Journal of Applied Finance & Banking, vol. 6, no. 3, 2016, 55-67
ISSN: 1792-6580 (print version), 1792-6599 (online)
Scienpress Ltd, 2016

Modelling Day of the Week Effect on the Zimbabwe Stock Exchange

Batsirai Winmore Mazviona[1] and Milton Webb Ndlovu[2]

Abstract

The study examined the day of the week effect on the Zimbabwe Stock Exchange (ZSE). The objective of the study was to relate the overall stock market returns to the individual returns of trading days (Monday, Tuesday, Wednesday, Thursday and Friday). The aim was to establish whether returns of trading days were statistically different from each other. The ordinary least square regression model was used to model the returns. The study focussed on ZSE stocks with data from 19 February 2009 when the ZSE started to trade in United States dollars to 31 December 2013. A total of 62 stocks were used in this study. These stocks constitute the Industrial and Mining indices. Industrial and mining indices data were also utilised in the modelling exercise. Data was obtained from the ZSE website and other secondary data were sourced from journal articles, papers and reports. Data analysis was done in EViews 7. We found little presence of day of the week effect, about 26% of the stocks had significant positive and negative returns. We conclude that the mean returns of the stocks on the ZSE under the study period do not vary across trading days at the 5% level of significance.

JEL classification numbers: G14
Keywords: Day of the week, Zimbabwe Stock Exchange, Efficient market hypothesis

1 Introduction

The day of the week effect is a phenomenon that constitutes a form of anomaly of the efficient capital markets theory, in which the average daily return of the market is not the same for all days of the week, as we would expect on the basis of the efficient market theory (Tachiwou 2010). The day of the week effect is one of the most extensively researched anomalies, especially in developed markets, but the same cannot be said about African

---

[1]Department of Insurance and Actuarial Science, National University of Science and Technology.
[2]Faculty of Commerce, National University of Science and Technology.

Article Info: *Received :* December 11, 2015. *Revised :* January 8, 2016.
Published online : May 1, 2016

stock markets such as Zimbabwe Stock Exchange (ZSE) which have received little attention in this regard.

The ZSE, which is the only stock exchange currently operating in Zimbabwe, was established in 1896 and it only became a significant capital market in the 1990s, after the introduction of market reforms in the form of the Economic Structural Adjustment Programme (ESAP), adopted in 1991 (Chikoko & Muparuri 2013). The opening up of the stock exchange to foreign investors in 1993 with limits on foreign ownership of listed companies of 10% and 40% for individuals and companies respectively (Mazviona & Nyangara 2013), has led to the immense growth of the ZSE to become one of Africa's leading equity exchanges and a leading provider of services that facilitates the raising of capital and trading of shares (Chikoko & Muparuri 2013). The ZSE is regulated by the Securities and Exchange Commission of Zimbabwe (SECZ) and it is governed by the Securities Act (Chapter 24:25). The ZSE has two indices, the Mining Index which consists of mining companies and the Industrial Index, comprising all companies other than mining companies. Trading is done once a day during an open outcry call-over session from 1000hrs to 1130hrs and trades have a 7 day settlement period. The ZSE has an established Central Securities Depository (CSD). Plans are underway to establish an exchange for small and medium enterprises which is targeted for emerging businesses.

The Zimbabwean dollar lost its power as legal tender in late 2008 at the height of macro-economic instability and hyperinflation which peaked at 231 million per cent in July 2008 (Gono 2012). In 2009, the government introduced a multiple currency exchange rate regime, which saw the use of the US dollar alongside other regional and international currencies, such as the Pound Sterling, South African Rand, and the Botswana Pula for trading purposes. The stable monetary regime that has prevailed since 2009 has been seen as a confidence booster for the ZSE and the increase in trading activity since then corroborates this assertion (Mazviona & Nyangara 2013). In light of this, it is hence important to check the efficiency of the ZSE in the multiple currency exchange rate regime.

The efficient market hypothesis (EMH) postulates that stock prices must efficiently reflect all available information and hence should be equal to its true investment value. Fama (1970) classified market efficiency into three forms: weak-form EMH, semi-strong form EMH, and strong form EMH. If the market is efficient in the weak form, stock returns are time invariant which means that there is no short-term seasonal pattern in the stock returns (Pathak 2013). As for the semi-strong form, it asserts that abnormal large returns cannot be earned consistently by investors using public information. The strong form of the EMH states that no information whether it is public or private will allow investors to consistently achieve abnormal high returns.

