AN EMPIRICAL TEST FOR SEMI-STRONG FORM EFFICIENT MARKET HYPOTHESIS OF THE NIGERIA STOCK MARKET

Abstract

A capital market is said to be efficient if new information are quickly reflected in stock prices. This study empirically examines how the prices of stocks listed on the Nigerian Stock Exchange quickly respond to monetary policy announcement. The daily All Shares Index and 41 monetary policy announcement from 2014 -2020 were used as proxy for stock prices and new information respectively. The Researcher adopted the event study methodology and a 21 day event window was constructed. That is 10 days before monetary policy announcement (-10) and 10 days after the announcement (+10) in addition to the event day. The average abnormal returns (AAR) and the cumulative average abnormal returns (CAARs) were computed and analyzed using the t-statistic to ascertain whether it is possible to earn abnormal return due to monetary policy announcement. The findings revealed that it was not possible to earn abnormal return due to monetary policy announcement. The implication of this result is that stock prices quickly adjust to new information (monetary policy rate announcement) therefore making it difficult for market participants to outperform the market.Thus, the Researcher concluded that the Nigeria stock market is semi-strong form efficient.

1 Introduction

One of the major reasons for investing in stocks quoted on the Stock market is to earn a return that will compensate for the consumptions forgone. The stock market offers a platform for procuring long term capital for both private and public organizations. Due to the role played by the capital market in providing investment opportunities and avenues for sourcing for capital, it is expected that it should be efficient. The reason is that, the efficiency of the stock market has a role to play regarding the expected returns on stocks traded in the market.

The economic condition of the stock market is commonly defined in relation to the efficiency of the stock market. A capital market is assumed to be efficient if the security's value is a reflection of an adequate calculation of its intrinsic value. This is usually seen in the light of security price responsiveness to information which in the long run translates to security return. From the

forgoing, if all the pertinent information is evidenced in the stock values, it will be a futile attempt trying to forecast price changes in the market thereby making it impossible to earn abnormal profits on portfolios. The reason is that, investors can earn only average return on their investment in an efficient capital market.

The behaviour of stock prices cannot be divorced from the efficiency of the capital market in pricing stocks and the relationship between stock values and volatility. Stock prices are usually sensitive to new information. The resultant effect of this sensitivity is what gives rise to volatility (Gbanador, 2021). Empirical evidence suggests that stock prices are specifically sensitive to macroeconomic pronouncements such as monetary policy announcement (see Chen & Xie, 2016; Connolly & Kohler, 2004; Ghani & Chaudhary, 2016). Thus, it is a major determinant of investors required rate of return which is what influences investors' investment decision.

The announcement of monetary policy directly influenced every aspects of the economy. Monetary policy deals with the measures in which the government regulate the volume of money in circulation in order to accomplish some predetermine macroeconomic objectives. The Central Bank of Nigeria (CBN) conducts monetary policy meeting after every two months (8weeks) for proper implementation, monitoring and control of the volume of money supply. The monetary policy decision of the CBN revolves around pronouncements concerning monetary policy rate, liquidity ratio, and cash reserve requirement for private and public sector deposits among others. The CBN uses monetary policy to realize stability in exchange rate, maintenance of balance of payment equilibrium, attainment of increased level of employment, promotion of high and accelerated economic growth and maintenance of domestic price stability.

The Weak Form Market Efficiency hypothesis asserts that the value of stocks is a reflection of past price data. Thus, it is assumed that investors cannot perform better than the market, since all players possess the same kind of data or information. That is stock values reflect all relevant information available in the record of previous values and volumes. The Semi-strong form market efficiency holds that stock prices adjust quickly to all publicly available information. The implication of this assertion is that using information that is available to the public, investors will find it impossible to earn abnormal returns. This is because new information will quickly or speedily be impounded into asset prices. Conversely, the strong form efficient market theory holds that security values reflect all available information from both public and private sources. Consequently, if the stock market is strong form efficient, it will not be possible to earn abnormal return even if an investor is privy to news that is not available in the public domain (Chandra, 2005; Fama, 1965; Gbanador, 2019).

Comment [A1]: No citation

The semi-strong form market efficiency is adopted for this study to test how quickly asset prices adjust to monetary policy rate pronouncement. The rationale behind our choice is because it is the most appropriate for testing the behaviour of stock prices towards public information like monetary policy rate announcement which is also the foundation upon which the theory is built. The other two variants of the efficient market hypotheses were not adopted because of the deficiencies noticeable in their possible adoption. The weak and strong form market theory tend to pose problems when it comes to the reaction of security prices to adjustments in monetary policy rates. For instance, the weak form market hypothesis suggests a slow adjustment period where abnormal return can still be earned long after information about adjustment in monetary policy rate arrive the stock market. Conversely, the strong form market theory suggests that all adjustments in monetary policy rate are expected and already reflected in the value of securities.

