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The Wandering Day of the Week Effect: Evidence from the Dhaka Stock Exchange

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Abstract: *This study examines the wandering nature of the day of the week effect in the Dhaka Stock Exchange (DSE). Using the DGEN (later continued as the DSEX) as the benchmark index to measure daily returns over the period between November, 2001 and September, 2018, this study provides evidence that the day of the week effect is present in the whole sample period as well as in the September, 2005-September, 2018 sub-sample period. However, when the day of the week effect is examined in each of the sample year, the effect is not found to be consistent. Lowest returns are found on Sunday as the first trading day, Sunday as the second trading day and Tuesday. Moreover, the first trading day of the week is not always significantly negative but significantly positive. On the other hand, the highest returns are found on Saturday, Sunday, Monday, Tuesday, Wednesday and Thursday. Overall, results of this study support the wandering nature of the day of the week effect in the DSE.*

Keywords: *Day of the week effect, wandering hypothesis, OLS and GARCH model, Dhaka stock exchange.*

Introduction

Stock return anomaly is a well-known phenomenon that challenges the efficient market hypothesis. Anomalies in stock return indicates persistent pattern as opposed to random movement assumed under the efficient market hypothesis. Stock return anomalies could provide opportunity of earning abnormal profits from stock investment by observing those patterns and movements in the past return behavior. From behavioral finance viewpoint, anomalies are the product of observed behavior of the investors. Standard finance theories, so far, have not been able to explain those anomalies. However, it is also evident that anomalies are sometimes very noisy and it is difficult to make trading strategy to realize abnormal profits.

Many kinds of anomalies have been documented in the stock markets of developed and developing countries so far. Some anomalies are related to the fundamental properties of stock such as value, size, P/E ratio and so on while some others are related to the seasonal pattern such as the day of the week effect, January effect, turn of the month effect, momentum effect, Halloween effect and so on.

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Day of the week effect or weekend is a well-documented anomaly that shows stock returns are significantly lower in the first trading day and significantly higher in the last trading day of the week. If the process generating returns are continued then first trading day should earn higher return than other days because two days before the first trading days should also provide return to the security holders. If the process generating continuous return is not possible then at least the first trading day should offer similar return as other trading days if return is assumed to be generated only in the trading days. Contrary to this fact, it has been evident in many stock markets that Monday, the first trading day, offers significantly lower returns and Friday, the last trading day of the week, offers significantly higher returns even after considering risk. Early studies to examine the day of the week effect or the weekend effect include Cross (1973) and French (1980). Later, many researchers from all over the world have found similar kind of effect. Of course, some other researchers found a lot of noise in the evidence of this effect.

Although the evidence of the day of the week effect or the weekend effect is universal, its explanations provided by researchers differ to a great extent. Any convincing explanation to the day of the week effect is still unavailable. However, several studies have made attempt to explain the day of the week effect from the following perspectives. First, Jaffe et al., (1989) argued that low Monday returns were twisted by the previous weeks' performance of returns. They found that Monday effects were evident only when previous week's returns were declining. Second, some researchers have explained low Monday returns by risks. According to standard theories of finance, security's return is the compensation for assuming risks. However, Jaffe and Westerfield (1985) found that risk on Monday was rather higher than being low. Additionally, negative returns on Monday cannot be explained by risks. Third, Doyle and Chen (2009) provided evidence of the wandering nature of the day of the week effect, which indicated that the effect is not fixed over the period of time rather can be observed for any other days of the week as a result of general inefficiency of pricing of securities. Fourth, some studies pointed out the possibility of coming more negative information during weekends causing return in the first trading day lower. Damodaran (1989) argued for the possibility of appearing more negative information in weekends that affected investors decision negatively and caused them to sell in the following Monday. If this argument is true, then all pre-holiday returns should be higher and post-holiday returns should be lower. Lakonishok and Smidt (1988) found that average pre-holiday returns were significantly higher but average post-holiday returns were neither significantly negative nor as negative as Monday returns. Fifth, Several studies argued for the measurement error hypothesis as the cause of the day of the week effect. According to this hypothesis, low Monday returns are at least due to positive errors in prices on Friday. If these errors vary over time then higher than average returns on Friday would produce lower than average returns on Monday. This pattern