However, the efficient market hypothesis was contradicted by some anomalies such as: calendar anomalies, fundamental anomalies and technical anomalies. Calendar anomalies refer to the tendency of securities to behave differently on a particular day of the week, or month of the year (Al- Jafari 2012) and existence of these anomalies cast doubts on the validity of asset pricing models and hence challenges the belief in stock market efficiency (Alagidede 2012).

This study tests the efficiency of the ZSE by examining a well-known market anomaly, the day of the week effect, defined in (Mbululu & Chipeta 2012) as the tendency for stocks to exhibit relatively large returns on Fridays compared to those on Mondays. Examining day of the week effect is very crucial to investors because it provides the necessary information to investors to adjust their portfolios based on the abnormality of the calendar effect (Basher & Sadorsky 2006), for example they could buy stocks on days with abnormally low returns and sell stocks on days with abnormally high returns, (Tachiwou 2010). If investors know whether there is variation in mean stock returns of a particular day in a week, it makes investment much easier based on both returns and risks.

The day of the week effect has been extensively investigated by finance researchers especially in well developed economies but the same cannot be said about emerging economies like Zimbabwe. This study adds to the body of knowledge as it focuses on the period after the hyperinflationary environment. Hence, it is important to test the day of the week effect on the ZSE after the introduction of the multi-currency regime.

The implications of the EMH are that it is not possible for investors to consistently find undervalued or overvalued securities using a pre-selected strategy and if any mispricing is not immediately corrected, it is expected that all investors will be able to discover the same securities such that, if one wants to sell, the only other person willing to trade will also be selling and if a superior strategy could be found, investors will adapt it until its superiority is neutralized, (Mabhunu 2004). Mabhunu (2004) went further to explain that rational expectations literature suggests that there should be very little or no trading in individual stocks under these conditions, but on a typical day millions of shares exchange hands on stock exchanges around the world. If the markets were sufficiently efficient to provide no profitable opportunities, then it should be expected that active money managers would not exist.

If a market is efficient and follows a random walk then it should not be possible to find calendar anomalies within stock price data (Starcevic & Rodgers 2011) for example higher returns made on Fridays than any other day of the week. Alagidede (2012) explains that if calendar effects hold it would be possible for investors to devise strategies that would yield returns over and above buy and hold and these would be inconsistent with the EMH. Pathak (2013) asserts that the existence of the calendar anomalies is a denial of the weak form of efficient market hypothesis and the subsistence of seasonal pattern in the stock return infers that a market is inefficient and investors should be able to earn abnormal return. This implies that it is also necessary to test the robustness of the ZSE. An anomaly which can be useful to the investor on the ZSE is the day of the week effect on stock market returns as it can assist investors can gain some abnormal returns by using well planned strategies within the market, for example they could buy stocks on days with abnormally low returns and sell stocks on days with abnormally high returns, (Tachiwou 2010) and also diversify their portfolio by selecting stocks that best suit their risk appetite. The degree to which the ZSE is efficient affects all those who invest on the bourse; such players include individual investors and investment managers. The accounting and economic research needed to make investment decisions, the regulatory standards, performance evaluation, and even corporate disclosure decisions are dependent, to some degree, on the efficiency of the market (Mabhunu 2004).

2 Literature Review

The concept of the day of the week effect was first introduced by Fields (1931) where it was reported that in the US stock market, there are negative returns on Monday and positive returns on Fridays. Maberly (1995) shows that financial practitioners were well aware of the Monday effect as early as the 1920s. A wide range of literature provides a set of explanations for the occurrence of negative equity Monday returns.

Pettengill (2003) groups the day of the week effect explanations into those based on statistical errors, micro-market effects, information flow, and order flow. The two main statistical error arguments explaining the apparent weekend effect are data mining and reliance on the normality assumption. However, Pettengill (2003) dismisses both of these arguments, citing the sheer number of studies, using varied robust statistical tests and sample periods, that document the effect.The market arrangements that have been advocated as the causes of the day of the week effects are settlement procedures and pricing misquotes of the stock market. Philpot and Peterson (2011) explain that Friday purchases inject a weekend into the settlement period and therefore letting two extra days of float. This argument is however, dismissed by studies showing the weekend effect is strongest when interest rates are low, and thus float has slight value. Pettengill (2003) identifies other proposed explanations, including Friday reversal of prior measurement errors and the possibility that ex-dividend dates may fall disproportionately on Mondays and none of these causes enjoys empirical support. Pettengill (2003) explains that if relevant market information has a discernable weekday pattern, one would expect such pattern in security returns. Some researchers propose that information flow, which is reflected in stock prices, may follow a consistent weekly pattern that causes the weekend effect. For example, firms may opt to release poor earnings reports on Friday afternoon, so as to avoid market disruption and an instantaneous negative stock price response. Empirical studies, however, reveal that only a small proportion of the weekend effect can be attributed to earnings announcements. A final set of potential explanations in (Pettengill 2003) includes effects of human and institutional behaviour on order flows. The most obvious reason for a negative Monday effect is general human lack of confidence when returning to a working week and it is also suggested that individual investors require processing time to arrive at sell decisions of which weekends allow for this time. As the individual investor has been eclipsed in importance by institutions, this should have reduced the negative Monday effect. Short selling is suggested as a final explanation. Studies posit that short sellers prefer not to be exposed to the unlimited risk of their open positions over the weekends and will buy stocks on Fridays to close their positions and sell on Mondays to re-establish their positions (Pettengill 2003).

