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Stock Market Consequences of the Suspension of the Central Bank of Nigeria's Governor

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The sudden announcement of the suspension of the Governor of the Central Bank of Nigeria (CBN) on the 20th February 2014 created mixed reactions among analysts and market participants in Nigeria and beyond. The objective of this study is to empirically establish the reaction of listed firms' stock prices to the announcement of the suspension of the Governor of the CBN. Using the standard event study methodology on a sample of 104 out of the 122 listed firms that traded on the floor of the NSE on the fateful day, the study sought to establish the significance of abnormal return and cumulative abnormal return on the announcement day, and fifteen trading days after the announcement became public. The study found the presence of statistically significant abnormal return and cumulative abnormal return of –0.06 percent and –5.95 percent on the announcement day. It also established the presence of statistically significant cumulative abnormal return of approximately –6.91 percent fifteen trading days after the announcement. The study concluded that the sudden announcement of the suspension of the Governor of the CBN gave rise to a negative market reaction by listed firms in Nigeria, and the negative trend persisted for the fifteen trading days after the announcement. It was recommended that subsequently, policy makers should as much as possible avoid sudden announcements of the suspension or removal of the Chief Executive Officers (CEOs) of public institutions that have close links with the stock market. Where the need for such action becomes inevitable, the announcement should be preceded by the release of information that will minimize asymmetry between policy makers and the stock market.

Key Words: stock prices, Governor of the CBN, event studies
JEL Classification: G12, G14, G21

Introduction

The role of the financial system in mobilizing funds from the deficit to the surplus units of any economy cannot be overstressed. The financial sys-

tem ensures that resources are directed from the surplus spending units to the most productive sectors of the economy. At the centre of this important intermediation function is the stock market, which ensures channelling of resources into long-term productive investments. The stock market of any economy therefore sees to the mobilization of funds on long-term basis to stimulate economic growth. Thus, it is therefore not surprising that a number of studies in developed and emerging markets have empirically documented the role of the stock market in fostering economic growth (Atje and Jovanic 1993; Yartey 2007; Aruwa 2009).

A central question to the operation and performance of stock markets all over the world is the extent to which such markets instantaneously and unbiasedly impound new information into stock prices. Thus, a market is considered efficient if it quickly and automatically adjusts to reflect new information. This process of stock prices adjustment to new information is referred to as market efficiency in finance. Fama (1970) identified three forms of efficiency associated with stock markets. According to him, a stock market is said to be weak-form efficient if information on past stock prices is fully reflected in current prices, semi-strong form efficient if all publicly available information is captured in stock prices; and strong-form efficient if all information including the one held by insiders is fully reflected in stock prices. On the other hand, banks complement the functions of the stock market by providing short-term credit and liquidity to the various players within the financial system. Hence, banks also play a very crucial role on the intermediation process by mobilizing resources from the surplus to the deficit spending units albeit on short-term basis. Being profit maximizers, the resource allocation process of banks is highly regulated and often done within the framework provided by the apex bank, which core mandate is to ensure macroeconomic and financial stability. The central bank of any economy therefore plays an indispensable role in promoting the stability of its financial system. Central banks are headed by CEOs who are referred to as governors in some economies and presidents in others.

According to Lassoued and Attia (2013), CEO attitude can have serious effect on the financial, investment and operational decisions of his/her organization. Thus, as the CEO of a corporate organization, the integrity and independence of the CEO of a central bank plays a crucial role in determining the confidence the general public will have in the economic system locally and internationally.

Most of the extant studies on CEO turnover centre exclusively on cor-

porate organizations, thereby ignoring public institutions. Previous studies on CEO changes such as Adelegan (2009a) and Bonnier and Bruner (1989) have argued that since CEOs and boards of organizations have power of influence over the firm's strategy, policy and decision-making, change of CEOs or board members will be a significant event that could have implications for the firm's market value. This implies that the removal or suspension of the CEO of a sensitive public institution such as the central bank will have market consequences. This is especially true for banks that are most of the time the direct target group of the central bank.

Like other value-relevant announcements, stock prices reaction to the announcement of the removal or suspension CEOs are studied using the event study approach because of its ability to accurately capture the impact of an event announcement (Ball and Brown 1968). This methodology involves the thorough analysis of the difference between the return earned as a result of the announcement and the return that would have been earned had the announcement not been made (Brown and Warner 1985). The analysis is usually for a defined time period around the date of announcement (event window). The presence of abnormal return at whatever level is an evidence of semi-strong form inefficiency (Peterson 1989).

In Nigeria, the sudden announcement of the suspension of the Governor of the CBN on the 20th February 2014 has generated controversy and many reactions among observers and market analysts as to the likely consequences of such an action on the market value of listed firms. It was worrisome to many stakeholders that policy makers could take such an abrupt decision without recourse to the likely consequences such action may have on the Nigerian capital market in particular and the financial system in general. While a number of opinions exist on the extent of listed firms' stock prices reaction to the announcement of the suspension, they can at best be considered as mere conjectures and not products of empirical research. The need to conduct an empirical study to establish the extent of this reaction therefore becomes imperative.

