Day of the Week Effect: Evidence from the Nigerian Stock Exchange

Onoh, John Okey
Department of Banking & Finance,
Abia State University, Uturu, Nigeria
johnonoh@yahoo.com

Ndu- Okereke, Obianuju Edith
Department of Banking and Finance
University of Nigeria, Nsukka, Enugu Campus,
Nigeria

Abstract
It is well documented that expected stock returns vary with the day of the week in developed stock markets as well as in emerging stock markets. The evidence of this seasonal pattern has, however, been very scanty in the case of Nigeria. The research therefore investigates the presence of the day of the week in the Nigerian Stock Exchange. The Ordinary Least Square method was used to analyze the stock returns pattern for a period ranging from 2nd January 2009 to 31st December 2015. Results obtained from the study shows that Friday returns is significantly higher than returns of other days of the week. This finding confirms the existence of the day of the week effect in the NSE daily return.

1.0 INTRODUCTION

Efficient Market Hypothesis (EMH) postulates that prices of financial assets, at all times, fully reflect all available information to the extent that an investor cannot earn abnormal returns from past price information, publicly available information, and privately held information (Fama, 1970). This implies that investors and market operators cannot consistently earn abnormal returns from the information set available because the value of the information is already incorporated in security prices. Proponents of EMH argue that competition between investors seeking abnormal information drives prices to their fair values (Ritter, 2003). Under conditions of efficiency therefore, the availability of information is expected to facilitate the reprising of undervalued or overvalued securities, thereby ensuring that, at any time, a fair value for a security is achieved. Thus, the capital market is expected to ensure fair valuation and optimal allocation of investment resources.

In contrast to EMH, a growing number of studies have documented different seasonal patterns in stock returns. Seasonal stock price pattern, also known as seasonality, occurs when stock price or

index displays positive or negative movements over specific days of the week, week of the month or month of the year. One seasonal pattern that has received more attention by researchers is the day of the week effect. The day of the week effect posits that stocks exhibit negative returns on Monday and positive returns on Friday. This pattern has been confirmed in numerous empirical studies. For instance, major findings of the early studies conducted on the United States stock market have been that returns on Mondays tend to be lower than returns on other days of the week; and Friday returns tend to be higher than other days of the week (see Cross, 1973; French, 1980; Gibbons and Hess, 1981; Jaffe and Westerfield, 1985; Berument and Kiymaz, 2001). The month-of-the-year or January Effects postulates that stock returns in January are higher than in other months of the year (Keim, 1983; Ariel, 1987; Jaffe et al., 1989). The existence of such systematic seasonal movements in security returns may lead to predictability of stock returns and, in turn, earning abnormal returns. Earning of abnormal returns in security trading is diametrically opposed to the notion of Efficient Market Hypothesis (EMH).

Over the past couple of decades, a huge body of evidence has also emerged to support seasonal stock price patterns in emerging stock markets. Majority of the studies confirm the existence of Monday negative returns and Friday positive returns. (See for example, Choudhry, 2000; Alagidede and Panagiotidis, 2006; Agathee, 2008; Dimitris and Samitas, 2008).

In the NSE, studies on day of the week seasonality have been scanty. The few exceptions to my knowledge are Alagidede (2005) and Chukwuogor (2008), which examined day of the week effect in African stock markets including Nigeria. The results obtained from these studies are mixed. While Alagidede found evidence of the day of the week effect in volatility of the NSE returns, Chukwuogor did not find evidence of any pattern and concluded that the NSE is weak form efficient. Other studies of seasonal effects concentrated on monthly seasonal pattern (see, Ayadi, et al., 1988; Emenike and Onoh, 2011)

This investigation seeks evidence of the day of the Month effect on the NSE. In so doing, it not only contributes to existing literature in Nigeria but extends existing evidence using recent data.

2.0 LITERATURE REVIEW

The literature review is categorized into two main parts; the theoretical aspect and the empirical aspect of previous studies carried out by other scholars.

Theoretical Framework

The day of the week effect refers to the tendency of stocks to exhibit relatively large returns on Fridays compared to those on Mondays. The theoretical framework, upon which the study of the day of the week effect is based, is the Efficient Market Hypothesis (EMH). The existence of day of the week effect in stock returns violates EMH.

