	BELGIUM	BRAZIL	CANADA	CHILE	CHINA	CROATIA
ALL	0.00021 (-0.0005, 0.00022)	0.00025 (4.6e-05, 0.00046)	0.000208 (-0.00014, 0.00054)	-2.44e-04 (-7.6e-03, 4.8e-04)	0.0013 (0.00004,0.0023)	0.00015 (-2.6e-04,5.2e-04)	0.00059 (0.000135,0.0011)	0.00021 (-0.00031,0.00072)	0.00047 (-5.58e-05,0.0010)
MON	0.0173* (0.016, 0.0186)	0.00018 (-0.00031, 0.00068)	0.00031 (-0.00054, 0.00115)	-0.00094 (-0.0024, 0.00045)	-0.0004 (-0.0019, 0.0016)	0.00041 (-0.00041,0.00121)	-0.0016** (-0.0027,-0.00065)	-0.00034 (-0.0017,0.00107)	-0.00028 (-0.00127,0.00071)
TUE	0.015 (0.014, 0.063)	-0.000205** (-0.00079, 0.00032)	0.00042 (-0.00035, 0.00118)	-0.00039 (-0.0018, 0.00099)	0.00035 (-0.0055, 0.0042)	-0.00039 (-0.0013, 0.00051)	0.00028 (-0.00097, 0.00147)	0.000203 (-0.00085, 0.00123)	0.000303 (-0.00107, 0.00161)
WED	3.3e-05 (-4.4e-05, 7.3e-05)	0.00056 (0.00014, 0.00098)	0.00035 (-0.00035,0.00106)	0.00077 (-0.00051, 0.0019)	0.0025 (0.0011,0.0039)	-0.00021 (-0.0011,0.00066)	0.0017* (0.00067,0.00275)	0.0014* (0.00032,0.00252)	0.00137 (0.00008,0.00269)
THU	7.29e-05 (3.68e-05, 0.0003)	0.00036 (-0.0006, 0.00078)	-0.00047 (-0.0012,0.00023)	-0.00039 (-0.0018,0.00102)	0.000105 (-0.0015,0.00172)	0.00043 (-0.00031,0.00118)	0.0013 (0.00032,0.00233)	-0.00068 (-0.0018,0.00045)	0.000409 (-0.00075,0.00156)
FRI	0.0014* (0.0004, 0.0016)	0.00037 (-6.2e-05, 0.00079)	0.00037 (-0.00035,0.00112)	0.00023 (-0.0011,0.00172)	0.0039* (0.0024,0.0055)	0.0005 (-0.00034,0.00134)	0.001139 (0.00029,0.00197)	0.00041 (-0.00059,0.00143)	0.00051 (-0.00053,0.00155)
JAN	0.00025* (-0.00018, 0.00047)	0.00018 (0.00016, 0.00094)	0.00068 (-0.00042, 0.0017)	-4.1e-04 (-0.00024, -2.8e-05)	0.0031 (0.00021, 0.0062)	0.00045 (-0.00089, 0.00181)	0.00032 (-0.0019, 0.00260)	0.000116 (-0.0023 0.00251)	0.0031* (0.00114, 0.00511)
FEB	5.28e-05* (-0.00030, 0.00022)	0.00019 (0.00027, 0.00051)	0.00075 (-0.00036, 0.00184)	4.10e-04 (-0.00011, 0.0021)	0.0021 (-0.00030, 0.0047)	0.00010 (-0.0011, 0.00131)	0.0013 (-0.00052, 0.00310)	0.00059 (-0.0018, 0.00305)	0.000707 (-0.00082, 0.00227)
MAR	-3.7e-05 (-0.00014, 0.00013)	0.00046 (-0.00017, 0.0011)	0.00046 (-0.00061, 0.0015)	0.00057 (-4.4e-05,3.2e-06)	-0.0057** (-0.019, 0.0032)	-0.000175 (-0.0014, 0.00113	0.000206 (-0.0013, 0.00163)	0.00027 (-0.0012, 0.00177)	0.00048 (-0.00107, 0.00206)
APR	-6.19e-05 (-9.3e-05, 6.9e-07)	0.0013* (0.00062, 0.0019)	0.0013 (0.00053, 0.0021)	0.00064 (-0.00076, 0.0021)	0.0018 (-0.00031, 0.0041)	0.00023 (-0.0011,0.00156)	0.0008 (-0.00032, 0.00191)	0.0014 (-0.00028, 0.00315)	0.000052 (-0.00172, 0.00181)
MAY	-0.00012** (-0.0003,9.9e-03)	0.00048 (-1.07e-05,0.00103)	0.00019 (-0.00087, 0.0012)	-0.00099 (-0.0027, 2.4e-04)	0.0023 (0.00024, 0.0043)	0.00095 (-0.00018, 0.00208)	0.00095 (-0.00052, 0.00243)	0.00086 (-0.0011, 0.00281)	-0.00036 (-0.0022, 0.00148)
JUNE	-0.0003 (-0.00054,0.00022)	-0.00024 (-0.00078, 0.00028)	0.00025 (-0.00071, 0.00121)	-0.0017 (-0.0037, 0.00012)	0.0026 (0.00055, 0.0048)	0.00005 (-0.0011, 0.00101)	0.0014 (0.00019, 0.00282)	0.00028 (-0.0018, 0.00242)	-0.00016 (-0.0015, 0.00114)
JULY	-0.00062 (-0.0029, 0.00016)	0.00075 (0.00017, 0.0013)	0.00005 (-0.00092, 0.00104)	-0.00056 (-0.002, 0.0015)	0.00087 (-0.00097, 0.0027)	-0.00015 (-0.0014, 0.00109)	0.00016 (-0.0013, 0.00161)	-0.00011 (-0.0018, 0.00160)	0.00035 (-0.00101, 0.00166)
AUG	-0.0026** (-0.004, 0.0009)	0.00032 (-0.0002, 0.0009)	-0.00044 (-0.0014, 0.0005)	0.00066 (-7.4e-05, 1.3e-05)	0.00067 (-0.0012, 0.0027)	0.00054 (-0.00047, 0.00156)	0.00049 (-0.00098, 0.00196)	0.00019 (-0.0017, 0.00132)	-0.00177 (-0.0036, 1.21e-06)
SEP	-1.78e-05 (-0.00015,4.5e-05)	0.000014 (-0.00064, 0.00067)	-0.0018** (-0.0030, -0.0005)	-0.0011 (-0.0045,0.0029)	0.0013 (-0.0013, 0.0040)	-0.0017** (-0.0034, -4.94e-06)	0.00041 (-0.00107, 0.00179)	-0.00081 (-0.0024, 0.00088)	-0.00017 (-0.00231,0.00206)
OCT	3.74e-06 (-6.6e-05, 0.00015)	-0.00042** (-0.0017, 0.00073)	-0.000443 (-0.0022, 0.00138)	0.00055 (-0.00087, 0.0019)	-0.00022 (-0.0031, 0.0027)	0.000206 (-0.0015, 0.00185)	0.0015 (0.00017, 0.00277)	-0.00028 (-0.0022, 0.00172)	0.000203 (-0.00242, 0.00279)
NOV	3.62e-05 (-0.00012, 0.00086)	0.00053** (-0.0013, 0.00023)	-8.0e-05 (-0.0013, 0.00127)	-0.00043 (-0.0024, 0.0012)	0.0036 (0.0013, 0.00602)	0.00043 (-0.00067, 0.00153)	-0.00046 (-0.0022, 0.0014)	-0.00011 (-0.0015, 0.00125)	0.0023* (0.00034, 0.00441)
DEC	0.0029 (0.00049, 0.0054)	0.0011* (0.00046, 0.0016)	0.0015* (0.00043, 0.0026)	0.0014 (0.00007, 0.0027)	0.0027 (0.00076,0.0048)	0.0011 (5.0e-06, 0.00228)	0.000099 (-0.0016, 0.00174)	0.0008 (-0.00041, 0.00201)	0.001165 (-0.00017, 0.00254)
TOM	0.0029* (0.0011,0.0046)	0.00116* (0.00068,0.0016)	0.0013* (0.0021, 0.0030)	0.0018* (0.00049, 0.0031)	0.0046* (0.0028, 0.0064)	0.0021* (0.0012, 0.00307)	0.0015 (0.00040, 0.00261)	0.000027 (-0.0013, 0.00139)	0.000828 (-0.0006, 0.00233)
NTOM	-0.00023** (-0.00097,0.00049)	0.00010** (-0.00013, 0.00033)	-0.00012** (-0.0005,0.00025)	-0.00046** (-0.0011, 0.0023)	0.00074** (-0.00071, 0.00192)	-0.00019** (-0.00061, 0.00021)	0.00044 (-0.00006, 0.00096)	0.00023 (-0.00031, 0.00078)	0.00041 (-0.00014,0.00098)
FIRST FORT	-0.00061** (-0.0015,0.00035)	0.000179 (-9.6e-05, 0.00045)	-0.00011 (-0.00058, 0.00036)	-0.00023 (-0.0011, 0.00056)	0.00041 (-0.0021,0.00236)	-0.000074 (-0.00057,0.00043)	-0.00025** (-0.0009,0.00039)	0.00016 (-0.00058,0.00089)	0.000296 (-0.0004,0.00099)
SECOND FORT	-0.000607** (-0.0015,0.00034)	0.00018 (-8.4e-05, 0.00048)	-0.00011 (-0.00059, 0.00035)	-0.00023 (-0.0011, 0.00053)	0.00047 (-0.0019,0.00238)	0.00013 * (0.0001,0.00014)	-0.00025** (-0.00089,0.00039)	0.000149 (-0.00058,0.00088)	0.000296 (-0.00039,0.00099)

*and** indicate that the relevant one-sided null hypotheses (20) and (21) respectively are rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 2. (cont.) Seasonality in expected returns