assumes that correlation between returns on Friday and Monday should be low and negative than any other pairs of the days of the week. However, Keim and Stambaugh (1984) did not find the proof of this hypothesis in the USA. Sixth, proponents of the efficient market hypothesis often explain market anomalies from the viewpoint that they are not consistent over time and suffer from data snooping bias. Regarding day of the week effect, the issue of data snooping is probably inappropriate because so many studies have been made using almost all combinations of sample period. However, whether choice of index can influence the result could be a concern. Most of the researchers have used indices comprised of large stocks or indices where large stocks have more weights. Gibbons and Hess (1981) used equal and value weighted indices of the NYSE and AMEX and found that magnitude of the weekend effect varied with the firm size. Kato (1990) also found that weekly pattern in stock returns are more pronounced for small firms in Japanese stock market. Friday returns were more significant for small firms dominated indices than larger firms dominated indices. However, Keim and Stambaugh (1984) did not find the influence of firm size on returns across the days of the week. They found that Friday returns were more significantly positive for small firms but Monday returns were not influenced by firm size. Seventh, the divergence of opinion hypothesis of Miller (1977), which argued that divergence of opinion caused low returns of risky securities, could be used to explain low Monday returns. According to this hypothesis, higher divergence of opinion makes securities risky and produces lower returns. Miller (1977) also argued that turnover of securities can represent divergence of opinion. Cooley and Roenfeldt (1975) showed that high turnover of securities are associated with low returns. Findings of Cooley and Roenfeldt (1975) are consistent with divergence of opinion hypothesis. Thus, lower or negative Monday returns could be explained by higher Monday turnover.

The objective of this study is to find evidence of the day of the week effect or the weekend effect in the Dhaka Stock Exchange and to explain it from the viewpoint of wandering hypothesis. The wandering hypothesis indicates that the day of the week effect is not fixed in a day of the week rather can be changed over the period of time. Day of the week effect was initially found in the developed stock markets and later also found in the emerging stock markets. Researchers found that evidence of this anomaly is not universal rather depends on time, geographic location and level of international integration of the stock markets. The possibility of being affected by market anomalies is determined by the globalization and the extent of integration. Although there have been quite a large effort to find evidence of the day of the week effect, little is known about its causes. In Bangladesh, no comprehensive study is found to explore reasons behind the day of the week effect. From this viewpoint, this study makes an important contribution to the literature. To the best of my knowledge, this is the first study that examines the wandering nature of the day of the week effect in the DSE.

Review of Literature and Previous Studies

Early Evidence of Day of the Week Effect: Initially found in U.S. stock market and then in other developed markets

Early evidence of the day of the week effect is found in the USA stock markets. A number of studies during the 1970s and 1980s provided evidence of the day of the week effect and the weekend effect. In general, those studies found that average daily returns on Monday were significantly lower and average daily returns on Friday were significantly higher than those on other days of the week. Cross (1973) used S&P 500 index from 1953 to 1973 to find that average Monday return was significantly lower than average Friday return. Later, the weekend effect was also documented by French (1980) when he observed that average returns on Monday based on S&P composite index during the 1953-1977 period were negative but those on other trading days were positive. Keim and Stambaugh (1984) extended the earlier works on the day of the week effect by taking more time period and types of stocks. They used S&P composite index from 1928 to 1982, included exchange traded stocks of all size, and actively traded OTC stocks for their study. Their findings also supported the fact that Monday returns were negative. However, they also found that correlation between Friday and Monday returns were positively related. Using Nikkei-Dow index, TSE index and S&P 500 composite index for 1970 to 1983, Jaffe and Westerfield (1985a) found the weekly seasonal patterns in Japanese stock markets. They found that, unlike U.S Market, Tuesday returns were negative for Japanese market. Tuesday negative returns were also reported for Australian Stock Market (Jaffe and Westerfield, 1985b). Their cross correlation study between Japanese and U.S indices did not provide any proof that negative Tuesday returns in Japanese market was induced by negative Monday returns in U.S market. However, Kato (1990) identified that Jaffe and Westerfield (1985b) did not correctly specify trading settlement process in Japan, which could produce some confusion in Japanese market's weekly pattern. Kato (1990) also found that Tuesday returns are lowest and Wednesday returns were highest during the 1978-1987 period in the Japanese market. The weekly patterns were found to be more pronounced for small firms, which confirmed the size effect in weekly seasonal patterns. He argued that the lower Tuesday returns are related to the lower Monday returns of the USA market. Lakonishok and Smidt (1988) found the presence of the Monday effect and the holiday effect over a 90 years sample period in the USA market as well. They divided the sample periods in several non-overlapping sub periods to endure persistency in seasonal patterns. They found that average Monday returns were significantly negative and preholiday returns were significantly positive. Jaffe et al., (1989) provided a different explanation for the Monday effect. Using a sample period, which was divided into two sub-periods from 1930 to 1962 and 1962 to 1981, they conducted the study on six stock market indices from USA, Japan, Canada, Australia, and UK. They found that average Monday return was negative only when the

previous week's return was declining. Monday returns were higher when previous week's returns were above average.