Efficient Market Hypothesis (EMH) holds that in an efficient market, prices at all times fully reflect all available information that is relevant to their valuation (Fama, 1970). Thus, security prices at any point in time are unbiased reflection of all available information on the security's expected future cash flow and the risk involved in owning such a security. This implies that

investors can expect to earn merely risk-adjusted return from all investment as prices move instantaneously and randomly to any new information (Kendal, 1953). Efficiency is categorized into three different levels according to the information item reflected in the prices. The three levels of EMH are expressed as follows: weak-form, semi–strong, and strong-form efficiency. The weak-form version of EMH asserts that prices of financial assets already reflect all information contained in the history of past prices, trading volume or short interest. Semi-strong version postulates that stock prices already reflect all the publicly available information regarding the prospects of a firm. Lastly, the strong-form posits that the prices of financial assets reflect, in addition to information on past prices and publicly available information, information available only to company's insiders (Fama, 1970).

Market prices can at times deviate from the securities' true value; these deviations should be completely random and uncorrelated. Price changes are only expected to result from the arrival of new information, which is unpredictable. Given that new information is random, period-to-period price changes are expected to be random and independent. In other words, they must be unforcastable if they fully incorporate the expectations and information available to market participants (Lo, 1997: xii). The EMH proposes that it is not possible to out-perform the stock market through market timing or stock selection. However, in the context of financial market and particularly in the case of stock market, seasonal components have been uncovered.

The presence of seasonality in stock returns violates weak form of market efficiency because stock prices are no longer random and can be predicted based on past pattern. This facilitates market participants to device market strategy which could fetch abnormal profits on the basis of past pattern. Evidence of the day of the week effect, for instance, may lead investors into devising a trading strategy of selling on Friday and buying on Monday in order to make excess profit.

The presence of the day of the week effect in stock market returns has been widely documented in the finance literature. Cross (1973), French (1980), Gibbons and Hess (1981), Keim and Stambaugh (1984), Lakonishok and Levi (1982), and Rogalski (1984) demonstrate day of the week patterns in stock returns. For example, average returns on Mondays are significantly less than average returns during the other days of the week. The studies of calendar anomalies are not limited to the U.S. equity markets. Numerous researchers have investigated equity, fixed income, and derivative markets both here and abroad. For example, Aggarwal and Rivoli (1989), Athanassakos and Robinson (1994), Chang, Pinegar, and Ravichandran (1993), Dubois (1986), Kato and Schallheim (1985),
Jaffe and Westerfield (1985a, 1985b), and Solnik and Bousquet (1990) show that the distribution of foreign stock returns varies by day of the week, and Corhay, Fatemi, and Rad (1995), Flannary and Protopapadakis (1988), Gay and Kim (1987), and Gesser and Poncet (1997) indicate that return distribution of futures and foreign exchange markets also variesby day of the week.

While the focus of the above studies has been on the patterns in mean returns, other studies have investigated the time series behavior of stock prices in terms of volatility by using variations of

GARCH models. French et al. (1987) examine the relationship between stock prices and volatility and report that unexpected stock market returns are negatively related to the unexpected changes in volatility. Campbell and Hentschel (1992) report similar results and argue that an increase in stock market volatility raises the required rate of return on common stocks and hence lowers stock prices. Glosten et al. (1993) and Nelson (1991), on the other hand, report that positive unanticipated returns reduce conditional volatility whereas negative unanticipated returns increase conditional volatility.

Baillie and DeGennaro (1990) find no evidence of a relationship between portfolio mean returns and variance. These findings are further supported by Chan, Karolyi, and Stulz (1992), who report a significant foreign influence on the time-varying risk premium for U.S. stocks but find no significant relationship between the conditional expected excess return on the S&P 500 and its conditional variance. Corhay and Rad (1994) and Theodossiou and Lee (1993) find no significant relationship between stock market volatility and expected returns for major European stock markets.

Most of the studies referenced above report that the expected returns in stock markets are time varying and conditionally heteroskedastic. Another stream of research has investigated temporal patterns in volatility of asset pricing. The question of why asset prices fluctuate has been investigated on two fronts. The first one is that volatility is mainly caused by the arrival of public information (i.e., macroeconomic news) while the second front ties the arrival of private information to volatility. French and Roll (1986) point out that asset prices are more volatile during trading hours than nontrading hours and variances for the days following an exchange holiday are larger than for other days. Hence, the use of the class of GARCH models is appropriate for this study. H. Kiymaz, H. Berument / Review of Financial Economics 12 (2003) 363–380 365). They hypothesize that more public information arrives during normal business hours and that informed traders are more likely to trade when the exchanges are open. Harvey and Huang (1991) observe higher volatility in interest rates and foreign exchange futures markets during the first few trading hours on Thursdays and Fridays. They interpret their results as evidence of more public information (i.e., macroeconomic data announcements) arriving on Thursdays and Fridays.