Consequently, this study aims at empirically analyzing the reaction of listed firms' stock prices to the announcement of the suspension of the Governor of the CBN. The specific objectives include to:

1. Establish the significance of listed firms' abnormal return on the announcement day of the suspension of the Governor of the CBN.

2. Establish the significance of listed firms' cumulative abnormal return on the announcement day of the suspension of the Governor of the CBN.
3. Establish the significance of listed firms' cumulative abnormal return fifteen trading days after the announcement day of the suspension of the Governor of the CBN.

To achieve this, the paper hypothesized that there exists no significant abnormal and cumulative abnormal return within listed firms' event window on the announcement day of the suspension of the Governor of the CBN. The hypotheses are presented in statement and notational forms as follows:

H1 *There is no significant abnormal return on the announcement day of suspension of the CBN Governor* ($AR_{(t0)} = 0$).

H2 *There is no significant cumulative abnormal return from fifteen trading days before the announcement day to the announcement day of suspension of the CBN Governor* ($CAR_{(t-15,t0)} = 0$).

H3 *There is no significant cumulative abnormal return from fifteen trading days before the announcement day to fifteen trading days after the announcement day of suspension of the CBN Governor* ($CAR_{(t-15,t+15)} = 0$).

The remainder of the paper is structured as follows: section two provides a review of literature and theoretical postulations on stock prices reaction to CEO/board changes and sudden ouster of corporate boards, section three discusses the methodology, section four presents the results and discusses the findings; and section five concludes, draws policy implications, and recommends the appropriate course of action.

Literature Review

Studies on stock prices reaction to value-relevant announcements are usually conducted by examining the market's response to the disclosure of an event. Identifying previous studies, whether in developed or emerging markets, where the governors (or presidents) of their central banks have been suddenly suspended or sacked becomes very difficult for two reasons. First and foremost, policy makers always avoid such kind of decision because of its likely effect on the economy as a whole, and secondly, the central banks of most economies have clearly established laws and excessive checks regarding the suspension and sack of CEOs of public institutions that are economically and financially sensitive. Thus, the closest

link between previous studies and this paper is the study of stock market reaction to changes in CEOs of corporate organizations.

Despite the sharp contrast between the operations of corporate organizations and important public institutions such as the CBN, the review of such studies could provide useful insights to understanding the context of this study better. This section therefore presents a review of some studies on stock prices reaction to CEO/board changes and sudden ouster of corporate boards in developed and emerging markets.

Adelegan (2009b) investigated the reaction of stock prices of firms listed on the NSE to the announcement of change in top management, with a view to establishing whether or not the Nigerian stock market is informationally efficient in that regard. The study employed the traditional event study methodology on a sample of firms listed on the NSE from 1997 to 2005. The study documented a significant positive pre-announcement, announcement and post-announcement price reactions. Furthermore, negative stock price reaction was recorded for the announcement of resignation of top management; while the concurrent announcement of resignation, retirement and new appointment of top management gave rise to positive market reactions. The study concluded that top management change in Nigeria is perceived by the market as a positive signal in favour of shareholders' interest. However, a proportion of the scope of the study falls within the period when the NSE was not automated, and the study did not to correct for thin trading and volatility effects in the return series.

Furthermore, Lassoued and Attia (2013) examined the market effects of CEO turnover in post-revolution Tunisia, using a sample of 16 turnover announcements by 53 firms listed on the Tunisian stock market. The work employed the standard event study methodology in their analysis and found that the announcement of a CEO turnover is on the average bad news for equity investors. The results showed negative abnormal returns following the announcement of CEO change. They concluded that their results are affected by the bear market. A close look at the analysis conducted by the study revealed the absence of unit root, serial correlation test and the test in ARCH effects as these tests increase the robustness of computed abnormal return.

In Nigeria, Osuala, Nto and Akpan (2013) investigated the reaction of the banking sector to the sudden removal of corporate CEOs of some DMBs. Using a sample of five DMBs whose CEOs were suddenly sacked by the board of the CBN on the 14th August 2009, the study utilized the

event study methodology to report that positive but statistically insignificant abnormal return was observed for the sample banks. The study concluded that the non-significance of the observed positive abnormal return could be explained by the prompt intervention of the CBN through its timely injection of N420 billion in the affected banks. On the contrary, however, the statistical insignificance of abnormal return could be as a result of the violation of the requirement for normality of abnormal return as the evidence of such test was not presented in the work.

In a related study, Pessarossi and Weill (2013) analyzed the consequences of CEO turnover on the stock prices of majority of the state-owned listed firms in China. The work employed the standard event study methodology on a sample of 1155 CEO turnover announcements by 658 listed Chinese firms between 2002 and 2010. The study's findings revealed that CEO turnover announcements are associated with positive market reaction for Chinese listed firms. However, the positive reaction is significantly positive only for firms owned by the central government, and not significant for their state and privately owned counterparts. The study concluded that their results provide evidence that CEO turnover in a central state-owned enterprise is an indication of renewed commitment to the economic performance of the firm. Being a relatively volatile market, the study did not take into account the likely effects of volatility on the estimated return.