	DENMARK	EGYPT	ESTONIA	FINLAND	FRANCE	GERMANY	GREECE	HONG KONG	INDIA	INDONESIA
ALL	0.000227 (-7.3e-05, 5.2e-04)	0.00083 (-0.0017, 0.0034)	0.0006359 (0.00025, 0.0010)	0.00019 (-0.00048, 0.0008)	0.00009 (-0.0002,0.0004)	0.000224 (-1.2e-04,5.7e-04)	-2.603e-05 (-6.4e-04, 6.0e-04)	0.00029 (-1.0e-04,7.0e-04)	0.000281 (-0.00026, 0.00081)	0.0002 (-0.0003, 0.0008)
MON	-0.000206 (-0.00097, 0.00055)	0.006574 (0.00093, 0.0158)	0.000105 (-0.0008, 0.00098)	0.000539 (-0.0009,0.00194)	-0.00038 (-0.0012, 0.00048)	0.000736 (-1.9e-04, 0.0016)	-0.00084 (-0.0023, 0.00074)	-0.001032** (-0.0023, 0.00016)	0.000759 (-0.0006,0.00217)	-0.001738 (-0.0031,-0.0003)
TUE	0.000282 (-0.00039,0.00096)	0.000019 (-0.0006,0.00067)	0.001050 (0.00020,0.00189)	-0.00088 (-0.00235,0.0005)	0.000478 (-0.00023,00118)	0.000597 (-0.0001,0.00134)	-0.00067 (-0.00196,0.00058)	0.000573 (-0.0002,0.00133)	0.000352 (-0.00076,0.00146)	0.00019 (-0.0009,0.00139)
WED	0.000505 (-0.00015,0.00114)	0.000836 (0.00015,0.00152)	0.000781 (2.4e-05,0.00154)	-0.00119** (-0.0026,0.00021)	-0.00017 (-8.9e-04,0.0055)	-0.00045 (-0.0012,0.00029)	0.000838 (-0.00044,0.00216)	0.001190* (0.00035,0.00203)	0.000848 (-0.00029,0.00195)	-0.000055 (-0.0013,0.00118)
THU	0.000071 (-0.00057,0.00071)	-0.003208 (-0.0121,0.00174)	0.000348 (-0.00053,0.00121)	0.000588 (-0.00118,0.0023)	0.000229 (-5.2e-04,0.0009)	0.000034 (-0.0007,0.00081)	-0.000217 (-0.00175,0.00122)	-0.00056** (-0.0013,0.00023)	-0.00089 (-0.001194,0.0010)	0.001026 (-0.0003,0.00231)
FRI	0.00047 (-0.00013,0.00107)	-0.0153 (-0.0542,0.00750)	0.000902 (5.4e-05,0.00176)	0.001996* (0.00061,0.00338)	0.000263 (-4.5e-04,0.0009)	0.000203 (-0.00055,0.0009)	0.000726 (-0.00063,0.00203)	0.00128* (0.00052,0.00204)	-0.000468 (-0.00176,0.0078)	0.001767* (0.0005,0.00301)
JAN	0.000234 (-0.00075, 0.00121)	0.003171 (-0.02733, 0.0334)	0.00110 (-0.00019, 0.00235)	-0.000791 (-0.0035, 0.00187)	0.000255 (-0.00089, 0.0014)	0.000128 (-0.0010, 0.00132)	0.000323 (-0.0016, 0.00232)	-0.000364 (-0.0018, 0.00111)	-0.000248 (-0.00221, 0.00169)	0.00138 (-0.00103, 0.0037)
FEB	0.000106 (-0.00082, 0.00100)	0.00087 (-0.0006, 0.00237)	0.000819 (-0.00112, 0.00279)	-0.000354 (-0.0023, 0.00169)	0.00034 (-0.0007, 0.00135)	0.000195 (-0.0009, 0.0013)	-0.000973 (-0.0025, 0.00067)	0.00172* (0.00045, 0.0030)	0.00049 (-0.00122, 0.00216)	-0.000364 (-0.0022, 0.00157)
MAR	-0.00005 (-0.00104, 0.0093)	0.00073 (-0.00054, 0.0020)	0.001635 (0.00029, 0.00299)	0.000655 (-0.0016,0.00292)	0.000748 (-0.0004,0.00187)	0.000077 (-0.0011,0.00133)	0.000268 (-0.0016,0.00217)	-0.000616 (-0.0018,0.00057)	-0.000458 (-0.00252,0.00161)	0.000658 (-0.00092,0.0022)
APR	0.000171 (-0.00096, 0.00131)	0.00085 (-0.0007, 0.00237)	0.000264 (-0.00085, 0.00136)	0.001598 (-0.00122,0.0043)	0.001165 (0.00016,0.00215)	0.001497* (0.00047,0.00255)	0.002405* (-4.7e-05,0.00478)	0.00088 (-0.00027,0.0020)	-0.000376 (-0.0025,0.00174)	0.00124 (-0.0006,0.00306)
MAY	0.00067 (-0.00032,0.00166)	-0.000617 (-0.00222,0.0009)	-0.00011 (-0.00119,0.0098)	-0.00124 (-0.0034,0.00099)	-0.000114 (-0.0010,0.00085)	0.000396 (-0.00061,0.0013)	0.000318 (-0.0013,0.00197)	0.00055 (-0.00062,0.0017)	-0.00061 (-0.0028,0.00161)	0.000596 (-0.0015,0.0027)
JUNE	0.000305 (-0.00062,0.00121)	-0.000903 (-0.00217,0.0003)	0.000684 (-0.00036,0.00174)	-0.00066 (-0.0033,0.00164)	-0.000581 (-0.0015,0.00034)	0.00005 (-0.0009,0.00094)	-0.0020 (-0.0036,-5.23e-04)	-0.00011 (-0.00157,0.0012)	0.000014 (-0.00197,0.00198)	0.001538 (-0.0002,0.00332)
JULY	0.000534 (-0.00043, 0.00148)	0.000032 (-0.00124, 0.0013)	-0.00077** (-0.00194, 0.00036)	-0.000734 (-0.0028, 0.00138)	-0.00021 (-0.0013,0.00091)	0.000162 (-0.0009,0.00129)	0.001652 (-8.3e-05,0.00338)	0.001138 (0.00022,0.00204)	0.000692 (-0.00099,0.00235)	0.000393 (-0.0009,0.0017)
AUG	0.00046 (-0.00061, 0.00152)	0.00079 (-0.0004, 0.00201)	0.001299 (0.00011, 0.00241)	-0.001419 (-0.0033,0.00043)	-0.000758 (-0.0019,0.00045)	-0.00073 (-0.0019,0.00046)	-0.000484 (-0.0021,0.00106)	-0.00063 (-0.0018,0.00058)	0.000746 (-0.00066,0.00124)	-0.00462** (-0.00667,-0.002)
SEP	-0.00104 (-0.00223,0.00013)	0.001616 (0.0004,0.00280)	-0.000241 (-0.00193,0.00142)	-0.00052 (-0.0025,0.00161)	-0.001839* (-0.0032,-5.1e-04)	-0.00204* (-0.0034,-6.7e-04)	-0.00111 (-0.0033,0.00106)	-0.000086 (0-.0013,0.00114)	0.000098 (-0.0016,0.00173)	-0.00087 (-0.0031,0.00134)
OCT	0.00007** (-0.00123, 0.00134)	0.000966 (1.9e-05,0.00191)	0.000104 (-0.00116,0.00135)	0.003338* (0.00055,0.00616)	0.000872 (-0.00065,0.0024)	0.000911 (-0.00074,0.0025)	-0.002241** (-0.0067,0.00208)	-0.00035 (-0.0029,0.00208)	-0.0013 (-0.00362,0.00096)	-0.00104 (-0.0036,0.00147)
NOV	0.000346 (-0.00049, 0.00119)	0.000712 (-0.0029, 0.00424)	0.00082 (-0.00041, 0.00208)	0.00241* (0.00028, 0.0045)	0.000521 (-0.00067,0.0016)	0.000973 (-0.00026, 0.0022)	0.000845 (-0.00085, 0.00251)	0.00042 (-0.0009, 0.00172)	0.00174 (7.0e-05, 0.00349)	0.001464 (-0.00041, 0.0033)
DEC	0.001139 (0.00021, 0.00206)	0.002575 (0.0014, 0.00369)	0.002346* (0.00127, 0.00342)	0.000571 (-0.00192, 0.0030)	0.000725 (-0.00034, 0.0017)	0.001313 (3.4e-05, 0.00256)	0.000781 (-0.00086, 0.00244)	0.001256 (-3.6e-04, 0.0025)	0.00238* (0.00096, 0.00382)	0.002785* (0.0009, 0.00457)
TOM	0.001765* (0.00099,0.00251)	0.002311 (0.00418,0.00315)	0.00157* (0.00067,6 0.00247)	0.001451 (-0.00023,0.0031)	0.001336* (0.00042, 0.0022)	0.001149* (0.000199,0.00210)	0.001213 (-0.00067,0.00294)	0.001274* (0.00032, 0.0022)	0.002843* (0.00138,0.0042)	0.002279* (0.0008,0.0038)
NTOM	-0.000207** (-0.00035,0.00030)	0.00065 (-0.0023, 0.00367)	0.000479** (6.3e-05,0.0009)	-0.00005 (-0.0007,0.00072)	-0.00012** (-4.8e-04, 0.0002)	-0.000077** (-0.0003, 0.00045)	-0.000242 (-0.0009, 0.00041)	0.000137** (-0.0003,0.00057)	-0.000132 (-0.0007,0.00044)	-0.000096** (-0.0007,0.00052)
FIRST FORT	0.00030 (-0.00012,0.00072)	0.001123 (0.00059, 0.0016)	0.00094 (0.00041, 0.00148)	-0.00048** (-0.00143,0.0004)	-0.000152 (-0.00065,0.0003)	0.000288 (-0.00023,0.0008)	-0.000198 (-0.0013,0.00063)	0.000347 (-0.0002,0.0009)	0.000539 (-0.00023,0.00012)	0.000037 (-0.0008,0.00087)
SECOND FORT	0.00030 (-0.00011,0.00072)	0.000645 (-0.00233, 0.0036)	0.00094 (0.00040, 0.00147)	-0.00048** (-0.00143,0.0004)	-0.000151 (-0.00064,0.0003)	0.00029 (-0.00022,0.00079)	-0.000208 (-0.0010,0.00062)	0.000351 (-0.00019,0.0009)	-0.000144** (-0.00072,0.00044)	0.00004 (-0.00079,0.00096)

*and** indicate that the relevant one-sided null hypotheses (20) and (21) respectively are rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 2. (cont.) Seasonality in expected returns

	IRELAND	ISRAEL	ITALY	JAPAN	LATVIA	LITHUANIA	LUXEMBURG	MALAYSIA	MEXICO	NETHERLANDS
ALL	0.000344 (0.0001, 0.00058)	0.00033 (-0.0001, 0.00085)	-0.000329 (-7.7e-04, 1e-04)	-0.000029 (-0.0003,0.0002)	0.00059 (6.7e-05,0.0011)	0.00056 (0.00023, 0.0009)	0.00026 (-0.00068, 0.0014)	0.00026 (-0.0006, 0.0014)	0.000607 (0.00018, 0.0010)	-0.000061 (-5.53e-04, 3.9e-04)
MON	-0.000319** (-0.0008, 0.00027)	0.001879* (0.00042,0.00331)	-0.000625 (-0.0018,0.0053)	-0.000873** (-0.0016, -0.0001)	-0.00078** (-0.002,0.00039)	-0.000516** (-0.0013, 0.00026)	0.001399 (-0.0023, 0.00647)	0.001343 (-0.0023, 0.00659)	-0.000995** (-0.0019, 9.5e-06)	-0.000266 (-0.0022, 0.00132)
TUE	-0.000012 (-0.0005, 0.00051)	0.000089 (-0.0008, 0.00096)	-0.000313 (-0.00125, 0.0006)	0.000164 (-0.0005,0.00085)	0.000371 (-0.0007, 0.00143)	0.00008 (-0.0007, 0.0008)	-0.001072 (-0.0025,0.00039)	-0.001060 (-0.0025,0.0041)	0.000812 (-0.00015,0.00177)	0.000349 (-0.0004,0.00103)
WED	0.000091 (-0.0004,0.00061)	-0.000704** (-0.0016,0.00019)	-0.000264 (-0.0011,0.0066)	0.000357 (-0.0003,0.0010)	0.00035 (-0.0007,0.00141)	0.000675 (-1.8e-05,0.0013)	-0.00005 (-0.0013,0.00131)	-0.00003 (-0.0013,0.00129)	0.0010 (7.7e-05,0.00193)	-0.000465 (-0.0012,0.00029)
THU	0.001272* (0.00063,0.00191)	-0.0001044 (-0.00106,0.0007)	-0.000167 (-0.0011,0.0073)	0.000412 (-0.0003,0.0011)	0.001209 (-7.5e-05,0.0024)	0.00128* (0.00058,0.00196)	-0.000186 (-0.0016,0.00121)	-0.000194 (-0.0016,0.00122)	0.001169 (0.00022,0.00209)	-0.000314 (-0.0011,1.0.00049)
FRI	0.000644 (0.00019,0.00109)	0.00143 (-0.0004,0.00331)	-0.00029 (-0.0012,0.00065)	-0.000262 (-0.00091,0.0004)	0.001793 (0.0005,0.00299)	0.001241* (0.00054,0.00194)	0.001287 (-1.8e-05,0.00261)	0.001285 (-3.9e-05,0.0026)	0.001021 (0.00019,0.00184)	0.000382 (-0.0004,0.00018)
JAN	0.00142* (0.00077 0.00216)	-0.000939 (-0.0028, 0.00097)	-0.0003 (-0.0016,0.0009)	0.000299 (-0.0008,0.00144)	0.000571 (-7.5e-04,0.0018)	0.0003 (0.00025,0.00045)	-0.000159 (-0.0034,0.00270)	-0.000171 (-0.0034,0.00272)	0.000405 (-0.0012,0.00201)	-0.0022** (-0.0063,0.00061)
FEB	0.0011 (0.00028 0.00189)	0.001305 (-0.00017, 0.0027)	-0.00006 (-0.0014,-0.0013)	0.000092 (-0.00075,0.0009)	-0.00092 (-0.0021,0.00029)	0.00021 (0.00014,0.00066)	-0.001179 (-0.0034,0.00105)	-0.001141 (-0.0034,0.00110)	-0.000647 (-0.0020,0.00073)	0.000182 (-0.0009,0.000127)
MAR	0.00065 (-9.6e-05, 0.0014)	0.000087 (-0.0017, 0.00185)	-0.000532 (-0.0022, 0.00119)	0.000598 (-0.0005, 0.00166)	0.001263 (-0.0002, 0.00273)	4.09e-05* (4.0e-05, 9.7e-05)	-0.000967 (-0.0033, 0.00133)	-0.000969 (-0.0033,0.00129)	0.002114* (0.0007,0.00351)	-0.000092 (-0.0014,0.00128)
APR	0.00093 (0.00024, 0.0016)	0.002194 (0.00014, 0.0042)	0.001082 (-0.0001,0.00227)	0.000578 (-0.0004,0.00160)	0.000861 (-0.00014,0.0018)	-5.58e-05* (-7.1e-05,3.1e-05)	0.000262 (-0.0019,0.00258)	0.000251 (-0.0002,0.00260)	0.000301 (-0.0011,0.00175)	0.001349 (0.00022,0.00245)
MAY	-0.000014 (-0.00066,0.0006)	0.00218* (0.00042,0.0040)	-0.00061 (-0.0018,0.0006)	0.000184 (-0.0007,0.00105)	-0.0011** (-0.0025,0.00025)	-2.65e-05* (-3.4e-05,5.2e-05)	0.001339 (-0.0003,0.00296)	0.001344 (-0.0003,0.00303)	0.000183 (-0.0011,0.00144)	0.00015 (-0.0009,0.00096)
JUNE	-0.000108 (-0.00076,0.0005)	-0.00061 (-0.00205,0.0008)	-0.001107 (-0.0023,8.2e-05)	-0.000291 (-0.0011,0.00054)	0.000956 (-3.6e-04,0.0027)	0.00033 (3.1e-05,0.00035)	0.001611 (-0.0004,0.00370)	0.0016 (-0.0004,0.00370)	0.000416 (-0.0009,0.0077)	-0.000016 (-0.0010,0.00101)
JULY	0.000208 (-0.0006, 0.00102)	-0.000017 (-0.00156, 0.0015)	-0.000695 (-0.002,0.00059)	-0.00033 (-0.0012,0.00055)	0.002346* (0.0004,0.00432)	0.00019 (0.00017,0.00053)	-0.001443 (-0.0035,0.00065)	-0.001466 (-0.0035,0.00057)	0.000129 (-0.0011,0.00148)	0.000092 (-0.0012,0.00137)
AUG	-0.000094 (-0.0009,0.00074)	-0.001128 (-0.0026,0.0041)	0.000168 (-0.0010,0.00139)	-0.000176 (-0.0011,0.00078)	0.001463 (-0.0016,0.00447)	5.64e-05* (3.8e-05,0.00015)	-0.001699 (-0.0035,0.00019)	-0.001725 (-0.0035,0.0016)	-0.000564 (-0.0018,0.00069)	-0.000082 (-0.0013,0.00116)
SEP	-0.001095** (-0.0021,-0.0001)	-0.000967 (-0.0026,0.00064)	-0.002568** (-0.0045,-0.0005)	-0.001121** (-0.0022,-1.6e-05)	-0.001265** (-0.0036,0.00105)	1.74e-05* (1.6e-06,0.00006)	0.000469 (-0.0021,0.00322)	0.00045 (-0.0022,0.00324)	0.00021 (-0.0014,0.00186)	-0.002234** (-0.0038,-6.47e-04)
OCT	-0.000075 (-0.0013, 0.0015)	-0.001267 (-0.00397, 0.0012)	0.000486 (-0.0017, 0.00269)	-0.000681 (-0.0022, 0.00087)	0.00036 (-0.0016,0.00244)	2.56e-05* (-8.6e-05,4.2e-05)	-0.000827 (-0.0031,0.00148)	-0..000824 (-0.0031,0.00147)	0.000713 (-0.0011,0.00253)	0.000461 (-0.0012,0.00221)
NOV	0.000076 (-0.00078, 0.0009)	0.002012 (0.00012,0.0039)	0.000586 (-0.0010,0.00217)	0.000138 (-0.0010,0.00134)	0.001085 (-0.0006,0.00277)	0.00025 (0.00024,0.00047)	-0.000748 (-0.0031,0.00161)	-0.00074 (-0.0031,0.00603)	0.001678 (0.00021,0.00318)	0.000949 (-0.0003,0.00221)
DEC	0.001331* (0.00063,0.00202)	0.001673 (-0.0001,0.00343)	-0.000349 (-0.0017,0.00101)	0.000324 (-0.0007,0.00134)	0.001460 (0.00014,0.00281)	0.00029 (0.00028,0.00053)	0.006659 (-0.00034,-0.0186)	0.006715 (-0.0003,0.0187)	0.002231* (0.0010,0.00344)	0.001120 (2.2e-05,0.00222)
TOM	0.001493* (0.00083,0.00216)	0.00088 (-0.0004, 0.00221)	0.000683 (-0.0004,0.00176)	0.000525 (-0.0003,0.00134)	0.00033 (-0.0004, 0.00119	0.00016* (-0.0005,0.00026)	-0.000967 (-0.0034, 0.00136)	-0.00092 (-0.00340.00132)	0.002799* (0.0017,0.00391	0.001126* (0.00010,0.00213)
NTOM	0.000154** (-0.0001,0.00041)	0.000256 (-0.0003,0.00081)	-0.000499 (-0.0009,-9.8e-06)	-0.000124 (-0.0004,0.0002)	0.000686 (4.9e-05, 0.00131)	0.00013** (0.0001, 0.00061)	0.000463 (-0.00053, 0.00167)	0.000457 (-0.0005,0.00705)	0.000246** (-0.0002,0.0007)	-0.000251** (-0.0008,0.00024)
FIRST FORT	0.000416 (7.6e-05,0.00075)	0.00024 (-0.0003, 0.00151)	-0.000606 (-0.0012,0.00383)	-0.000116 (-0.00055,0.0003)	0.000587 (6.1e-05,0.00111)	0.00011 (0.0001,0.00042)	-0.000568 (-0.0014,0.00031)	-0.00058 (-0.0014,0.0003)	0.000466 (-0.00013,0.00106)	-0.000307 (-0.00115,0.00042)
SECOND FORT	0.000417 (8.5e-05,0.00075)	0.00024 (-0.0003, 0.0008)	-0.000608 (-0.0012,0.00514)	-0.000114 (-0.00055,0.0003)	0.000591 (6.6e-05,0.00112)	0.00030 (0.00026,0.00054)	-0.000578 (-0.00146,0.00031)	-0.000576 (-0.0014,0.00031)	0.000465 (-0.00014,0.00106)	-0.000304 (-0.00115,0.00043)