Recent Evidence of the day of the week effect: the disappearance and wandering hypotheses

Schewart (2002) used Dow Jones index for the period between 1885 and 1927 and S&P composite index for the period between 1928 and 2002 to find the weekend effect. He divided the total time span in different sub groups and observed the sign of return as well as their magnitude. His findings confirmed the findings of French (1980) for the period between 1953 and1977 that Monday returns were negative during 1928–1952 and 1885-1927 period. However, he found that Monday returns were not statistically different from other days of the week since 1978 and that during 1978-2002, the return was negative but the magnitude was one fourth of effect during the 1953-1977 period. Hui (2005) studied six stock markets including the USA, Japan and some ASEAN markets for a relatively shorter time period of 1998 to 2001 to test the disappearance hypothesis of the day of the week effect. He found that the day of the week effect during this period was not evident with any stock market except for Singapore. While the disappearance or losing the strength of the day of the week effect is evident in different timeframe, some authors have come up with a different explanation and evidence of this effect. Doyle and Chen (2009) have found that the Monday effect is not fixed rather wandering while working on eleven stock markets during 1993 to 2007 period. They also found that the day of the week effect is not conditional on previous week's returns and the effect is not disappearing during their period of study.

The day of the week effect in emerging markets

Emerging stock markets are believed to be more prone to anomalies than developed stock markets because of the presence of individual investors, structural incapability, less regulatory and supervisory activities. General findings of the day of the week effect in emerging markets shows that the effect is present in many markets but forms are not consistent across the countries. Basher and Sadosky (2006) studied 21 emerging stock markets during the period between 1992 and 2003. They found strong presence of the day of the week effect in stock market of Philippines, Taiwan and Pakistan. Other stock markets of Argentina, Thailand, Malaysia, Turkey and others showed inconsistent evidence of the day of the week effect. Lim and Chia (2010) reported that the day of the week effect is present in Malaysian and Thailand stock markets while testing the presence of the effect in five ASEAN markets. They also found that Monday returns are influenced by the previous week's return in Indonesian, Malaysian and Philippines Stock Markets. Garg, Bodla and Chhabra (2010) found no evidence of the weekend or the day of the week effect in the USA market but found the Monday effect in Indian Stock market. Bohl et al., (2010) found interesting evidence in Chinese B share markets in

Shanghai and Shenzhen. They found that the day of the week behavior of stock returns are related to the trading behavior of individual and institutional investors. The day of the week effect in Chinese B share markets became evident only after individual investors were allowed to trade in these markets. Their findings suggest that individual investors' presence in the stock market drives the day of the week effect.

Hypotheses

Evidence of the day of the week effect

In the DSE, trading takes place from Sunday to Thursday (although trading used to take place from Saturday to Thursday until September, 2005) while in other stock markets trading happens from Monday to Friday. If the market is efficient then mean returns of all the five trading days should be equal. The day of the week effect or the weekend effect hypothesizes that returns are significantly lower in the first trading day and significantly higher in the last trading day of the week. Thus, null hypothesis of this study is the equality of mean across the trading days of the week.

H_0: $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5$

Explaining the day of the week effect

This study explains the day of the week effect using the wandering hypothesis. According to this hypothesis, the day of the week effect is not fixed in the first and the last trading day of the week rather can be observed in any day of the week as a result of general anomalous pattern of returns in the market.