Comment [A2]: citation

Hence, the changes in monetary policy rate are anticipated and no more serve as news or surprises to the market.

As an emerging stock market, low market capitalization, thin trading, illiquidity, and low turnover rate experienced in the Nigerian capital market could be due to the level of efficiency of the market and other macroeconomic factors surrounding the operations in the market. Based on the efficient market theory, if the Nigerian capital market is semi-efficient, it is expected that it will be sensitive to monetary policy announcement by capturing the information in the prices of stocks thereby preventing possible earning of abnormal return.

However, lately, there have been issues concerning price manipulation by people with privileged information in the Nigerian stock market, a situation that led to the indictment of two stock broking firms (Fittco Securities Limited, Resort Securities and Trust Limited) and a stock broker (Salako, 2015). If a market is efficient, these manipulations will not yield any benefit that will enable the manipulators to perform better than the market.

1.1 Statement of the Problem

Capital market efficiency is built on information. If the market is efficient, it calls for less regulation but if it is inefficient it calls for more regulation. The market efficiency theory affirms that asset prices evidenced information about a security such that even those with privileged information cannot beat the market. This assertion alludes that if the Nigeria stock market is efficient, monetary policy rate announcement cannot be manipulated to earn abnormal return. The reason is that the relevant and available information is anticipated to have been captured in the security prices.

Monetary policy sends signals about the direction of interest rate. Based on these signals, the market forms an opinion about its expectations. Monetary policy rate (MPR) is the rate at which the banks borrow from the CBN. It is also known as the Discount rate. The MPR is a benchmark policy rate because it determines the rate at which commercial banks offer loans to their clients. The MPR is a perfect tool for controlling the volume of money in circulation. Thus, a shift in the monetary policy rate affects every facet of the economy including the stock market. The connection between the monetary policy rate adjustment and asset prices is inverse. An increase in the MPR is expected to lead to a decline in asset prices ceteris paribus. This relationship is further connected to the real economy. The reason being that the influence of monetary policy rate on security values is linked to its impact on interest rate, inflation, volume of money supply and the anticipations of market participators about the future performance of the economy.

Comment [A6]: No citation

The problem that the study will investigate is; if the capital market is efficient in the semi-strong form, will it be possible to earn Average Abnormal Return (AAR) or Cumulative Average Abnormal Return (CAAR) due to monetary policy announcement? The implication is that, if the capital market is efficient, it will be impossible to earn AAR or CAAR due to monetary policy rate announcement or any profitable announcement.

Comment [A7]: The problem is not well situated. This is already concluded that there are abnormal return but just trying to know whether it is cumulative or average.
The problem in the capital market should be articulated from the performance of the stock and the returns generated... What was the expectation and how did the market reacted to the MPR announcements? In the last five years, have there been possible indications of abnormal gains or otherwise? This should situate the problem adequately

Majority of the studies conducted using the Nigerian Stock Exchange data tend towards the weak form market theory which stipulates that security prices reflect all relevant information in the record of previous prices and volumes. However, only a very few amongst the studies conducted on the Nigerian stock exchange are built on the semi-strong market theory (see Adelegan, 2009; Ajayi and Ogbulu, 2017; Onoh and Nkama, 2016). Also, none of these studies examined if the Nigerian Stock Market responds efficiently to Monetary Policy rate announcement by capturing this information in security prices to avoid possible earning of abnormal return.

Comment [A8]: This is not absolutely correct. There are studies that have conducted this.

From the foregoing, this study is built on testing how the Nigerian Security market adjusts to monetary policy announcement using the event study methodology. As an event study it analyzes the behaviour of stock prices around the event. Thus, it will reveal if the Nigerian capital Market is Semi-strong efficient.

2. Literature Review

The theory upon which this study is anchored is the efficient market hypothesis. Fama (1965) developed the efficient market hypothesis which hinges on the work of Bachelier (1900) and Kendall (1953). The efficient market hypothesis postulates that if the market is efficient, stock prices will fully reflect all relevant and available information about the stock such that even those with privilege information will find it difficult to beat the market consistently.

The efficient market hypothesis has three variants namely; the weak form, semi-strong form and strong form market hypothesis. The *weak form market hypothesis* posits that stock prices reflect past price data and volume. As a result, it will be impossible to outperform the market using this information because all investors have the same sets of information. *Semi-strong form market hypothesis* asserts that stock prices reflect all public available information. By so doing, it will be impossible to beat the market using publicly available information since stock prices quickly react to public information. Finally, the *Strong form market hypothesis* states that stock prices reflect all private and public available information. Thus, it will be impossible for even those with privilege information to outperform the market (Gbanador and Gbanador, 2018).