*and** indicate that the relevant one-sided null hypotheses (20) and (21) respectively are rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 2. (cont.) Seasonality in expected returns

	NEW ZEALAND	NORWAY	PAKISTAN	PERU	PHILIPPINE	PORTUGAL	RUSSIA	SINGAPORE	SOUTH KOREA	SPAIN
ALL	0.000115 (-2.3e-04, 4.6e-04)	0.000322 (-1.6e-04, 8.1e-04)	0.0010 (-0.0002, 0.00057)	0.00059 (0.00016,0.0010)	-0.000243 (-0.00073,0.00025)	8.74e-05 (-4.03e04, 0.00058)	0.0014 (0.00052, 0.0022)	-0.0054 (-0.0159, 0.0050)	0.00027 (-0.00044, 0.0009)	0.000204 (-0.00018, 0.0006)
MON	0.000399 (-0.0004, 0.00118)	0.000075 (-0.0011, 0.00126)	-0.000329 (-0.0018, 0.00120)	-0.000573** (-0.0016,0.00042)	0.001010* (-3.1e-05,0.00207)	-0.000080 (-0.0012, 0.00096)	0.008950 (0.00042, 0.0189)	0.013123 (-0.0017, 0.0409)	-0.000355 (-0.0022, 0.00145)	0.000635 (-0.0002, 0.00145
TUE	0.000348 (-0.00037, 0.00105)	-0.000533 (-0.0016, 0.00058)	-0.012941 (-0.0395,0.00101)	-0.000276** (-0.0011, 0.00056)	-0.00083 (-0.0021,0.00041)	-0.000667 (-0.0018,0.00048)	0.002118 (8.1e-05, 0.00413)	-0.001671 (-0.0026, -6.8e-04)	-0.000321 (-0.0016, 0.00096)	-0.00025 (-0.00087, 0.00081)
WED	0.000395 (-0.00035,0.00114)	-0.000398 (-0.0014, 0.0057)	0.01915* (0.0056, 0.056)	0.000592 (-0.00036, 0.00153)	-0.001662** (-0.0026,-0.00067)	0.000564 (-0.00046,0.00160)	0.001412 (-0.00046,0.00330)	0.012183 (-0.00097,0.0373)	0.000685 (-0.00077,0.00213)	0.000431 (-0.00042,0.00130)
THU	-0.000066 (-0.0008,0.00073)	0.001305* (0.00017,0.00243)	0.000761 (-0.00034,0.0019)	0.000816 (-0.00013,0.00175)	-0.000334 (-0.0013,0.0007)	-0.000415 (-0.0015,0.00064)	-0.001191** (-0.0031,0.0007)	-0.011796 (-0.037,0.0133)	0.000905 (-0.00054,0.00235)	0.000626 (-0.00028,0.00153)
FRI	-0.000418 (-0.0012,0.00036)	0.001176 (0.00011,0.00224)	0.000427 (-0.0007,0.00160)	0.002381* (0.0015,0.00328)	0.00058 (-0.00053,0.00017)	0.001023 (-0.0001,0.00221)	0.001674 (-0.00025,0.00362)	-0.037967** (-0.0767,-0.0102)	0.000244 (-0.0011,0.00164)	-0.000665** (-0.00158,0.00024)
JAN	-0.00122** (-0.0024,-4.18e-05)	-0.000389 (-0.0023,00145)	0.002561 (0.00067,0.00448)	0.001828 (-0.00014,0.00376)	0.0014* (-0.0009,0.00385)	-0.001632 (-0.0041,0.000705)	0.000948 (-0.0022,0.00418)	0.001947 (-0.00042,0.00432)	0.0001978 (-0.00072,0.00464)	-0.000212 (-0.0016,0.00118)
FEB	-0.000087 (-0.0014,0.0017)	0.00113 (-0.00025,0.00243)	0.001961 (0.00011,0.00379)	0.002458* (0.0011,0.00377)	0.000078 (-0.0016,0.00190)	0.000795 (-0.00098,0.00257)	0.004646* (0.0021,0.00720)	-0.000967 (-0.0027,0.00088)	-0.000255 (-0.0025,0.00192)	0.001239 (5.1e-05,0.00238)
MAR	0.000398 (-0.0010,0.00178)	0.000344 (-0.00114,0.00183)	0.000914 (-0.00118,0.0029)	0.000781 (-0.0003,0.00191)	-0.00103 (-0.0026,0.00044)	0.000325 (-0.0011,0.00178)	0.004803* (0.0023,0.00728)	-0.000565 (-0.0018,0.00076)	-0.000147 (-0.00205,0.00175)	-0.000170 (-0.0015,0.00113)
APR	0.000689 (-0.0006,0.00205)	0.001528 (0.00014,0.00288)	-0.0318 (-0.097,0.00232)	0.001868 (0.0006,0.00318)	0.000354 (-0.0011,0.00181)	0.001325 (0.000335,0.00234)	0.002775 (0.00061,0.00497)	0.000044 (-0.0014,0.00158)	0.000560 (-0.0018,0.00292)	0.001143 (-6.7e-05,0.00235)
MAY	-0.000091 (-0.0011,0.0096)	0.001137 (-0.0007,0.00304)	-0.005136 (-0.0074,-0.00280)	-0.000429 (-0.0020,0.00116)	-0.000789 (-0.0022,0.00068)	0.000230 (-0.00085,-1.0e-06)	-0.000158 (-0.0035,0.00318)	-0.000452 (-0.00192,0.0010)	-0.000673 (-0.0029,0.00158)	-0.000187 (-0.00128,0.00087)
JUNE	-0.000361 (-0.0017,0.00094)	0.000304 (-0.0014,0.00203)	0.046* (-0.0013,0.136)	0.000064 (-0.0010,0.00118)	-0.000376 (-0.0019,0.00125)	-0.001579** (-0.0031,-5.54e-05)	0.001824 (-0.0011,0.00480)	-0.000599 (-0.0022,0.00102)	0.000267 (-0.0021,0.00267)	-0.000345 (-0.00141,0.00072)
JULY	0.000973 (-0.00025,0.00219)	-0.000364 (-0.0019,0.00125)	0.0010 (-0.0007,0.00275)	-0.000044 (-0.0010,0.00091)	-0.000946 (-0.0024,0.00058)	-0.000361 (-0.0023,0.00157)	-0.001367 (-0.0041,0.00145)	-0.000990 (-0.0023,0.00054)	0.000246 (-0.0018,0.00230)	-0.000622 (-0.0019,0.00068)
AUG	-0.000498 (-0.0016,0.00061)	-0.000067 (-0.0015,0.00137)	0.000429 (-0.0014,0.00225)	-0.001485** (-0.0029,1.17e-06)	-0.003450** (-0.0051,-0.00177)	0.000298 (-0.0014,0.00190)	-0.001290 (-0.0040,0.00142)	-0.003669 (-0.0054, -0.00198)	-0.000440 (-0.0021,0.00138)	-0.000692 (-0.00197,0.00059)
SEP	0.000690 (-0.0005,0.00181)	-0.003110** (-0.0055,-6.64e-04)	0.000439 (-0.0010,0.00189)	0.000876 (-0.0007,0.00253)	0.000467 (-0.0013,0.00219)	-0.001037 (-0.0034,0.00156)	-0.003813** (-0.0064,-0.00109)	0.000582 (-0.0011,0.00236)	-0.001961 (-0.0043,0.00035)	-0.000574 (-0.00222,0.00107)
OCT	-0.000357 (-0.0014,0.00065)	0.001092 (-0.0007,0.00290)	0.001598 (-0.0005,0.00372)	0.000012 (-0.0010,0.00111)	-0.000075 (-0.0018,0.00168)	0.000664 (-0.00063,0.00197)	0.001530 (-0.0022,0.00539)	-0.000027 (-0.0905,0.0913)	-0.000170 (-0.0027,0.00232)	0.000572 (-0.00115,0.00226)
NOV	0.000269 (-0.0007,0.00122)	0.001330 (-0.00013,0.00281)	-0.000664 (-0.0023,0.00098)	0.001537 (3.2e-05,0.00305)	0.000592 (-0.00108,0.00228)	0.000913 (-0.00028,0.00212)	0.001854 (-0.00097,0.00473)	-0.033983 (-0.1038,0.00123)	0.002609* (0.00023,0.00495)	0.001722* (0.0005,0.00293)
DEC	0.000942 (-0.0002,0.000208)	0.001385 (4.9e-05,0.00271)	0.002256 (0.0007,0.00376)	-0.000099 (-0.00018,0.00155)	0.001725* (0.00022,0.00321)	0.001531 (0.00039,0.00266)	0.004607* (0.0020,0.00717)	-0.035552 (-0.1085,0.00284)	0.000808 (-0.0019,0.00357)	0.001083 (-0.00037,0.00252)
TOM	0.001705* (0.00089,0.00250)	0.002041* (0.0009,0.00318)	0.027* (0.0011,0.0821)	0.001891* (0.0006,0.00312)	0.001172* (-0.00024,0.00259)	0.001132 (-9.4e-05, 0.00230)	0.003276 (0.00101, 0.00565)	0.001938 (0.00061,0.00332)	0.002176* (0.00054,0.00383)	0.001492* (0.0005,0.00246)
NTOM	-0.000157** (-0.0005,0.00220)	0.000033** (-0.0005,0.00057)	-0.002875** (-0.0091,0.00068)	0.000415** (-3.1e-05,0.00085)	-0.000448** (-0.00097, 6.1e-05)	-0.000090 (-0.00065,0.00045)	0.001063 (0.00016, 0.00196)	-0.006546 (-0.01850,0.00531)	-0.00083** (-0.0008,0.00063)	-0.00008** (-0.00042,-0.0004)
FIRST FORT	-0.000418** (-0.00089,4.8e-05)	-0.000031 (-0.0007,0.00062)	0.00805 (-0.0101, 0.0240)	0.000651 (7.9e-05,0.00122)	0.000070 (-0.00065, 0.0008)	0.000101 (-0.00057,0.00077)	0.002264* (0.00108,0.00348)	-0.005745 (-0.02152,0.00980)	0.001071* (0.00012,0.00203)	0.000047 (-0.00051,0.00059)
SECOND FORT	-0.000419** (-0.00089,5.3e-05)	-0.000027 (-0.00069,0.00062)	0.00799 (-0.0102, 0.0241)	0.000650 (7.9e-05,0.00123)	0.000064 (-0.00067, 0.0008)	0.000101 (-0.00057,0.00076)	0.002284* (0.0011,0.00346)	-0.005686 (-0.02157,0.00992)	0.001071* (0.00013,0.00202)	0.000053 (-0.0005,0.00059)

*and** indicate that the relevant one-sided null hypotheses (20) and (21) respectively are rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 2. (cont.) Seasonality in expected returns