H_1: Lower return in the first trading day and higher return in the last trading day of the week is fixed throughout the sample period

Methodology

Data

This study examines the wandering nature of the day of the week effect during the sample period between November, 2001 and September, 2018. Sample period of this study is determined by the availability of data. We collected data from the Dhaka stock exchange. Selection of index for this kind of study has immense importance. Construction of index can greatly influence the result of the study. This study plans to use the most widely used index called the DGEN (later continued as DSEX). Table 1 shows descriptive statistics of the key variables of this study. Results are presented for the whole sample period as well as for two sub-sample periods. Division of the sample period is based on the change of trading days in the DSE. Until the first week of September, 2005, first trading day was Saturday, which was changed to Sunday from the second week of September, 2005. As a result, our first sub-sample period is from November, 2001 to

September 8, 2005 and second sub-sample period is from September 11, 2005 to September 5, 2018. Results show that average returns on Monday and Tuesday were negative during the whole sample period while those in other trading days of the week were positive. As a result, lower return in the first trading day of the week is not evident. During the first sub-sample period, average returns on Sunday were negative while those in the other days of the week were positive including the Saturday, which was the first trading day of the week. Lower returns in the first trading day of the week are not evident in the first sub-sample period. However, in the second sub-sample period, which constitute the recent periods is evident with the lower returns on Sunday, which was the first trading day of the week. Results of the whole sample period and the two sub-sample periods show that Sunday had the lowest returns but the highest returns were not fixed in any day.

Table 1: Descriptive statistics

Nov, 2001 – Sept, 2018					
Variable	Obs	Mean	Std. Dev.	Min	Max
Saturday	165	0.0011	0.0094	-0.0337	0.0279
Sunday	786	-0.0018	0.0147	-0.0776	0.0782
Monday	803	-0.0006	0.0152	-0.0891	0.2261
Tuesday	798	0.0021	0.0142	-0.0709	0.1558
Wednesday	809	0.0009	0.0116	-0.0642	0.0727
Thursday	790	0.0021	0.0107	-0.0849	0.0556
Nov. 2001 – Sept. 2005					
Saturday	165	0.0011	0.0094	-0.0337	0.0279
Sunday	174	-0.0004	0.0093	-0.0484	0.0286
Monday	178	0.0002	0.0109	-0.0665	0.0318
Tuesday	176	0.0008	0.0122	-0.0709	0.0593
Wednesday	184	0.0016	0.0097	-0.0267	0.0495
Thursday	174	0.0011	0.0078	-0.0364	0.0278
Sept. 2005 – Sept. 2018					
Sunday	612	-0.0022	0.0159	-0.0776	0.0782
Monday	625	-0.0009	0.0162	-0.0891	0.2261
Tuesday	622	0.0025	0.0146	-0.0468	0.1558
Wednesday	625	0.0007	0.0122	-0.0642	0.0727
Thursday	616	0.0024	0.0113	-0.0849	0.0556

Modeling Daily Returns

Previous studies show that behavior of stock prices can be described by a multiplicative random walk (French, 1980), where the random walk model looks like –

$$P_t = P_{t-1}\{\exp[E(R_t) + \varepsilon_t]\} - D_t$$

Where, P_t is the end of period t prices of stocks, D_t is the dividend paid during period t, $E(R_t)$ is the expected return in period t, and ε_t is a serially independent random variable whose expected value is zero. This model is equivalent to

$$R_t = \ln\left\{\frac{P_t + D_t}{P_{t-1}}\right\} = E(R_t) + \varepsilon_t$$

Where, R_t is the continuously compounded return of a stock observed in period t.

As this study will use returns of the overall market, returns must be calculated based on market index. Based on this stock return model, daily returns of the market will be calculated based on the natural logarithm of change in daily closing index value.

$$Return\ (r_t) = \ln\left(\frac{I_t}{I_{t-1}}\right)$$

Where, r_t stands for the return of the market and I_t stands for the market index at time 't'.

5.3 Testing Equality of Mean

Test of the day of the week effect requires testing the equality of mean across the days of the week. We use mean comparison test to examine whether returns of the first trading day of the week are significantly different than those of the rest of the days of the week. To examine the equality of return across the days of the week, we use Kruskall-Wallis (K-W) rank test. The H statistic following the non-parametric K-W test is based on the assumption that returns of stock market are not normally distributed. Since, some studies found that time series data of stock index is not normally distributed, non-parametric test could be applied. H Statistic is calculated using following formula -

$$H = \left[\frac{12}{N(N+1)} \times \sum_{j=1}^{5} \frac{R_j^2}{n_j}\right] - 3(N+1)$$

Where, R_j = sum of Ranks in each of the column j

n_j = Number of observation in each of the column j

N = Total number of observation

Parametric tests need to be performed in addition to the non-parametric test as well. Researchers found that non parametric tests have less predictive power than parametric

tests. Thus, considering less predictive power of non parametric test and the assumption of normal distribution, parametric test like ANOVA is also performed to measure the equality of the mean of the days of the week. F test will be calculated using the following formula -

$$F = \frac{BSS \,/\, df_B}{WSS \,/\, df_W}$$

Where, BSS is between sum of squares, WSS is within sum of squares, df_B is between group degrees of freedom and df_W is within group degrees of freedom.