Al-Khazali (2008) tested the day of the week effect by examining the impact of thin trading in the emerging equity markets of the United Arab Emirates (UAE). Data used was from the Abu Dhabi Securities market (ADSM) from 30 July 2001 to 30 August 2006 and Dubai Financial Market (DFM) from 26 March 2000 through 30 August 2006. Non-parametric tests were employed to detect the day of the week effect as they are appropriate for assets with non-normally distributed returns. The findings reveal a day of the week effect in published daily prices, but after it is corrected to remove any measurement bias arising from thin trading, it vanishes. The results show that the day of the week effect is not present in the UAE equity markets when corrections for thin and infrequent trading are made to the raw data.

Mehdian and Perry (2001) examine weekday returns over a period from 1964 to1998 that includes positive average Monday returns at the end of the period and a Chow test is applied to three large-firm indexes and two small-firm indexes. The weekday effect is found to be unstable and different regimes appear to occur at arbitrary selected breakpoints of 1982, 1987, and 1992. Mehdian and Perry (2001) found that in the period pre-1987, average returns are negative and significantly lower than other weekday returns for all five indexes and although the differences are not significant at the 5% level, average Monday returns are higher than average return for the rest of the week. However, Monday returns remain negative and significantly lower than the average return for other weekdays.

Tonchev and Kim (2004) investigated the day of the week effects in the newly developing financial markets of three European countries Czech Republic (PX-50 and PX-D), Slovakia (SAX) and Slovenia (SBI-20 and SBI-20NT) using OLS for mean and GARCH for variance. No significant day of the week effect was found to be present except that the returns on Wednesday were significantly lower than on Monday in both Slovenian SBI-20 and SBI-20NT indices. Hussain, Hamid, Akash, and Khan (2011) tested the Karachi stock exchange (KSE-100) for the period January 2006 to December 2010 using regression analysis. A significant positive Tuesday effect was found and the returns on Tuesday were found to be higher compared to other days of the week. On the other hand, Abdullah, Baharuddin, Shamsudin, Mahmood, and Sahudin (2011) examined the day of the week effect on Malaysia Shariah-compliant market, with sample data covering the period from 21 May 2007 to 19 September 2008 using OLS methodology. Day of the week effects were found in the Kula Lumpur Shariah index (KLSI), with no presence of this phenomenon being found for FBM Emas Shariah and FBM Hijrah Emas Shariah. Furthermore, KLSI exhibited a significant negative return on Monday while positive significant return was noticed on Friday.

Aly, Mehdian, and Perry (2004) investigated daily stock market anomalies in the Egyptian stock market using its major stock index, the Capital Market Authority Index (CMA), with the sample covering the period April 1998 to June 2001, using an OLS approach. Monday returns were found to be positive and significant on average, but not significantly different from returns of the rest of the week. Thus, no evidence was uncovered to support any daily seasonal patterns in the Egyptian stock market, indicating that stock market returns are consistent with the weak form of market efficiency and this was only limited to the stocks that are actively traded, which are very few. Kamaly and Tooma (2009) examined stock markets in twelve Arab countries over the period 2002-2005 and found significant daily return effects associated with the first and last days of the trading week (different Arab countries have different trading weeks, with most closed on Fridays) in the four most developed (Egypt, Bahrain, Kuwait, and UAE) markets. Al-Rajoub (2004) investigated this anomaly in Amman stock exchange and found that returns on Thursday, the end of the week, were positive and the highest, while returns on Monday were negative and the lowest. Tachiwou (2010) found the first evidence for the presence of the day of the week effects in West African regional stock market, with the sample covering the period September 1998 to December 2007. The observed daily patterns revealed lower daily means and lower standard deviations. The data was collected from two indexes namely Brvm-10 index and Brvm composite index. The findings, in local currency terms, revealed a pattern of lower returns around the mid-week, Tuesday and then Wednesday; and a higher pattern towards the end of the week, Thursday and then Friday, were observed.