Similarly, Suchard, Singh and Barr (2001) employed a sample of 59 CEO change announcements by 89 out of the 150 listed public firms on the Australian Stock Exchange (ASX) between June 1989 and July 1995 to examine the market effects of CEO turnover for Australian firms. Using the standard event study methodology, the study found a negative lagged market reaction on the announcement day of the CEO change. It concluded that the negative market reaction could be explained by two potential effects: the short-term damage from the CEO dominates the potential long-term benefits from a change in CEO, and secondly, the news of change in CEO might trigger the release of previously unknown potential problems or managerial behaviour at the firm. The latter explanation closely resembles the circumstances surrounding the suspension of the Governor of the CBN when shortly after the announcement of his suspension, information about a number of financial allegations against him filtered into public domain. However, the results would have been more robust had the study modelled the effect of serial correlation and heteroskedastic effects.

Finally, Warner, Watts, and Wruck (1988) utilized a sample of 351 top management changes by 269 firms listed on the New York and American Stock Exchanges (NYSE and AMEX) between 1962 and 1978 to examine the reaction of stock prices to changes in top management. Using the standard event study methodology, the study found no average stock price reaction at announcement of a top management change. However, there is an inverse relationship between the probability of management change and a firm's stock performance. Being one of the oldest studies, the work did not model for the effect of serial correlation and ARCH effects.

In summary, evidence from the studies reviewed on CEO change announcements in developed and emerging markets is overwhelmingly in favour of negative stock prices response to such announcements. It was also seen that some of the studies reviewed had methodological challenges such as the absence of correction for thin trading, serial correlation and ARCH effects.

This study adopted the efficient market theory as the bedrock upon which the analysis rests. The efficient market theory developed by Fama (1970; 1991) holds that in an efficient market, stock prices adjust instantaneously to reflect new information such that it becomes difficult for an individual to trade on such information exclusively. New information could negatively or positively impact on stock prices, depending on the market's judgement of the information. According to the work, managers can communicate to the market about the prospects of firms through information releases. This theory adequately explains the study in that the announcement of the suspension of the CBN Governor may be an attempt to convey to the market the information at the disposal of policy makers in Nigeria. Thus, it will not be out of place to say that stock prices of listed firms in Nigeria (particularly DMBS) will definitely react to the announcement, especially considering the role the CBN plays in achieving financial and economic stability.

Methodology

The population of this study consists of the 122 listed firms on the Nigerian Stock Exchange that traded on the 20th February 2014. The study utilized all listed firms in Nigeria that traded on the floor of the NSE on the 20th February 2014, which was the day the news of suspension became public. For a firm to be part of the sample however, the following criteria must be met:

- Data on daily stock prices must be available for the bank at least over

the period of 120 trading days before the announcement and another fifteen trading days after the announcement. This criteria resulted in the elimination of three firms.

- The bank did not undergo technical suspension within the 120 trading days before the announcement day, and fifteen trading days after it. Six firms could not meet this criterion and were therefore dropped.
- No other simultaneous important announcement such as earnings and bonus issues announcement have taken place and contaminated the effect of the event within the event window.

The first criterion resulted in the elimination of three firms, whiles the second and third resulted in dropping six and nine firms respectively. Thus, application of the above criteria resulted in a total observation of 104 listed firms.

The study utilized the standard event study methodology advocated by Mackinlay (1997) where abnormal return is computed as the prediction errors of the market model. The methodology have been found over time to be consistent and valid in measuring the impact of important corporate events such as stock splits, bonus issues, mergers and CEO sudden ouster (Bonnier and Bruner 1989; Shaheen 2006). In this study, the event is defined as the announcement of the suspension of Sanusi Lamido Sanusi as the Governor of the CBN. This study treats the announcement of the suspension as technically synonymous to removing the Governor because the two events are likely to have very similar market effects since they both suggest discontinuity in the policies and programmes of the suspended or ousted CEO.

An event window of thirty-one trading days, covering fifteen trading days prior to the announcement day, the announcement day itself, and another fifteen trading days after the announcement day was utilized by the study. Although Panayides and Gong (2002) opined that an event window of 11 trading days covering five days before the announcement and five days after it is sufficient to fully capture the effect of an event, the study utilizes a larger event window because emerging markets like Nigeria are generally known to be less efficient than matured markets and thus tend to be more sluggish in reflecting new information in stock prices (Afego 2010). It is therefore expedient to choose a reasonably large event window to accommodate this speed of adjustment. In line with De Medeiros and Matsumoto (2006), an event window of thirty-two trading

days, covering fifteen trading days before the announcement, the two-day announcement date and another fifteen trading days after the announcement was utilized by the study.

Furthermore, the study also utilized a parameter estimation window of one hundred and twenty trading days (from day –16 to day –135) over which the parameters for normal return were estimated. According to Dyckman, Philbrick and Stephan (1984), Brown and Warner (1985) and Shaheen (2006), a parameter estimation period of 120 days is adequate since daily return data for the 120 days prior to the event can sufficiently formulate a benchmark for normal returns.

This study relied solely on data collected from secondary sources. Specifically, the study utilized secondary data relating to the daily stock prices of sample-listed firms for the period under study. Similarly, the corresponding NSE daily All Share Index (ASI) was collected for the same period. Both the daily series of stock prices of the sample firms and the corresponding NSE ASI were retrieved electronically from the online database of Cashcraft Asset Management Limited.

