가나 증권시장의 주말 효과와 1월 효과
The Weekend and January Effect in the Ghana Stock Market

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요약

 본 연구의 목적은 가나증권거래소 종합지수를 바탕으로 가나 증권 시장에서 주말 효과 및 1월 효과가 나타나고 있는지를 분석하고자 하는 것이다. 이를 위해 가나 증권시장에 상장된 기업을 대상으로 2005년 1월 4 일부터 2013년 12월 31일까지 9년간의 일별종가와 종합지수를 나타내는 ASI 및 CI를 토대로 회귀 분석을 이용하여 두 효과를 검증하였다. 회귀분석 결과에 따르면 가나 증권 시장에서는 주말효과가 나타나지 않아 선행 연구 결과와 다르게 나타났으며 이는 연구기간과 연구 자료가 다르기 때문인 것으로 사료된다. 월간효과의 회귀 분석 결과, ASI가 사용된 2005년부터 2010년까지 6년의 기간 전체를 대상으로 분석한 결과 4월 효과가 나타났으며, ASI가 사용된 기간을 3년을 기준으로 두 개의 기간으로 구분하여 분석한 결과 2005년부터 2007년까지의 기간은 4월 효과가 보이지 않지만 2008년부터 2010년까지 기간의 경우에는 4월 효과가 나타났다. CI가 사용된 2011년부터 2013년까지 기간의 경우에는 1월 효과가 존재하는 것으로 나타났다.

■ 중심어 : | 가나증권거래소 | 종합지수 | 주말 효과 | 1월 효과 |

Abstract

 The aim of this study is to analyze the Weekend and January effect in the Ghana Stock Exchange (GSE) using daily closing prices of GSE-All Share Index (ASI) and Composite Index (CI) between the period of January 4th, 2005 and December 31st, 2013. The dataset covers the period of 2005 to 2010 (6 years) for the ASI and 2011 to 2013 (3 years) for the CI. The following results are obtained based on a parametric regression using dummy variables. First, no weekly effect or anomaly is documented for both GSE-ASI and GSE-CI. Second, market abnormalities are captured for both GSE-ASI and GSE-CI over their respective entire periods. However, no consistent April effect is found for ASI when the period was segregated into two periods of three years. The April effect is uncovered for the GSE-ASI at 5% significant level while the January effect is found for the GSE-CI at 1% significant level.

■ keyword : | Ghana Stock Exchange | Composite Index | Weekend Effect | January Effect |

I. Introduction

The issue of calendar anomalies has been of great interest not only to academicians but also to practitioners for almost half a century. Their existence in a financial market is essential because they guide the decision making process of an investor. Calendar anomaly simply refuses to accept the Efficiency Market Hypothesis(EMH) which was touched on by[1]. According to Fama, the EMH theory is the situation where stock market prices show a full reflection of all available and relevant information. This implies that abnormal gains cannot be made based on the past pieces of information. However, calendar anomalies emphasize empirically that prices of stocks exhibit abnormal trends of decrease or increase depending on a specific day or month of the calendar year. The most frequently captured calendar anomalies consist of the day-of-the-week (Weekend) and month-of-the-year effect (January effect).

Day of the week effect according to [2] refers to the situation where returns on Fridays are positive while returns on Mondays are low or abnormally negative. He called this "The Weekend Effect." The month of the year effect occurs when returns in January and December are large and low respectively[3]. This is the situation where January's returns are significantly higher than the other eleven remaining months. Most of the theoretical and empirical research on this subject focuses on developed markets such as the New York Stock Exchange (NYSE) and emerging economies like the BRICs. Only a limited amount of research has been conducted on the calendar anomalies of the stock markets of developing markets like the Ghana Stock Exchange. As far as market seasonality is concerned, the empirical evidence on the GSE is limited. In fact, only two researchers have touched on this topic. The Ghana Stock Market has been the fundamental stock exchange in Ghana.

It was established in the late nineteen eighties to turn the economic fortunes of the country. It was incorporated in July 1989 as a private company limited under the Companies Codes 1963. In 1994, a resolution was passed and the name of the Exchange was changed from private company limited by guarantee under the Companies Code 1963 (Act 179). It started trading in 1990 with 11 listed companies. Securities listed on the GSE comprises of equities, corporate, and government bonds. As of December 31st, 2013, the number of companies listed on the exchange amounted to 34.