Mahendra and Kumari (2006) studied the day of the week effect using data from 1979 to 1998 on BSE and NSE. They reported negative returns on Tuesday in the Indian stock market. Moreover, they found returns on Monday to be higher compared to the returns of other days in BSE and NSE. Paul and Theodore (2006) examined two calendar anomalies in both for the day-of-the week and month of the year effects using daily closing prices of major share index on Ghana Stock Exchange for the period of 1994 to 2004 using an OSL model. The results showed significant Monday returns at 5% level and 1% for Wednesday and Friday. Mean daily returns during the estimation period on Mondays were also lower than other days of the week.

Abdalla (2012) used ordinary least squares (OLS) and GARCH models to investigate the day-of-the-week effect on stock market returns and volatility of Khartoum stock exchange

(KSE). His findings show no evidence of this phenomenon in KSE. On the other hand, Mbululu and Chipeta (2012) analysed the day of the week effect on skewness and kurtosis on the nine listed economic sector indices of the Johannesburg Stock Exchange (JSE) in the sample for the period July 1995 to May 2011. The empirical results of this study show no evidence of the day of the week effect on skewness and kurtosis for eight of the nine JSE stock market sectors, with the Monday effect being detected for the basic materials sector only.

Muhammad and Rahman (2010) did an empirical analysis in order to establish whether the day of the week effect existed on the Malaysian Kuala Lumpur Composite Index for the period January 1999 to December 2006, using an OLS method. The sample was divided into two sub samples of four years each, January 1999 to December 2002, the period immediately after the financial crisis and January 2003 to December 2006, period after the financial crisis. The day of the week effect was found to be present in the Malaysian stock market for the whole period, and it was found not to be significant for the sub-period analysis. The pattern of the effect changed over time from negative Monday and Wednesday, positive Friday to negative Monday and positive Friday.

Deyshappriya (2014) examined the day of the week effect on stock market returns and volatility in the Colombo Stock Exchange (CSE) covering the period 2004 to 2013, with the sample period being subdivided into the war period and post war period in order to take into account the impacts of the war. To capture the day of the week effects, Ordinary Least Squares (OLS) and GARCH (1,1) models were employed. For the war period, significant negative Monday effects and positive effects for all other days were found.

Kashif and Ahmed (2014) tried to find the out the significance of the day of the week effect by studying the Karachi Stock Exchange for the period from 1 January 2010 to 31 December 2013. The Dummy variable approach was used to investigate this and empirical results explain the evidence of the Monday effect in the Karachi Stock market, and negative Monday returns were also observed.

Previous studies have found different results depending on the markets and the study period. The existence of vast literature on the day of the week effect indicates the importance of insights into the efficiency of stock exchange markets. Modelling of the day of the week effect is divided into two main approaches. The first one makes use of a linear model whilst the second is based on non-linear models. In this study we model the day of the week effect using the former approach. The later approach is left for further studies. To the knowledge of the researchers, no studies of the day of the week effect have been carried on the ZSE after the introduction of the multi-currency system.

3 Methodology

The aim of the study was to test the day of the week effect anomaly on the ZSE using the OLS approach. The data utilized in this study consists of daily closing values for the two Zimbabwean indices, namely the Industrial index and Mining index and also daily closing prices for 62 individual counters from the ZSE covering the period from 19 February 2009 to 31 December 2013, which is a five day trading period. The 62 stocks chosen form the whole stock market but exclude those counters that were either suspended during the period or were delisted. New listings are also excluded, thus only those stocks in which a complete set of data for the period could be ascertained are included in the study. The data has been collected from ZSE website for the above period. EViews 7 software was used to carry out data analysis. Daily closing prices of stock were converted into natural logarithms returns, because in statistical study, the price of stock is fluctuating all the time, while return has a steady trend. The daily returns are calculated using the log-difference as follows:

$$R_t = ln\left(\frac{P_t}{P_{t-1}}\right) \times 100$$

Where:

R_t is the daily returns,

P_t and P_{t-1} are the closing prices at time t and time t-1 respectively.