4.3.3 Multiple Regression Model

In order to test the day of the week effect, the following multiple regression model with dummy variables has been used –

$$R_t = \alpha + \sum_{t=2}^{5} \beta_t D_t + \varepsilon_t$$

$$= \alpha + \beta_2 D_2 + \beta_3 D_3 + \beta_4 D_4 + \beta_5 D_5 + \varepsilon_t$$

Where, R_t is daily market return, α is the constant, β_i is coefficient of dummy variable, D_t are the dummy variables used to indicate days of the week on which return is observed and ε_t is the error term. $D_{2t,}$ $D_{3t,}$ $D_{4t,}$ $D_{5t,}$ are used to denote Monday, Tuesday, Wednesday and Thursday when trading is conducted from Sunday to Thursday. The expected return in the first day of the week, Sunday in case of the DSE, is measured by α and difference between α and respective β are the returns for any particular day of the week. The day of the week effect will be evident if β coefficients are significantly different from zero.

Multiple regression analysis needs to be tested for heteroskedasticity in the residuals or error terms. To perform well, the error terms of the regression model must be homoscadastic. If Q statistic is highly significant, and variance clustering is observed, then the returns series may have the ARCH effect. Applying the ARCH effect in the OLS regression will improve the quality of estimation. The autoregressive ARCH model was first developed by Engle (1982) that allows error term of the regression equation to vary over time in contrast to the time series regression's assumption of constant variance. Bollerslev (1986) introduced the generalized form of the ARCH model by introducing conditional variance as a function of prior period's squared errors. The GARCH model can effectively control volatility clustering in the return series. If large price changes follow large price change and small price changes follow small price change, then the data series is deemed to have volatility clustering. The GARCH model allows conditional variance to be a function of the prior period's squared errors as well as of its past conditional variances. The GARCH model can be used to capture the day of the week

effect in returns as well as in volatility. Engle et al., (1987) provided the extension of GARCH model where conditional mean is used as a function of conditional variance.

$$r_t = \sigma_t + \alpha + \sum_{i=2}^{3} \beta_i D_t + \sum_{j=1}^{n} \theta_j r_{t-j} + \varepsilon_t$$

$$h_t = \alpha + \sum_{n=1}^{q} \alpha_n \varepsilon_{t-n}^2 + \sum_{m=1}^{p} \gamma_m h_{t-m} + \sum_{i=2}^{3} \beta_i D_t$$

$$\varepsilon_t / \theta_{t-1} \sim N(0, h_t)$$

Where, σ_t is the conditional standard deviation used in the mean equation, h_t is the conditional variance equation, α is the intercept that represents Sunday (the first trading day of the week in the DSE), D_t is the dummy variable from Monday to Thursday, β_i is the coefficients for day dummy variables, p is the GARCH order and q is the ARCH order.

Empirical findings

Results of the equality of mean across the days of the week

As a mean to examine whether average returns of all trading days of the week are significantly not different, we conducted both parametric and non-parametric test. First, we examine whether average returns of the first trading day of the week are significantly different than those of the other trading days of the week. Table 2 shows the results of the mean comparison test. Results show that average returns in the first trading day is significantly different than those in the other trading days of the week in the whole sample period as well as in the second sub-sample period. However, there is no significant difference between average returns in the first trading day and rest of the trading days of the week in the first sub-sample period when Saturday was the first trading day. Results suggest that lower return in the first trading day of the week become evident in the recent decade. Table 3 shows the results of the test of equality of mean across the trading days of the week. Non-parametric K-W test and parametric F test have been performed to examine equality of mean. Panel A shows the results of the K-W test and Panel B shows the results of the F test. Both the K-W and F tests show that average returns are significantly different across the trading days of the week in the whole sample period and in the second sub-sample period. However, average returns are not significantly different across the trading days of the week in the first sub-sample period. Results of the parametric and no-parametric tests are indicative of a possible day of the week effect in the recent decade.

