CURRENCY DEVALUATION ANNOUNCEMENT AND SHARE PRICES OF DEPOSIT MONEY BANKS IN NIGERIA

BY

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P13ADBA8017

A DISSERTATIONSUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF SCIENCE (M.Sc.) DEGREE IN BUSINESS ADMINISTRATION.

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ZARIA

SEPTEMBER, 2016

Declaration

I declare that the work in this dissertation entitled “Currency DevaluationAnnouncement and Share Prices of Deposit Money Banks in Nigeria” has been performed by me in the Department of Business Administration. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma in this or any other institution.

Nurudeen JIMOH	----------	----------
Name of Student	Signature	Date

Dedication

This dissertationis dedicated to my lovely parents for their parental guidance, patience and prayers throughout the course of this program

Certification

This dissertation entitled“CURRENCY DEVALUATIONANNOUNCEMENT AND SHARE PRICES OF DEPOSIT MONEY BANKS IN NIGERIA”by Nurudeen JIMOH meets the regulations governing the award of Master of Science (M.Sc.) Degree in Business Administration of the Ahmadu Bello University Zaria, and is approved for its contribution to knowledge and literary presentation.

Dr. Yusuf Abdullahi
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ACKNOWLEDGEMENTS

All praises are due to Allah, the Master of the universe, the Omnipotent for His uncommon favours on me. He alone is the Merciful, the Giver of Knowledge and Wisdom. To Allah, I say*ALHAM-DU-LI-LLAH*.

My profound appreciation goes to my able supervisors in persons of Dr. Yusuf Abdullahi and Dr. Salisu Abubakar who are the brain behind the success of this dissertation and may Allah reward you all abundantly. I also wish to acknowledge the Head of Department, Professor-Bello Sabo, the M.Sc Coordinator, Mal. Masoud Garba and the assistant coordinator, Malam Ibrahim Muhammad for their immense assistance, encouragement and support towards the successful completion of this dissertation. "*Jazakumu LLahu Bilkahir*". The same goes to all my lecturers who have assisted in one way or the other, may Allah Almighty reward them abundantly.

My sincere appreciation further goes to my lovely parents, Alhaji Jimoh Ilyas Alao and Hajiya Taibat Usman for their support and prayers, may Allah continue to guide and protect you and keep you to reap the benefits of your hard labour (Ameen). The same goes to all the members of my family; I thank you all for always being there for me "*Jazakumu LLahuBilkahir*".

A number of persons have assisted in the course of this program; worthy of mention is Nazifi Aliyu, Abdulfatai Jaiyeola, Suraj Abubakar Gambo, Nasiru Saidu Musa, Ramatu Muhammad, Eng. Mudassir Shitu, Lawal Muhammad, Aminu Garba, Idris Muhammad, Salisu Bashir Gwangwazo, Aliyu Tsoho, Abdulkarim Ibn Shuaib, Umar Farouk Abdulkarim, Chrest Azubuike and lots of others whose names could not be mentioned here.May Allah in His infinite mercy reward you all abundantly;indeed, you have all contributed enormously to the success of this program.

This acknowledgement would not be complete without conveying my heartfelt appreciation to an important person in my life, my beloved one (Dr. Meena Abdulrazak) who touched my heart and gave me strength to move forward to a higher level. The person who encourages and believes in me when no one else does; Thank you for everything, May Almighty continue to increase you in wisdom and knowledge and elevate you among your contemporaries (Ameen).