For non-trading periods shorter than five days, the return for those days was taken as zero. The ZSE index is a weighted index that incorporates the individual indices of the 62 counters based on each counter's market capitalization on each particular trade day. The methodology employed in this study is mostly similar to that of (Deyshappriya 2014).

3.1 Testing the Day of the Week Effect using the Dummy Variable Approach

The day of the week effect primarily relates to stock market patterns occurring on Friday and Monday trading days and the tendency for stock prices to rise on Fridays and fall on Mondays. With more evidence appearing, the day of the week effect not only occurs on Mondays and Fridays but also on the other days among the world stock market. All weekdays were tested separately to determine whether day of the week effect existed in the Zimbabwean stock market. The following regression with binary dummy variables for each weekday was used to test whether there is any statistically significant difference among stock market returns:

$$R_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \varepsilon_t \qquad (1)$$

Where:

R_t is the index log return as defined earlier.

D_{it} is a dummy variable that is equal to zero prior to the chosen event date and one thereafter.

Thus:

D_{1t} = 1 if day t is a Monday = 0 otherwise

D_{2t} = 1 if day t is a Tuesday = 0 otherwise

D_{3t} = 1 if day t is a Wednesday = 0 otherwise

D_{4t} = 1 if day t is a Thursday = 0 otherwise

D_{5t} = 1 if day t is a Friday = 0 otherwise

ε_t = error term

β_1 , β_2, β_3, β_4 , β_5 are coefficients to be estimated.

If the *p*-value of the estimated coefficients was found to be less than 5%, this would indicate either a significant positive or negative day of the week effect, depending on the sign of the estimated coefficient. It is not possible to estimate this equation by including all the dummy variables and the constant term and this problem is termed perfect multicollinearity. In the case of perfect multicollinearity the regression coefficients remain indeterminate and their standard errors are infinite, (Mazal 2009). This is termed the dummy variable trap and it is circumvented either through elimination of the constant term or removal of one of the

dummy variables from the regression equation (Gujarati 2004). In order to avoid this trap, the researchers excluded the constant term from the equation.
The Wald Test was used to test the presence of the day of the week effect based on the following hypothesis:

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5$
H_1: At least one of the coefficients is not equal to another coefficient.

If daily returns are drawn from the identical distributions, they will be expected to be equal. However, the rejection of the null hypothesis would indicate a specific, observable pattern in the stock market returns, thus violation of the weak form efficiency. If the *p*-value of the F-statistic is found to be greater than 5%, the null hypothesis is accepted otherwise if it is less than 5%, this will indicate differences in mean daily returns.

4 Findings

Table 1 shows the descriptive statistics for the industrial index for varying trading days ranging from Monday to Friday. The minimum and maximum returns were observed on Friday and Tuesday respectively over the study period. The mean returns was positive for most of the trading days with the exception of Monday which registered a negative mean return. For efficient market hypothesis to hold we would expect the mean return to be the same for all trading days. However, by merely looking on the mean returns for the trading days we cannot make a conclusive decision. The standard deviation is around 0.015 for the trading days which indicate a low variability of daily returns. Monday and Friday returns exhibits a highly negative skewness, an approximate symmetry distribution (normal distribution) is resembled for Tuesday and Thursday returns, and Wednesday returns have a moderately negative skewness. The trading days return have positive kurtosis indicating a distribution that is more peaked than that of a normal distribution. A kurtosis of more than 3 indicates a possibility of frequent extreme price movements (Mbululu & Chipeta 2012).

Table 1: Descriptive statistics for industrial index

	Maximum	**Minimum**	**Range**	**Mean**	**Standard deviation**	**Skewness**	**Kurtosis**
Monday	0.0654	-0.1175	0.1829	-0.0010	0.0161	-2.4415	22.5298
Tuesday	0.0944	-0.1063	0.2007	0.0005	0.0150	0.0026	20.5053
Wednesday	0.0633	-0.0913	0.1546	0.0002	0.0135	-0.7709	15.2594
Thursday	0.0739	-0.1079	0.1818	0.0014	0.0145	-0.4688	21.2336
Friday	0.0711	-0.1904	0.2615	0.0017	0.0171	-5.2219	68.1521
All	0.0944	-0.1904	0.2848	0.0006	0.0153	-2.1895	35.5306

In Table 2, we report the descriptive statistics for mining index. The highest and lowest observed returns are 0.4055 and -0.2149 respectively. The mining sector is highly risk as compared to the industrial sector and therefore investors would expect a higher compensation for taking increased risk. This explains why returns as high as 0.4055 can be achieved. The mean return for mining index across trading days is generally negative with the exception of Tuesday. The negative mean returns are generally because the mining counters are less liquid as compared to the industrial counters. We observe that the standard deviation of mining index is almost twice that of the industrial index which reflects the higher risk that comes with trading in mining stocks. The skewness for Tuesday and Wednesday is highly positive whereas for Monday it is highly negative. A close symmetric distribution is achieved for Thursday and Friday return series. The same kurtosis status in industrial index is observed in mining index which indicates a leptokurtic returns distribution.