The sectors that trade on the GSE include Finance, Distribution, Food and Beverage, Information Communication Technology (ICT), Insurance, Manufacturing, Mining, Agriculture, and Exchange Traded Fund (ETF). The medium of trading on the GSE is mainly electronic. A (T+ 3) settlement system is used and shares are transferd automatically into clients account on the day of settlement. Since it started operation, the GSE has adopted four main indexes : Databank Stock Index (1990-2004), GSE-All Share Index (2 0 0 5 - 2 0 1 0), GSE-Composite Index and GSE- Financial Index (2011-present) [18]. However, for the purpose of this study, we focus only on the GSE-ASI (2005-2010) and CI (2011-2013). The GSE has seen a tremendous growth in the volume of shares traded, value traded, and its market capitalization, except for 2009 and 2012, which experienced sharp decreases. This may be due to 2008/9 global financial crises and European economic crises in 2012 which spilled over to Ghana.

Previous studies by [4] and [5] on the GSE were conducted when the GSE operated on a 3-day (Monday, Wednesday, and Friday) a week basis.

However, after their research so many changes have taken place on the GSE. For example, from 2005, the GSE began operating on a-5-day per week and opened from 9:00 until 15:00 hours(GMT). Because the researchers conducted their studies while the GSE traded only three times a week, their research does not address the changes that might have occurred when the trading days were changed. This gap needs to be filled because other markets empirically document market seasonality on the days (Tuesdays and Thursdays) which were left out in the previous studies. Also, from January 4th, 2011 the index, again changed from an All Share Index to a Composite Index. (See [9])

To upgrade the literature on GSE's seasonality, 1) a total of 2,181 more recent data points are examined and 2). two trading days (Tuesdays and Thursdays) which were absent from previous research are taken into account. As a result, we investigate the Weekend and January effect using daily closing prices of GSE-ASI (2005-2010) and GSE-CI (2011-2013). A parametric OLS regression using dummy variables is used in testing the above-mentioned effects. No weekly seasonality or traditional January effect is found in the ASI. However, we find an April effect. Also, we captured January effect for the CI but not the weekend effect. The presence of these effects can be explained by the release of financial reports of firms listed on the GSE by the ending of March and December respectively. Accordingly, this paper is expected to have two important effects on both investors and practitioners. First, the results of this paper is expected to be used as basic data for improving the efficiency of the GSE. Finally, the outcome is expected to be of great asset to investors in their decision making process.

II. Literature Review

1. Weekend Effect

The initial work on the day of the week effect literature began in the U.S. which focused mainly on the Dow Jones Industrial Average (DJIA) and Standards and Poor. [2] termed the day-of-the-week effect as the Weekend Effect. He used the parametric linear regression using dummy variables in illustrating empirically that returns on Mondays are negative at a 5% significant level while the returns of the remaining four trading days are positive during his 25 year-period of investigating the Standards and Poor's composite portfolio. He argued that the negative Monday return may be due to the unfavorable information that was release over the weekend. Negative Mondays do not offer any shortcut to making abnormal gains. [2] emphasizes that because of transaction cost no profit can be made.

Another research that backs French's weekend effect is [6]. Their 90 years observation of DJIA revealed that negative Monday's rate of return are significantly different from zero and somewhat positive return on the last trading day (usually Fridays). In spite of this earlier documentations of this seasonality, recent research showed that the weekend effect has gone extinct in the U.S. and other emerging countries. A recent study conducted on two developed economies (U.S and Japan) and four other countries (Korea, Hong Kong, Singapore, and Taiwan), using data from their various exchanges for the period 1998 through 2001, confirmed the disappearance of the anomaly in all the countries except Singapore [7]. The story is not that different for the biggest stock exchange in Africa. The All Gold Index (Johannesburg Stock Exchnage-JSE) was investigated over 11-year period in search for the

Weekend, January, and Pre-holiday effect. No weekend effect was documented for the JSE. Only insignificant negative mean return of -0.00049 was recorded for the entire period [8].

The day-of-the week effect is not unique only to the U.S stock markets. This phenomenon is documented in other stock market worldwide. [9] examined the daily stock returns for four countries (U.K, Japan, Canada, and Australia) in addition to the U.S. They also investigated if seasonal patterns in these countries are independent of those previously studied in the U.S. They found a negative average Monday and a high average return for the last trading day (Fridays) for all countries except for Japan which traded on Saturdays. They also, uncovered the lowest mean returns on Tuesdays for Japan (-0.090 %) and Australia. (-0.0133).

Obtaining daily closing prices from Databank Stock Index from June 15, 1994 through April 28, 2004, [5] examined the weekend and January effect on the Ghana Stock Exchange using GARCH model. Unlike this study, their sample period is made up of three days a week (Monday, Wednesday, and Friday). Though positive, they found Mondays return to be lower than the rest of the days. However, this seasonality disappeared when rolling frame work was applied.

