

# Santa Claus rally and Nigerian stock market return: An illusion or reality?

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## ABSTRACT

The paper investigates the existence of Santa Claus rally on the Nigerian stock market return using regression technique with the errors modelled by GARCH (1, 1). The authors employ generalized error distributions for the errors of regression model. Some descriptive statistics and residual diagnostic tests such as autocorrelation test; ARCH-LM test among others confirmed that the errors of the return exhibit heteroscedasticity. The significance of the regression coefficients are evaluated by p-values and the highest returns has been observed in January. The empirical findings of this study do not justify the Santa Claus rally instead January effect on the Nigerian stock market returns. Moreover, they observed that the assumptions of intergeneration and tax-selling hypotheses and the effect of window dressing hold for the Nigerian Stock Market.

**Keywords:** Santa Claus rally, January effect, GARCH (1,1) model, Nigerian Stock Market return.

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## INTRODUCTION

The assertive position of weak form market hypothesis is that current stock prices fully reflect all security market information, which includes historical sequence of price, rate of return, block trades among others (Fama, 1970). Thus, past market rates and other market data should have no relationship with future rate of return. In view of this, understanding the stock market behaviour, especially the price movement and the return generating mechanism is always of great interest not only to the market participants but also academicians. Price movement and return are main tools of predicting the stock market movement and the performance of quoted companies. However, the evidence of growing number of anomalies in the stock market constitutes theoretical and practical challenge to the weak form market hypothesis which has been widely accepted. Month-of-the-year effect is one of the anomalies which implies return of a specific month is consistently different from those of other months.

The month-of-the-year effect has important implications for the markets and investors. It enables market participants to take advantage of relatively regular patterns in the market in order to design trading strategies. This is because if investors can identify a

certain pattern of volatility, it is easier to make investment decisions based on both the projected returns and the risks associated with the particular security (Kiymaz and Berument, 2003).

The most prevalent month-of-the-year effect is the January effect, where returns are significantly higher than any other month (Fountas and Segredakis, 2002; Agnani and Aray, 2011). Contrary to this, Johnston and Paul (2005) reported November effect in some stock markets while some researchers (Simbolon, 2015; Raharjo et al., 2013) are of the view that December effect which also known as the Santa Claus rally is the month with the highest return. Santa Claus rally occurs when there is rise in stock prices in the month of December prior to the New Year. It is generally attributed to anticipation of the January effect, injection of additional funds into the market, and trading activities which must be completed by the end of the year (Wong et al., 2007).

Based on this disparity, the study of month of the year effect remains afresh, earnestly awaiting further investigation, especially in an emerging market such as Nigerian Stock market. Against this backdrop the main objective of the study is to examine Santa Claus Rally on Nigerian Stock Market return. In line with this objective

the research question is: Does Nigerian Stock Market return exhibit Santa Claus Rally? In order to answer this question the remaining part of the paper is structured as follows: section two reviewed the theory that underpins the study, section three outlines the methodology adopted for the study. Data analysis and discussion were presented in section four while section five concludes the paper and proffer recommendations.

A wide range of researches has been documented on month of the year effect on stock market return. Ray (2012) confirmed the evidence for a month-of-the-year effect on Indian stock markets. The result of the findings supported the tax-loss selling hypothesis and January effect. Similarly, Debasish (2012) documented month-of-the-year effect mostly in September, August or February. The study concluded that returns on October and July were significant. In 2012, Verma and Sharma found month of year effect in Indian stock market during post liberalization period. They concluded that Indian stock market was inefficient and does not follow Random Walk Theory. Raharjo et al. (2013) made use of descriptive statistics which revealed that December is the best month for investor to buy stock in Indonesia Stock Exchange. The average of return in December is 5.21%, which is the highest return and has lower risk -2.79% with deviation 4.74%. Efayena (2014) stressed that there is presence of January effect. He concluded that the study is consistent with the tax-loss selling hypothesis explanation in the manner of the December – January seasonality.