Table 2: Descriptive statistics for mining index

	Maximum	**Minimum**	**Range**	**Mean**	**Standard deviation**	**Skewness**	**Kurtosis**
Monday	0.0967	-0.2040	0.3007	-0.0010	0.0275	-1.3629	16.1284
Tuesday	0.4055	-0.1524	0.5579	0.0007	0.0379	4.6973	56.3187
Wednesday	0.1924	-0.1034	0.2958	-0.0003	0.0295	1.4800	13.8393
Thursday	0.2144	-0.2149	0.4293	-0.0007	0.0413	-0.4241	15.5890
Friday	0.1125	-0.1561	0.2686	-0.0018	0.0283	-0.1086	8.6544
All	0.4055	-0.2149	0.6204	-0.0006	0.0334	1.2598	30.1755

We present a summarised descriptive statistics for individual stocks in Table 3. The mean return is -0.0004 for the stock with minimum and maximum daily return. The median daily return stock has an average return of -0.0001. We observe a skewness which approximately mimics a normal distribution for the minimum, median and maximum daily returns. There is generally a leptokurtic distribution for individual stocks confirming that stock returns conform to non-normal (fat-tailed) stable distributions (Mandelbrot 1996). In addition, about 84% of individual counters exhibit negative skewness, while 16% exhibit positive skewness. Negative skewness implies that the left tail is longer and the bulk of the values lie more to the right of the mean than to the left and if skewness is positive, the right tail of the distribution is longer hence the bulk of the values lie more to the left of the mean and applied to investment returns, negative skewness implies frequent small gains and a few extreme losses and positive skewness implies frequent small losses and a few extreme gains (Mbululu & Chipeta, 2012).

Table 3: Summarised descriptive statistics for individual stocks

	Range	**Mean**	**Standard deviation**	**Skewness**	**Kurtosis**
Minimum	8.7280	-0.0004	0.1921	-0.0998	439.0717
Median	2.6390	-0.0001	0.1153	-0.0882	39.0862
Maximum	8.7280	-0.0004	0.1921	-0.0998	439.0717

Table 4 highlights a summarised significance obtained from regressing Model 1 in the section 3.1 in testing the day of the week effect on the ZSE. To avoid spurious regression and to ensure that every variable is stationary, we carried a test for a unit root using the Augmented Dickey-Fuller (ADF) test. We observe that the return series data does not suffer from a unit root as p-values of 0.00 were found for both stocks and indices thus confirming that all series are stationary and thus useful for further statistical analysis. These results were found to be similar to those of (Mitra & Khan 2014). In order the test the null hypothesis of equality of means, that is $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5$, the Wald test statistic was used.

At the 5% significance level, 16 out of the 62 stocks (26%) had significant (positive or negative) day of the week effects. We observe a significant negative return for only 6% of the stocks on Monday and nearly 1.6% of stocks on Thursday. A positive significant was found for all trading days which comprise 3% of stocks for Monday, Tuesday and Friday, 1.6% for Wednesday and 6% for Thursday. As expected, the results vary across the stocks due to the different characteristics that they exhibit, that is, they perform differently across the different trading days. The null hypothesis of equality of mean returns was rejected at the 5% level using the Wald test for 3% of stocks. Hence, although the mean returns of 97% of the stocks may be different from each other, the differences are not statistically significant. These results are very similar to (Bayar & Kan 2002) the only difference being that they studied nineteen stock markets from different countries. The results we obtained are in line with (Basher & Sadorsky 2006) who found significant positive Thursday and Friday and negative Monday in some of the markets that were analysed. The results suggest that investors can take advantage of earning abnormal returns in a very small number of specific stocks. There can buy some specific stocks on Monday or Thursday and sell on any other trading day. We found that the mean returns do not differ significantly across trading days for the majority of stocks when using the Wald test and hence the EMH hold using the OLS model and the sample study period.