Another theory upon which this study is built is the signalling theory. As in the signalling theory propounded by Miller and Rock (1985), it stipulates that because of the asymmetry of information between the managers and investors, firms usually employ different announcements

as a signal to send useful information to the general public such as dividend announcement. Other information like monetary policy announcement rate, presidential election date announcement, stock split and merger announcement also give signals that influence the security market.

The CBN possess more information about the economy and its performance than the general public. This situation breeds the issue of asymmetry of information. As a result, the public observed the actions or pronouncements by the CBN over time as a means that signals the transmission of useful information. It is expected that monetary policy signals have effect on the capital market performance. The policy decision of the CBN's Monetary Policy Committee after each meeting send signals to the market which exerts influence on stock prices.

Hussain (2011) conducted a study to examine how monetary policy announcement influence the European and United States stock indexes returns and volatilities are influenced by monetary policy shocks. The research showed that monetary policy shocks on security indexes react quickly and vanishes within 5-10 minutes after announcement.

Bonfim (2003) examines the influence of pre-announcement and the effect of news on monetary policy decision on the United States market within the period of 1989-1998. The findings of the study revealed that the US capital market is silent prior to policy announcements. In a study conducted by Raman (2012) to x-ray the influence of monetary policy on the security returns, the event study methodology was used for the study using a 3l day event window and a 250 day estimation period. The findings from the study showed that monetary policy possess a significant influence on security prices.

Abdioglu and Aytekin (2016) examined whether the monetary policy committee decisions of the Central Bank of the Republic of Turkey have impact on the stock returns of the Deposit Banks quoted on Borsa Istanbul Bank Index. The research work utilized the event study methodology using the index data from 2008 to 2012. Findings from the study revealed that monetary policy announcements influence the Cumulative Abnormal Returns of the index within the period of study.

In a study conducted by Mandura and Schnusenberg (2000), the findings revealed a negative connnection between bank security returns and the US Federal Reserve monetary policy rate. Similarly, Born and Moser (1990) adopted the event study approach to examine how Bank security returns respond to Fed's change in policy rate. The findings indicated that a rise in the policy rate gave rise to a decreasing trend in both pre-event and post event windows.

Rahman, Mohsin and Rivers (2014) did a study to investigate the effect of monetary policy rate fluctuations on bank security return in Pakistan utilizing daily security returns from 1998 to 2011. The study adopted the event study methodology with a 31 days event window. Findings from the study indicated that monetary policy rate significantly influence Banks' stock prices and returns. Similarly, Vaz, Ariff and Brooks (2008) did a study to examine how public announcement about modifications in the official interest rates influence banks' security returns in Australia between 1990 and 2005. The event study methodology was utilized for the study and the findings show that official interest rates announcement does not negatively influence the security returns of Australian Banks. These findings tend to tally with dividend valuation theory which asserts that security return need not to be negatively impacted if income effects dominate.

Chen and Xie (2016) conducted a study to examine the responsiveness of China's stock market to monetary policies. The event study methodology was adopted and the study reveals varying

degrees of responses from Shanghai and Shenzhen stock market when the policies were introduced. However, the effects vanished on the third trading day after its enactment.

In a study conducted by Ghani and Chaudhary (2016) to evaluate the semi-strong market theory, by testing the influence of monetary policy announcement on Pakistan Stock Market from 2014 to 2015. The event study procedure was utilized for the research and the market model was employed to determine the expected returns. The results obtained from the computations on Cumulative abnormal return and Aggregate abnormal return revealed notable influence of all the monetary policy announcements on banks asset returns in Pakistan.

3. Methodology

The methodology employed in this study requires the selection of variables for the population, sample of the study and data collection procedure. The researcher adopted the ex-post facto and the historical data research design for this study. The ex-post facto design was employed to establish the cause and effect relationship amongst the variables while the historical research design was adopted due to the nature of the sources of data used for the study.

The study is more of a population study because the daily All Shares Index (ASI) which is a weighted average of all quoted stocks on the Nigeria stock exchange is adopted for the study. The duration of this research is basically from January 1, 2014 to December 31, 2020 which is in the range of 7years and equivalent to 1820 trading days. This duration is used because it is detailed enough to give a good result and analysis while using econometric tools.

The event study methodology as developed by Fama, Fisher, Jensen and Roll (1969) and re-examined by Brown and Warner (1985) was adopted for this study.