The daily stock price data collected was then converted to daily continuously compounded stock return. Given that the study utilized an event window and estimation window of less than a year, dividends were constant at zero. The logarithmic transformation of the time series data became necessary in view of the need to keep the effect of outliers under control. The same approach was also applied to the NSE ASI to create daily continuously compounded market return

The log daily returns of sample firms and those of the NSE ASI were the main variables employed to estimate the model for generating individual bank and market returns. Being time series data, the daily stock and market return series were subjected to stationarity test using the Augmented Dickey-Fuller (ADF) test for the presence of unit root.

Although the daily firm and market returns were computed using the market model, they are not free from inherent statistical bias due to the effect of thin or infrequent trading. According to Abuzarour (2005) and Sohawon (2006), emerging markets like Nigeria are typically characterised by low liquidity and thin trading. Furthermore, the study by Tijjani et al. (2009) clearly revealed the presence of significant thin trading in the Nigerian stock market, especially the petroleum and banking sectors. Thus, given that the observed index in thinly traded markets does not represent the true underlying index value, there is always a systematic bias towards rejecting the efficient market hypothesis (EMH).

Against this backdrop, this paper corrected for the effect of thin trading in the data. The study employed the correction procedure introduced by Miller, Muthuswamy, and Whaley (1994). According to them, thin trading correction reduces the negative correlation among returns. The methodology proposed by Miller, Muthuswamy, and Whaley (1994) suggests that a moving average model (MA) that reflects the actual number of non-trading days should be estimated and then returns adjusted accordingly. However, given the difficulty in identifying the actual non-trading days, Miller, Muthuswamy, and Whaley (1994) have shown that it is similar to estimating an AR(1) model from which the trading adjustment can be obtained. The model, as advanced by Miller, Muthuswamy, and Whaley (1994), involves estimating the following equation:

$$R_t = \alpha_1 + \alpha_2 R_{t-1} + \varepsilon_t, \tag{1}$$

where α_1 and α_2 are parameters to be estimated (α_1 is the slope and α_2 is the coefficient of the AR(1) term), R_t is the index return at time t, R_{t-1} is the index return at time $t-1$, and ε_t is a random disturbance term.

Using the residuals from the regression, adjusted returns were estimated as follows:

$$R_t^{adj} = \frac{\varepsilon_t}{1-\alpha_2}, \tag{2}$$

where R_t^{adj} is the return at time t adjusted for thin trading, and ε_t and α_2 are as defined above.

The model above assumes that the adjustment for non-trading is constant overtime. In order to capture the abnormal returns in the event window, the study utilized the market model pioneered by Ball and Brown (1968), Fama et al. (1969) and Brown and Warner (1985). The single factor market model was employed to estimate the return within the event window and the parameter estimation window. The model is presented as follows:

$$R_{i,t} = \alpha + \beta R_{m,t} + \varepsilon_t, \tag{3}$$

where $R_{i,t}$ is the return on firm i at time t, α and β are parameters to be estimated, $R_{m,t}$ is the return on the market index at time t, and ε_t is the stochastic error term, which is random and follows a normal distribution pattern.

To ensure robustness of the estimated residuals from the model, equation (3) was estimated using the Newey-West's (Newey and West 1987)

Heteroskedasticity and Autocorrelation-Consistent (HAC) estimator, which automatically corrects for autocorrelation and heteroskedastic effects in residuals. However, these were still checked for in the residuals of all the estimated models.

Assuming a constant beta value, the estimated return for firm *i*'s security can be computed by substituting the estimated values of α_i and β_i over the estimation window in equation (3) above as follows:

$$\overline{E}_{i,t} = \widehat{\alpha}_i + \widehat{\beta}_i R_{m,t}, \tag{4}$$

where $\overline{E}_{i,t}$ is the expected return on bank *i*'s security at time *t*; $\widehat{\alpha}_i$ and $\widehat{\beta}_i$ are the estimated parameters based on the estimation window; and $R_{m,t}$ is the market return at time *t*. The abnormal return is defined as the difference between equation (3) and equation (4) as follows:

$$\text{AR} = R_{i,t} - \overline{E}_{i,t}. \tag{5}$$

Once the estimated equation has been obtained, the actual return on firm *i*'s security is calculated as follows:

$$R_{i,t} = \widehat{\alpha}_i + \widehat{\beta}_i R_{m,t} + \varepsilon_{i,t}. \tag{6}$$

Since $\overline{E}_{i,t} = \widehat{\alpha}_i + \widehat{\beta}_i R_{m,t}$ equation (6) simplifies to:

$$R_{i,t} = \overline{E}_{m,t}\varepsilon_{i,t}. \tag{7}$$

This implies that abnormal return for firm *i* at time *t* is simply given as:

$$\text{AR} = \varepsilon_{i,t} \tag{8}$$

Thus, the abnormal return on the security of a given sample firm is simply the residual of the OLS after regressing the firm's stock return on the market return. For the residuals to be considered as the abnormal return however, the parameters estimated over the estimation window must be integrated into the equation as shown above.