Table 4: Summarised day of the effect results for individual stocks

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Negative significant	4	0	0	1	0
Positive significant	2	2	1	4	2
Total	6	2	1	5	2
Number of Significant Wald Test	2				

5 Conclusions and Recommendations

The main objective of this study was to examine the day of the week effect on stock market returns on the ZSE after introduction of the multicurrency system. Daily return data of 62 stocks, industrial index and mining index excluding delisted and suspended stocks, for the period from 19 February 2009 to 31 December 2013 were considered. From the unit root tests carried out, the data was found to be stationary and hence suitable for further statistical analysis. The OLS model, no significant day of the week effects are found for both the industrial and mining index whilst 26% of stocks showed significant day of the week effects. There is a general pattern of significantly negative returns of stocks on Monday and Thursday, and significant positive returns across all trading days. The null hypothesis of equality of mean returns was rejected at the 5% level using the Wald test for 3% of the stocks.

Tachiwou (2010) explains that the presence of the day of the week anomaly indicates inefficiency of the market; it informs regulators and policy makers that appropriate

measures should be taken to bring informational and operational efficiency in the market. Islam and Gomes (1999) argue that a combination of factors which include inadequate financial information, thin trading and discontinuous trading, reliance on price momentum as a basis for trading and manipulation by the market makers creates the conditions that lead to the positive weekend effect and thus regulators should take appropriate steps to remove such anomaly to bring the efficiency of the market, (Tachiwou 2010).
We therefore recommend further research into the statistical properties of stock returns, with the arrival of more data, before and after currency reforms and also evolutionary aspects of efficiency in emerging stock markets. Additionally, policy makers may consider encouraging the free flow of capital across borders through integrating the operations on the ZSE to other African and international markets, paying more attention to issues concerning attraction of foreign investments and improvements in real investments and improving liquidity through formulating policies to enhance market efficiency. The study opens up potential grey areas that require examination and these include investigating the day of the week effect on the skewness and kurtosis, and day of week effect on portfolios.

ACKNOWLEDGEMENTS
The authors would like to acknowledge the anonymous reviewers.

References

[1] A. M. Tachiwou, Day-of-the-Week-Effects in West African Regional Stock Market, *International Journal of Economics and Finance*, **2**(4), (2010), 167-173.
[2] L. Chikoko and W. Muparuri, Zimbabwe Stock Exchange and Efficiency in the Multiple Currency Exchange Rate Regime, *Journal of Business and Economic Management*, **1**(3), (2013), 41-47.
[3] B. W. Mazviona and D. Nyangara, A Test of the Weak Form Efficiency of the Zimbabwe Stock Exchange after Currency Reform, *International Journal of Business, Economics and Law*, **2**(2), (2013), 43-48.
[4] G. Gono, 2012 Mid-Term Monetary Policy Statement, *Reserve Bank of Zimbabwe*, (2012).
[5] E. F. Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, *The Journal of Finance*, **25**(2), (1970), 383-417.
[6] M. R. Pathak, Stock Market Seasonality: A Study of the Indian Stock Market (NSE), *Indian Journal of Research*, **2**(3), (2013), 200-202.
[7] M. K. Al-Jafari, An Empirical Investigation of the Day-of- the-Week Effect on Stock Returns and Volatility: Evidence from Muscat Securities Market, *International Journal of Economics and Finance*, **4**(7), (2012), 141-149.
[8] P. Alagidede, Month of the year and pre-holiday effects in African Stock Markets, *SAJEMS*, **16**(1), (2013), 64-74.
[9] D. Mbululu and C. Chipeta, Day of the Week Effect: Evidence from nine Economic Sectors on the JSE, *Investment Analysts Journal*, **41**(75), (2012), 55-65.
[10] S. Basher and P. Sadorsky, Day of the Week Effects in Emerging Stock Markets, *Applied Economic Letters*, **13**(10), (2006), 621-628.
[11] M. Mabhunu, The Market Efficiency Hypothesis and the Behaviour of Stock Returns on the JSE Securities Exchange, *Rhodes University*, (2004).