2. January Effect

Another globally recognized calendar anomaly is the month of the year effect. Many researchers have documented evidence backing January effect after [10] pointed it out in the U.S stock market. [11] explained this effect as being characterized by high stock returns on the last trading day of December and during the first few weeks of the subsequent January. [12] simply put it as certain types of stock tend to produce abnormal return at the turn of the year. On

their examination of the of the NYSE from 1926 to 1993, they captured evidence in support of the January effect.

Being worldwide phenomena, January effect is proven to exist beyond the borders of the U.S. Most studies have reported this anomaly in other industrial, emerging and developing economies. [13] in their international investigation found evidence in support of the monthly effect. They use Capital International Perspective (CIP) stock returns from January 1959 through December 1979 to examine the stock returns of 17 industrial stock markets. Unlike other countries that have higher January mean rank, UK's mean rank seems to be higher than the rest of the months and December is higher for Australia. [14] examined the January effect and the tax-loss hypothesis over a 9-year period for eighteen emerging countries including South Korea ,Nigeria and Zimbabwe. Strong significant (1% significant level) seasonal effect was uncovered in all markets except for Jordan, Pakistan, Taiwan, and Venezuela which reported a weak significant effect at a 10% significant level. However, only one country (Chile), out of the 18, has evidence in support of the typical January effect and the tax-loss selling hypothesis.

The above result contradicts the findings of [15]. They investigated 20 emerging economies and 7 industrial markets using non-parametric (Kruskal Wallis) and parametric (regression) approach in pursuit of turn of the year effect. Zimbabwe, Nigeria plus 15 other markets could not reject the null hypothesis of equality of returns based on Kruskal Wallis test. When they examined whether January return was significantly different from other months, no seasonal effect was documented for all emerging countries studied. They argued that lack of the January effect could be explained by weakness of their analytical test and the weak form of the tax

codes in the countries studied. Also [8] documented no evidence in support of the January effect when they investigated JSE All Gold Index over a 11-year period.

For the Ghana Stock Exchange, [5] focused on the calendar anomaly using GARCH model. They studied both the day of the week and the month of the year effect from 1994 to 2004. No traditional January effect was found during their period of study. Instead, April returns were found to be significantly higher than the remaining months, hence the April effect. This finding is consistent with that of [13] on the UK market. They argued that the April effect is due to releasing of financial reports in March. [4] investigated monthly seasonality for Ghana (1991-1996) Nigeria (1984-1995), and Zimbabwe(1986-1995) using non-parametric and parametric analysis. While their results document no seasonality for Nigeria and Zimbabwe based on the tests conducted, both Wilcoxon-Mann-Whitney and dummy variable regression analysis show somewhat a January effect for GSE at a 10% significant level.

After the January effect surfaced in the seasonality literature, numerous researchers tried to empirically find the cause of this effect. A frequently tested hypothesis is a tax loss selling which was first proposed by Watchel (1942) and subsequently investigated by [11] and [16]. The latter argued that firms that have seen decline in prices in the preceeding month will experience more decline in the final lap of the year thereby pushing owners to sell most of their shares. He further pointed out that as the New Year unfolds tensions about selling fades away and the price in tend rises [16]. Empirical results about this hypothesis is mixed. For instance, seasonality is documented for markets in which the tax year is not January. Out of 18 emerging countries studied, only Chile shows evidence in support for the January effect [14]. This cause for the January effect is ruled out for Ghana because securities listed on the GSE are exempted from capital gains tax.

Another hypothesis which is attributed to the January effect is new information. This is the time of the year (January for most firms) when important financial announcements are made available to the public [10]. As mentioned above, we find April and January effect for ASI and CI respectively. This findings are in support of this hypothesis GSE required listed companies to quarterly make public their financial report.

III. Empirical Design

1. Data

The main data for this study is made up of daily closing prices from Ghana-ASI and CI from January 4, 2005 to December 30, 2013. The ASI is an index that is based on the last share price that traded on the market at the close of trading [18] while CI uses the volume weighted average prices of shares that got traded on the market at the close of trading in exception of shares traded on other stock exchanges. It has a base value of 1000 [19]. Data is obtained from Databank Group Ghana over a 9-year period. In total 2,181 observations are considered. These observations are reduced to 2,088 because three days of trading a week in 2005 were eliminated from this study. The dataset for ASI constituted 1438 (6 years) and 742 (3 years) observations for CI. This helps update on the previous studies on the GSE as far as market anomaly is concerned. The data employed in this research does not take into account adjusted dividends. This is in line with [8], and [5] who affirmed that using non-dividend adjusted returns would have an insignificant statistical impact on the

result.