Countries	SRI LANKA	SWEDEN	SWITZERLAND	TAIWAN	THAILAND	TURKEY	UK (FTSE-100)	UK (FTSE-250)	U.S.A. (DOW JONES)	USA (NASDAQ 100)
ALL	0.00045 (6.45e-05, 0.00085)	-0.0000774 (-0.00056, 0.000414)	0.000351 (7.46e-05, 6.3e-04)	-0.000163 (-0.00067, 0.00039)	-0.000024 (-8.47e-04, 7.8e-04)	0.0011 (0.00015, 0.0020)	0.00019 (-2.9e-05, 0.00043)	7.36e-06 (-3.38e-04, 3.5e-04)	0.000336 (0.00014, 0.00053)	0.00032 (0.00012, 0.00052)
MON	-0.001273** (-0.0022, -0.00035)	0.000082 (-0.0011, 0.00126)	-0.000063 (-0.00078, 0.00065)	-0.001491** (-0.0029, -8.58e-05)	-0.004423** (-0.0064,-0.00246)	-0.002964** (-0.0051, -0.00071)	-0.000339** (-0.00094, 0.00025)	-0.000640 (-0.0014, 0.00017)	0.000237 (-0.00033, 0.00076)	-0.001313** (-0.0018, -8.3e-04)
TUE	-0.000683** (-0.0014, 0.000137)	-0.000824 (-0.0019, 0.00026)	0.000394 (-0.0002, 0.0010)	-0.001112 (-0.0022, -2.04e-05)	-0.001112 (-0.00272, 0.0005)	-0.000367 (-0.0022, 0.00159)	0.000472 (-4.6e-05, 0.00097)	-0.000630 (-0.0014, 0.00016)	0.000481 (6.2e-05, 0.00089)	-0.000279** (-0.0007, 0.00018)
WED	0.00081 (-0.00014,0.00173)	-0.000131 (-0.00121, 0.00095)	0.000405 (-0.00016, 0.00097)	0.00059 (-0.00047, 0.00164)	0.000868 (-0.00102, 0.00273)	0.000812 (-0.0012,0.00287)	0.000035 (-0.00046,0.00052)	-0.000334 (-0.0010,0.00039)	0.000641 (0.00024, 0.00103)	0.001163* (0.00074,0.00159)
THU	0.000936 (0.00006, 0.00178)	0.000473 (-0.00065, 0.00158)	0.000351 (-0.00029,0.00098)	0.000144 (-0.00096, 0.00122)	0.000897 (-0.00082, 0.00262)	0.003508* (0.0014,0.00552)	0.000098 (-0.0004,0.00058)	0.000285 (-0.00046, 0.00102)	0.000140 (-0.00028,0.00056)	0.001021* (0.00058, 0.00146)
FRI	0.002417* (0.00156,0.00327)	0.000017 (-0.00097, 0.00103)	0.000649 (4.8e-05, 0.00124)	0.001066* (1.5e-05, 0.00211)	0.003306* (0.00148,0.00514)	0.004198* (0.0023,0.00604)	0.0007* (0.00019,0.00120)	0.001290* (0.0005,0.00202)	0.000167 (-0.00024, 0.00057)	0.000941* (0.00052,0.00136)
JAN	0.000948 (-0.00062,0.00251)	-0.000359 (-0.00198,0.00128)	0.000217 (-0.0008,0.00123)	0.001807* (-0.00012,0.00377)	0.003757* (0.00049,0.00718)	-0.000964 (-0.0043,0.00242)	0.000131 (-0.00064,0.00089)	-0.000454 (-0.0015,0.00067)	0.000547 (-0.00016,0.00119)	0.001374* (0.00061,0.00213)
FEB	0.000941 (-0.00064,0.00234)	-0.000598 (-0.00169,0.00151)	0.000352 (-0.0005,0.00121)	0.001118 (-0.00095,0.00320)	-0.000392 (-0.00445,0.00266)	0.001018 (-0.0029,0.00485)	0.00030 (-0.00043,0.00102)	0.000728 (-0.00028,0.00174)	0.000217 (-0.00038,0.00082)	0.000038 (-0.0006,0.00067)
MAR	-0.000461 (-0.00161,0.000714)	-0.000343 (-0.0021,0.00151)	0.000509 (-0.00055,0.00157)	0.000614 (-0.00106,0.00272)	-0.001865 (-0.00414,0.0004)	-0.000803 (-0.0039,0.00239)	0.000249 (-0.00057,0.00106)	-0.000048 (-0.0012,0.00110)	0.000469 (-0.00018,0.00112)	0.000091 (-0.0005,0.00075)
APR	0.001818* (0.00067,0.00294)	0.000813 (-0.00078,0.00243)	0.000819 (0.0000,0.00163)	-0.001069 (-0.0026,0.000443)	0.001343 (-0.00108,0.00383)	0.005411* (0.0023,0.00852)	0.000898 (0.00023,0.00156)	0.000379 (-0.00065,0.00143)	0.000819 (0.00017,0.00145)	0.000507 (-0.00028,0.0013)
MAY	-0.000255 (-0.00144,0.00097)	-0.000519 (-0.00211,0.00103)	0.000624 (-0.00021,0.00144)	-0.000498 (-0.0021,0.00110)	-0.002190 (-0.00512,0.0007)	-0.002433** (-0.0049,0.00011)	-0.00016 (-0.0007,0.00065)	0.000576 (-0.00065,0.00175)	0.000553 (1.0e-05,0.00110)	0.000478 (-0.00015,0.0011)
JUNE	0.000354 (-0.00091,0.00160)	-0.001106 (-0.00267,0.00047)	-0.000117 (-0.00097,0.00074)	-0.000428 (-0.0021,0.00122)	0.000149 (-0.00258,0.00292)	-0.001466 (-0.0039,0.00108)	-0.00030 (-0.00092,0.00032)	-0.000714 (-0.0018,0.00042)	-0.000089 (-0.00063,0.00043	0.000364 (-0.0002,0.00096)
JULY	0.001049 (-0.00021,0.00224)	-0.000407 (-0.0023,0.00151)	-0.000019 (-0.00101,0.00099)	-0.000867 (-0.0025,0.000787)	-0.002029 (-0.0049,0.00097)	0.001958 (-0.0007,0.00460)	0.000136 (-0.00064,0.00089)	-0.000709 (-0.0020,0.00057)	0.000092 (-0.00052, 000071)	-0.000228 (-0.0008,0.00042)
AUG	-0.000816** (-0.0018,0.0002)	-0.000393 (-0.00194,0.00115)	-0.000513 (-0.00161,0.00057)	-0.000293 (-0.00191,0.00129)	-0.002212 (-0.0047,0.00035)	-0.002218** (-0.0047,0.000202)	0.000279 (-0.0005,0.00103)	0.00140* (0.00032,0.00247)	-0.000024 (-0.0007,0.00065)	0.000064 (-0.0005,0.00068)
SEP	0.002317* (0.001304,0.00331)	-0.00203** (-0.00423,0.00019)	-0.000729** (-0.00196,0.000494)	-0.003183** (-0.0049,-0.00136)	-0.00078 (-0.0036,0.00209)	0.000864 (-0.0020,0.00388)	-0.000741** (-0.0016,0.00015)	-0.002638** (-0.0042,-0.0010)	-0.000674** (-0.0014,6.60e-05)	-0.000556** (-0.0012,0.00015)
OCT	0.001191 (-3.7e-05,0.00246)	0.001899* (3.0e-05,0.00381)	0.001109 (1.6e-05,0.00224)	-0.000289 (-0.0024,0.00188)	0.001814 (-0.00097,0.00467)	0.004697* (0.0015,0.00778)	0.000062 (-0.0011,0.00123)	0.000205 (-0.0012,0.00156)	0.000604 (-0.00049,0.00161)	0.000198 (-0.0006,0.00104)
NOV	-0.000985* (-0.00321,0.00118)	0.001698* (9.9e-05,0.00331)	0.001018 (0.00020,0.00181)	0.000728 (-0.00121,0.00262)	0.001211 (-0.00157,0.0040)	0.001407 (-0.0024,0.00512)	0.000324 (-0.0005,0.00114)	0.000883 (-0.00023,0.00199)	0.000733 (0.00010,0.00136)	0.000799 (9.0e-05,0.0015)
DEC	-0.000564 (-0.0022,0.00103)	0.000215 (-0.00103,0.00147)	0.001113 (0.000312,0.00190)	0.001054 (-0.00056,0.00266)	0.001303 (-0.00071,0.00330)	0.005055* (0.0015,0.00873)	0.001168* (0.00044,0.00187)	0.000816 (-0.00011,0.00171)	0.000822 (0.00025,0.00139)	0.000815 (0.00012,0.0015)
TOM	0.000680 (-0.00029,0.00161)	0.001427* (0.00032,0.00254)	0.001915* (0.00115, 0.00266)	0.000191 (-0.0011, 0.00153)	0.001215 (-0.00102, 0.00349)	0.003285* (0.0010, 0.00547)	0.001425* (0.00082, 0.00201)	0.002227* (0.00145, 0.00301)	0.001269* (0.00078, 0.00175)	0.001259* (0.0007, 0.00182)
NTOM	0.000411 (-1.9e-05, 0.00084)	-0.000336** (-0.00089, 0.000215)	0.000101** (-0.00019, 0.000402)	-0.000221 (-0.00077, 0.00032)	-0.000236 (-0.0011,0.00062)	0.000711** (-0.00025, 0.00168)	-0.000004** (-0.00025, 0.00025)	-0.000365** (-0.0007, 1.59e-05)	0.000176** (-4.3e-05, 0.00039)	0.000169* (-4.6e-05, 0.0004)
FIRST FORT	-0.000004** (-0.0006, 0.000608)	-0.000103 (-0.00077,0.00057)	0.000462 (7.1e-05, 0.00085)	0.000177 (-0.00054, 0.000906)	0.000233 (-0.00102,0.00149)	0.000897 (-0.00036,0.00214)	0.000267 (-6.0e-05, 0.00058)	-0.000093 (-0.00058, 0.00039)	0.000358 (9.4e-05, 0.00061)	0.000527 (0.0002, 0.00081)
SECOND FORT	-0.000001** (-0.00061, 0.00060)	-0.000101 (-0.00078,0.00058)	0.000461 (6.6e-05, 0.00085)	0.000174 (-0.00055, 0.00091)	0.000232 (-0.00102,0.00148)	0.000918 (-0.00032,0.00213)	0.000269 (-6.1e-05, 0.00059)	-0.000085 (-0.00059, 0.00041)	0.00036 (9.2e-05, 0.00062)	0.000527 (0.0002, 0.00081)

*and** indicate that the relevant one-sided null hypotheses (20) and (21) respectively are rejected at significance level $\alpha = 0.05$ level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 2. (cont.) Seasonality in expected returns

	USA (NY COMPOSITE)	USA (S&P 500)	YUGOSLAVIA	ZAMBIA	JORDAN	KUWAIT
ALL	0.00024 (0.000103, 0.00039)	0.00023 (0.00012, 0.00039)	-4.07e-05 (-9.1e-04, 8.39e-04)	0.0016 (0.0010, 0.0021)	0.00053 (4.74e-05, 0.0010)	0.000717 (-0.0045, 0.0058)
SUN					0.000261 (-0.0015, 0.00153)	0.011754 (-0.0012, 0.0359)
MON	-0.000661** (-0.0010, -0.00027)	-0.000805** (-0.0011, -0.00046)	-0.00045 (-0.0026, 0.00190)	-0.002581 (-0.0058, 0.00035)	0.000257 (-0.0010, 0.00204)	-0.00014 (-0.00092, 0.00067)
TUE	0.000254 (-5.8e-05, 0.00056)	0.000323 (4.1e-05, 0.00061)	-0.002428** (-0.0043,-0.00054)	0.000639 (-0.00057, 0.00183)	0.000190 (-0.0003,0.00072)	-0.011249 (-0.0357,0.00143)
WED	0.00081* (0.00050, 0.00111)	0.000752* (0.00048 , 0.00102)	-0.000928 (-0.0028,0.00093)	0.001775 (0.00048 ,0.00304)	0.000566 (4.7e-05,0.00108)	0.001502 (0.0008, 0.00220)
THU	0.000234 (-6.4e-05, 0.00053)	0.000287 (1.3e-05, 0.00056)	0.001347 (-0.00041, 0.00306)	0.002664* (0.0014, 0.00391)	0.001703 (0.0010,0.00237)	0.000313 (-0.0019,0.00262)
FRI	0.000562* (0.00026, 0.00086)	0.000687* (0.0004 , 0.00094)	0.002313* (0.000382, 0.00434)	0.001544 (0.00048 , 0.00261)		
SAT					0.001030 (0.00025,0.00179)	0.002206 (0.00124, 0.00315)
JAN	0.000536 (4.5e-05,0.00102)	0.000470 (3.0e-05,0.00091)	0.001528 (-0.0010,0.00420)	0.002550 (0.0006,0.00452)	0.001689 (0.00076,0.00263)	0.001389 (0.00052,0.00223)
FEB	-0.000008 (-0.00047,0.00046)	-0.000190 (-0.0006,0.00022)	0.002354 (-0.0007,0.00544)	0.001195 (-0.0011, 0.00361)	-0.000028 (-0.00089,0.00081)	0.000815 (-7.6e-05,0.00168)
MAR	0.000356 (-0.0001,0.00082)	0.000467 (5.2e-05,0.00087)	0.001369 (-0.0028,0.00549)	-0.000010 (-0.0027, 0.00272)	-0.000730 (-0.0016, 0.00013)	0.000477 (-0.061, 0.0623)
APR	0.000632 (0.00016,0.00109)	0.000625 (0.0002,0.00103)	0.000914 (-0.0023,0.00421)	0.001447 (-0.00022 ,0.00318)	0.000993 (0.00018,0.00180)	0.002339 (0.0011,0.00357)
MAY	0.000169 (-0.00028,0.00062)	0.000128 (-0.00026, 0.00052)	-0.000757 (-0.006, 0.00520)	0.002292 (0.0011, 0.00344)	0.001036 (-0.0038,0.00583)	0.000953 (-0.00026,0.00220)
JUNE	0.000045 (-0.00036,0.00045)	-0.000016 (-0.0004,0.00036)	-0.001218 (-0.0034,0.00106)	0.004395* (0.0030,0.00588)	0.000429 (-0.0004,0.00125	0.000931 (-0.00015,0.00199)
JULY	-0.000096 (-0.00056,0.00038)	0.000337 (-6.4e-05,0.00074)	-0.000028 (-0.0021,0.00211)	0.000201 (-0.00098,0.00135)	0.000239 (-0.00072, 0.00121)	0.00053 (-0.00063,0.00167)
AUG	0.000028 (-0.00046,0.00052)	-0.000012 (-0.0004,0.00039)	-0.000437 (-0.0021,0.00123)	0.00240 (0.0001, 0.00476)	-0.000168 (-0.0009,0.00061)	0.000833 (1.9e-05,0.00164)
SEP	-0.000325** (-0.00088,0.00023)	-0.000392** (-0.0009,9.52e-05)	-0.003726** (-0.0071, -0.00052)	0.001370 (-0.00011, 0.000285)	0.000403 (-0.00042, 0.00124)	-0.000558 (-0.002,0.00088)
OCT	0.000312 (-0.0004,0.00102)	0.000205 (-0.0004,0.00084)	-0.001323 (-0.0030, 0.00042)	0.000304 (-0.0010, 0.00163)	0.000706 (3.5e-05, 0.00138)	-0.00014 (-0.0016, 0.00129)
NOV	0.000635 (0.00012,0.00113)	0.000702* (0.00018,0.00121)	-0.000966 (-0.0032, 0.00106)	0.001808 (0.00026, 0.00335)	0.001301 (0.00043,0.00217)	-0.000546 (-0.0020,0.00088)
DEC	0.000737 (0.00029,0.00118)	0.000747* (0.0003,0.00116)	0.002567 (0.00046, 0.00465)	0.000831 (-0.00031, 0.00196)	0.000633 (-0.00018,0.00144)	0.001107 (-3.7e-05,0.00223)
TOM	0.00110* (0.0007,0.00146)	0.001237* (0.0009,0.00156)	0.001331 (-0.00032, 0.00299)	0.001873 (0.0006, 0.00317)	0.001457 (0.00081,0.00209)	0.001660 (0.00081,0.00250)
NTOM	0.000108** (-4.9e-05, 0.00026)	0.000094** (-4.7e-05, 0.00023)	-0.000252 (-0.0012, 0.00071)	0.001517 (0.00096,0.00208)	0.000379 (-0.00016,0.00092)	0.000506 (-0.0055,0.00649)
FIRST FORT	0.000338 (0.0001,0.00053)	0.000371 (0.00018, 0.00055)	0.000289 (-0.0011, 0.00171)	0.001505 (0.0008, 0.00220)	0.000660 (0.00031, 0.00101)	0.000450 (-0.0097, 0.01084)
SECOND FORT	0.000336 (0.0001,0.00053)	0.000368 (0.00018, 0.00054)	0.000296 (-0.0010, 0.00170)	0.00150 (0.00078, 0.00221)	0.000660 (0.00031, 0.00101)	0.000599 (-0.0096, 0.01080)