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Abstract

The sudden announcement of the devaluation of the Nigerian Naira to US Dollar by the Central Bank of Nigeria (CBN) on the 25th November 2014 has created an intense debate and a great deal of mix responses among market analysts and the general populace. However, available opinions on the degree of effects such announcement might have on Deposit Money Banks (DMBs) stock prices can at best be adjudged as a mere presumption and not an outcome of empirical investigation. This study empirically examined Naira devaluation announcement of the 25th November 2014 and share prices of Deposit Money Banks in Nigeria. Employing the standard event study methodology and correlational design on a sample of thirteen out of the sixteen registered DMBs with the Nigeria Deposit Insurance Commission (NDIC) and listed on the Nigerian Stock Exchange that traded on the historic day. The study ascertained the significance of cumulative abnormal return on the fifteen trading days prior to the announcement, day of the announcement and fifteen trading days succeeding the announcement day. The study documented a statistically non-significant cumulative abnormal return of 0.9078 percent on the fifteen trading prior to the announcement. The study also established the presence of statistically significant cumulative abnormal return of 0.6851 percent and 3.0982 percent on the announcement day and fifteen trading days after the announcement. The study concluded that the sudden announcement of Naira devaluation led to positive market reaction by investors of DMBs in Nigeria and the positive trend continued for fifteen trading days succeeding the announcement. The study recommended that import substitution policy should be implemented to ensure persistent of the positive returns as this would encourage an upsurge in the foreign portfolio and increase the liquidity base of the Deposit Money Banks as well as the Nigerian Stock Exchange. This would enhance their readiness to lend to the real sector of the nation's economy.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In all economies, banks are the principal players in financial market for the intermediation of funds from the surplus economic units to the deficit units for productive and investment purposes and as such, the relevance of Deposit Money Banks (DMBs) in the Nigerian financial system cannot be over emphasized. Taylor (1998) posited that globally, a number of nations had at one time or another devalued their currencies. The main motive for devaluation in most of these countries is that fixed exchange rate was upheld by these nations over a period of time which eventually became unsustainable.

Theoretical evidence suggests that fixed exchange rates reduce exchange rate risk as far as the exchange rate remains fixed. Thus, if the supply of a country's currency surpasses the demand for the currency, the currency will be forced to decline in value. Also, if a country imports more goods than it exports, there will bepressure on the currency to devalue. However, if the deficit in trade is counterbalance by capital inflows into the country for investment purposes, the country can maintain the trade deficit without being forced to devalue. Though, if the capital inflows are no more obtainable, the available option for the country to avoid devaluation is by buying or supporting its own currency in the market through its currency reserves in order to augment the meagre capital inflow, but once currency reserves run out thendevaluation becomes unavoidable (Taylor, 1998).

Emerging economies such as the Nigerian economy is not an exemption from the above global scenario, as the Nigerian government was forced to devalue its Naira due to the sharp decline in the global oil prices which serves as the major source of capital inflow for the

nation. Moreover, the inability of the apex monetary authority to sustain her defence of the Nigerian Naira via the nation's external reserves which was on a serious decrease also precipitates the devaluation. In this regard,Emefiele (2015) argued that the Central Bank of Nigeria (CBN) had to devalue the naira to protect the reserves. This is due to the fact that the CBN has spent a substantial amount of its reserves in shoring up the naira and in contrast, inflow of foreign exchange(FOREX) into the banks or the country has been less than anticipated in view of dwindling oil prices. Thus, the CBN took the decision that it would be sub-optimal to continue to heavily deplete the country's reserves in defending the naira.This is because the magnitude of a nation's reserve also serves as one of the indicators usually considered by foreign investors as to whether to direct their investment into such nation's stock market or not.

Market price of the share is one themost vital factor which influences investment decision of investors.It has also been theoretically established that market price of share depends upon many factors, such as earning per share, dividend per share, pay-out ratio and major corporate announcement such as the naira devaluation among others. Mbutor (2010) opined that the stock market tends to signal the level of confidence in the economy in general and the financial system in particular. It reflects the strength of the productive sector and expectations about the stability of the financial system. Persistent increase in the stock indices would encourage banks to increase advances, both for direct investment in the stock market and other productive sectors of the economy. Foreign investors cash in on the higher returns at the stock market and direct the inflow of foreign portfolio investment to that economy. This further boosts the capital base of banks and induces further increases in their intermediation activities. In this respect, a number of models have been postulated to establish the nexus between stock or asset prices and devaluation of a nation's currency.

For instance, Models of international asset pricing such as those developed byAdler and Dumas (1984) and Stulz (1981) predicted that devaluation will have a significant impact on asset prices of countries, and to the extent that the real cash flows of the firms in these countries are affected by the devaluation, the security prices will also change. This connotes that the announcement of currency devaluation of a country will have market repercussions. This is particularly true for deposit money banks who are the principal actors of financial intermediation and implementing agents of most monetary policies of apex banks.