Patel (2014) revealed that monthly barometer that can accurately predict the future direction of the stock market. Simbolon (2015) employed unconditional and conditional method to validate the claim of December effect. Friday and Bo (2015) also established the presence of December and Halloween effect in both the SET composite and SET50 indices. Mouselli and Al-Samman (2015) confirmed the existence of positive and significant returns during May compared to remaining months. Sarpong (2015) employed GARCH, EGARCH and GJR model and found no evidence of January effect or any other form of monthly seasonality in the first period, but the second period documented significant anomalous positive returns in the month of January, April, May and June while the month of March and July also recorded statistically significant negative return.

### Behavioural finance theory

Behavioural finance paradigm claims that investment adoptions are not always made on the basis of full rationality, but it is necessary to understand the investment market sensations. The theory is based on the alternative notion that investors are subject to behavioural biases that mean their financial decisions can be less than fully rational. As Curtis (2004) puts it, "sometimes we behave like perfect economic beings, but other times we behave like, well, human beings. We

make decisions on the basis that do not reflect real world facts". The attitude of an investor towards the risk associated with obtaining gains may be quite different from his attitude towards risk associated with losses. The underpinning consideration in investors' decision is what the extra return would be required to compensate for undertaking a risky investment? In an attempt to answer this question, the assumptions of both efficient market hypothesis and random walk hypothesis may be violated. This is due to cognitive behavioural psychology. This is in line with finding of La Porta et al. (1997) who argue that predictability of stock prices (returns) reflect the psychological factors, social movements, noise trading and fashion and fads of irrational investors in speculative markets. As such this theory underpins the study.

### METHODOLOGY

The study aimed at empirical analysis of Santa Claus rally on the Nigerian stock market returns. The study used quasi-experimental design and study focused on Nigerian stock market and uses All Share Index in the Nigeria Stock exchange to compute monthly returns. The population of the study constitutes one hundred and eighty quoted companies on the Nigerian Stock Exchange (NSE) covering different sectors as at 2016. Accidental sampling technique, a non-probability sampling method was employed. The study covered the period of thirty-two years from January 1985 to December 2016. This data is considered appropriate because Engle and Mezrich (1995) suggested that at least eight years of data should be used for proper GARCH estimation. This choice of this period is because there is lots of uncertainty in the market such as stock market crash that happened between 2008/2009 which affected not only the market but the Nigerian economy at large. Secondary source of data was used and the data were collected from central securities clearing system limited.

### Model specification

The return is computed using continuous compounding formula for each month of the year. The formula thus adopted is displayed below:

$$R_t = [\log(P_t) - \log(P_{t-1})]. \quad (1)$$

Where  $R_t$  is the return in period  $t$ ,  $P_t$  and  $P_{t-1}$  are the stock price on the ( $t$ ) month and ( $t-1$ ) month. This method of computing return has been used by many researchers among are Kiyamaz et al. (2003) and Umar (2013).

The study made non-linear regression model, that is, Generalised Autoregressive Conditional Heteroscedasticity GARCH (1,1) to address the autocorrelation problem and allow variances of errors to be time

dependent. In such a model, returns have the following stochastic process:

$$R_t = \theta_0 + \theta_1 Df_t + \theta_2 Dm_t + \theta_3 Da_t + \theta_4 Dm_t \dots + \theta_{11} Dd_t + \sum_{i=1}^n \alpha_i R_{t-i} + \varepsilon_t \tag{2}$$

$$h_t = a_0 + a_1 h_{t-1} + a_2 \varepsilon_{t-1}^2$$

Where:  $R_t$  is the log return of the market index at month  $t$ ,  $Df_t$ - $Dd_t$  represents the dummy or auxiliary variables from February to December which take value between 1 and 0: it is 1 on February and every other months is zero, it is 1 on February and every other month is 0, it is 1 on march and every other month is 0, up to December,  $\theta_1$ - $\theta_{11}$  represents the co-efficient of the dummy variable which measure the sign and size of the month-of-the-effect for the monthly returns. The co-efficient  $\theta_0$  measures the mean return for January,  $R_{t-1}$  is the value of the endogenous variable which capture the dynamic process, it eliminate the possibility of having autocorrelated errors,  $\alpha_i$  account for autoregressive component of the return,  $n$  is the number of lag order. Thus, error terms now have a mean of zero and a time changing variance of  $h_t[e_t(0, h_t)]$ . The study specified the conditional variance as a function of lagged values of both  $h_t$  as well as  $\varepsilon_t^2$ .