**The procedure for conducting an event study is as follows:**

(a) Identification of an event and constructing the event window

The first step we adopted in this study was to identify the event of interest after which we constructed the event window. The event of interest is monetary policy rate pronouncement and the event window reckons with monetary policy announcement dates from January 1, 2014 to December 31, 2020. Monetary Policy Committee (MPC) usually holds their meeting after 2 months (8 weeks) to make decision about the monetary policy to adopt. Reckoning with the event window, the MPC have announced monetary policy rates 41 times within the periods selected for the study. Recall, the stock market reacts to announcement about an event rather than the event itself. This is because market watchers construct their portfolio of assets based on anticipated news about an event.

(b) Collection of returns data around the announcement date

At this stage, daily data around the announcement date were collected and decision about the return window was made. The determination of the duration of the estimation period and event window is subject to the researcher's discretion (Brown and Warner, 1985; Mackinlay, 1997 and Fama *et al*, 1969). In this study, returns were calculated daily. The number of periods used in calculating the return before and after the event date were 10days before and 10days after the monetary policy announcement.

Figure 1: The Return Window

$R_{j\,-10}$　　　　　　　　$R_{j\,0}$　　　　　　　　$R_{j\,+10}$

Pre-event window　　　Event date　　　Post event window
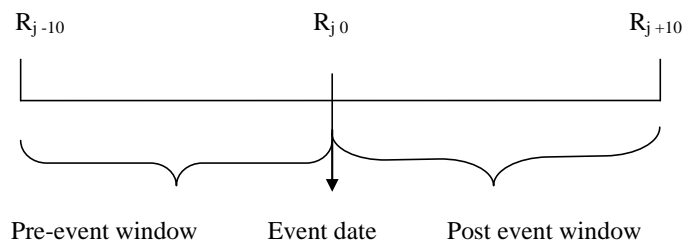
Where:

R_j = return for ASI for period t

(c) **Calculation of the abnormal returns by period, around the pronouncement date for the ASI**.

The constant mean return model (statistical model) was adopted for this study. This is in line with the framework used by Campbell, Lo and Mackinlay (1997), Chowa, Nyannete and Mhlanga (2014), Chan-Lau (2001) and Brown and Warner (1980). The reason for choosing this model is because of its robustness, simplicity and its ability to produce results that is similar to that of complex models.

$$E(R_{jt}) = R_{jt} + E_{jt} \quad \text{...(1)}$$

Where:

ER_{jt} = the expected return of ASI at time t relative to the event (expected return)

R_{jt} = the normal return of j at time t. (actual return)

$E_{j,t}$ = abnormal return (unexpected return)

Therefore;

$$E_{j,t} = E(R_{jt}) - R_{jt} \quad \text{………………………………...………………………………(2)}$$

(d) Calculate the average and the standard error of the abnormal return.

The average excess return reckons with the pattern of excess return for the monetary policy announcements within the periods of study. Thus, the daily cross sectional average was employed to compute the AAR and CAAR used in evaluating the hypotheses. This implies that for a sample of n events, the average excess return was computed using the following formula:

AAR or $\bar{r}_t = \sum_{t=1}^{n} \frac{E_{jt}}{N}$ ……………………………………………......... (3)

Where $\bar{r}_t$ = Average abnormal return (AAR)

E_{jt} = abnormal return (unexpected return)

N = period

Alternatively, the cumulative average abnormal return (CAAR) was utilized to determine the abnormal returns. The formula for CAAR is given as:

CAAR = $\sum AAR_t$……………………………………………..…..(4)

Where:

CAAR = Cumulative Average Abnormal Return

(e) **To assess whether the abnormal returns around pronouncement date are different from zero**.

The test of hypothesis examined whether there is a zero Average Abnormal Return at time t. This is expected to reveal how the market responds to monetary policy rate announcement. In a situation whereby, monetary policy is anticipated, it is normal for some traces of excess earning to show up within the pre-event window. However, in conducting a test for market efficiency, the behaviour of post event returns and the speed at which the market incorporate the information into the stock prices is the mainstay of the analysis.

The average abnormal returns and the cumulative average abnormal returns for all the trading periods in the event window were analyzed using t-test to examine whether the abnormal returns around the pronouncement date are significantly different from zero. The reason is that, if the market is semi-strong efficient, the excess return is expected to be zero. This was done by estimating the t- statistic for each period.

T statistic for abnormal return of period t $= \dfrac{\text{Average abnormal return}}{\text{Standard error}}$ or $\dfrac{AAR_t}{\frac{\sigma}{\sqrt{n}}}$ ……….............. (5)

T statistic for abnormal return of period t $= \dfrac{\text{Cumulative Average abnormal return}}{\text{Standard error}}$ or $\dfrac{CAAR_t}{\frac{\sigma}{\sqrt{n}}}$ …........ (6)

If the t-statistic is significantly different from zero, then the null hypothesis will be accepted.