Since CI has a period of 3 years, ASI is split into two sub-periods of 3 years. This is necessary in unifying the sample period and also in investigating if there is existence and continuity of Weekend and January effect over these periods. This is consistent with [17] and [8]. The sample period that are examined are listed below:

- ASI entire period : 2005/01/04 – 2010/12/30
- ASI sub-period 1 : 2005/01/04 – 2007/12/27
- AS1 sub-period 2 : 2008/01/07 – 2010/12/24
- CI entire period   : 2011/01/04 – 2013/12/30

Again, the sample period of CI is a three year period so no additional segregation is performed on it.

In calculating the daily return for both ASI and CI, the equation below is used :

$$R_t = \ln\left(\frac{U_t}{U_{t-1}}\right) * 100 \qquad (1)$$

Here, R_t represents daily returns for ASI and CI of the GSE, U_t is the closing value of the index on day t, and U_{t-1} is the closing value of index t-1.

2. Methodology

Preceding works such as [1] argued that stock returns are leptokurtic and non-normal. In the same way, [5] affirmed this by arguing that financial assets show certain features that cannot be explain by linear models. This means that non-parametric approaches are better at explaining the characteristics of financial assets. However, [13] claims that both parametric and non-parametric models yield similar results. [8] confirmed this by arguing that regression using dummy variable is as good as non-parametric in providing similar conclusions. Hence, this paper is centered on the parametric approach using dummies.

In other words, this study uses what is termed in the seasonality literature by some researchers as conversional methodology in investigating the weekend and the January effects.

2.1 Weekend effect

A regression for the entire period and two sub-periods were run to examine if there exist a statistical difference between the means for both ASI and CI. Below is the model that was used in examining the differences which might exist within the mean returns.

$$R_t = c + \alpha_2 D_2 + \alpha_3 D_3 + \alpha_4 D_4 + \alpha_5 D_5 + \epsilon_t \qquad (2)$$

Here R_t represents the return on both ASI and CI, C (intercepts) represents the average mean for Monday, D_2 to D_5 depict dummy variables for which the value for Tuesday is 1 and 0 for others, the coefficients of the dummies (D_2 to D_5) show the difference in return between Mondays and the rest of the individual trading days of the week. and ϵ_t is a random error term. The null hypothesis examined is:

$$H_0 : H_0 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0 \qquad (3)$$

Each coefficient of the dummy variable equals zero. The hypothesis that the coefficient of each of the dummies is not equal to zero will be an alternative. A rejection of the null hypothesis would imply that there is a sort of day-of-the week effect.

2.2 January effect

The model below is employed to examine the presence of the January effect:

$$R_t = c + \alpha_2 D_2 + \alpha_3 D_3 + \dots + \alpha_{12} D_{12} + \epsilon_t \qquad (4)$$

where, R_t represents the return on both ASI and CI, c (intercepts) represents the average mean for January, D_2 to D_{12} depict dummy variables for which the value for February is 1 and 0 for others, the coefficients of the dummies (D_2 to D_{12}) show the difference in return between January and the rest of the individual months of the year. and ϵ_t is a random error term. The null hypothesis investigated is:

$$H_0 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 ... = \alpha_{12} = 0 \qquad (5)$$

This means each coefficient of the dummy variable equals zero. The hypothesis that the coefficient of each of the dummies is not equal to zero will be an alternative. A rejection of the null hypothesis would imply that there is a type of month of the year effect in the both ASI and CI. In other words, when the coefficients of the dummies are significantly less than zero, that will be an indication for the January effect.

2.3 Basic Statistics

[Table 1][Table 2] below shows in percentages the descriptive statistics for the daily returns of the week and monthly returns of the year for GSE All Share Index and Composite index. Each table has four sections. The first-three sections represent the distribution for the entire and two sub-periods for ASI while the fourth section shows the distribution for the entire period for CI. The first, second, third, and fourth columns of the tables represents the daily/monthly mean returns, standard deviation, kurtosis, and skewness respectively for the two indexes.

The daily mean return for the entire period for ASI shows positive returns for all days except Thursday which recorded a negative mean return of −0.21704. The highest daily mean return is observed on

Tuesday (0.74044). A positive daily mean return is documented throughout for sub-period 1 for ASI. The lowest mean return is seen on Tuesday (0.01632). Thursday recorded the highest with 0.07721. Monday and Tuesday show positive returns. On the contrary negative returns were recorded for the remaining days for ASI's sub-period 2. The largest return of 0.11937 was captured on Tuesday. Like ASI's sub-period 1, the lowest return 0.38494 was observed on Tuesday for CI's entire period. However, the highest return was recorded on Wednesday 0.15720 for CI. [Table 1] below shows the distribution for the ASI's overall period, the two sub-periods, and the CI's weekly returns.