Admati and Pfleiderer (1988) and Foster and Viswanathan (1990) develop models to explain time-dependent patterns in security trading caused by the arrival of private information. Both studies demonstrate how information is incorporated into pricing and how various groups of investors influence prices. Specifically, both Admati and P fleiderer and Foster and Viswanathan take into account the roles of liquidity and informed traders in explaining variations in volume and volatility. Accordingly, traders would try to minimize their trading costs and therefore trade when the trading costs are lower (or liquidity is higher). The difference between the Admati and Pfleiderer and Foster and Viswanathan models lies in the assumption about the trading patterns of informed and liquidity traders. While the Admati and Pfleiderer model predicts that both informed and liquidity traders trade together, the Foster and Viswanathan model predicts that private information is short lived and liquidity traders avoid trading with informed traders. The implications of these two models are as follows: Foster and Viswanathan suggest that liquidity

traders avoid trading with informed traders when private information is intense. The resulting volume would be low and this would imply low volume comes with high volatility. Admati and Pfleiderer speculate that trading volume would be high when price volatility is high.

Following these theoretical models, Foster and Viswanathan (1993) find that for actively traded firms, trading volume, adverse selection cost, and return volatility are higher in the first-half hour of trading day. Furthermore, they find higher trading costs and lower trading volume on Mondays. Similarly Chang, Pinegar, and Schachter (1997) observe U-shaped volatility patterns across weekdays in selected commodity futures markets and find that return variance is the highest while volume is the lowest on Mondays, supporting Foster and Viswanathan's (1990) model. Recently, Wei and Zee (1998) find higher volatility on Fridays and lower volume on both Mondays and Fridays in their study of the currency futures markets, providing partial support to the Foster and Viswanathan (1990) argument. Berument and Kiymaz (2001) use the S&P 500 index data and document that there are differences in stock market volatility across the days of the week, with the highest volatility observed on Fridays.

This study investigates the day of the week effect in stock market volatility and volume using the major stock market indexes of Canada, Germany, Japan, the United Kingdom, and the United States. Previous studies have not investigated day of the week effect in stock market volatility internationally using a conditional variance framework. This paper also investigates whether the observed return volatilities on various days of the week are related to Harvey and Huang also consider the possibility that volatility may be induced by the concentration of trading by investors with private information. Since the private information traders have access to FX markets almost 24 hours a day, they argue that volatility increases are mostly induced by the release of macroeconomic information. 366 H. Kiymaz, H. Berument / Review of Financial Economics 12 (2003) 363–380 trading volume, indirectly testing the Admati and Pfleiderer (1988) and Foster and Viswanathan (1990) models.

Empirical Review

Numerous empirical studies have been conducted in the developed capital markets to examine the day of the week effect. French (1980) examined the daily returns of Standard & Poor (S&P) 500 indexes for the period between 1953 and 1977 using Ordinary Least Square (OLS) method with dummy variables for each day of the week. He found significant negative Monday effect and positive Wednesday, Thursday and Friday effect. Gibbons and Hess (1981) studied the S&P 500, and the value and equal-weighted portfolios constructed by the Center for Research in Securities Prices (CRSP) over the period July 2 1962 to December 28 1978 using OLS method with dummy variables for each day of the week. They first tested time pattern for the overall sample periods and then divided that data to sub-periods. They provide evidence to show that for the overall sample period, the average annual return for Monday ranges from -33.5% (S&P 500) to -26.8% (CRSP).

When they divided the data to sub-periods, they found that for all periods the hypothesis of equality of mean was rejected for each index and that lowest returns appeared on Mondays. Only for the periods from November 1974 to December 1979 the negative returns occurred on

Tuesdays. In addition, Gibbons and Hess reported significantly higher returns on Wednesdays and Fridays. Keim and Stambaugh (1984) used a longer time period and additional stocks to further investigate the weekend effect. They found consistently negative Monday returns (1) for the S & P Composite as early as 1928, (2) for Exchange-traded stocks of firms of all sizes, and (3) for actively traded over-the-counter (OTC) stocks. The OTC results are based on bid prices and therefore appear to reject specialist-related explanations. For the 30 individual stocks of the Dow Jones Industrial Index, the average correlation between Friday and Monday returns is positive and the highest of all pairs of successive days. Harris (1986) examined the weekly and intra-daily patterns in common stock prices using transaction data. For large firms, negative Monday close-to-close returns accrue between the Friday close and the Monday open; for smaller firms they accrue primarily during the Monday trading day.