4.1 Data Presentation and Analysis

This subsection contains the tabular presentation of the data used in our analyses. The tables are labelled Table 1 to 2 as follows:

Table 1: Average Abnormal Return and t-test Result during the testing period

Event window	AAR 2014	AAR 2015	AAR 2016	AAR 2017	AAR 2018	AAR 2019	AAR 2020	AAR	STD	STD ERROR	t-stat	Sig
-10	0.002229	-0.011440	0.007937	0.001992	0.0062049	0.005664	-0.002898	-0.000056	0.006853	0.002590	-0.021497	No
-9	-0.011605	-0.009076	0.006320	0.000749	0.0015554	0.000447	0.002138	-0.001353	0.006480	0.002449	-0.552481	No
-8	-0.000826	-0.000633	-0.015554	0.005920	-0.0057953	-0.001092	-0.009137	-0.003874	0.006967	0.002633	-1.471057	No
-7	0.001974	0.016377	0.001005	0.003150	0.0016895	0.002008	-0.001279	0.002660	0.006351	0.002400	1.108293	No
-6	0.001323	-0.016930	-0.003653	-0.003885	-0.0009812	0.001131	-0.000268	-0.003570	0.006190	0.002340	-1.525849	No
-5	-0.002726	-0.005279	0.001772	0.001895	0.0002589	0.000127	0.000538	-0.001257	0.002286	0.000864	-1.454998	No
-4	-0.000710	-0.004235	0.000012	0.001229	0.001328	0.000632	0.001664	-0.000015	0.002036	0.000770	-0.019108	No
-3	-0.000082	0.004392	0.004760	0.002451	0.0067932	0.008986	0.004335	0.001928	0.005286	0.001998	0.965014	No
-2	0.004083	0.003519	0.005845	0.002991	0.002765	0.000379	0.005675	0.003500	0.002098	0.000793	4.413230	Yes
-1	-0.000728	0.008390	0.001138	0.003002	0.0034787	0.006161	-0.000546	0.000094	0.004682	0.001770	0.053288	No
0	**0.005967**	**0.004358**	**0.006691**	**0.003486**	**0.0011395**	**-0.003525**	**-0.001403**	**0.001392**	**0.004352**	**0.001645**	**0.846107**	**No**
1	0.001837	0.004060	0.009213	0.010288	0.0015414	0.000329	-0.002974	0.003377	0.004867	0.001839	1.835730	No
2	0.001288	-0.000764	0.002127	0.002942	0.003333	0.000597	-0.004282	0.000578	0.002673	0.001010	0.572246	No
3	0.006206	0.006333	0.000208	0.004880	-0.0013853	0.004986	0.003405	0.003519	0.003005	0.001136	3.098495	Yes
4	-0.001001	-0.000352	0.008795	0.006716	0.0033487	0.003024	-0.001879	0.003588	0.003092	0.001169	3.070375	Yes
5	-0.003862	0.006035	0.004335	0.000688	0.0070507	0.004378	0.004322	0.002040	0.004637	0.001753	1.163625	No
6	-0.000339	0.015573	0.004504	0.010216	0.005141	0.006614	-0.001933	0.005682	0.005989	0.002264	2.510377	Yes
7	0.005996	0.009325	0.001024	0.007994	-0.0022213	0.00232	-0.00189	0.003221	0.004639	0.001753	1.837106	No
8	0.004359	0.002850	0.004749	0.007248	0.0088781	0.005521	-0.005215	0.001519	0.006090	0.002302	0.659904	No
9	0.003165	0.002925	0.004921	-0.002352	0.0019445	0.003789	0.000254	0.001537	0.002887	0.001091	1.408452	No
10	0.001017	-0.003743	0.003251	-0.005240	-0.006128	0.000694	-0.002403	-0.000538	0.003976	0.001503	-0.358223	No