Table 1. Summary of daily log return for ASI and CI

Days	Mean	Std D	Kurtosis	Skewness
ASI entire period : 2005/01/04 − 2010/12/30				
Monday	0.065	0.712	17.575	−0.551
Tuesday	0.074	0.747	16.095	2.217
Wednesday	0.008	0.740	11.795	−0.365
Thursday	−0.022	0.962	30.488	−3.331
Friday	0.025	0.780	14.261	0.482
ASI sub-period 1 : 2005/01/04 − 2007/12/27				
Monday	0.041	0.149	8.074	1.524
Tuesday	0.016	0.211	23.960	−3.190
Wednesday	0.029	0.171	11.375	−0.414
Thursday	0.077	0.386	92.565	9.007
Friday	0.071	0.419	67.560	7.287
AS1 sub-period 2 : 2008/01/07 − 2010/12/24				
Monday	0.084	0.948	9.082	−0.490
Tuesday	0.119	0.981	8.349	1.662
Wednesday	−0.008	0.978	5.770	−0.235
Thursday	−0.104	1.249	17.403	−2.849
Friday	−0.013	0.985	7.673	0.072
CI entire period : 2011/01/04 − 2013/12/30				
Monday	0.109	0.580	6.576	0.300
Tuesday	0.038	0.488	6.649	−0.246
Wednesday	0.157	0.653	2.654	0.718
Thursday	0.153	0.564	4.536	0.208
Friday	0.056	0.512	0.899	−0.021

[Table 2] depicts the distribution for the monthly average return for the ASI's entire period, ASI's two sub-periods, and the CI's entire period. ASI captured monthly positive mean return for the entire period

except for May (−0.41144), June (−0.29859), July (−0.36904), and October (−0.10874). The biggest mean return was however found in April (0.24244). November (0.10841) and August (0.41043) were the highest mean return for ASI's first and second sub-periods respectively. CI's largest return was captured in February (0.03643). In brief, it can be seen there is no consistency in neither the largest nor lowest mean return over the short periods.

Table 2. Summary of monthly log return for ASI and CI

Months	Mean	Std.D	Kurtosis	Skewness
ASI entire period : 2005/01/04 − 2010/12/30				
Jan.	0.001	0.347	22.782	0.131
Feb.	0.002	0.358	14.183	−2.88
Mar.	0.137	0.784	19.013	2.964
Apr	0.242	0.851	8.311	1.950
May	−0.041	1.165	33.943	−4.993
June	−0.299	1.138	6.955	−2.059
July	−0.037	0.671	4.750	−1.132
Aug.	0.210	0.918	9.381	2.080
Sept.	0.061	0.658	17.812	1.371
Oct.	−0.109	0.744	10.917	−2.230
Nov.	0.083	0.734	14.483	2.593
Dec.	0.080	0.627	7.638	1.517
ASI sub-period 1 : 2005/01/04 − 2007/12/27				
Jan.	−0.016	0.238	7.593	−1.458
Feb.	0.022	0.075	5.466	2.017
Mar.	0.035	0.054	2.945	1.949
Apr.	0.035	0.119	27.714	5.115
May	0.072	0.182	4.807	1.261
June	0.027	0.124	19.132	3.587
July	0.053	0.160	9.332	1.663
Aug.	0.019	0.249	12.346	−2.051
Sept.	0.061	0.204	13.221	2.965
Oct.	0.060	0.152	5.154	1.739
Nov.	0.108	0.730	26.051	4.943
Dec.	0.056	0.194	5.509	1.897
AS1 sub-period 2 : 2008/01/07 − 2010/12/24				
Jan.	0.012	0.404	20.319	0.273
Feb.	−0.012	0.458	7.748	−2.244
Mar.	0.207	1.015	10.107	2.139
Apr.	0.364	1.052	4.18	1.311
May	−0.122	1.517	19.160	−3.796
June	−0.525	1.439	2.792	−1.282
July	−0.094	0.845	1.897	−0.748
Aug.	0.410	1.268	3.309	1.215
Sept.	0.060	0.915	8.729	1.022
Oct.	−0.273	1.001	4.314	−1.310
Nov.	0.056	0.744	3.672	0.301
Dec.	0.102	0.855	3.071	1.092

CI entire period : 2011/01/04 − 2013/12/30				
Jan.	0.216	0.495	2.484	0.611
Feb.	0.349	0.611	1.458	1.126
Mar	0.282	0.693	0.864	0.292
Apr	0.144	0.502	0.869	−0.037
May	0.086	0.576	2.096	0.876
June	0.066	0.389	0.362	−0.140
July	0.010	0.390	1.136	−0.651
Aug	−0.016	0.429	2.114	−1.233
Sept	−0.046	0.623	6.138	−0.709
Oct.	0.110	0.754	3.339	−0.001
Nov	−0.017	0.319	2.094	0.331
Dec.	0.060	0.701	7.029	0.655

IV. Empirical Results

We document the estimated coefficient, t statistics, p, and F-value for both weekend and January effect based on regression using dummy variable.