For all firms, significant weekday differences in intraday returns accrue during the first 45 minutes after the market opens. On Monday mornings, prices drop, while on the other weekday mornings, they rise. Otherwise the pattern of intraday returns is similar on all weekdays. Most notable is an increase in prices on the last trade of the day. Later study by Lakonishok and Smidt (1988) used 90 years of daily data on the Dow Jones Industrial Average to test for the existence of persistent seasonal patterns in the rates of return. They found evidence of persistently anomalous returns around the turn of the week, around the turn of the month, around the turn of the year, and around holidays. Arsad and Coutts (1997) investigated the existence of security price anomalies in the Financial Times Industrial Ordinary Shares Index over a 60 year period: 1 July 1935 through 31 December 1994. Their results broadly support similar evidence documented for many countries concerning stock market anomalies, as the weekend, January and holiday effects all appear, to some extent, to be present in their data set. They concluded that even if these anomalies are persistent in their occurrence and magnitude, the cost of implementing any potential 'trading rules' may be prohibitive due to the illiquidity of the market and 'round trip' transactions costs.

This is of course perfectly consistent with the notion of market efficiency; in that no strategy exists that will consistently yield abnormal returns. Kamara (1997) observed that equity derivatives and the institutionalization of equity markets affect the Monday seasonal. He noted that the seasonal in the S&P 500 declines significantly over 1962-93. This decline is positively related to the ratio of institutional to individual trading volume. In contrast, the seasonal for small stocks does not decline and is unaffected by institutional versus individual trading. Higher trading costs sustain the seasonal in small stock, and unlike the S&P, these costs are not lower for institutions than for individuals. Futures minus spot S&P returns exhibit a reverse seasonal. He concluded that informed traders use the less costly market to exploit the seasonal. Berument and Kiymaz (2001) tested the presence of the day of the week effect on stock market return and volatility using the S&P 500 market index during the period of January 1973 and October 1997. They found evidence of the day of the week effect in both volatility and return equations. While the highest and lowest returns are observed on Wednesday and Monday, the highest and the lowest volatility are observed on Friday and Wednesday, respectively. Further analysis of sub-periods reinforces their findings that the volatility pattern across the days of the week is statistically different.

The validity of the day of the week effect has also been tested in the international stock markets. Jaffe and Westerfield (1985) studied the day of the week on four international stock markets. Their study was the first to provide international evidence on the day of the week anomaly. Their paper examined the stock returns in United Kingdom (UK), Japan, Canada and Australia. The indices and time period of study were: Japan Nikkei from 1970 to 1983, Canada – Toronto Stock Exchange Index from 1976 to 1983, Australia – Statex Actuaries Index from 1973 to 1982, and the United Kingdom – Financial Times Ordinary Index from 1950 to 1983. Their results clearly documented evidence of the day of the week effect as well. For the returns in the UK and Canada, the lowest returns occurred on Mondays, but in contrast of the earlier studies based on the USA market; they found that the lowest returns for both Japan and Australian stock markets occurred on Tuesdays. These results are partly similar to the results of Gibbons and Hess (1981).

However, Jaffe and Westerfield documented new evidence of the negative Tuesday effect. More International evidence was documented by Condoyanni et al. (1987) when they examined six international stock exchanges which include Canada, Australia, France, United Kingdom, Japan and Singapore during the period from 1969 to 1984. Their result confirm that Canada and UK markets exhibit negative Monday returns; France, Japan, Australia and Singapore markets show negative returns on Tuesday; and a significant positive Friday effect for Canada, France, Australia and Singapore. Agrawal and Tandon (1994) examined five seasonal patterns in stock markets of eighteen countries: the weekend, turn-of-the-month, end-of-December, monthly and Friday-the-thirteenth effects. They found a daily seasonal in nearly all the countries, but a weekend effect in only nine countries. Interestingly, the daily seasonal largely disappears in the 1980s.