Source: Researcher's Computation

Figure 2: Average Abnormal Return (AAR) Graph
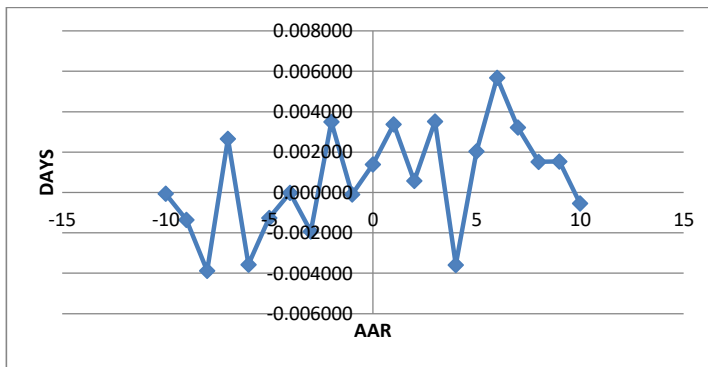
This interpretation is based on the provision of the decision rule. The essence is to test for the semi strong market efficiency of the Nigerian Stock Exchange. Thus, we examine if there exist any significant difference between Average Abnormal return before and after monetary policy rate announcement. From Table 1 and Figure 2, the result shows that the Average Abnormal Returns before the event announcement date are not statistically significant including the event date. However, the AAR during the post event window showed an inconsistent pattern (Random walk) which is consistent with theory (see Connolly and Kohler 2004; Fama *et al*, 1969 and Gbanador, 2019). Thus, for every period in which the market tends to be bullish, there was a quick reversal of what would have been a positive AAR earned within the post event window. Hence, we accept the null hypothesis which stipulates that there is no significant difference between Average Abnormal Return before and after monetary policy announcement. Based on this result, it could be deduced that investors can not earn abnormal return due to monetary policy announcement. The implication of this result is that new information (monetary policy

announcement) quickly incorporates into the prices of stocks listed on the Nigerian Stock Exchange. If we relate this result to the efficient market hypothesis, the interpretation of the result is that the Nigeria Stock Market is semi-strong efficient.

In an attempt to validate the above result, the Cumulative Average Abnormal Return was utilized to see if the result will be at variant with the result obtained from the Average Abnormal Return. The outcome is as shown in Table 2.

Table 2: Cumulative Average Abnormal Return and t-test Result during the testing period

Event window	CAAR 2014	CAAR 2015	CAAR 2016	CAAR 2017	CAAR 2018	CAAR 2019	CAAR 2020	CAAR	STD	STD ERROR	t-stat	Sig
-10	0.002229	-0.011440	-0.007937	0.001992	0.006205	0.005664	0.002898	-0.000056	0.006853	0.002590	-0.021497	No
-9	-0.009376	0.020516	0.001617	0.002741	0.00776	0.006111	-0.005036	0.001409	0.010231	0.003867	-0.364331	No
-8	-0.010202	0.021149	0.017171	0.008661	0.001965	0.005019	-0.004102	0.005283	0.011341	0.004287	-1.232384	No
-7	-0.008228	0.004772	0.016166	0.005511	0.003655	0.007026	-0.005381	0.002622	0.008424	0.003184	-0.823656	No
-6	-0.006905	0.021703	0.019820	0.001625	0.002673	0.005895	0.005114	0.006192	0.010907	0.004122	1.502126	No
-5	-0.009631	0.026982	0.018048	0.000270	0.002415	0.006022	0.005652	0.007449	0.011777	0.004451	1.673570	No
-4	-0.010341	0.031217	0.018060	0.000959	0.003742	0.006654	0.003988	0.007464	0.013495	0.005101	1.463364	No
-3	-0.010423	0.026825	0.013300	-0.001491	-0.003051	0.002332	0.008323	0.009392	0.008887	0.003359	2.796162	Yes
-2	-0.006340	0.023306	0.007455	0.001500	-0.000286	0.002711	0.002648	0.005892	0.008293	0.003134	1.879943	No
-1	-0.007068	0.014916	0.008593	0.004502	-0.003764	0.008872	0.003194	0.005987	0.006038	0.002282	2.623040	Yes
0	-0.001101	0.010558	0.001902	0.001016	-0.002625	0.012397	0.004596	0.004595	0.005021	0.001898	2.421207	Yes
1	0.000736	-0.006499	0.007311	0.011305	-0.001084	0.012725	-0.007571	-0.001218	0.008505	0.003215	-0.378937	No
2	0.002024	0.007263	0.009437	0.014247	0.002249	0.013322	0.011852	0.000640	0.010559	0.003991	0.160352	No
3	0.008230	-0.000929	0.009645	0.019127	0.000864	0.008336	0.008448	0.002879	0.010092	0.003814	0.754796	No
4	0.007229	0.001281	0.000851	0.012411	-0.002484	0.011361	0.010327	0.000709	0.008632	0.003262	0.217281	No
5	0.003368	0.004753	-0.003484	0.013099	0.004566	0.006983	0.006005	0.001331	0.007199	0.002721	0.489071	No
6	0.003029	0.020327	0.001021	0.023315	0.009707	0.000369	0.007938	0.007013	0.011402	0.004310	1.627269	No
7	0.009025	0.029652	0.002044	0.031309	0.007486	0.001951	0.009828	0.010234	0.015102	0.005708	1.792967	No
8	0.013384	0.032502	0.006793	0.038557	-0.001392	0.007472	0.015043	0.011753	0.018643	0.007046	1.667963	No
9	0.016549	0.035426	0.011714	0.036205	-0.003337	0.011262	-0.01479	0.013290	0.018696	0.007066	1.880715	No
10	0.017566	0.031683	0.008463	0.041445	-0.009465	0.011956	0.012387	0.012752	0.019788	0.007479	1.704939	No