*and** indicate that the relevant one-sided null hypotheses (20) and (21) respectively are rejected at significance level $\alpha = 0.05$ level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 3. Seasonality in Volatility

	ARGENTINA	AUSTRALIA	AUSTRIA	BELGIUM	BRAZIL	CANADA	CHILE	CHINA	CROATIA
ALL	0.0156 (0.0152, 0.0161)	0.0066 (0.0064, 0.0067)	0.0087 (0.0085, 0.0090)	0.0078 (0.0073, 0.0082)	0.0189 (0.0180, 0.020)	0.0075 (0.0072, 0.0078)	0.0072 (0.0069, 0.0075)	0.0112 (0.0108, 0.0116)	0.0106 (0.0102, 0.0110)
MON	0.0173* (0.016, 0.0186)	0.007162* (0.0068, 0.00753)	0.0094* (0.0088, 0.0101)	0.0069 (0.0059, 0.0081)	0.018 (0.017, 0.0198)	0.0071 (0.0066, 0.0077)	0.0071 (0.0064, 0.0078)	0.0135* (0.0125, 0.0146)	0.0084** (0.0077, 0.0092)
TUE	0.015 (0.014, 0.063)	0.006358 (0.0059, 0.0068)	0.0088 (0.0082, 0.0094)	0.0082 (0.0073, 0.0092)	0.021 (0.017, 0.026)	0.0081* (0.0075, 0.0080)	0.0079* (0.0071, 0.0088)	0.0097** (0.0090, 0.0106)	0.0126* (0.0116, 0.0137)
WED	0.015 (0.014, 0.016)	0.0066* (0.0063, 0.0069)	0.0084 (0.0079, 0.0089)	0.0077 (0.0068, 0.0085)	0.018 (0.017, 0.019)	0.0078 (0.0072, 0.0085)	0.0078* (0.0071, 0.0085)	0.0112 (0.015, 0.0120)	0.0111 (0.0101, 0.0122)
THU	0.016 (0.0154, 0.0173)	0.0064 (0.0062, 0.0067)	0.0083 (0.0078, 0.0089)	0.0082 (0.0073, 0.0092)	0.019 (0.018, 0.020)	0.0072 (0.0067, 0.0077)	0.0070 (0.0064, 0.0077)	0.0114 (0.0107, 0.0123)	0.0103 (0.0094, 0.0112)
FRI	0.0146** (0.0135,0.0156)	0.0062** (0.0059,0.0065)	0.0086 (0.0081,0.0092)	0.0077 (0.0067,0.0088)	0.017* (0.016,0.0185)	0.0072 (0.0065,0.0078)	0.0061** (0.0056,0.0067)	0.0099** (0.0092,0.0106)	0.0101 (0.0093,0.0109)
JAN	0.017* (0.015, 0.0195)	0.0068 (0.0063, 0.0074)	0.0093 (0.0086, 0.00101)	0.0084 (0.0063, 0.0108)	0.021 (0.019, 0.024)	0.0077 (0.0068, 0.0087)	0.0098* (0.0082, 0.0115)	0.0142* (0.0125, 0.0160)	0.0125* (0.0110, 0.0141)
FEB	0.014 (0.012, 0.0158)	0.0064 (0.0060, 0.0068)	0.0087 (0.0079, 0.0095)	0.0076 (0.0061, 0.0091)	0.017 (0.015, 0.019)	0.0071 (0.0063, 0.0081)	0.0076 (0.0063, 0.0090)	0.0122 (0.0104, 0.0141)	0.0097 (0.0085, 0.0107)
MAR	0.0143 (0.013, 0.0158)	0.0064 (0.0059, 0.0068)	0.0091 (0.0083, 0.0098)	0.0073 (0.0063, 0.0085)	0.026* (0.018, 0.040)	0.0082 (0.0074, 0.0091)	0.0070 (0.0061, 0.0079)	0.0103 (0.0093, 0.0114)	0.0107 (0.0097, 0.0118)
APR	0.0157 (0.014, 0.0175)	0.0062 (0.0058, 0.0067)	0.0068** (0.0063, 0.0074)	0.0058** (0.0049, 0.0068)	0.016 (0.015, 0.018)	0.0077 (0.0068 ,0.0087)	0.0057** (0.0050 ,0.0063)	0.0113 (0.0101, 0.0125)	0.0112 (0.0100, 0.0126)
MAY	0.0158 (0.0143, 0.0173)	0.0060** (0.0056, 0.0063)	0.0080 (0.0073, 0.0088)	0.0068** (0.0057, 0.0085)	0.017 (0.015, 0.0186)	0.0069 (0.0062, 0.0077)	0.0073 (0.0065, 0.0082)	0.0119 (0.0106, 0.0133)	0.0112 (0.0099, 0.0127)
JUNE	0.0153 (0.0138,0.0169)	0.0054** (0.0050, 0.0057)	0.0077** (0.0070,0.0083)	0.0081 (0.0068,0.0095)	0.017 (0.016,0.019)	0.0073 (0.0067,0.0079)	0.0066 (0.0058,0.0076)	0.0133* (0.0118,0.0149)	0.0089** (0.0079,0.0097)
JULY	0.0148 (0.0133, 0.0163)	0.0061 (0.0058, 0.0065)	0.0083 (0.0076, 0.0089)	0.0096* (0.0082, 0.015)	0.0157 (0.0145, 0.017)	0.0077 (0.0068, 0.0086)	0.0064 (0.0054, 0.0075)	0.0114 (0.0102, 0.0127)	0.0089** (0.0079, 0.0099)
AUG	0.0142 (0.0127, 0.0158)	0.0062 (0.0057, 0.0066)	0.0078** (0.0071, 0.0086)	0.0087 (0.0074, 0.011)	0.0166 (0.0154, 0.0179)	0.0065* (0.0057, 0.0071)	0.0065 (0.0055, 0.0076)	0.0103 (0.0093, 0.0115)	0.0096 (0.0081, 0.0112)
SEP	0.015 (0.0131, 0.0169)	0.0065 (0.0061, 0.007)	0.0093 (0.0083, 0.0103)	0.0113* (0.0087, 0.014)	0.019 (0.017,0.021)	0.0091* (0.0077,0.0104)	0.0066 (0.0057,0.0075)	0.0113 (0.0101,0.0125)	0.0123* (0.0106,0.0142)
OCT	0.019* (0.0169, 0.0213)	0.0079* (0.0090, 0.0102)	0.0123* (0.0108, 0.0138)	0.0055** (0.0046, 0.0064)	0.0229* (0.0205, 0.0250)	0.0089* (0.0076, 0.0102)	0.0067 (0.0059, 0.0075)	0.0114 (0.0101, 0.0130)	0.0125* (0.0104, 0.0149)
NOV	0.0147 (0.0161, 0.0172)	0.0072* (0.0067, 0.0078)	0.0088 (0.0078, 0.0099)	0.0068 (0.0054, 0.0082)	0.018 (0.016, 0.019)	0.0066 (0.0059, 0.0073)	0.0088* (0.0077, 0.0099)	0.0094** (0.0085, 0.0104)	0.0112 (0.0097, 0.0129)
DEC	0.015 (0.0132,0.0169)	0.0059** (0.0056,0.0064)	0.0081 (0.0073,0.0089)	0.00504** (0.0041,0.0059)	0.0158 (0.014,0.0171)	0.0058** (0.0050,0.0067)	0.0072 (0.0061,0.0084)	0.0084** (0.0076,0.0092	0.0077** (0.0066,0.0088)
TOM	0.01595 (0.014,0.017)	0.0065 (0.0061,0.0068)	0.0092 (0.0086,0.0099)	0.0069 (0.0061,0.0078)	0.0187 (0.017,0.02)	0.0073 (0.0066,0.0079)	0.0065 (0.0058,0.0073)	0.0105 (0.0096,0.0115)	0.0102 (0.0091,0.0115)
NTOM	0.0155 (0.015,0.016)	0.0065 (0.0064,0.0067)	0.0086 (0.0084,0.0086)	0.0079 (0.0074,0.0084)	0.0188 (0.0178,0.0202)	0.0075 (0.0072,0.0078)	0.0073 (0.0070,0.0077)	0.0112 (0.0108,0.0116)	0.0106 (0.0101,0.0110)
FIRST FORT	0.0157 (0.015,0.0164)	0.0065 (0.0063,0.0067)	0.0086 (0.0083,0.0090)	0.0075 (0.0075,0.0080)	0.0199* (0.0182,0.0222)	0.0074 (0.0070,0.0077)	0.0072 (0.0068,0.0076)	0.0111 (0.0105,0.0116)	0.010** (0.0095,0.0106)
SECOND FORT	0.0157 (0.015,0.0164)	0.0065 (0.0063,0.0067)	0.0086 (0.0083,0.0090)	0.0074 (0.0069,0.0080)	0.0199* (0.0182,0.0223)	0.0074 (0.0070,0.0077)	0.0072 (0.0068,0.0077)	0.0111 (0.0106,0.0116)	0.010** (0.0095,0.0106)

*indicates that the relevant one-sided null hypothesis is rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 3. (cont.) Seasonality in Volatility