1. Weekend Effect

[Table 3] shows the regression results of the weekend effect for the overall period and the two sub-periods of the GSE-ASI. For ASI's weekly effect, the coefficient of the dummy variables suggest that the mean returns of the days of the week are statistically zero for the entire 9-year period, and the two 3-year sub-periods. However, for the entire period, we find Tuesday return to be higher than rest of the days but statistically insignificant. Put simply, the null hypothesis that coefficient of the dummy variable equals to zero could not be rejected. This indicate the absence of the weekend or any seasonality effect for the GSE-All Share Index. This findings appear to go along with that of [8]. They found no weekend effect on the South Africa's All Gold Index. They suggested that the absence of the anomaly could be explained by the uniqueness or particular microstructure of the Johannesburg Stock Exchanges (JSE).

Table 3. GSE-All Share Index Weekly Regression Analysis for the Entire and the two Sub-periods

Regression Coefficient	ASI Entire Period (2005/01/04 - 2010/12/30)		
	β	t	P
Constant	.065	1.317	.188
Tuesday	.009	.133	.894
Wednesday	−.057	−.828	.408
Thursday	−.087	−1.263	.207
Friday	−.087	−.569	.570
F	0.678		.607
Regression Coefficient	ASI sub-period 1 (2005/01/04 - 2007/12/27)		
Constant	.041	1.510	.132
Tuesday	−.025	−.643	.520
Wednesday	−.012	−.328	.743
Thursday	.036	.967	.334
Friday	.030	.797	.426
F	1.002		.406
Regression Coefficient	AS1 sub-period 2 (2008/01/07 - 2010/12/24)		
Constant	.084	.976	.329
Tuesday	.035	.293	.769
Wednesday	−.092	−.769	.442
Thursday	−.188	−1.561	.119
Friday	−.097	−.796	.426
F	1.002		.363

***,**,and *represent 1%,5%, and 10% significant level respectively

The regression analysis for the GSE-Composite Index is illustrated in [Table 4]. This result is somewhat different from that of GSE-All Share Index. The mean return for Monday is statistically greater than zero at a 5% significant level. However, the result of the F-statistics shows that the null hypothesis could not be rejected. The results for both the ASI and CI contradict the findings of [5] who documented the weekend effect in the GSE using data from 1994 through 2004 with mean Monday return of 0.0018 being the lowest. This variation in results can be explained by the numerous changes that have occurred between their sample period and ours. The biggest transition being the changing of trading from 3 to 5 days. Another is the replacement of the Databank Stock Index with the All Share Index.

Table 4. GSE-Composite Index Weekly Regression Analysis for the Entire Period

Regression Coefficient	CI Entire Period (2011/01/04 - 2013/12/30)		
	β	t	P
Constant	.109	2.303	.022**
Tuesday	−.070	−1.066	.287
Wednesday	.049	.736	.287
Thursday	.044	.670	.503
Friday	−.053	−.799	.425
F	1.401		.232

***,**,and * represent 1%,5%, and 10% significant level respectively

2. January Effect

Tests for the January effect are shown in [Table 5] for ASI and [Table 6] for CI. We find no evidence for typical January effect which states that the returns in January are statistically higher than returns for other months is not found in the GSE-All Share Index for the entire 9-year. In other words, evidence for the January mean return being significantly greater than the remaining months of the year is not captured for the entire period. Monthly returns that are significantly different from zero include April, June, and August. April recorded the highest monthly difference of 24% followed by August 20%. However, June has seen the lowest significant return of approximately −30%. This indicates a kind of seasonality in the ASI. Accordingly, we find an April effect for the GSE-ASI. This finding reinforces the findings of [5] for Ghana and [13] for UK. For the overall period for ASI the null hypothesis for coefficients being equal to zero are rejected. The April effect in the ASI may be partly explained by quarterly submission of financial reports of firms listed on the GSE. Firms are required by the Ghana Stock Exchange to make their financial statements available to the public every three months.