[12] A. Starcevic and T. Rodgers, Market Efficiency within the German Stock Market: A Comparative Study of the Relative Efficiencies of the DAX, MDAX, SDAX and ASE Indices, *International Econometric Review*, **3**(1), (2011), 25-37.
[13] M. J. Fields, Stock Prices: A Problem in Verification, *The Journal of Business of the University of Chicago*, **4**(4), (1931), 415-418.
[14] E. Maberly, Eureka! Eureka! Discovery of the Monday Effect Belongs to the Ancient Scribes, *Financial Analysts Journal*, **51**(5), (1995), 10-11.
[15] G. N. Pettengill, A Survey of the Monday Effect Literature, *Financial Analysts Journal*, **42**(3), (2003), 3-27.
[16] J. Philpot and C. A. Peterson, A Brief History and Recent Developments in the Day-of-the-Week Effect Literature, *Quarterly Journal of Business and Economics*, **3**(9), (2011), 808-816.
[17] O. M. Al-Khazali, The Impact of Thin Trading on Day-of-the-Week Effect: Evidence from the United Arab Emirates, *Review of Accounting and Finance*, **7**(3), (2008), 270-284.
[18] S. Mehdian and M. J. Perry, The Reversal of the Monday Effect: New Evidence from U.S. Equity Markets, *Journal of Business, Finance and Accounting*, **28**(7), (2001), 1043-1065.
[19] D. Tonchev and T. Kim, Calendar effects in Eastern European financial markets: Evidence from the Czech Republic, Slovakia and Slovenia, *Applied Financial Economics*, **14**(14), (2004), 1035-1043.
[20] F. Hussain, K. Hamid, R. Akash, and M. Khan, Day of the Week Effect and Stock Returns: (Evidence from Karachi Stock Exchange-Pakistan), *Far East Journal of Psychology and Business*, **3**(1), (2011), 25-31.
[21] R. Abdullah, N. Baharuddin, N. Shamsudin, W. Mahmood, and Z. Sahudin, The Day of the Week Effect on Bursa (Bourse) Malaysia Shariah-Compliant Market, *Interdisciplinary Journal of Research in Business*, **1**(4), (2011), 29-36.
[22] H. Aly, S. Mehdian, and M. Perry, An Analysis of Day-of-the-Week effects in the Egyptian Stock Market, *International Journal of Business*, **9**(3), (2011), 301-308.
[23] A. Kamaly and E. A. Tooma, Calendar Anomalies and Stock Market Volatility in Selected Arab Stock Exchanges, *Applied Financial Economics*, **19**(11), (2009), 881-892.
[24] S. Al-Rajoub, The Daily Return Pattern in the Amman Stock Exchange and the Weekend Effect, *Journal of Economic cooperation*, **25**(1), (2004), 99-114.
[25] R. Mahendra and D. Kumari, Day-of-the-Week and other Market Anomalies in the Indian Stock Market, *International Journal of Emerging Markets*, **1**(3), (2006), 235-246.
[26] A. Paul and P. Theodore, Modeling and Forecasting Volatility of Returns on the Ghana Stock Exchange Using GARCH Models, *Journal of Emerging Market in Finance*, **4**(2), (2006), 115-132.
[27] S. Abdalla, Day-of-the-Week Effect on Returns and Conditional Volatility: Empirical Evidence from Sudanese Stock Market, *Middle Eastern Finance and Economics*, **16**(1), (2012), 167-180.
[28] N. M. N. Muhammad and N. M. N. A. Rahman, Efficient Market Hypothesis and Market Anomaly: Evidence from Day-of-the Week Effect of Malaysian Exchange, *International Journal of Economics and Finance*, **2**(2), (2010), 35-42.

[29] R. Deyshappriya, An Empirical Investigation on Stock Market Anomalies: The Evidence from Colombo Stock Exchange in Sri Lanka, *International Journal of Economics and Finance*, **6**(3), (2014), 177-187.
[30] U. Kashif and N. S. Ahmed, The Monday Effect on Stock Market, *European Academic Research*, **1**(11), (2014), 4322-4330.
[31] L. Mazal, Stock Market Seasonality: Day of the Week Effect and January Effect, *Master's Thesis*, (2008).
[32] D. N. Gujarati, *Basic Econometrics*, New York: McGraw-Hill, (2004).
[33] B. Mandelbrot, Forecasts of Future Prices, Unbiased Markets, and Martingale Models, *Journal of Business*, **35** (Special Supplement, January), (1966), 242-255.
[34] P. Mitra and G. S. Khan, An Analysis of Day-of-the-Week and Intraday Effects in the Indian Stock Market: Evidence from National Stock Exchange, *Journal of Contemporary Issues in Business Research*, **3**(3), (2014), 115-127.
[35] A. Bayar and O. B. Kan, Day of the Week Effects: Recent Evidence from Nineteen Stock Markets, *Central Bank Review*, 3, (2002), 77-90.
[36] M. M. Islam and J. L. Gomes, The Day-of-the-Week Effects in Less-Developed Countries' Markets: The Case of Bangladesh, *International Advances in Economic Research*, **5**(3), (1999), 397.