The last trading day of the month has large returns and low variance in most countries. Many countries have large December pre-holiday and inter-holiday returns. The January returns are large in most countries and a significant monthly seasonal exists in ten countries. Dubois and Louvet (1996) re-examined the day-of-the-week effect for eleven indexes from nine countries (Canada, USA, Japan, Hong Kong, Australia, Germany, France, Switzerland, and UK) during the 1969–1992 period using both parametric and non-parametric methodology. Their results show significant negative Monday effect for the stock market indexes in Canada, USA, Germany, France, UK Switzerland and Hong Kong; negative Tuesday effect for Japan and Australia; and positive Friday effect for most of the markets. Choudhry (2000) investigated the day of the week effect on seven emerging Asian stock markets returns and volatility. The empirical research was conducted using the GARCH model and daily returns from India, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand from January 1990 to June 1995. Results obtained indicate the significant presence of the day of the week effect on both stock returns and volatility, though the result involving both the return and volatility are not identical in all seven cases. Results also show that these effects may be due to a possible spill-over from the Japanese stock market.

The day of the week effect has substantially been investigated in the emerging stock markets. Alagidede and Panagiotidis (2006) examined the day of the week and month of the year effects for Ghana stock market covering the period 15 June 1994 to 28 April 2004. Their result show

that Monday returns are lower than the return for the other days of the week (0.1% on Monday as opposed to 0.18 and 0.19 on Wednesdays and Fridays respectively). Also, contrary to a January return pattern in most markets, they find April effect for Ghana and concluded that the April return pattern is due to the submission of company reports in late March. Dimitris and Samitas (2008) examined the day of the week effect patterns on the Athens stock market return and volatility using a conditional variance framework. They provide evidence to show the existence of the day of the week effect in both returns and volatility over the period 1995 to 2000. They found also, that the day of the week effect loses its strength and significance after the entry of Greece to the Euro zone during the period 2001 to 2005. They therefore concluded that the disappearance of the anomaly is a consequence of the competitive transformation and the institutional reforms introduced in the Market. Agathee (2008) investigated the day of the week effect on the Mauritius Stock Exchange during the period of January 1998 to December 2006 using OLS method with dummy variables for each day of the week. The results show that the Friday returns are higher than the returns for other days of the week. His further analyses suggested that the mean returns across the five days of the week are jointly not significantly different from zero.

The empirical literature of stock return seasonality on the NSE is rare. Alagidede (2005) examined evidence of the Day of the week effects in Egypt, Kenya, Morocco, Tunisia, Zimbabwe, Nigeria, and South Africa. His results did not indicate evidence of the day of the week effects in Egypt, Kenya, Morocco and Tunisia, but showed evidence of Friday return being consistently higher in Zimbabwe; Nigeria returns tend to display seasonality in volatility than in returns; South African returns displays seasonality in returns than in volatility. Ayadi, Dufrene and Chatterjee (1988) surveyed emerging markets of Ghana, Zimbabwe and Nigeria for evidence of market efficiency and seasonal patterns in monthly stock returns for the period between 1985 and 1995. Their results show absence the January effects in Nigeria and Zimbabwe stock indexes, but indicate presence of the January effect in Ghana. They explained that the existence of the January effect in Ghana stock market may be a result of spillover from London. Other studies of seasonality in NSE stock returns concentrated on the day of the week effects. Chukwuogor (2008) investigates the presence of day of the week effects in returns volatility and annual returns for Botswana, Egypt, Nigeria, Ghana and South Africa. The results did not support the existence of the day of the week effects on all the markets studied. The study therefore concluded that all the markets studied are Weak Form efficient.

Many empirical studies have also been conducted to explain the reason for the calendar anomaly. Lakonishok and Maberly (1990) in trying to explain the reason for the day of the week anomaly, document regularities in trading patterns of individual and institutional investors related to the day of the week. They found a relative increase in trading activity by individuals on Mondays and a tendency for individuals to increase the number of sell transactions relative to buy transactions. Abraham and Ikenberry (1994) noted that the trading behavior of individual investors appears to be at least one factor contributing to the day of the week effect. They observed that when Friday's return is negative, return is negative nearly 80 percent of the time with a mean return of -0.61 percent. When Monday's Friday's return is positive, the subsequent Monday's mean return is positive, 0.11 percent. Steeley (2001) showed that the weekend effect in

UK stock prices has disappeared in the 1990s. Beneath the surface however there remain systematic day of the week effects only visible when returns are partitioned by the direction of the market. A systematic pattern of market-wide news arrivals into the UK stock market is discovered and found to provide an explanation for the day of the week effects. Chan et al. (2004) used institutional stock holdings information during the 1981–1998 periods to examine the impact of institutional trading on the day of the week effect. They document that the Monday seasonal is stronger in stocks with low institutional holdings and that the Monday return is not significantly different from the mean Tuesday to Friday returns for stocks with high institutional holdings during the 1990–1998 period. They concluded that the Monday seasonal may be related to the trading activities of less sophisticated individual investor.