Table 2: Mean comparison test

	Nov, 2001 - Sept, 2018	Nov, 2001 - Sept, 2005	Sept, 2005 - Sept, 2018
First trading day	-0.0015	0.0011	-0.0022
Rest of the days	0.0010	0.0007	0.0012
Difference	-0.0026 (-4.87)***	0.0004 (0.51)	-0.0034 (-5.32)***

t statistics are in the parenthesis. *, **, and *** show significance level at 1%, 5%, and 10% level, respectively.

Table 3: Test of equality of mean

	Nov, 2001 - Sept, 2018	Nov, 2001 - Sept, 2005	Sept, 2005 - Sept, 2018
Panel A: Kruskal Walis Test			
Chi squared	64.76	4.58	66.11
df.	5	5	4
Probability	0.0001	0.4690	0.0001
Panel B: ANOVA Test			
F	11.07	0.91	13.17
df.	5	5	4
Probability	0.0000	0.4710	0.0000

Evidence of the day of the week effect

The parametric and non-parametric tests indicate the possibility of day of the week effect in the recent decade. To test the hypothesis that first trading day of the week has significantly lower returns than those of rest of the days, I conduct OLS and GARCH regression models. Table 4 shows the OLS and GARCH regression coefficients in the whole as well as two sub-sample periods. Results show that average returns in the first trading day is not significantly lower than those in the other trading days of the week in the whole sample period as well as in the first sub-sample period. In the whole sample period, average returns in Sunday and Monday are found to be significantly negative but those in other days are not significant. In the first sub-sample period, none of the trading days has significant returns. However, in the second sub-sample period, Sunday has the significantly negative returns supporting the hypothesis of this study. Consistent with the

hypothesis of the weekend effect, average returns on Thursdays, the last trading day of the week, are found to be significantly positive although not the highest among the trading days. All other trading days of the week have the significantly positive returns. Results in the second sub-sample period support the findings of other studies on the day of the week effect in the developed and developing countries (Lim and Chia, 2010; Basher and Sadosky, 2006; Schewart, 2002; Lakonishok and Smidt, 1988; French, 1980). Our study does not support the hypothesis of Hui (2005) that day of the week effect has disappeared from most of the stock markets. Significant positive returns in the last trading day of the week also support the Friday effect (Friday is the last trading day in the most of the developed countries) found in the developed countries (Al-Rjoub, 2004; Kato, 1990; Keim and Stambaugh, 1984).

Table 4: Regression coefficients for the day of the week effect

	Nov, 2001 – Sept, 2018	Nov, 2001 – Sept, 2005	Sept, 2005 – Sept, 2018
Sunday	-0.0029 (-2.8)*** -0.0026 (-2.51)**	-0.0015 (-1.38) -0.0011 (-1.18)	
Monday	-0.0017 (-1.52)* -0.0007 (-0.63)	-0.0009 (-0.84) -0.0006 (-0.61)	0.0014 (1.70)* 0.0019 (3.34)***
Tuesday	0.0011 (0.94) 0.0009 (0.87)	-0.0003 (-0.28) 0.0001 (0.09)	0.0048 (5.92)*** 0.0037 (6.67)***
Wednesday	-0.0002 (-0.19) 0.0002 (0.15)	0.0005 (0.45) 0.0002 (0.25)	0.0029 (3.61)*** 0.0027 (4.78)***
Thursday	0.0010 (0.91) 0.0007 (0.74)	0.0000 (0.03) 0.0003 (0.35)	0.0046 (5.73)*** 0.0037 (7.26)***
Constant	0.0011 (1.05) 0.0006 (0.60)	0.0011 (1.39) 0.0005 (0.68)	-0.0022 (-3.92)*** -0.0021 (-4.94)***
Observation	4151	1051	3100

The first and second row of each cell show coefficients of the OLS and GARCH regression models, respectively. t statistics are in the parenthesis. *, **, and *** show significance level at 1%, 5%, and 10% level, respectively.

Explaining the day of the week effect

There have been several attempts to explain the causes of the day of the week or weekend effect. Jaffe et al., (1989) argued that low Monday returns were twisted by the previous

weeks' declining performance of returns. Some studies explained low Monday returns risk. However, Doyle and Chen (2009) did not find evidence in support of the twisting hypothesis and Jaffe and Westerfield (1985) did not find the evidence in favor of explaining the day of the week effect from the viewpoint of risks. Doyle and Chen (2009) found the wandering nature of the day of the week effect by providing evidence that the Monday or weekend effect is not fixed over the period of time. Day of the week effect can be observed for any other days of the week as a result of general inefficiency of pricing of securities. This study also examines the wandering nature of the day of the week effect. I run the OLS and GARCH regression in each year of the sample period to observe whether the lower return in the first trading day and higher returns in the last trading day are observed consistently throughout the sample period. Table 5 shows the year-wise OLS and GARCH regression coefficients. The constant term indicates the first trading day of the week.