Source: Researcher's Computation

Figure 3: Cumulative Average Abnormal Return (CAAR) Graph
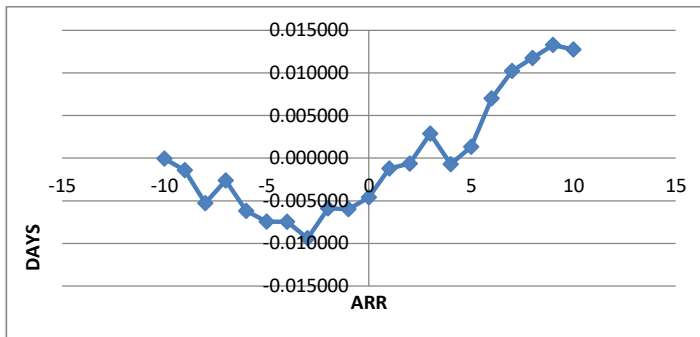
This interpretation is based on the provision of the decision rule. The essence is to test for the semi strong market efficiency of the Nigerian Stock Exchange. Thus, we examine if there exist any significant difference between Cumulative Average Abnormal return before and after monetary policy rate announcement. From Table 2, the result shows that the Cumulative Average Abnormal Returns before and after the event announcement date are not all statistically significant. The market seems to be bullish between the 1st and 3rd day to the news but the CAAR values were all negative. This gives an impression that the market anticipated that the Monetary Policy Committee will make announcement that will be unfavourable to the market. However, the market made some corrections by reversing the likely excess returns earned when the market was bullish within the pre-event window. The CAAR on the event day was significant. The situation remains like that until the first day into the post event window. The market later corrected itself by reversing the possible excess return earned on the first day of the post event period after which the results were insignificant throughout the rest of the post event window. Based on this result, it could be deduced that investors can not earn abnormal return due to monetary policy announcement. The implication of this result is that new information (monetary policy announcement) quickly incorporates into the prices of stocks listed on the Nigerian Stock

Exchange. If we relate this result to the efficient market hypothesis, the interpretation of the result is that the Nigeria Stock Market is semi-strong efficient. This result is consistent with Mackinlay, (1997), Connolly and Kohler (2004) and Vaz, Ariff & Brooks (2008).

5 Conclusion

If the capital market is semi-strong efficient, it is expected that share prices will adjust quickly to new information such that investors cannot outperform the market using such information. The implication of this assertion is that if the Nigeria stock market is semi-strong efficient, it will be impossible to earn Average Abnormal Return and Cumulative Average Abnormal Return due to the announcement of new monetary policy rates by the monetary policy committee.

The test for semi strong efficient market requires a measure of abnormal earning due to new information. Thus, it requires the deduction of actual returns from expected returns over the event window to get the abnormal return (see Mackinlay, 1997; Chandra, 2005; and Fama *et al,* 1969). This led us to test the semi strong market efficiency by examining the Average Abnormal Return and the Cumulative Average Abnormal Return to evaluate the performance of the Nigeria stock market after news about monetary policy rate is publicized.

The outcome of our analysis suggests that market participants seem to have anticipated the proposed monetary policy rate. This is because the CBN seem not to be independent, thus, serve as a political stooge of the government. This possibly made the market not to pay attention to the CBN's monetary policy announcement. However, the result from Figures 2 and 3 indicated no established pattern because the market was able to capture the announcement.

Based on the results obtained from the hypotheses, we could deduce that investors cannot earn abnormal return due to monetary policy announcement. The implication of this result is that new

information (monetary policy rate announcement) cannot be manipulated by investors to outperform the market. Thus, the Nigerian Capital Market is semi-strong efficient.

6 **Recommendations**

Based on our findings, the following recommendations were made:

i. Regulators should not interfere much in the operations of the market because the market is semi strong efficient.

ii. The government should encourage and sponsor capital market research. This will go a step forward to reveal the various aspects of the market and its activities that need attention in order to enhance market efficiency.

iii. The SEC and other related agencies of government should keep close surveillance on the Nigeria stock market to avert possible insider abuse.

REFERENCES

Abdioglu. N. and Aytekin, S. (2016). The role of monetary policy announcements on Turkish banks stock returns. *Emerging Markets Journal, (6)*1, 63-69.