In finance literature, the day-of-the-week-effect is one of the finance puzzles since the late 1920' where Kelly (1930) recognized that the average daily return of the market is not alike for all trading days, and that the Monday returns in the US markets are negative. Fama (1965) noticed that Monday's variance was higher than other daily returns. It is observed that the stock exchange market starts downwards and ends upwards (Cross, 1973). In other words, the average return on Monday and Tuesday in developed markets is significantly less than the average return on the rest of trading days. Possible explanation for these findings is the unfavorable news appeared during the weekends which caused investors to sell on the coming Monday (Mehdian and Perry, 2001), while for Tuesday's returns it is argued that the unfavorable news of the weekend affecting the USA's market as a leading market, influence negatively
some markets lagged one day (Aggarwal and Rivoli, 1989).

In general, the empirical studies on this issue might be divided into three groups. The first group has shown negative return on the first day of the week and positive on the last day. In contrast, the second group has shown positive return on the first day of the week and negative on the last day of the week, while the third group has shown no day of the week effect. The first group has provided an evidence of the existence the day of the week effect. They reported that there is a statistically significant negative return on the first day of the week, and positive on the last day of the week (see for example, Cross, 1973; Solnik and Bousquet, 1990; Barone, 1990; Athanassakos and Robinson, 1994; Balaban, 1995; Poshakwale, 1996; Berument *et al*., 2003; Berument and Kiymaz, 2001; Angelidis and Lyroudi, 2004; and Ndu, 2006). The following section is a brief review of these studies.

Cross (1973) examined the day of the week effect in stock market returns on the S&P 500 Index over the period from 1953 to 1970. He provided evidence that the mean return on Friday is higher than the mean return on Monday. Poshakwale (1996) examined the day of the week effect in Bombay Stock Exchange over a period 1987-1994. He found that the returns achieved on Fridays are significantly higher than the rest of the trading days of the week. Another study by Berument and Kiymaz (2001) investigated the day of the week effect in stock market volatility by examining the S&P 500 stock index during the period of January 1973 and October 1997. They found that the day of the week effect is present in both volatility and return equations. They observed that the highest and lowest returns are on Wednesday and Monday respectively, while the highest and the lowest volatility are observed on Friday and Wednesday, respectively.

Furthermore, Ndu (2006) used parametric and nonparametric tests to examine the day-of-the-week effect in Czech Republic, France; Italy; Slovakia; Spain; Turkey and United Kingdom. He confirmed that there is a presence of the day of the week effect for seven of the European financial markets as they experienced negative return on Monday.

Berument *et al*., (2003) used Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model to test the day of the week effect on return and volatility for Istanbul Stock Exchange through the period from 1986 to 2003. They found that there is a day of the week effect. Friday has the highest return and Monday has the lowest return compared to return on Wednesday. In regard to volatility, they observed that Monday has the highest volatility and Tuesday has the lowest volatility compared to Wednesday. This finding is consistent with other similar results in Amman Stock Exchange Al-Rjoub (2004) Angelidis and Lyroudi (2004) examined empirically the day of the week effect anomaly in the French Stock Exchange for the period 2000 to 2003. They observed the negative returns occur on Wednesdays instead of Mondays or Tuesdays as in most of the other studies during other periods.

Other studies have provided evidence of the existence of negative Tuesday returns. Solnik and Bousquet (1990) examined the day of week effect for French Stock Exchange and found a strong negative return on Tuesday. This finding is consistent with other similar results in Italian Stock Market (Barone, 1990) and Istanbul stock exchange (Balaban, 1995) Toronto Stock Exchange (Athanassakos and Robinson, 1994).

The second group revealed that there is positive return on the first days of the week and negative on the last day of the week and the market index moves from upwards and ends downwards (Al-Loughani and Chappell, 2001; Aly *et al*., 2004).