	DENMARK	EGYPT	ESTONIA	FINLAND	FRANCE	GERMANY	GREECE	HONG KONG	INDIA	INDONESIA
ALL	0.0081 (0.0079, 0.0083)	0.0094 (0.0071, 0.0125)	0.0064 (0.0062, 0.0067)	0.0146 (0.0141, 0.0151)	0.0101 (0.0098, 0.0103)	0.0102 (0.0100, 0.0105)	0.0119 (0.0114, 0.0124)	0.0115 (0.0112, 0.0118)	0.0128 (0.0124, 0.0132)	0.0126 (0.0122, 0.0130)
MON	0.0084 (0.0078, 0.0090)	0.0145* (0.0091, 0.0237)	0.0069 (0.0062, 0.0075)	0.0139 (0.0129, 0.0149)	0.0108* (0.0102, 0.0115)	0.0113* (0.0107, 0.0120	0.0134* (0.0122, 0.0146)	0.0139* (0.0129, 0.0150)	0.0147* (0.0138, 0.0157)	0.0132 (0.0121,0.0142)
TUE	0.0084 (0.0079, 0.0088)	0.0061 (0.0056, 0.0066)	0.0064 (0.0058, 0.0071)	0.0140 (0.0130, 0.0151)	0.0097 (0.0092, 0.0102)	0.0096** (0.0091,0.0102	0.0115 (0.0105, 0.0125)	0.0103** (0.0097, 0.0109)	0.0113** (0.0106, 0.0121)	0.0118 (0.0110, 0.0127)
WED	0.0081 (0.0077, 0.0086)	0.0064 (0.0059, 0.0069)	0.0059 (0.0054, 0.0065)	0.0145 (0.0135,0.0155)	0.0099 (0.0093, 0.0104)	0.0101 (0.0096,0.0107)	0.0112 (0.0101, 0.0123)	0.0115 (0.0109, 0.0122)	0.0119** (0.0112, 0.0127)	0.0127 (0.0118,0.0136)
THU	0.0081 (0.0077, 0.0085)	0.0103 (0.0055, 0.0119)	0.0064 (0.0058, 0.0071)	0.0167 (0.0155, 0.0181)	0.0102 (0.0097, 0.0107)	0.0100 (0.0094,0.0106)	0.0122 (0.0111, 0.0135)	0.0110 (0.0104,0.0116)	0.0123 (0.0116, 0.0130)	0.0128 (0.0118,0.0138)
FRI	0.0073** (0.0069,0.0077)	0.0264 (0.0041,0.0628)	0.0064 (0.0058,0.0071)	0.0137 (0.0127,0.0147)	0.0097 (0.0092,0.0102)	0.0099 (0.0093,0.0104)	0.0110 (0.0099,0.0121)	0.0105** (0.0100,0.0111)	0.0134 (0.0125,0.0144)	0.0123 (0.0113,0.0132)
JAN	0.0078 (0.0072, 0.0086)	0.0374* (0.0082, 0.0689)	0.0071 (0.0063, 0.0080)	0.0160 (0.0141, 0.0181)	0.0104 (0.0097, 0.0112)	0.0101 (0.0092, 0.0110)	0.0121 (0.0107, 0.0135)	0.0133* (0.0122, 0.0144)	0.0136 (0.0123, 0.0149)	0.0155* (0.0138, 0.0173)
FEB	0.0075 (0.0069, 0.0081)	0.0084 (0.0074, 0.0095)	0.0084 (0.0070, 0.010)	0.0132 (0.0118, 0.0147)	0.0093 (0.0087, 0.0100)	0.0099 (0.0091, 0.0107)	0.0105 (0.0094, 0.0117)	0.0114 (0.0105, 0.0123)	0.0115 (0.0104, 0.0127)	0.0109** (0.0095, 0.0124)
MAR	0.0083 (0.0077, 0.0090)	0.0068 (0.0059, 0.0079)	0.0068 (0.0058, 0.0078)	0.0150 (0.0135, 0.0167)	0.0104 (0.0097,0.0114)	0.0111* (0.0103,0.0120)	0.0130 (0.0116, 0.0145)	0.0116 (0.0108,0.0125)	0.0146* (0.0132,0.0160)	0.0116 (0.0106,0.0127)
APR	0.0086 (0.0079, 0.0094)	0.0067 (0.0056, 0.0081)	0.0058 (0.0051, 0.0066)	0.0171* (0.0151, 0.0192)	0.0089** (0.0083, 0.0096)	0.0089** (0.0082,0.0096)	0.0137* (0.0120,0.0157)	0.0102** (0.0095,0.0110)	0.0137 (0.0123,0.0152)	0.0121 (0.0109,0.0133)
MAY	0.0076 (0.0069, 0.0083)	0.0077 (0.0065, 0.0090)	0.0052** (0.0044, 0.0060)	0.0134 (0.0157, 0.0181)	0.0086** (0.0080,0.0093)	0.0089** (0.0083,0.0095)	0.0111 (0.0100,0.0122)	0.0103** (0.0095,0.0112)	0.0141* (0.0126,0.0158)	0.0135 (0.0120,0.0151)
JUNE	0.0073** (0.0067,0.0079)	0.0070 (0.0061,0.0080)	0.0053** (0.0045,0.0061)	0.0138 (0.0121,0.0157)	0.0089** (0.0083,0.0095)	0.0082** (0.0076,0.0087)	0.0100** (0.0090,0.0111)	0.0102** (0.0091,0.0114)	0.0137 (0.0124,0.0150)	0.0110** (0.0098,0.0124)
JULY	0.0076 (0.0069, 0.0083)	0.0071 (0.0061, 0.0080)	0.0060 (0.0051, 0.0069)	0.0134 (0.0118, 0.0151)	0.0097 (0.0090, 0.0105)	0.0097 (0.0089, 0.0106)	0.0106 (0.0094, 0.0119)	0.0092** (0.0086, 0.0098)	0.0123 (0.0112, 0.0135)	0.0093** (0.0085, 0.0102)
AUG	0.0088* (0.0081, 0.0095)	0.0067 (0.0058, 0.0076)	0.0058 (0.0050, 0.0067)	0.0140 (0.0128,0.0152)	0.0109* (0.0101,0.0117)	0.0099 (0.0091,0.0109)	0.0101** (0.0089,0.0113)	0.0112 (0.0103,0.0121)	0.0104** (0.0096,0.0113)	0.0139 (0.0124,0.0154)
SEP	0.0091* (0.0082,0.010)	0.0066 (0.0057,0.0076)	0.0083* (0.0071,0.0096)	0.0142 (0.0128,0.0157)	0.0116* (0.0106,0.0126)	0.0117* (0.0107,0.0127)	0.0127 (0.0109,0.0145)	0.0106 (0.0097,0.0115)	0.0118 (0.0106,0.0129)	0.0142* (0.0126,0.0159)
OCT	0.0095* (0.0086, 0.0105)	0.0055 (0.0049, 0.0062)	0.0062 (0.0053, 0.0071)	0.0172* (0.0152,0.0194)	0.0125* (0.0114,0.0137)	0.0134* (0.0122,0.0147)	0.0182* (0.0144,0.0223)	0.0158* (0.0137,0.0181)	0.0151* (0.0135,0.0168)	0.0154* (0.0135,0.0175)
NOV	0.0069** (0.0063, 0.0074)	0.0085 (0.0054, 0.0123)	0.0064 (0.0056, 0.0073)	0.0141 (0.0128, 0.0155)	0.0098 (0.0090, 0.0107)	0.0098 (0.0089, 0.0107)	0.0101** (0.0089, 0.0114)	0.0118* (0.0108, 0.0127)	0.0118 (0.0106, 0.0131)	0.0123 (0.0110, 0.0137)
DEC	0.0075 (0.0070,0.0081)	0.0066 (0.0057,0.0074)	0.0058 (0.0050,0.0065)	0.0138 (0.0120,0.0156)	0.0091** (0.0083,0.0099)	0.0103 (0.0094,0.0112)	0.0100** (0.0087,0.0114)	0.0117 (0.0108,0.0126)	0.0107* (0.0097,0.0116)	0.0108** (0.0095,0.0122)
TOM	0.0084 (0.0079,0.0088)	0.0065 (0.0059,0.0071)	0.0062 (0.0056,0.0069)	0.0140 (0.0128,0.0152)	0.0106* (0.0100,0.0112)	0.0105 (0.0099,0.0112)	0.0127 (0.0113,0.0144)	0.0112 (0.0105,0.0119)	0.0131 (0.0121,0.0141)	0.0127 (0.0116,0.0138)
NTOM	0.0080 (0.0078,0.0082)	0.0099 (0.0072,0.0133)	0.0064 (0.0061,0.0068)	0.0147 (0.0142,0.0152)	0.0099** (0.0097,0.0102)	0.0101 (0.0099,0.0104)	0.0117 (0.0112,0.0123)	0.0115 (0.0111,0.0118)	0.0127 (0.0123,0.0131)	0.0125 (0.0121,0.0130)
FIRST FORT	0.0080 (0.0078,0.0084)	0.0068 (0.0065,0.0073)	0.0064 (0.0060.0068)	0.0145 (0.0139,0.0152)	0.0102 (0.0099,0.0106)	0.0103 (0.0099,0.0107)	0.0116 (0.0110,0.0123)	0.0114 (0.0110,0.0119)	0.0128 (0.0122,0.0133)	0.0130* (0.0124,0.0137)
SECOND FORT	0.0081 (0.0078,0.0084)	0.0069 (0.0065,0.0073)	0.0064 (0.0060.0068)	0.0145 (0.0139,0.0152)	0.0102 (0.0099,0.0106)	0.0103 (0.0099,0.0107)	0.0116 (0.0110,0.0123)	0.0114 (0.0110,0.0119)	0.0128 (0.0122,0.0133)	0.0130* (0.0124,0.0137)

*indicates that the relevant one-sided null hypothesis is rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 3. (cont.) Seasonality in Volatility

	IRELAND	ISRAEL	ITALY	JAPAN	LATVIA	LITHUANIA	LUXEMBURG	MALAYSIA	MEXICO	NETHERLANDS
ALL	0.0071 (0.0070, 0.0073)	0.0111 (0.0107, 0.0115)	0.0087 (0.0084, 0.0091)	0.0101 (0.0099, 0.0104)	0.0085 (0.0081, 0.0089)	0.0065 (0.0062, 0.0067)	0.0152 (0.0144, 0.0163)	0.0152 (0.0144, 0.0163)	0.0119 (0.0116, 0.0122)	0.0099 (0.0095, 0.0103)
MON	0.0067** (0.0063, 0.0072)	0.0165* (0.0155, 0.0174)	0.0096* (0.0088, 00106)	0.0115* (0.0109, 0.0120)	0.0083 (0.0074, 0.0093)	0.0065 (0.0059, 0.0072)	0.0174 (0.0134, 0.0225)	0.0175* (0.0138, 0.0225	0.0122 (0.0115, 0.0129)	0.0118* (0.0103, 0.0136)
TUE	0.0067** (0.0063, 0.0071)	0.0089** (0.0082, 0.0095)	0.0084 (0.0077, 0.0091)	0.0096** (0.0091, 0.0101)	0.0082 (0.0074, 0.0091)	0.0067 (0.0062, 0.0073)	0.0155 (0.0143, 0.0167)	0.0155 (0.0143, 0.0167)	0.0121 (0.0114, 0.0128)	0.0089** (0.0084, 0.0095)
WED	0.0069 (0.0065,0.0073)	0.0097** (0.0092,0.0104)	0.0084 (0.0077,0.0091)	0.0099 (0.0094,0.0104)	0.0083 (0.0075,0.0092)	0.0063 (0.0059,0.0068)	0.0144 (0.0134,0.0155)	0.0144 (0.0134,0.0155)	0.0122 (0.0116,0.0128)	0.0094 (0.0089,0.0100)
THU	0.0092* (0.0087,0.0097)	0.0096** (0.0090,0.0102)	0.0086 (0.0080,0.0093)	0.0099 (0.0094,0.0105)	0.0088 (0.0078,0.0099)	0.0064 (0.0059,0.0069)	0.0151 (0.0140,0.0162)	0.0150 (0.0140,0.0162)	0.0119 (0.0113,0.0126)	0.0096 (0.0090,0.0102)
FRI	0.0061** (0.0057,0.0065)	0.0084** (0.0071,0.0098)	0.0084 (0.0077,0.0092)	0.0097** (0.0092,0.0101)	0.0086 (0.0076,0.0096)	0.0063 (0.0058,0.0068)	0.0137 (0.0126,0.0148)	0.0137 (0.0126,0.0148)	0.0108** (0.0102,0.0114)	0.0095 (0.0090,0.0101)
JAN	0.0072 (0.0067, 0.0078)	0.0129* (0.0117, 0.0142)	0.0083 (0.0074, 0.0092)	0.0107 (0.0099, 0.0115)	0.0072 (0.0063, 0.0083)	0.0060 (0.0053, 0.0068)	0.0167 (0.0144, 0.0197)	0.0167 (0.0143, 0.0196)	0.0137* (0.0126, 0.0148)	0.0116* (0.0089, 0.0156)
FEB	0.0069 (0.0063, 0.0076)	0.0097** (0.0088, 0.0106)	0.0090 (0.0080, 0.0099)	0.0084** (0.0078, 0.0090)	0.0063** (0.0054, 0.0073)	0.0056** (0.0050, 0.0064)	0.0154 (0.0136, 0.0172)	0.0154 (0.0136, 0.0172)	0.0112 (0.0102, 0.0122)	0.0088 (0.0081, 0.0096)
MAR	0.0072 (0.0066,0.0077)	0.0118 (0.0107,0.0130)	0.0109* (0.0097,0.0122)	0.0111* (0.0103,0.0118)	0.0087 (0.0076,0.0098)	0.0058 (0.0051,0.0065)	0.0157 (0.0139,0.0177)	0.0157 (0.0139,0.0178)	0.0122 (0.0113,0.0132)	0.0106 (0.0096,0.0117)
APR	0.0062** (0.0057,0.0067)	0.0115 (0.0101,0.0130)	0.0071** (0.0062,0.0079)	0.0100 (0.0093,0.0107)	0.0061** (0.0055,0.0068)	0.0069 (0.0061,0.0077)	0.0154 (0.0136,0.0173)	0.0154 (0.0136,0.0173)	0.0116 (0.0106,0.0126)	0.0085 (0.0078,0.0093)
MAY	0.0057** (0.0052,0.0062)	0.0107 (0.0094,0.0120)	0.0075** (0.0066,0.0084)	0.0089** (0.0084,0.0095)	0.0068** (0.0058,0.0080)	0.0061 (0.0055,0.0068)	0.0131 (0.0119,0.0144)	0.0131 (0.0119,0.0144)	0.0107** (0.0099,0.0115)	0.0078** (0.0072,0.0085)
JUNE	0.0059** (0.0053,0.0064)	0.0091** (0.0081,0.0100)	0.0077 (0.0069,0.0084)	0.0087** (0.0081,0.0092)	0.0067** (0.0057,0.0078)	0.0064 (0.0057,0.0072)	0.0141 (0.0126,0.0158)	0.0141 (0.0125,0.0159)	0.0113 (0.0103,0.0122)	0.0082** (0.0076,0.0089)
JULY	0.0074 (0.0068, 0.0080)	0.0102 (0.0092, 0.0113)	0.0079 (0.0070, 0.0088)	0.0092** (0.0086, 0.0098)	0.0101* (0.0087, 0.0117	0.0050** (0.0044, 0.0056)	0.0147 (0.0130, 0.0164)	0.0147 (0.0130, 0.0164)	0.0115 (0.0107, 0.0125)	0.0100 (0.0091, 0.0110)
AUG	0.0075 (0.0068,0.0082)	0.00105 (0.0096,0.0115)	0.0076** (0.0068,0.0085)	0.0099 (0.0093,0.0106)	0.0134* (0.0108, 0.0162)	0.0065 (0.0057,0.0073)	0.0133 (0.0118,0.0149)	0.0133 (0.0118,0.0148)	0.0109 (0.0100,0.0117)	0.0099 (0.0091,0.0108)
SEP	0.0081* (0.0073,0.0090)	0.0099 (0.0089,0.00112)	0.0105* (0.0090,0.0121)	0.0105 (0.0097,0.0113)	0.0108* (0.0089,0.0129)	0.0094* (0.0083,0.0105)	0.0160 (0.0138,0.0185)	0.0161 (0.0138,0.0186)	0.0121 (0.0109,0.0134)	0.0116* (0.0105,0.0129)
OCT	0.0098* (0.0088,0.0108)	0.0139* (0.0120,0.0160)	0.0116* (0.0099,0.0135)	0.0126* (0.0114,0.0139)	0.0093 (0.0078,0.0117)	0.0070 (0.0063,0.0079)	0.0152 (0.0135,0.0172)	0.0154 (0.0135,0.0172)	0.0140* (0.0127,0.0154)	0.0128* (0.0115,0.0142)
NOV	0.0070 (0.0063, 0.0077)	0.0117 (0.0103, 0.0130)	0.0087 (0.0075, 0.0099)	0.0111* (0.0102, 0.0119)	0.0083 (0.0070, 0.0096)	0.0065 (0.0057, 0.0073)	0.0145 (0.0126, 0.0166)	0.0145 (0.0127, 0.0166)	0.0127 (0.0117, 0.0137)	0.0094 (0.0085, 0.0104)
DEC	0.0063** (0.0058,0.0068)	0.0108 (0.0095,0.0121)	0.0072** (0.0062,0.0083)	0.0099 (0.0091,0.0106)	0.0069** (0.0059,0.0080)	0.0061 (0.0051,0.0073)	0.0181 (0.0115,0.0301)	0.0183 (0.0115,0.0302)	0.0100** (0.0091,0.0109)	0.0083** (0.0075,0.0092)
TOM	0.0076* (0.0071,0.0081	0.0114 (0.0105,0.0123)	0.0084 (0.0076,0.0092)	0.0103 (0.0097,0.0109)	0.0090 (0.0078,0.0103)	0.0069 (0.0062,0.0075)	0.0173 (0.0153,0.0195)	0.0173 (0.0154,0.0195)	0.0123 (0.0115,0.0131)	0.0104 (0.0097,0.0111)
NTOM	0.0070** (0.0068,0.0073)	0.0110 (0.0106,0.0114)	0.0087 (0.0084,0.0091)	0.0100 (0.0098,0.0103)	0.0084 (0.0079,0.0088)	0.0064 (0.0061,0.0066)	0.0148 (0.0139,0.0160)	0.0148 (0.0139,0.0160)	0.0118 (0.0114,0.0121)	0.0098 (0.0093,0.0102)
FIRST FORT	0.0072 (0.0069,0.0074)	0.0114 (0.0109,0.0119)	0.0090* (0.0086,0.0095)	0.0100 (0.0097,0.0103)	0.0087 (0.0081,0.0093)	0.0064 (0.0061,0.0067)	0.0144 (0.0137,0.0151)	0.0144 (0.0137,0.0150)	0.0120 (0.0115,0.0124)	0.0101 (0.0095,0.0109)
SECOND FORT	0.0072 (0.0069,0.0074)	0.0114 (0.0109,0.0119)	0.0090* (0.0086,0.0096)	0.0100 (0.0097,0.0103)	0.0087 (0.0081,0.0092)	0.0064 (0.0060,0.0067)	0.0144 (0.0137,0.0151)	0.0144 (0.0137,0.0150)	0.0120 (0.0115,0.0124)	0.0101 (0.0095,0.0109)