Although Brown and Warner (1985) have concluded that estimates from OLS using the market model are generally well specified and display no significant mean bias, it has been empirically documented that the OLS estimation fails to adequately capture ARCH effects in returns series. According to De Medeiros and Matsumoto (2006) and Brooks (2008), estimating a model that adequately captures ARCH effects is important because their existence renders the coefficient estimates inefficient and thus produces a downward bias in abnormal returns.

Studies by Akgiray (1989), Bollerslev (1986) and Chiang and Doong (2001) have shown that daily stock returns exhibit variable volatility along time, thus tending to show ARCH effects. Similarly, the study by Emenike (2010) concluded that the Nigerian stock market index return exhibits significant volatility and the presence of ARCH innovations. Consequently, this study employed the Engle (1982) test to check for the presence of ARCH effects in the residuals of the market model over the parameter estimation window and the event window.

In the event that significant ARCH effects were detected, the OLS market model estimation for the affected sample firms was re-estimated using ARCH or GARCH models according to their best fits. When a GARCH (1,1) model is considered, equation (6) is replaced with:

$$\sigma^2_{i,t} = \alpha_{i0} + \alpha_{i1} u^2_{i,t-1} + \alpha_{i2} \sigma^2_{i,t-1}. \tag{9}$$

Equation (9) becomes an ARCH (1) process if $\alpha_{i2} = 0$. To be sure that there are no traces of other forms of heteroskedasticity in the return series, the White (1980) test for heteroskedasticity was also conducted on the return series. Furthermore, the study also employed the Breusch-Godfrey test for serial correlation (Godfrey 1988) to check for the presence of first order serial correlation in the residuals series. According to Gujarati (2003), serial correlation affects the efficiency of estimated coefficients in a regression model. In the same vein, the Doornik-Hansen (Doornik and Hansen 2008) normality test, the Shapiro-Wilk W test (Shapiro and Wilk 1965) for normality, the Lilliefors test (Lilliefors 1967) for normality, and the Jarque-Bera (Bera and Jarque 1981) test were conducted to ensure the normality of residuals.

The cumulative abnormal return of bank *i* in the sample for a given period was obtained by summing up the abnormal return in a given period. The procedure is demonstrated by the following formula:

$$\text{CAR}(t_0, t_1) = \sum_{t=0}^{n} \text{AR}_{i,t} = \sum_{t=0}^{n} \varepsilon_{i,t}, \tag{10}$$

where $\text{CAR}_{i(to,t1)}$ is the cumulative abnormal return of firm *i* from time t_0 to t_1, $\text{AR}_{i,t}$ is the abnormal return of firm *i* at time *t*, and $\varepsilon_{i,t}$ is the residual of firm *i* at time *t*; *n* is the number of observations.

The null hypotheses of no significant cumulative abnormal return for bailout announcement on the announcement date and over the entire event window was tested using the *t*-test for the significance of abnor-

mal returns. According to Brown and Warner (1985), the test statistic is simply the ratio of period t_0 to period t_1 CAR to its estimated standard deviation over the estimation window as shown in the equation below:

$$t(\text{CAR}) = \frac{\text{CAR}(t_0, t_1)}{\text{S}(\text{AAR}_t)}. \tag{11}$$

$t(\text{CAR})$ is the test statistic for cumulative abnormal return, $\text{CAR}(t_0, t_1)$ is as defined above, and $\text{S}(\text{AAR}_t)$ is the standard deviation of average abnormal return over the parameter estimation window.

The t-test for the significance of abnormal return takes the $N-1$ degrees of freedom. For the decision criteria, the null hypothesis of no significant abnormal return is rejected if the computed t value is greater than the critical value at a given a priori alpha level and vice versa.

Results and Discussion

Analysis of the results started with establishing the stationarity of the variables utilized for the study. Thus, the ADF test was employed to establish the stationarity of the stock return series and the corresponding market return series within the event window. Conducting the test became necessary in order to avoid dealing with non-stationary variables that may give rise to spurious results. Results for the unit root test were based on the 104 stock return series and the corresponding 104 market return series for the respective sample listed firms using the ADF test.

Results from the ADF test revealed that 76 out of the 104 stock return series of the sample firms were found to be stationary at levels between one and ten percent levels of significance. This implies that the 76 stock return series are integrated of the order I(0). However, the stock return series of 12 firms were found to be non-stationary at levels. To correct the anomaly, the ADF test was repeated on the first difference of the stock return series for the firms. At the first difference, the stock return series of the 12 firms were found to be stationary at the one and five percent levels. This means that the stock return series of the 12 firms were integrated of the order I(1). The return series of the remaining 16 listed firms did not pass the test even at the first difference, but eventually became stationary after the test was undertaken on the second difference of the return series. This means that 16 series of sample firm returns were integrated of the order I(2). On the other hand, the corresponding 104 market return series are all found to be stationary at levels between the one percent and five percent levels of significance. This means that all the 104 market re-

turn series are integrated of the order I(0) and have no unit root in them.