Al-Loughani and Chappell (2001) used the price index of KSE and GARCH model to examine the day-of-the-week effect in the KSE during the period from January 1993 to December 1997. They found that the mean daily returns are significantly different from each other and therefore a day- of- the week effect does exist on daily stock returns in the KSE. They also observed, unlike in mature Western stock market, the returns for the first day in the trading week in the KSE are higher. Aly *et al*., (2004) examined the day-of-the-week effect in the Egyptian Stock Market using its major stock index, the Capital Market Authority Index with a four-day trading week during the period from April 26, 1998 to June 6, 2001.They provided evidence that Monday returns in the Egyptian stock market are positive and significant on average, but are not significantly different from returns ofthe rest of the week.

The third group has shown no day of the week effect and found there are no statistically significant differences among daily returns for all the weekdays (Santemases, 1986).
Santemases (1986) examined the effects of the day-of-the-week effect using the daily returns of the Madrid Stock Exchange Index and the daily returns of a sample of 40 actively traded stocks from 1979 to1983. He provided no evidence for the presence of a day-of-the-week effect. Santemases concluded that there is no confirmation of pressures of the "day of the week effect" in the Spanish Stock Market.These findings are consistent with Pena (1995) findings in Spanish

Stock Exchange. Syed and Perry (2006) examined the day-of-the-week effect in 21 emerging stock markets.

They provided evidence that the day-of-the-week effect is not present in the majority of emerging stock markets except Philippines, Pakistan and Taiwan. Recently, Agathee (2008) investigated the day of the week effects in the Stock Exchange of Mauritius using data covering the market operation on a daily basis for a full calendar year to 2006. He has shown that the Friday returns appeared to be higher relative to other trading days. However, Agathee provided evidence that the mean returns across the trading days are jointly not significantly different from zero across all given years as well as for the whole sample period of 1998-2006.

In conclusion, it appeared that the day of the week effect in stock returns is still a controversial issue as results differs across countries, time, and method of estimation.

3.0 METHODOLOGY

Hypotheses

This seminar paper tests one hypothesis to examine whether the day of the week effect exists in the NSE. The hypothesis involves determining whether the stock returns on each day of the week are equal or not. Equality of returns on each day of the week would indicate evidence against the day of the week effect. The null and alternative hypotheses are:

Ho: Mean returns in the NSE are not significantly different across the five trading days.
H_1: Mean returns in the NSE are significantly different across the five trading days.

Rejection of the null hypothesis would indicate that the NSE daily returns exhibit day of the week effect.

Data

The data for this seminar paper primarily consist of daily All-Share Index (ASI) of the NSE. The ASI is a value weighted index computed with all the listed ordinary shares on the NSE and it is computed daily. The period under consideration begins from 05 January 2009 and ends on 31 December 2015. The data was obtained from the Nigerian Stock Exchange website: http://www.nigerianstockexchange.com.

Description of Variables

This empirical investigation used daily Market returns as individual time series variables. Market returns are proxied by the log difference change in the daily all-share price index of the NSE.

$R_{dt} = Ln\ (P_t - P_{t-1})$ …… (3.1)

Where:

R_{dt} = Daily returns for All-share Index for period$_t$
P_t = All-share 1ndex for day$_t$
P_t = All-share 1ndex for day$_{t-1}$
Ln= Natural logarithm

To test for the existence of the day of the week effect on the NSE, the following OLS regression was estimated for the sample period:

$R_{dt} = B_1D_1 + B_2D_{2t} + B_3D_{3t} + B_4D_{4t} + B_5D_{5t} + \varepsilon_t$ ..... (4.1)

Where R_{dt} is daily returns, B_1 to B_5 are the coefficients for the mean returns for Monday through Friday, D_1 is a dummy variable which takes the value 1 if the return is on Monday and 0 otherwise; D_2 is 1 if the return is on Tuesday and 0 otherwise; and so on to the last dummy D_5, which takes the value 1 if return is on Friday and 0 otherwise, and ε_t is the error term. If the returns are from identical distribution, they will be expected to be equal. Inequality of the mean returns (coefficients) would indicate a specific observable pattern in the stock returns, thus, implying day of the week effect in the NSE returns.