*indicates that the relevant one-sided null hypothesis is rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 3. (cont.) Seasonality in Volatility

Countries	NEW ZEALAND	NORWAY	PAKISTAN	PERU	PHILIPPINE	PORTUGAL	RUSSIA	SINGAPORE	SOUTH KOREA	SPAIN
ALL	0.0050 (0.0048, 0.0053)	0.0095 (0.0092, 0.0095)	0.410 (0.01119, 0.81)	0.0085 (0.0082, 0.0088)	0.0108 (0.0104, 0.0112)	0.0059 (0.0055, 0.0062)	0.0197 (0.0191, 0.0203)	0.0262 (0.0161, 0.0369)	0.0150 (0.0145, 0.0155)	0.0098 (0.0095, 0.0100)
MON	0.0050 (0.0045,0.0055)	0.0099 (0.0091, 0.0108)	0.0114 (0.0093, 0.0117)	0.0085 (0.0078, 0.0093	0.0101** (0.0094, 0.0104)	0.0055 (0.0047,0.0064)	0.0142 (0.0071, 0.0227)	0.0254 (0.0108, 0.0534)	0.0184* (0.0171, 0.0197)	0.0094 (0.0088, 0.0099)
TUE	0.0045** (0.0041,0.0050)	0.0096 (0.0089, 0.0104)	0.0120 (0.0103, 0.0138)	0.0081 (0.0075, 0.0087)	0.0114 (0.0105, 0.0125)	0.0058 (0.0049, 0.0068)	0.0199 (0.0184, 0.0215)	0.0102 (0.0096, 0.0108)	0.0133** (0.0124, 0.0142)	0.0097 (0.0091, 0.0102)
WED	0.0050 (0.0045,0.0055)	0.0088** (0.0081,0.0094)	0.111* (0.0092,0.352)	0.0087 (0.0080,0.0094)	0.0102 (0.0095,0.0109)	0.0063 (0.0056,0.0070)	0.0196 (0.0182,0.0211)	0.0232 (0.0104,0.0481)	0.0143 (0.0133,0.0154)	0.0097 (0.0091,0.0103)
THU	0.0051 (0.0046,0.0057)	0.0102* (0.0095,0.0102)	0.0119 (0.0098,0.0142)	0.0088 (0.0081,0.0095)	0.0109 (0.0102,0.0117)	0.0058 (0.0050,0.0067)	0.0204 (0.0191,0.0219)	0.0237 (0.0107,0.0487)	0.0143 (0.0133,0.0154)	0.0099 (0.0093,0.0106)
FRI	0.0052 (0.0047,0.0058)	0.0089 (0.0081,0.0096)	0.0117 (0.0100,0.0137)	0.0083 (0.0076,0.0090)	0.0112 (0.0104,0.0120)	0.0057 (0.0049,0.0067)	0.0205 (0.0191,0.0219)	0.0484* (0.0107,0.0875)	0.0144 (0.0134,0.0155)	0.0100 (0.0094,0.0107)
JAN	0.0048 (0.0040,0.0056)	0.0101 (0.0089,0.0114)	0.0114 (0.0101,0.0128)	0.0116* (0.0102,0.0131)	0.0116* (0.0102,0.0131)	0.0072 (0.0054,0.0092)	0.0226* (0.0205,0.0248)	0.0142 (0.0124,0.0162)	0.0175* (0.0156,0.0194)	0.0096 (0.0086,0.00107)
FEB	0.0050 (0.0042,0.0058)	0.0083** (0.0075,0.0091)	0.0116 (0.0104,0.0128)	0.0081 (0.0072,0.0091)	0.0081 (0.0072,0.0091)	0.0063 (0.0051,0.0077)	0.0177 (0.0159,0.0196)	0.0107 (0.0094,0.0121)	0.0139 (0.0124,0.0155)	0.0089 (0.0082,0.0097)
MAR	0.0057 (0.0048,0.0066)	0.0089 (0.0080,0.0099	0.0132 (0.0118,0.0146)	0.0072** (0.0065,0.0080)	0.0072** (0.0065,0.0080)	0.0055 (0.0045,0.0067)	0.0196 (0.0176,0.0210)	0.0093 (0.0084,0.0102)	0.0126** (0.0113,0.0139)	0.0101 (0.0093,0.0110)
APR	0.0053 (0.0045,0.0062)	0.0081** (0.0073,0.0091)	0.043 (0.0098,0.109)	0.0078 (0.0067,0.0087)	0.0078 (0.0068,0.0087)	0.0043** (0.0036,0.0050)	0.0166** (0.0152,0.0181)	0.0100 (0.0091,0.0110)	0.0153 (0.0136,0.0170)	0.0090 (0.0083,0.0098)
MAY	0.0053 (0.0046,0.0059)	0.0099 (0.0085,0.00114)	0.0155 (0.0139,0.0172)	0.0101* (0.0090,0.0113)	0.0101* (0.0090,0.0112)	0.0047 (0.0040,0.0054)	0.0216 (0.0192,0.0242)	0.0096 (0.0086,0.0105)	0.0152 (0.0136,0.0168)	0.0085** (0.0078,0.0092)
JUNE	0.0059* (0.0051,0.0067)	0.0100 (0.0088,0.0112)	0.470* (0.0136,0.720)	0.0069** (0.0062,0.0075)	0.0069** (0.0062,0.0077)	0.0065 (0.0055,0.0075)	0.0195 (0.0174,0.0219)	0.0110 (0.0092,0.0115)	0.0152 (0.0135,0.0169)	0.0086** (0.0079,0.0093)
JULY	0.0051 (0.0042, 0.0060)	0.0095 (0.0085, 0.0106)	0.0114 (0.0102, 0.0127)	0.0067** (0.0060, 0.0074)	0.0067** (0.0060, 0.0074)	0.0073* (0.0058, 0.0088)	0.0203 (0.0183, 0.0224)	0.0103 (0.0093, 0.0114)	0.0144 (0.0130,0.0159)	0.0104 (0.0095,0.0113)
AUG	0.0052 (0.0045,0.0059)	0.0091 (0.0082,0.0100)	0.0121 (0.0108,0.0124)	0.0087 (0.0079,0.0099)	0.0087 (0.0076,0.0099)	0.0061 (0.0049,0.0075)	0.0184 (0.0164,0.0207)	0.0113 (0.0101,0.0126)	0.0124** (0.0112,0.0136)	0.0097 (0.0087,0.0105)
SEP	0.0047 (0.0039,0.0056)	0.0131* (0.0113,0.0149)	0.0094 (0.0085,0.0105)	0.0097* (0.0085,0.0110)	0.0097* (0.0085,0.0110)	0.0086* (0.0067,0.0107)	0.0186 (0.0167,0.0207)	0.0116 (0.0103,0.0119)	0.0150 (0.0133,0.0168)	0.0117* (0.0105,0.0129
OCT	0.0040** (0.0033,0.0047)	0.0104 (0.0093,0.0117)	0.0134 (0.0119,0.0150)	0.0072** (0.0065,0.0079)	0.0072** (0.0065,0.0079)	0.0047 (0.0038,0.0056)	0.0250* (0.0220,0.0282)	0.129* (0.0410,0.226)	0.0167* (0.0150,0.0185)	0.0121* (0.0109, 0.0134)
NOV	0.0041** (0.0035,0.0047)	0.0086 (0.0077,0.0095)	0.0105 (0.0094,0.0116)	0.0089 (0.0078,0.0100)	0.0089 (0.0078,0.0100)	0.0041** (0.0033,0.0050)	0.0185 (0.0164,0.0208)	0.0454 (0.0096,0.114)	0.0152 (0.0136,0.0169)	0.0087** (0.0078,0.0095)
DEC	0.0046 (0.0038,0.0054)	0.0072** (0.0063,0.0081)	0.0090 (0.0080,0.0102)	0.0087 (0.0075,0.0100)	0.0087 (0.0075,0.0100)	0.0040** (0.0032,0.0049)	0.0176** (0.0157,0.0196)	0.0455 (0.0086,0.118)	0.0165 (0.0145,0.0187)	0.0090 (0.0080,0.0101)
TOM	0.0046 (0.0041,0.0052)	0.0089 (0.0082,0.0097)	0.275* (0.0106,0.890)	0.0086 (0.0076,0.0096)	0.0106 (0.0096,0.0117)	0.0056 (0.0047,0.0065)	0.0192 (0.0175,0.0211)	0.0103 (0.0094,0.0113)	0.0142 (0.0130,0.0153)	0.0097 (0.0090,0.0103)
NTOM	0.0050 (0.0048,0.0054)	0.0096 (0.0092,0.0100)	0.0152 (0.0118,0.0215)	0.0085 (0.0082,0.0088)	0.0108 (0.0104,0.0119)	0.0059 (0.0055,0.0063)	0.0197 (0.0191,0.0204)	0.0286 (0.0169,0.0407)	0.0151 (0.0146,0.0156)	0.0097 (0.0095,0.0100)
FIRST FORT	0.0048 (0.0045,0.0052)	0.0093 (0.0089,0.0098)	0.0818 (0.0115,0.242)	0.0086 (0.0082,0.0090)	0.0110 (0.0105,0.0115)	0.0059 (0.0054,0.0054)	0.0195 (0.0186,0.0204)	0.0267 (0.0154,0.0426)	0.0149 (0.0142,0.0156)	0.0097 (0.0093,0.0101)
SECOND FORT	0.0048 (0.0045,0.0052)	0.0093 (0.0089,0.0098)	0.0818 (0.0115,0.242)	0.0087 (0.0082,0.0090)	0.0110 (0.0105,0.0116)	0.0059 (0.0054,0.0054)	0.0195 (0.0186,0.0204)	0.0265 (0.0113,0.0425)	0.0149 (0.0142,0.0156)	0.0097 (0.0093,0.0101)

*indicates that the relevant one-sided null hypothesis is rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 3. (cont.) Seasonality in Volatility