Results show that neither the lowest returns are consistently found in the first trading day nor the highest returns are found in the last trading day of the week. During the whole sample period, lowest returns are found in Sunday as the first trading day, Sunday as the second trading day and Tuesday. Moreover, the first trading day of the week is not always significantly negative but significantly positive. On the other hand, the highest returns are found in Saturday, Sunday, Monday, Tuesday, Wednesday and Thursday. However, results also show the lowest returns in the first trading day in most of the years in second sub-sample period. In the first sub-sample period, the lowest returns are never found in the first trading day. Instead, first trading day has the highest returns in the week. As a result, the day of the week effect or the weekend effect are not consistently found in this study. Results suggest that the lowest returns are found in different days of the week and so do the highest returns. Thus, results of this study support the wandering nature of the day of the week effect (Doyle and Chen, 2009). Doyle and Chen (2009) provided evidence on the wandering nature of the day of the week or weekend effect in the eleven major stock markets of the world. The evidence on the wandering nature of the day of the week or weekend effect in the DSE is consistent with findings in emerging stock markets as well. Derbali and Khadraoui (2011) found significantly negative returns on the Wednesday in Morocco, Raj and Kumari (2006) found positive Monday returns and negative Tuesday returns in India, Tachiwou (2010) found negative returns in Tuesday and Wednesday and positive returns in Thursday and Friday in West African regional stock market.

Table 5: Year-wise regression coefficients for the day of the week effect

	Sunday	Monday	Tuesday	Wednesday	Thursday	Constant	Obs
2002	-0.0005 (-0.35) -0.0005 (-0.44)	0.0001 (0.04) 0.0002 (0.21)	-0.0026 (-2.03)** -0.0019 (-1.69)*	-0.0016 (-1.25) 0.0014 (-1.15)	0.0005 (-0.40) 0.0006 (0.53)	0.0009 (1.04) 0.0006 (0.69)	287
2003	-0.0032 (-2.08)*** -0.0031 (-2.76)***	-0.0005 (-0.37) -0.0017 (-1.36)	-0.0008 (-0.54) -0.0018 (-1.52)	0.0004 (0.31) -0.0010 (-0.91)	-0.0008 (-0.53) -0.0026 (-2.27)***	0.0013 (1.19) 0.0024 (2.54)***	286
2004	-0.0020 (-0.86) 0.0003 (0.13)	-0.0024 (-1.04) -0.0022 (-1.12)	-0.0002 (-0.09) 0.0007 (0.34)	-0.0011 (-0.48) 0.0002 (0.09)	-0.0011 (-0.47) -0.0005 (-0.22)	0.0039 (2.27)*** 0.0027 (1.85)*	266
2005	-0.0005 (-014) -0.0028 (-1.06)	0.0009 (0.28) -0.0009 (-0.33)	0.0044 (1.35) 0.0031 (1.24)	0.0051 (1.59) o.oo31 (1.06)	0.0042 (1.27) 0.003213 (1.06)	-0.0031 (-1.21) -0.00168 (-0.69)	258
2006		0.0007 (0.30) 0.0007 (0.31)	0.0038 (1.70)* 0.0042 (2.05)**	0.0053 (2.34)** 0.0056 (2.53)**	0.0058 (2.59)*** 0.0056 (2.06)**	-0.0033 (-2.05)** -0.0035 (-2.23)**	226
2007		-0.0011 (-0.44) -0.0012 (-0.51)	-0.0011 (-0.43) -0.0025 (-1.10)	-0.0021 (-0.81) -0.0030 (-1.26)	0.0015 (0.58) -0.0001 (-0.04)	0.0033 (1.80)* 0.0046 (3.54)***	237
2008		-0.0041 (-1.53) -0.0020 (-0.86)	0.0027 (1.05) 0.0035 (1.40)	0.0017 (0.67) 0.0021 (0.95)	0.0053 (1.97)** 0.0063 (2.66)***	-0.0014 (-0.73) -0.0016 (-1.07)	237
2009		0.0025 (0.68) 0.0025 (0.69)	-0.0001 (-0.03) -0.0002 (-0.06)	-0.0010 (-0.27) 0.0003 (0.06)	0.0031 (0.85) 0.0033 (1.06)	0.0012 (0.48) 0.0013 (0.72)	244
2010		0.0014 (0.57) 0.0007 (0.37)	0.0036 (1.47) 0.0031 (1.43)	0.0029 (1.17) 0.0020 (1.08)	0.0042 (1.71)* 0.0048 (2.62)***	0.0002 (0.09) 0.0003 (0.23)	244
2011		0.0071 (1.15) 0.0105 (2.11)**	0.0194 (3.21)*** 0.0118 (2.68)***	0.0134 (2.22)** 0.0140 (2.87)***	0.0145 (2.37)* 0.0138 (2.78)***	-0.0124 (-2.89)*** -0.0113 (-3.24)***	235
2012		-0.0051 (-1.22) -0.0047 (-1.33)	0.0073 (1.71)* 0.0079 (2.25)**	-0.0003 (-0.07) 0.0010 (0.29)	0.0056 (1.32) 0.0035 (1.00)	-0.0021 (-0.71) -0.0018 (-0.75)	238