For this purpose, our null hypothesis is that the mean returns across all the trading days are equal. If the *f*-statistic is less than the critical value, it implies that the null hypothesis should not be rejected, and that mean returns across the week-days are not significantly different from each other. The opposite reasoning holds when the *f*-statistic is more than the critical value. Test of hypothesis was conducted at the 5% significance level.

4.0 EMPIRICAL RESULTS AND DISCUSSIONS

Table 1 contains the descriptive statistics of daily returns for the NSE All-share Index. The average daily return for sample period is 0.01 per cent and the average variability of returns from expectation is 1.1 per cent. The distributional characteristics of the return series appear to be inconsistent with the normality assumption. In a normally distributed series, the skewness is zero (0), Kurtosis is three (3), and Jarque-Bera is equal to zero (0). Positive or negative skewness and J-B indicate evidence against the normality assumption. Also, Kurtosis greater than or less than three (3), suggest deviation from normality. From Table 1, Skewness is 0.057328, indicating that the daily stock returns are positively skewed. Kurtosis is 2.07768, suggesting that series has a platykurtic distribution. Jarque-Bera is 256.367014. The overall results from Table 1 indicate evidence against normal distribution of the NSE daily return series.

Table 1: Descriptive Statistics of the NSE Daily Return Series

	Observations	Mean	Variance	Skewness	Kurtosis	JarqueBera
DailyReturn	1421	0.000110	0.000121	0.057328	2.077683	256.367014

Source: Researcher's Stata Statistical Computer Package

The results of the OLS regression with binary dummy variables for the days of the week are presented in Table 2. For the sample period, positive and statistically significant coefficient (0.001388) is observed for Friday. This leads to higher return on Friday than other days of the week and a significantly different return from the NSE daily average return for the sample period (0.000110). The coefficients for Tuesday (-0.000465), Wednesday (-0.000477) and Thursday (-0.000062) are negative.

But the lowest return is observed on Thursday. On the other hand, positive but not significant

coefficient is observed for Monday. Evidence of the Friday highest return is consistent with earlier studies (see, French, 1980; Alagidede and Panagiotidis, 2006; Agathee, 2008). The result of the equality of mean is also presented in Table 2. It is observed that the OLS estimates reject the null hypothesis of equality of mean returns across the days of the week. Rejection of the null hypothesis is based on the decision rule specified on Section 4. From Table 2, it is glaring that the *p*-value of the *f*-statistics (0.23266) is more than the critical value (0.05). Hence, the alternative hypothesis of inequality of mean returns across the days of the week holds. Given these pattern, a plausible investment strategy would be to buy low on Thursdays and sell high on Fridays. However, there is need for caution because illiquidity and round trip transaction cost sets an upper bound to the use of profitable trading rules.

Evidence of the day of the week effect is usually attributed to market inefficiency, because if the price discovery process is efficient, all arbitrage opportunities should disappear upon discovery. With the Nigerian Stock Market still at its emerging stage of development with respect to processing price information, this could well represent the case. But, the day of the week effect is now a stylized fact in even the developed stock markets and for this reason market inefficiency cannot possibly explain this phenomenon well in Nigeria.

Table 2: Ordinary Least Square Regression Results for NSE Daily Return Series

	Coefficients	**Std. Errors**	***T*-Statistics**	***P*-Value**
Monday	0.000203	0.000676	0.3007	0.76367
Tuesday	-0.000465	0.000654	-0.7032	0.48203
Wednesday	-0.000477	0.000629	-0.7588	0.44804
Thursday	-0.000062	0.000646	-0.0962	0.92333
Friday	0.001388**	0.000650	2.1358	0.03286
***F*-statistics**	1.3971	-	-	-
Sig. of *F*	0.23266	-	-	-

***, **, *** denote significance at 10%, 5% and 1% respectively.**
Source: Researcher's Stata Statistical Computer Package.

6 Summary and Conclusions

This paper examined the day of the week effect in Nigeria using OLS regression with binary dummy variables for the period ranging from 2009 to 31ist December 2015. The major objective of the paper was to determine whether stock return on any particular day is significantly different from the average daily return on the NSE. Overall estimates indicate absence of Monday negative returns but presence of Friday effect. Mean Friday returns are estimated to be about 0.14%. This is much higher than the NSE daily average return of 0.01% and also higher than the returns for all other days of the week. It was also observed that returns on Thursdays are lower than the returns of the other days of the week. We therefore conclude that the NSE daily returns exhibit positive Friday effect.

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