**Estimation procedures**

The descriptive statistics and residual diagnostic tests that were employed for this study are: Normality test, ARCH LM test, Autocorrelation test, heteroscedastic test and unit root test. The skewness and kurtosis are important characteristics in determining whether data follow a normal distribution or not. The correlogram Q-Statistic was be used to test the presence of serial dependence in the daily stock return series. The study conducted unit root test on the data using Augmented Dickey-fuller unit root. The test for the ARCH effect

serves as a diagnostic test to justify the application of GARCH-type models. The Quasi Maximum Likelihood Estimation (QMLE) was used to estimate the GARCH (1,1) because QMLE parameter estimates have been shown to be consistent and asymptotically normal (Straumann, 2005).

**RESULTS AND DISCUSSION**

This section explains the preliminary analysis, regression result and discussion of findings.

**Preliminary analysis**

Jarque-Bera statistic based on a significance level of 5% rejected the null hypothesis that monthly return is normally distributed (Figure 1). The stationarity test or unit root test was conducted using the ADF test; the result shows that the null hypothesis is rejected at 0.05level of significance (Table 1). The Autocorrelation Function results generated for up to 10 lags of the series. The p-values from the Q-Statistic test are significant for all lags which implies persistence in return series and presence of serial correlation (Table 2). The test result of the ARCH effect is reported in Table 3 with the p-value of Obs\* R-square for all monthly return less than 0.05. This indicates that ARCH effect exists in the monthly return series. Thus, the results of the preliminary analysis above violate the homoscedasticity assumption which suggests that innovations in the monthly returns are heteroscedastic, and these tests allow the monthly returns to be model on GARCH (1, 1).

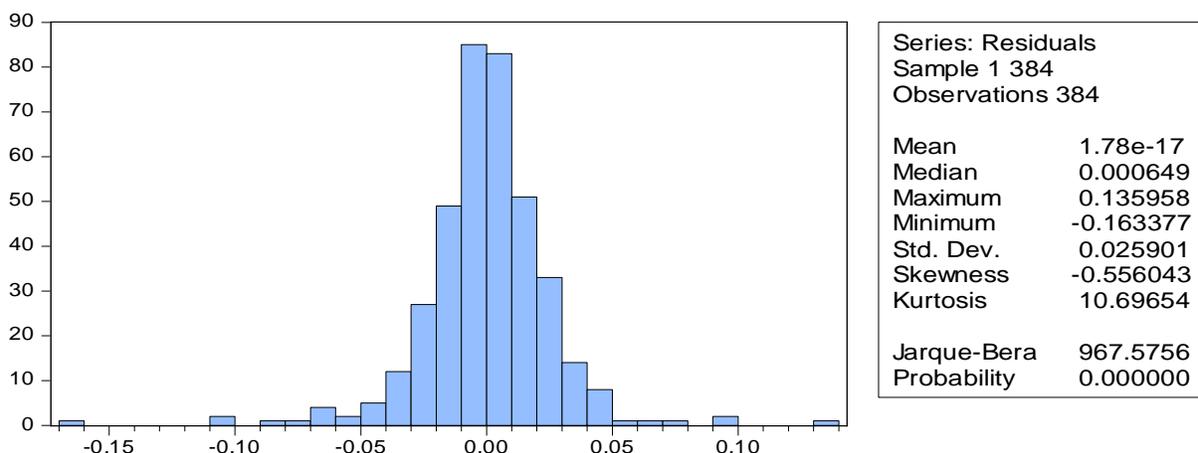


Figure 1. Normality test. Source: Computation from E-view Output (2017).