Adelegan, O.J. (2009). Price reactions to dividend announcements on the Nigerian stock market. *African Economic Research Consortium*, 188, 1-33

Ajayi, J.A. and Ogbulu, O.M. (2017). Test of the semi-strong market efficiency theory in the Nigerian stock market: An empirical analysis. *Journal of Finance and Accounting, 5*(4), 139-146.

Bachelier, L. (1900). Theorie de la Speculation. Paris; Gauthier –Villar. Reprinted English in Cootner, P (1964). *The Random Character of stock Market Prices. (ed)* Cambridge: M.I.T.

Bomfim, A. (2003). Pre-announcement effects, news effects and volatility: monetary policy and the stock market. *Journal of Banking and Finance*, 27(1), 133-151.

Born, J.A. and Moser, J.T (1990). Bank equity returns and changes in the discount rate. *Journal of Financial Services Research*, 4(3), 223-241.

Brown, S.J. and Warner, J.B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics,* 14, 3-31.

Brown, S.J. and Warner, J.B. (1980). Measuring security price performance. *Journal of Financial Economics,* 8, 205-258.

Campbell, J.Y, Lo, A.W and Mackinlay, A.C. (1997). *The Econometric of Financial Markets.* Princeton: Princeton University Press.

Chandra, P. (2005). *Investment analysis and portfolio management.* New Delhi: Tata McGraw Hill Publishing Company Limited.

Chan-Lau, J.A. (2001). *Corporate restructuring in Japan: an event study Analysis.* International Monetary Fund, WP/01/202, 1-14.

Chen, X and Xie, D. (2016). *How responsiveness is China's stock market to the monetary policies.* Proceedings of the International Multi Conference of Engineers and Computer Scientists, Hong Kong, 2, 16-18.

Chowa, T., Nyanhete, A.I. and Mhlanga, R. (2014). An event study of the Zimbabwe stock exchange (ZSE): implication for post–dollarisation market efficiency. Mediterranean *Journal of Social Sciences, 5*(3), 273- 282.

Connolly, E. and Kohler, M (2004). News and interest rate expectations: A study of six Central Banks, Group E & Australia. RBO (Eds). Reserve Bank of Australia.

Fama, E.F. (1965). "The Behaviour of Stock-Market Prices". *Journal of Business*, 38(1), 34-105.

Fama, E.F., Fisher, L., Jensen, M.C. and Roll, R. (1969). The adjustment of stock prices to new information. *International Economic Review*, 10(1), 1-21.

Gbanador, M.A. (2019). *An Empirical Test for Semi-Strong form efficient market hypothesis of the Nigeria Stock Market*. (Unpublished PhD Thesis, University of Uyo).

Gbanador, M.A. (2021). Test for semi strong form efficient market hypothesis of the Nigerian stock market "ASUP 6th National Conference on unmasking the potentials of Polytechnic education in addressing technology and socio-economic deficiency in Nigeria." Port Harcourt Polytechnic 30th June-3rd July, 120 -128.

Gbanador, M. A and Gbanador, B.N. (2018). An Empirical Analysis of Capital Market as a tool for economic growth in Nigeria. *IIARD International Journal of Economics and Finance Management*. 3(3), 59-68.

Ghani, M. and Chaudhary, G.M. (2016). Stock market response to policy announcement: evidence from banking sector of Pakistan. *Developing Country Studies, 6*(1), 1-14.

Hussain, S.M.(2011). Simultaneous monetary policy announcements and international stock markets response: An intraday analysis. *Journal of Banking and Finance*, 35(3), 752-764.

Kendall, M.G. (1953). "The Analysis of Economic Time-Series, Part 1: Price: *Journal of Royal Statistical Society*, 96, 11-25.

Mackinlay, A.C. (1997). Event studies in economics and finance. *Journal of Economic literature, 35*(1), 13-39.

Madura, J.A. and Schnusenberg, O (2000). The effect of Federal Reserve Policies on bank equity returns. *Journal of Financial Research*, 23, 421-447.

Miller, M.H. and Rock, K. (1985). Dividend policy under asymmetry information. *Journal of Finance*, 40(4), 1031-1051.

Onoh, J.O. and Nkama, N.O. (2016). Semi-strong market efficiency studies of the Nigerian capital market using dividend announcements. *Journal of Business and African Economy*, 2(1), 22-42.

Rahman, H., Mohsin, H.M. and Rivers, P.A. (2014). The effect of policy rate changes on Bank stock returns in Pakistan. *Journal of Finance and Economics,* 2(4), 1-16.

Salako, T. (2015). *SEC expels Stockbrokers over fraud, market manipulations*. The Nation, October 7. www.thenationonlineng.net.

Vaz, J.J., Ariff, M. and Brooks, R.D. (2008). The effect of interest rate changes on Bank stock returns. *Investment Management and Financial Innovations*, 5(4), 221-236.