Countries	SRI LANKA	SWEDEN	SWITZERLAND	TAIWAN	THAILAND	TURKEY	UK (FTSE-100)	UK (FTSE-250)	U.S.A. (DOW JONES)	USA (NASDAQ 100)
ALL	0.0075 (0.0072, 0.0078)	0.0096 (0.0092, 0.0099)	0.0082 (0.0080, 0.0084)	0.0119 (0.0115, 0.0122)	0.0144 (0.0139, 0.0150)	0.0200 (0.0193, 0.0206)	0.0079 (0.0077, 0.0080)	0.0069 (0.0067, 0.0071)	0.0069 (0.0068, 0.0071)	0.0079 (0.0077, 0.0080)
MON	0.0073 (0.0065,0.0080)	0.0097 (0.0089,0.0107)	0.0091* (0.0086, 0.0096)	0.0143* (0.0134, 0.0154)	0.0158* (0.0145, 0.0172)	0.0217* (0.0201, 0.0233)	0.0084* (0.0080, 0.0089)	0.0067 (0.0060, 0.0073)	0.0073* (0.0069, 0.0078)	0.0082* (0.0079, 0.0086)
TUE	0.0074 (0.0068,0.0080)	0.0094 (0.0087,0.0102)	0.0079 (0.0075, 0.0083)	0.0110** (0.0103, 0.0118)	0.0130** (0.0120, 0.0141)	0.0191 (0.0178, 0.0205)	0.0077 (0.0073, 0.0081)	0.0069 (0.0064, 0.0075)	0.0070 (0.0067, 0.0072)	0.0080 (0.0076, 0.0083)
WED	0.0079 (0.0072,0.0087)	0.0099 (0.0092,0.00106)	0.0079 (0.0075,0.0082)	0.0115 (0.0108,0.0122)	0.0154 (0.0142, 0.0167)	0.02011 (0.0187, 0.0216)	0.0076 (0.0073, 0.0080)	0.0073 (0.0067, 0.0076)	0.0066** (0.0063, 0.0068)	0.0079 (0.0075, 0.0082)
THU	0.0076 (0.0069,0.0083)	0.0101 (0.0094,0.0107)	0.0082 (0.0077,0.0086)	0.0113 (0.0106,0.0121)	0.0137 (0.0125, 0.0149)	0.0208 (0.0195, 0.0223)	0.0076 (0.0073, 0.0080)	0.0071 (0.0066, 0.0076)	0.0069 (0.0066, 0.0072)	0.0079 (0.0076,0.0082)
FRI	0.0072 (0.0066,0.0080)	0.0085** (0.0078,0.0093)	0.0077** (0.0073,0.0081)	0.0110** (0.0103,0.0117)	0.0140 (0.0127,0.0153)	0.0181** (0.0169,0.0195)	0.0078 (0.0074, 0.0081)	0.0064 (0.0059, 0.0070)	0.0068 (0.0065,0.0071)	0.0074** (0.0070,0.0077)
JAN	0.0084 (0.0072,0.0096)	0.0095 (0.0084,0.00106)	0.0082 (0.0075,0.0089)	0.0126 (0.0113,0.0139)	0.0169* (0.0146,0.0194)	0.0217 (0.0195,0.0240)	0.0078 (0.0073,0.0084)	0.0063 (0.0055,0.0072)	0.0074* (0.0070,0.0079)	0.0086 (0.0080,0.0092)
FEB	0.0063** (0.0052,0.0076)	0.0093 (0.0083,0.0104)	0.0075 (0.0070,0.0080)	0.0116 (0.0102,0.0131)	0.0171* (0.0147,0.0198)	0.0239* (0.0213,0.0269	0.0079 (0.0069,0.0084)	0.0057 (0.0050,0.0065)	0.0065* (0.0061,0.0069)	0.0074 (0.0069,0.0078)
MAR	0.0064** (0.0056,0.0074)	0.0106 (0.0094,0.0119)	0.0089* (0.0082,0.0097)	0.0113 (0.0102,0.0126)	0.0128 (0.0113,0.0143)	0.0208 (0.0186, 0.0231)	0.0083 (0.0077,0.0089)	0.0073 (0.0061,0.0081)	0.0071* (0.0067,0.0076)	0.0074 (0.0069,0.0079)
APR	0.0063** (0.0054,0.0071)	0.0093 (0.0081,0.0104)	0.0071** (0.0066,0.0077)	0.0105** (0.0095,0.0115)	0.0119** (0.0104,0.0136)	0.0199 (0.0178,0.0215)	0.0067** (0.0063,0.0072)	0.0062 (0.0055,0.0070)	0.0069 (0.0065,0.0074)	0.0085* (0.0079,0.0092)
MAY	0.0073 (0.0065,0.0082)	0.0084** (0.0073,0.0096)	0.0074** (0.0069,0.0079)	0.0109 (0.0098,0.0120)	0.0144 (0.0125,0.0164)	0.0175** (0.0159,0.0191)	0.0070** (0.0066,0.0075)	0.0067 (0.0058,0.0077)	0.0063** (0.0060,0.0067)	0.0073** (0.0069,0.0078)
JUNE	0.0078 (0.0069,0.0087)	0.0090 (0.0079,0.0101)	0.0075 (0.0070,0.0081)	0.0116 (0.0106,0.0127)	0.0135 (0.0116,0.0155)	0.0170** (0.0155,0.0186)	0.0068** (0.0065,0.0072)	0.0066 (0.0058,0.0074)	0.0060** (0.0057,0.0064)	0.0070** (0.0066, 0.0074)
JULY	0.0069 (0.0060, 0.0079)	0.0112* (0.0100, 0.0126)	0.0085 (0.0078, 0.0092)	0.0123 (0.0111, 0.0134)	0.0155 (0.0137, 0.0176)	0.0184 (0.0167, 0.0213)	0.0078 (0.0073, 0.0084)	0.0080 (0.0079, 0.0089	0.0067 (0.0063, 0.0072)	0.0078 (0.0073,0.0083)
AUG	0.0068 (0.0061,0.0076)	0.0094 (0.0084,0.0105)	0.0089* (0.0081,0.0097)	0.0111 (0.0100,0.0123)	0.0142 (0.0127,0.0158)	0.0162** (0.0145,0.0182)	0.0077 (0.0071,0.0082)	0.0061 (0.0054, 0.0069)	0.0072 (0.0067,0.0077)	0.0074 (0.0070,0.0079)
SEP	0.0068 (0.0061,0.0076)	0.0118* (0.0102,0.0135)	0.0100* (0.0091,0.0109)	0.0127 (0.0114,0.0140)	0.0153 (0.0135,0.0172)	0.0188 (0.0166,0.0211)	0.0087* (0.0080,0.0093)	0.0094 (0.0082,0.0106)	0.0075* (0.0069,0.0080)	0.0079 (0.0074,0.0085)
OCT	0.0073 (0.0063,0.0082)	0.0102 (0.0089,0.0116)	0.0089* (0.0082,0.0098)	0.0135* (0.0121,0.0151)	0.0148 (0.0130,0.0168)	0.0202 (0.0181,0.0224	0.0104* (0.0095,0.0114)	0.0077 (0.0068,0.0088)	0.0085* (0.0077,0.0094)	0.0100* (0.0087,0.0103)
NOV	0.0107* (0.0089,0.0128)	0.0088 (0.0078,0.0099)	0.0073** (0.0067,0.0078)	0.0127 (0.0114,0.0141)	0.0152 (0.0134,0.0172)	0.0247* (0.0222,0.0274)	0.0079 (0.0073,0.0085)	0.0076 (0.0061,0.0078)	0.0068 (0.0064,0.0072)	0.0080 (0.0075,0.0085)
DEC	0.0091* (0.0079,0.0104)	0.0064** (0.0056,0.0074)	0.0069** (0.0064,0.0074)	0.0110 (0.0099,0.0121)	0.0101** (0.0088,0.0114)	0.0206 (0.0179,0.0235)	0.0071** (0.0066,0.0076)	0.0051** (0.0045,0.0058)	0.0060** (0.0057,0.0065)	0.0076 (0.0071,0.0082)
TOM	0.0069 (0.0063,0.0075)	0.0085** (0.0078,0.0093)	0.0084 (0.0079,0.0089)	0.0123 (0.0114, 0.0132)	0.0142 (0.0126, 0.0159)	0.0187 (0.0172, 0.0203)	0.0081 (0.0077, 0.0086)	0.0066 (0.0060, 0.0071)	0.0069 (0.0066, 0.0073)	0.0080 (0.0076, 0.0084)
NTOM	0.0076 (0.0072,0.0079)	0.0097* (0.0093,0.0101)	0.0081 (0.0079,0.0083)	0.0117 (0.0114, 0.0121)	0.0144 (0.0138, 0.0150)	0.0201 (0.0194, 0.0208)	0.0078 (0.0076, 0.0079)	0.0069 (0.0066, 0.0073)	0.0069 (0.0068, 0.0071)	0.0078 (0.0077, 0.0080)
FIRST FORT	0.0075 (0.0070,0.0080)	0.0094 (0.0089,0.0099)	0.0080 (0.0078,0.0083)	0.0120 (0.0115, 0.0125)	0.0151* (0.0143, 0.0160)	0.0201 (0.0192, 0.0210)	0.0078 (0.0076, 0.0080)	0.0072* (0.0068, 0.0075)	0.0069 (0.0067, 0.0071)	0.0079 (0.0077, 0.0082)
SECOND FORT	0.0075 (0.0070,0.0080)	0.0093 (0.0089,0.0098)	0.0080 (0.0078,0.0083)	0.0120 (0.0115, 0.0125)	0.0151* (0.0143, 0.0160)	0.0200 (0.0192, 0.0210)	0.0078 (0.0076, 0.0080)	0.0072* (0.0068, 0.0075)	0.0069 (0.0067, 0.0071)	0.0079 (0.0077, 0.0082)

*indicates that the relevant one-sided null hypothesis is rejected at significance level α= 0.05 level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples

Table 3. (cont.) Seasonality in Volatility

	USA (NY COMPOSITE)	USA (S&P)	YUGOSLAVIA	ZAMBIA	JORDAN	KUWAIT
ALL	0.0064 (0.0063, 0.0065)	0.0065 (0.0064, 0.0066)	0.0094 (0.0088, 0.0101)	0.0059 (0.0055, 0.0064)	0.0067 (0.0063, 0.0072)	0.0112 (0.0063, 0.0165)
SUN					0.0080* (0.0068, 0.0097)	0.0185 (0.0059, 0.0428)
MON	0.0069* (0.0066, 0.0072)	0.0070* (0.0068, 0.0073)	0.0101 (0.0085, 0.0121)	0.0043 (0.0020, 0.0070)	0.0074 (0.0062, 0.0091)	0.0065 (0.0059, 0.0071)
TUE	0.0064 (0.0062, 0.0067)	0.0066* (0.0064, 0.0068)	0.0097 (0.0084, 0.0112)	0.0055 (0.0033, 0.0081)	0.0061 (0.0058,0.0065)	0.0184 (0.0058,0.0428)
WED	0.0062 (0.0060,0.0064)	0.0063 (0.0061,0.0065)	0.0093 (0.0079, 0.0108)	0.0053 (0.0033, 0.0075)	0.0059 (0.0055,0.0063)	0.0059 (0.0054,0.0064)
THU	0.0061** (0.0059,0.0063)	0.0062** (0.0060,0.0064)	0.0088 (0.0076, 0.0101)	0.0058 (0.0036, 0.0083)	0.0062 (0.0057,0.0067)	0.0066 (0.0049,0.0086)
FRI	0.0061** (0.0059,0.0064	0.0061** (0.0059,0.0063)	0.0089 (0.0074,0.0107)	0.0058 (0.0033,0.0086)		
SAT					0.0061 (0.0055,0.0067)	0.0070 (0.0064,0.0078)
JAN	0.0064 (0.0061, 0.0068)	0.0065 (0.0062, 0.0068	0.0091 (0.0075, 0.0109)	0.0077* (0.0062, 0.0094)	0.0071 (0.0064, 0.0078)	0.0046 (0.0039, 0.0052)
FEB	0.0061 (0.0058, 0.0064)	0.0061 (0.0058, 0.0064)	0.0095 (0.0073, 0.0120)	0.0086* (0.0067, 0.0108)	0.0060 (0.0053, 0.0066)	0.0044 (0.0038, 0.0050)
MAR	0.0062 (0.0059,0.0066)	0.0062 (0.0059,0.0065)	0.0141* (0.0111, 0.0172)	0.0096* (0.0073,0.0121)	0.0063 (0.0057,0.0070)	0.0680* (0.0070,0.0157)
APR	0.0063 (0.0059,0.0066)	0.0061 (0.0059,0.0064)	0.0115 (0.0094,0.0137)	0.0042** (0.0026,0.0059)	0.0063 (0.0058,0.0069)	0.0074 (0.0066,0.0082)
MAY	0.0061 (0.0058,0.0064)	0.0060** (0.0058,0.0063)	0.0152* (0.0109, 0.0202)	0.0038** (0.0028, 0.0049)	0.0104* (0.0063,0.0163)	0.0068 (0.0060,0.0077)
JUNE	0.0057** (0.0054,0.0059)	0.0060** (0.0057,0.0062)	0.0078 (0.0063,0.0095)	0.0050 (0.0037,0.0064)	0.0063 (0.0057,0.0069)	0.0057 (0.0050,0.0066)
JULY	0.0063 (0.0059, 0.0066)	0.0062 (0.0059, 0.0065)	0.0075 (0.0060, 0.0090)	0.0035** (0.0025, 0.0046)	0.0078 (0.0071, 0.0085)	0.0071 (0.0063, 0.0079)
AUG	0.0064 (0.0061,0.0068)	0.0062 (0.0059,0.0065)	0.0066** (0.0056,0.0077)	0.0079* (0.0059, 0.0100)	0.0059 (0.0054,0.0066)	0.0048 (0.0043,0.0054)
SEP	0.0068* (0.0064,0.0072)	0.0068 (0.0064,0.0072)	0.0102 (0.0077,0.0130)	0.0058 (0.0046,0.0071)	0.0066 (0.0060,0.0072)	0.0072 (0.0061,0.0084)
OCT	0.0076* (0.0071,0.0082)	0.0079* (0.0074,0.0084)	0.0066** (0.0054, 0.0078)	0.0048 (0.0037,0.0060)	0.0052 (0.0047,0.0057)	0.0075 (0.0065,0.0087)
NOV	0.0066 (0.0062, 0.0069)	0.0072* (0.0068, 0.0076)	0.0068** (0.0053, 0.0086)	0.0058 (0.0045, 0.0072)	0.0063 (0.0057, 0.0070)	0.0075 (0.0064, 0.0086)
DEC	0.0058** (0.0055,0.0061)	0.0060** (0.0057,0.0063)	0.0082 (0.0069,0.0086)	0.0039** (0.0030,0.0050)	0.0061 (0.0056,0.0067)	0.0058 (0.0050,0.0066)
TOM	0.0064 (0.0061,0.0066)	0.0065 (0.0063, 0.0068)	0.0074** (0.0063, 0.0086)	0.0052 (0.0041, 0.0064)	0.0067 (0.0062,0.0072)	0.0063 (0.0057,0.0069)
NTOM	0.0063 (0.0062,0.0065)	0.0064 (0.0063,0.0065)	0.0097* (0.0089, 0.00105)	0.0060 (0.0055, 0.0065)	0.0067 (0.0063,0.0073)	0.0121 (0.0063, 0.0204)
FIRST FORT	0.0064 (0.0062, 0.0065)	0.0065 (0.0063, 0.0066)	0.0098 (0.0087, 0.0109)	0.0056 (0.0049, 0.0062)	0.0065 (0.0063, 0.0068)	0.0164 (0.0064, 0.0310)
SECOND FORT	0.0064 (0.0062, 0.0065)	0.0065 (0.0063, 0.0066)	0.0098 (0.0087, 0.0109)	0.0056 (0.0049, 0.0062)	0.0065 (0.0063, 0.0068)	0.0163 (0.0064, 0.0310)

*indicates that the relevant one-sided null hypothesis is rejected at significance level $\alpha = 0.05$ level , numbers in parenthesis are the 5% and 95% quantiles for the means generated by 10,000 bootstrap samples