For the parameter estimation window stock return series, the stock return of 89 firms were found to be stationary at levels between the one and ten percent levels, implying that they are integrated of the order I(0). Furthermore, 13 stock return series were found not be stationary at levels, and thus the test was re-run on the first difference of the variables. Results of the test at the first difference showed that the 13 series were stationary between the one and ten percent levels, and hence integrated of the order I(1). However, the remaining two stock return series could not pass the test at levels and their first difference. Stationarity for these stocks were achieved at the second difference, which made them integrated of the order I(2). Results for ADF tests on the corresponding 104 parameter estimation window market return series revealed that 101 market return series were stationary at levels between the one and ten percent levels, and the remaining three series of market returns were found to be stationary at their first difference.

Analysis of the stationarity of stock and market returns under the event and parameter estimation windows revealed that the series were mostly stationary at their levels, with only a few achieving stationarity at either their first or second difference. This revelation supports the existing evidence that prices of financial assets tend to be non-stationary while their return tend to be stationary (Chiang and Doong 2001; Brooks 2008)

As described under the methodology section, the abnormal return in the event window for each of the sample firms was estimated by substituting parameters estimated over the estimation window into equation (3). Accordingly, the residuals realised from the estimation of equation (6) over the event window for each of the sampled firms were considered as the abnormal return for the firm. Out of the 104 regression models estimated over the event window, 27 models exhibited significant ARCH effects in their residuals, suggesting the presence of volatility. In line with the methodology of the study, the affected models which were estimated using OLS were substituted with ARCH/GARCH models estimated to their best fits using the Akaike Information Criterion, the Schwarz Criterion and the Hannan Quin Criterion. Specifically, 22 out of the 27 re-estimated models fitted better with GARCH (1,1), while the remaining five models were more fitted with ARCH (1). For the parameter estimation window, 12 out of the 104 models exhibited significant volatility and were re-estimated using ARCH/GARCH models. All the 12 models estimated fitted better with GARCH (1,1) model. In addition, results for

the White (1980) test suggested the absence of heteroskedasticity of unknown form in the residuals of the 104 models within the event window and the corresponding 104 within the parameter estimation window.

Even though the residuals from the market model were estimated using the HAC estimation, all goodness of fit tests were performed. The Breusch-Godfrey test for the presence of first order serial correlation in the residuals revealed that 11 out of the 104 models estimated within the event window exhibited significant serial dependence among the residuals, and to correct the anomaly, an autoregressive model AR(1) was introduced after which the observed serial correlation disappeared. For the parameter estimation window models, only eight out of the 104 showed signs of autocorrelation, which was also corrected using the same approach employed for the event window models.

The individual sampled firm abnormal return was then aggregated across firms to arrive at the abnormal return. Furthermore, the abnormal return was aggregated across time to arrive at cumulative abnormal return. Table 1 presents summary descriptive statistics for the abnormal return and cumulative abnormal return for the 104 sampled firms. It can be seen that the mean or average values for the abnormal return and cumulative abnormal return are approximately –0.0022 (or –0.22 percent) and –0.0477 (or –4.77 percent) respectively. Furthermore, the standard deviation, which measures the dispersion around the mean, stood at 0.00087 for abnormal return and 0.0232 for cumulative abnormal return.

Table 1 also revealed minimum abnormal return and cumulative abnormal return values of –0.0204 (or –2.04. percent) and –0.0725 (or –7.25 percent) respectively. On the other hand, the maximum value recorded for abnormal return was 0.0180 (or 1.8 percent), while that of cumulative abnormal return was 0.0041 (or 0.41 percent). The relative gap between the minimum and maximum values of abnormal return and cumulative abnormal return is indicative of the rate of variability among the return series.

The table also shows the skewness of the distribution of abnormal return and cumulative abnormal return. Skewness measures the length of the tail of the distribution. The skewness value of –0.06748 indicates that the distribution of abnormal return is negatively skewed, and thus has a longer left tail. However, the distribution of cumulative abnormal return has a skewness value of 1.0941, which is evidence that the distribution is positively skewed and thus has a longer right tail.

The descriptive statistics table also indicated a kurtosis of approxi-

TABLE 1 Descriptive Statistics

Statistics	AR	CAR	AAR
Mean	−0.0022	−0.0477	0.0000
Maximum	0.0180	0.0041	0.0202
Minimum	−0.0204	−0.0725	−0.0346
Stdandard deviation	0.0009	0.0232	0.0092
Skewness	−0.0675	1.0941	−0.0649
Kurtosis	0.0931	−0.1459	1.1914
Doornik-Hansen Probability	0.8659	0.1317	0.2316
Shapiro-Wilk W Probability	0.9700	0.3786	0.5689
Lilliefors Test Probability	0.5123	0.1029	0.3218
Jarque-Bera Probability	0.6316	0.4281	0.4570
Observations	31	31	120

NOTES AR – event window abnormal return, CAR – event window cumulative abnormal return, AAR – parameter estimation window average abnormal return.

mately 0.0931 for abnormal return, implying that the distribution exhibits flatness at the surface and is therefore platykurtic. For the cumulative abnormal return series, the approximate kurtosis value of –0.1459 also suggests platykurtosis or flatness of the distribution at the surface, since the value is less than the threshold of three.