The results of the two sub-periods are neither consistent with the ASI's entire period nor between the two sub-periods. We find November's mean return

Table 5. GSE–All Share Index Monthly Regression Analysis for the Entire and the two sub-periods

Regression Coefficient	ASI Entire Period (2005/01/04 - 2010/12/30)		
	β	t	P
Constant	.001	.010	.992
February	.001	.007	.994
March	.136	1.252	.211
April	.242	2.211	.027**
May	−.042	−.384	.701
June	−.299	−2.772	.006***
July	−.038	−.349	.727
August	.209	2.042	.041**
September	.060	.578	.564
October	−.109	−1.067	.286
November	.082	.794	.427
December	.079	.745	.456
F	3.778		.000***
Regression Coefficient	ASI sub-period 1 (2005/01/04 - 2007/12/27)		
Constant	−.016	−.359	.720
February	.038	.582	.561
March	.051	.803	.422
April	.089	.776	.438
May	.044	1.387	.166
June	.069	.685	.494
July	.035	1.077	.282
August	.078	.607	.544
September	.077	1.330	.184
October	.125	1.317	.188
November	.125	2.150	.032**
December	.072	1.198	.231
F	0.614		0.818
Regression Coefficient	AS1 sub-period 2 (2008/01/07 - 2010/12/24)		
Constant	.012	.093	.926
February	−.023	−.129	.898
March	.195	1.079	.281
April	.353	1.969	.049**
May	−.134	−.734	.463
June	−.536	−2.983	.003***
July	−.105	−.593	.554
August	.399	2.236	.026**
September	.048	.267	.790
October	−.284	−1.607	.109
November	.044	.243	.808
December	.091	.495	.621
F	4.079		.000***

***,**,and * represent 1%,5%, and 10% significant level respectively

(13 %) to be different from zero for sub-period 1. April (35%), June (−54%), August (40%) are all significantly different from zero for sub-period 2. This indicates seasonality over short periods but not

necessarily a consistent April Effect for the two sub-periods.

[Table 6] illustrates the results of CI′s over the 3-year period. It can be seen that the mean January return is statistically greater than zero and higher than the average return of the remaining months at a 1% significant level. Except for February and March′s positive average return, the average return of the remaining months are all negative. However, only July, August, September, and November are statistically significant. This implies that there is January effect in the CI. This re-affirms the findings of [4] who examined Ghana , Zimbabwe, and Nigeria Stock Exchanges. They document evidence in support for the January effect for the Ghana Stock Exchange using the Wilcoxon-Mann-Whitney and regression using dummy variables but not for Zimbabwe and Nigeria. They argued that the January effect in the GSE is a spillover from British since Ghana has a closer business relationship with them. This could be the reason why market activities of the GSE decreased drastically in 2012 following the European economic crises in that same year.

Table 6. GSE–Composite Index Monthly Regression Analysis for the Entire Period

Regression Coefficient	CI Entire Period (2011/01/04 - 2013/12/30)		
	β	t	P
Constant	.216	3.090	.002***
February	.133	1.335	.182
March	.066	.670	.503
April	−.072	−.719	.472
May	−.130	−1.310	.191
June	−.150	−1.519	.129
July	−.205	−2.079	.038**
August	−.232	−2.359	.019**
September	−.262	−2.630	.009**
October	−.105	−1.066	.287
November	−.232	−2.373	.018**
December	−.156	−1.533	.126
F	3.115		000***

***,**,and * represent 1%,5%, and 10% significant level respectively

V. Conclusion

A large amount of empirical evidence is in support of the calendar anomalies in both developed and emerging markets. However, research on the Ghana exchange is very limited. Only two researchers touched on this topic. First, January effect was recorded for Ghana during the period of 1991 through 1996 using Kruskal-Wallis and regression using dummy variables [4]. Second, more recently a GARCH model was used in investigating the presence of both weekend and January effect in the GSE over the period of 1994 to 2004. April and Weekend effect were documented for month of the year and day of the week effect respectively. Tuesdays and Thursdays were left out in both studies because during their sample period GSE traded three days a week.

This study investigated the weekend and January effect making use of regression using dummy variables based on a daily closing prices of the five trading days for GSE-All Share Index and Composite Index over 6 and 3 years period respectively. The dataset covers the period of January 4th, 2005 through December 30, 2013. The two days which were omitted from previous studies are taken into account in this study. We document a mix result for this study. No weekend effect or weekly seasonality is captured for both GSE All Share Index and Composite Index. This findings contrast the findings of Alagidede et.al who documented a weekend effect for the GSE during their period of examination. This difference in result may be partly due to the additional two days which is considered in this paper. The absence of the weekend effect on both indices is in line with the findings of [8] who have argued that non-existence of this anomalies in the South Africa's All Gold Index is due to the uniqueness of the JSE.

We document an April effect for the ASI's entire 6-year period. The two sub-periods exhibit some kind of seasonality but not a consistent April effect. This result confirms the findings of previous works such as [13] for UK and [5] for Ghana.