2013		0.0070 (2.67)*** 0.0028 (1.22)	0.0076 (2.90)*** 0.0058 (3.30)***	0.0058 (2.19)** 0.0040 (1.88)*	0.0043 (1.63) 0.0044 (2.51)**	-0.0048 (-2.60)*** -0.0038 (-3.03)***	237
2014		0.0029 (1.93)* 0.0029 (2.02)*	0.0050 (3.24)*** 0.0051 (3.4)***	0.0054 (3.56)*** 0.0054 (4.06)***	0.0043 (2.85)*** 0.0044 (2.72)***	-0.0028 (-2.65)*** -0.0029 (-3.08)***	238
2015		0.0019 (1.17) 0.0021 (1.76)*	0.0039 (2.40)** 0.0038 (2.54)**	0.0009 (0.57) 0.0003 (0.18)	0.0024 (1.49) 0.0032 (2.77)***	-0.0020 (-1.74)* -0.0019 (-2.12)**	244
2016		0.0012 (1.32) 0.0014 (1.71)*	0.0027 (3.04)*** 0.0022 (2.52)**	0.0015 (1.75)* 0.0018 (1.98)**	0.0031 (3.53)*** 0.0030 (3.03)***	-0.0014 (-2.18)** -0.0012 (-1.75)*	240
2017		0.0024 (2.11)** 0.0020 (2.13)**	0.0046 (3.95)*** 0.0039 (3.37)***	0.0018 (1.60) 0.0018 (1.88)*	0.0023 (2.01)** 0.0025 (2.86)***	-0.0013 (-1.64) -0.0012 (-1.90)*	248
2018		-0.0012 (0.64) -0.0012 (0.65)	0.0011 (0.56) 0.0019 (1.20)	0.0015 (0.77) 0.0016 (1.01)	0.0034 (1.79)* 0.0025 (1.73)*	-0.0016 (-1.18) -0.0015 (-1.52)	164

The first and second row of each cell show coefficients of the OLS and GARCH regression models, respectively. t statistics are in the parenthesis. *, **, and *** show significance level at 1%, 5%, and 10% level, respectively.

Conclusion

This study examines the day of the week effect and explains the effect from the viewpoint of wandering hypothesis. There have been several studies in the DSE as well documenting the day of the week effect. However, a convincing explanation is still unavailable. Although several studies document that the day of the week effect has been disappeared from the major stock market of the world, recent evidence shows that the effect has not been really disappeared but changed its nature. Recent development on the day of the week effect shows that the effect is not fixed but wandered across the days. This study contributed in the existing literature by providing evidence on the wandering nature of the day of the week effect in the DSE. Using DGEN and DSEX as the benchmark indices to measure daily returns during the period between November, 2001 and September, 2018, this study provides evidence that the day of the week effect is present in the whole sample period as well as in the September, 2005-September, 2018 sub-sample period. However, when the day of the week effect is examined in each of the sample year, the effect is not found to be consistent. Lowest returns are found in Sunday as the first trading day, Sunday as the second trading day and Tuesday. Moreover, the

first trading day of the week is not always significantly negative but significantly positive. On the other hand, the highest returns are found in Saturday, Sunday, Monday, Tuesday, Wednesday and Thursday. Thus, results of this study support the wandering nature of the day of the week effect in the DSE.

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