According to Ball and Brown (1968) and Brown and Warner (1985), the normality of abnormal return and cumulative abnormal return is a precondition for the *t*-test for the significance of cumulative abnormal return. Given the importance of normality to the test of hypothesis, the paper reports four variants of normality test for abnormal return and cumulative abnormal return. For the abnormal return series, the table shows an approximate Doornik-Hansen test probability of 0.8659, Shapiro-Wilk W test probability of 0.970009, Lilliefors test probability of 0.5123, and a Jarque-Bera probability of 0.63156, all of which are statistically not significant. This results in the failure to reject the null hypothesis which states that the abnormal return series is normally distributed. Thus, results from the various normality tests revealed that the abnormal return series is normally distributed.

For the cumulative abnormal return series, Doornik-Hansen test probability of 0.131741, Shapiro-Wilk W test probability of 0.378613, Lilliefors test probability of 0.102892, and Jarque-Bera probability of 0.428109 were all statistically not significant at the one and five percent levels, resulting

in the failure to reject the null hypothesis. This implies that the cumulative abnormal return series is also normally distributed. In a nutshell, it can be said the descriptive statistics showed that the abnormal return and cumulative abnormal return series are normally distributed and can conveniently be used for the *t*-test.

For the parameter estimation window, the summary statistics is important because the standard deviation of the AAR is important for the test of hypotheses using *t*-test. The descriptive statistics of AAR over the parameter estimation window is provided in table 1. It can be seen that the mean or average value for the average abnormal return is approximately 0.0000 (or 0.00 percent), and the standard deviation, which measures the dispersion around the mean, stood at 0.0092. The table also revealed minimum average abnormal return of –0.0346 (or –3.46. percent). On the other hand, the maximum value recorded was 0.0202 (or 2.02 percent. The relative gap between the minimum and maximum values of average abnormal return suggests the rate of variability among the return series.

The table also shows the skewness of the distribution of average abnormal return which stood at –0.06487 indicating that the distribution of average abnormal return is negatively skewed, and thus has a longer left tail. The descriptive statistics table also indicated a kurtosis of approximately 1.1914, implying that the distribution exhibits flatness at the surface and is therefore platykurtic.

In terms of normality, the table shows an approximate Doornik-Hansen test probability of 0.2316, Shapiro-Wilk W test probability of 0.5689, Lilliefors test probability of 0.3218, and a Jarque-Bera probability of 0.4570, all of which are statistically not significant. This results in the failure to reject the null hypothesis which states that the average abnormal return series is normally distributed. Thus, results from the various normality tests revealed that the average abnormal return series is normally distributed.

Accordingly, the non-parametric *t*-test was employed to test for the significance of abnormal return on the announcement day, significance of cumulative abnormal return on the announcement day, and the significance of cumulative abnormal return fifteen trading days after the announcement became public. Table 2 shows abnormal return and cumulative abnormal return (in percentages) over the thirty-one days' event window.

The hypotheses of the study were tested using the *t*-test for the signif-

TABLE 2 Event Window Abnormal Return and Cumulative Abnormal Return

Day	AR	CAR	Day	AR	CAR
−15	0.0000	0.0000	1	−0.0062	−0.0657
−14	0.0027	0.0027	2	−0.0069	−0.0725
−13	0.0014	0.0041	3	0.0062	−0.0664
−12	−0.0124	−0.0083	4	0.0021	−0.0643
−11	−0.0162	−0.0245	5	0.0012	−0.0631
−10	0.0004	−0.0241	6	−0.0016	−0.0647
−9	−0.0156	−0.0397	7	0.0065	−0.0583
−8	0.0180	−0.0217	8	−0.0019	−0.0601
−7	−0.0076	−0.0293	9	0.0002	−0.0600
−6	−0.0150	−0.0442	10	−0.0025	−0.0624
−5	−0.0204	−0.0647	11	0.0034	−0.0590
−4	0.0042	−0.0604	12	−0.0066	−0.0657
−3	0.0148	−0.0456	13	0.0023	−0.0634
−2	0.0004	−0.0453	14	−0.0009	−0.0643
−1	−0.0148	−0.0601	15	−0.0048	−0.0691***
0	−0.0006**	−0.0595***			

NOTES AR – event window abnormal return, CAR – event window cumulative abnormal return. *, ** and *** imply significance at the 10%, 5% and 1% levels respectively.

icance of abnormal return over three periods. In each of the cases, the *t*-statistic sought to establish whether the abnormal return or cumulative abnormal return over the period of interest is significantly different from zero. Thus, the three points at which the significance of abnormal return and cumulative abnormal return were tested include announcement day abnormal return, announcement day cumulative abnormal return, and post-announcement day cumulative abnormal return.

For the first hypothesis, the null hypothesis of no significant abnormal return on the announcement day was tested using the abnormal return observed on day zero. The abnormal return of −0.0006 or −0.06 percent observed on day zero, as shown in table 3, was tested for statistical significance using the standard deviation of 0.0092 obtained over the parameter estimation window and a degree of freedom of 15. The result revealed a test statistic of −2.0031, which was statistically significant at the one percent level. The result therefore, suggested the rejection of the null hypothesis which stated that the abnormal return exhibited by stock prices of DMBS in Nigeria on the announcement day of the suspension of the CBN Governor is not significantly different from zero.