We record January effect for the CI. This finding conforms to that of [4] result on Ghana Stock Exchange. Unlike most findings that attribute the Janaury's high return on tax loss selling, this is ruled out for Ghana because securities listed on the Ghana Stock Exchange are exempted from capital gains tax.

Both the April and January effect for ASI and CI can be explained more by the new information hypothesis which is the time of the year where essential or favorable financial information is released to the public [10]. Submission of the financial statements at the ending of both March and December can be said to have positive impact on the April and January large average returns.

Most of the works uncovered on the market anomalies are focused mainly on developed and emerging markets which have huge number of blue chip companies listed on their exchanges. GSE has relatively small number of companies listed. As of December 2013, the number of companies listed were 34. Furthermore the Ghana Stock exchange has a short history compared to other emerging economies and hence insufficient data is employed for this study.

Another limitation is the technique used in this research. Since stock returns are non-normal and leptorkurtic, techniques which do not assume for normality of data should be used in investigating these anomalies in the future studies.

The result of this study has two important effect. First, it is expected to guide investors in their decision making. Also, it will assist them in knowing when is the best time of the year to act. Second, it will not only enrich practitioners on the past and the

current status of the GSE but also it will serve as fundamental data for further research.

참 고 문 헌

[1] Eugene F. Fama, "The Behavior Stock-Market Prices," The Journal of Business, Vol.38, No.1, pp.34-105, 1965.

[2] Kenneth R. French, "Stock Returns and the Weekend Effect," Journal of Financial Economics, Vol.8, pp.55-69, 1980.

[3] Anup Agrawal and Kishore Tandon, "Anomalies or illusions: Evidence from Stock Market in Eighteen Countries," Journal of International Money and Finance, Vol.13, pp.83-106, 1994.

[4] Felix Ayadi, Uric B. Dufrene, and Amitavana Chatterjee, "Stock Return Seasonalities in Low-Income African Emerging Markets," Managerial Finance, Vol.24 No.3, pp.22-33, 1998.

[5] Paul Alagidede and Theodore Panagiotidis," Calendar Anomalies in the Ghana Stock Exchange," Journal of Emerging Market Finance, Vol.8, No.1, pp.1-23, 2009.

[6] Josef Lakonishok and Seymour Smidt, "Are Seasonal Anomalies Real? A Ninety Year Perspective," The Review of Financial Studies, Vol.1, No.4, pp.403-425, 1988.

[7] T. K. Hui, "Day-of-the-week effect in US and Asia-Pacific Stock Markets during the Asian Financial Crises: a non parametric approach," The International Journal of Management Science, Vol.33, pp.227-282, 2005.

[8] Andrew Coutts and Mohamed A. Sheik, "The Anomalies that Aren't there: the weekend, January, and pre-holiday effects on the all gold index on Johannesburg Stock Exchange

1987-1997," Applied Financial Economics, Vol.12, pp.863-873, 2002.

[9] Jeffery Jaffe and Randolph Westerfield, "The Week-End Effect in Common Stock Returns: The International Evidence," The Journal of Finance, Vol.XI, No.2, pp.433-454, 1985

[10] Michael S. Rozeff and Williams R. Kinney Jr. "Capital Market Seasonality: The Case of Stock Returns," Journal of Financial Economics, Vol.3, pp.379-402, 1976.

[11] Robert A. Ariel, "A Monthly Effect in Stock Returns," Massachusetts Institute of Technology, Working Paper #1629-84, 1984.

[12] Robert A. Haugen and Philippe Jorion, "The January Effect: Still there after all these years," Financial Analysts Journal, pp.27-31, 1996.

[13] Mustafa N. Gultekin and N. Bulent Gultekin, "Stock Market Seasonality: International Evidence," Journal of Financial Economics, Vol.12, pp.469-481, 1983.

[14] Stilianos Fountas and Konstantinos N. Segredakis, "Emerging Stock Markets Return Seasonalities: the January effect and the tax loss selling hypothesis," Applied Financial Economics, Vol.12, pp.291-299, 2002.

[15] Stijn Claessens, Susmita Dasgupta, and Jack Glen, " Return Behavior in Emerging Markets," The World Bank Economic Review, Vol.9, No.1, pp.131-151, 1995.

[16] Richard H. Thaler, "Anomalies: The January Effect," Economic Perspective, Vol.1, No.1, pp.197-201, 1987.

[17] L. Condoyanni, J. O' Hanlon, and C. W. R Ward, "Day of the Week Effects onStock Returns: International Evidence," Journal of Finance and Accounting, Vol.14, No.2, pp.159-174, 1987.

[18] http://www.gse.com.gh/index1.php?linkid=4

[19] http://www.bloomberg.com/quote/GGSECI:IND

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