**Table 1.** Unit root test for monthly returns.

	<b>T- statistics</b>	<b>T-Critical</b>	<b>Probability</b>
Augmented Dickey fuller Test Statistics	-6.562975	-2.868948	0.0000

Source: Computation from E-view Output (2017).

**Table 2.** Autocorrelation test.

	<b>AC</b>	<b>PAC</b>	<b>Q-Stat</b>	<b>Prob</b>
1	0.151	0.151	8.8100	0.003
2	0.172	0.153	20.349	0.000
3	0.179	0.140	32.780	0.000
4	-0.052	-0.124	33.846	0.000
5	0.184	0.169	47.074	0.000
6	0.091	0.054	50.352	0.000
7	0.047	0.008	51.205	0.000
8	0.081	-0.008	53.788	0.000
9	0.111	0.122	58.621	0.000
10	0.136	0.088	65.992	0.000

Source: Computation from E-view Output (2017).

**Table 3.** ARCH-LM test for monthly return.

F-statistics	5.090214	Prob.	0.0246
Observed R-square	5.049473	Prob. Chi-square	0.0246

Source: Computation from E-view Output (2017).

**Table 4.** Regression result of GARCH (1,1).

<b>Variable</b>	<b>Generalized error distribution</b>	
	<b>Coefficient</b>	<b>Prob.</b>
Jan	0.011932	0.0002
Feb	0.007335	0.0176
Mar	0.008240	0.0043
Apr	0.006577	0.0187
May	0.006375	0.0045
Jun	0.009758	0.0005
Jul	0.006953	0.0140
Aug	0.008223	0.0053
Sep	0.003730	0.2652
Oct	0.010690	0.0010
Nov	0.010639	0.0015
Dec	0.006852	0.0333
AR(1)	0.355486	0.0000
a <sub>1</sub>	0.424272	0.0000
a <sub>2</sub>	0.578797	0.0000

Source: Computation from E-view Output (2017).

### Regression result of GARCH (1, 1)

The result of the regression is reported in Table 4. The

coefficients of the dummy variables measure the average deviation of the month of the year mean return from other months' mean returns. From the result the coefficient of all the months of the year are significant at 5% level of significance except September. It was observed that January exhibits highest return among the months of the year. The coefficients of both the ARCH and GARCH terms represented in the results as alpha and beta were strongly significant at 5% level and this shows appropriateness in the model. The coefficient of the autoregressive term is significant which implies that the monthly return in Nigerian stock market is dependent. This means that a specific month return depends on previous month return.

### DISCUSSION

From the study, it was found that there is absence of Santa Claus rally on the Nigerian stock market as the December return does not exhibit highest return among the month of the year instead the January exhibits highest return. This does not conform to the finding of Simbolon (2015). The explanation for this could be as result of Intergenerational Transfers Hypothesis which asserts the liquidity request during thanksgiving and

Christmas time (that is, December Period) is very high because sales of highly capitalized stocks do not depress their prices, because of their high liquidity. The result of the finding can also be explained from the perspective of Tax loss hypothesis which implies that in December investors sell stocks in which they have losses in order to lower their taxes on net capital gains. Also the result conforms to effect of Window of dressing.

## CONCLUSION AND RECOMMENDATION

The paper investigates the Santa Claus Rally on the Nigerian stock market return. The study employed GARCH (1,1) model to analyse the monthly return from January 1985 to December 2016. The empirical findings do not justify the claim of the Santa Claus Rally instead January effect on the Nigerian stock market return. Also, the study observed that the assumptions of Intergeneration and Tax-loss selling Hypotheses, and Window Dressing Effect hold in the Nigerian Stock Market. Thus, based on the findings, the study concluded that Santa Claus rally is nothing but a misleading impression of reality. In view of this, the study recommends that investors are advised to sell their stock in January since it exhibits highest return among the months of the year. The implication of this is that the investors can formulate their investment strategies and timing on the basis of this result and can earn some abnormal return by predicting future prices. The main contribution of the study is to identify the behaviour of monthly return and provide fresh evidence of Santa Claus Rally on the Nigeria stock market return.

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