The second hypothesis of no significant cumulative announcement day abnormal return was tested using the observed cumulative abnormal return of –0.0595 or –5.95 percent over the event window of sixteen trading days, running from day –15 to day zero. The parameter estimation window standard deviation still remained 0.0092, with 15 degrees of freedom. The *t*-statistics value of –3.00829, was also found to be statistically significant at the one percent level, and this implies the rejection of the second null hypothesis. The result therefore, suggests that the cumulative abnormal return of –0.0595 percent is significantly different from zero at the one percent level.

The third hypothesis tested sought to establish the statistical significance of cumulative abnormal return fifteen trading days after the announcement of the suspension of the CBN Governor became public. The cumulative abnormal return on the fifteenth day is approximately –0.0691 or –6.91 percent. Similarly, the estimation window standard deviation of average abnormal return still remained at 0.0092, while the degrees of freedom under the *t*-distribution for the window is 30. The result revealed a *t*-value of –3.9387 over the thirty days event window period, which is statistically significant at the one percent level. Hence, the null hypothesis which states that stock prices of listed firms in Nigeria did not exhibit significant cumulative abnormal return fifteen trading days after the announcement day of the suspension of the CBN Governor could not be rejected. This therefore implies that the cumulative abnormal return of approximately –0.0691 or –6.91 percent for the period is significantly different from zero at the one percent level.

Results from the test of the first hypothesis revealed the presence of negative and statistically significant abnormal return of –0.0006 or –0.06 percent on the day the announcement of the suspension became public. This implies that the stock prices of listed firms that traded on the fateful day reacted negatively to the announcement of the suspension, and investors of these firms lost –0.06 percent in the value of their investments. Although studies on the sudden ouster of CEOs holding strategic positions such as the Governor of a central bank are not common because of the sensitive nature of such action, the finding of significant negative abnormal return on the announcement day is consistent with the findings of existing studies on change of CEO such as Lassoued and Attia (2013), and Suchard, Singh, and Barr (2001), and negates the findings of Osuala, Nto and Akpan (2013) and Adelegan (2009b).

Furthermore, the study established the presence of negative and statistically significant cumulative abnormal return of –0.0595 or –5.95 percent

for the firms on the day the announcement of the sudden suspension of the CBN Governor became public information. This means that an investor who held stock in the Nigerian stock market from fifteen trading days prior to the announcement up to the announcement day has experienced a –5.95 percent decline in the market value of his/her investment. The evidence of statistically significant announcement day cumulative abnormal return is consistent with previous studies on change of CEO such as Lassoued and Attia (2013), and Suchard, Singh, and Barr (2001), but negates the findings of Adelegan (2009b).

The study also found evidence of the persistence of negative cumulative abnormal return for the fifteen trading days after the announcement day. A statistically significant cumulative abnormal return of approximately –0.0691 or –6.91 percent was observed over the period after the announcement day. This finding is a pointer towards the persistence of negative market trend in the Nigerian stock market even after the information became public. Previous studies on change of CEO such as Lassoued and Attia (2013), and Suchard, Singh, and Barr (2001) have also established evidence of the persistence of negative cumulative abnormal return for the period after the announcement day. On the other hand, the finding is inconsistent with those of Osuala, Nto, and Akpan (2013) and Warner, Watts, and Wruck (1988).

Conclusion, Recommendations and Policy Implications

Following from the foregoing, it can be concluded that the evidence of negative abnormal return and cumulative abnormal return on the announcement day indicate that market participants in the Nigerian stock market adjudged the sudden announcement of the suspension of the Governor of the CBN as bad news. Fear of the sustainability of policies and programmes initiated by the suspended Governor may have accounted for the sharp negative reaction on the announcement day. By whatever name it was called, the market interpreted the news of suspension as synonymous with removal.

Furthermore, the fact that negative cumulative abnormal return persisted for days after the announcement date confirms that even subsequent efforts by policy makers to provide more information on the circumstances surrounding the suspension of the Governor of the CBN did not help reverse the initial downward trend of stock prices in the Nigerian stock market. This means that investors in listed firms continued to suffer losses up to fifteen days after the announcement became public.

This study has shown that there exist high economic and social costs associated with the sudden ouster of CEOs occupying sensitive public offices like that of the CBN Governor as such offices may be either directly or indirectly linked to delicate institutions like the stock market. It is obvious that the most manifest managerial implication of the sudden removal of the Governor of the CBN on the Nigerian stock market is that investors in the sector have suffered losses on the announcement day and several trading days beyond it.

In line with the revelations of this study, certain recommendations are pertinent to policy makers. First and foremost, there is the need for policy makers to refrain from sudden and unjustifiable suspension/removal of CEOs of sensitive institutions, especially if the inter-dependence between such institutions and the stock market is glaring.

Secondly, where the need to suspend/remove the CEO is inevitable, the announcement of such action should be preceded by the release of information that adequately justifies such action by policy makers. The release of such information is expedient as it will help the stock market to correctly interpret the philosophy underlying the suspension/removal of the CEO by policy makers.

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