Previous studies such as Yalcin (2010), Malkiel (2005) and Fama (1970, 1991) have shown that the extent of responsiveness of stock market to immediately incorporate new information into stock prices determines its efficiency. Therefore, studies on response of stock prices to major events announcement such as the Naira devaluation can be linked to efficient market hypothesis. Consequently, in an efficient market, current stock prices fully reflect all available information such that there is no way to earn excess return by using this information, such as the Naira devaluation announcement. Accordingly, Fama (1970) recognized three forms of efficiency in connection with stock market i.e. weak-form of efficiency is said to exist when current price fully incorporates information contained in the past history of prices only, semi-strong when the current price fully incorporates all publicly available information and strong-form when the current price fully incorporates allexisting information, both public and private (insider). Thus, examining the reactions of deposit money banks' stock prices to Naira devaluation announcement can be adjudged as a test of the semi-strong form efficiency of the stock market.

Similar to other relevant announcements such as mergers and acquisition, CEOs suspension, dividend, stock split and regulatory change among others; event study approach has also been used to study stock price reaction to the announcement of currency devaluation. For instance,

Patro, Wald and Wu, (2014) investigated the response of stock market to currency devaluation using the event methodology. This methodology entails a technique of empirical financial research that permits a researcher to assess the financial impact (positive or negative) of a particular sudden event (MacKinlay, 1997; Rao & Sreejith, 2014) on a company's share price. The assessment is usually for a definite event window-i.e. a time period around the day of announcement.

However, Glen (2001) argued that devaluation events both reflect the environment in which they occur, as well as set thestage for what is about to take place. In many cases, devaluations are the result ofa series of poor policy decisions and represent the only option for an embattled monetary authority. Without a change in the underlying policies, devaluations by themselvesare unlikely to solve the problem. More likely, inflation and economic stagnation will follow. But, when devaluation is accompanied by improved policies, one can seemiraculous results.

Despite the enormous benefits envisaged by the monetary authority on the 25thNovember, 2014 devaluation pronouncement, the phenomenon has not received enough attention by researchers. Consequently, the preciseeffect the devaluation announcement of the 25th November has on financial sectors of the Nigerian economy especially the banking sector to the best of our knowledge has not been thoroughly studied. This study is therefore motivated by the importance of examining the reactions of share prices of Deposit Money Banks (DMBs) in Nigeria to the Naira devaluation announcement, and the dearth of research in the subject area since the announcement was made despite the strategic importance of the banking sector and the dominance of its share trading in the capital market.

1.2 Statement of the Problem

Currency devaluation has come to be regarded as a measure of the last resort, with countless partial substitutes adopted before devaluation is finally undertaken. This is due to the associated trauma which arises because so many economic adjustments must be put in place due to a discrete change in the exchange rate within a relatively short period(Cooper, 1971).

In line with the above, the sudden announcement of the devaluation of the Nigerian Naira to US Dollar exchange rate on the 25th November, 2014 created an intense debate and a great deal of mix responses among market analysts and the general populace as to the probable repercussions of such an action on the market value of listed firms, especially, the banking industry which is the key player in the financial intermediation and in the implementation of the CBN's monetary policy. For instance, Boyo (2014)argued that the eight per cent devaluation of the naira was "a big mistake". He noted that the policy shift remained a wrong concept that will persist because the CBN has learnt nothing from history. He further opined that the devaluation will even move to 20 per cent as the black market continues to outstrip the official rate and mopping up the naira to achieve exchange rate stability is wrong. In contrast, Emefiele (2015) opined that devaluation of the naira is inevitable in order to protect the nation's reserves. Owing to the fact that large amount of the reserve has been spent in defending the naira. Therefore, the Apex bank took the decision that might be healthy for the nation; as itwould be counter-productive to continue to heavily deplete the country's reserves in defending the naira.

Theoretically, devaluation announcement is likely to make export cheaper, import dearer, trigger inflation, stock being over sold and investors' panic as regards to the future trend of the devalued currency may induce them to sell stock at any price, consequently, stock prices decline to irrational low levels which make stock bargaining for bottom fishers(Taylor,1998).However,

varied reactions among stakeholders have greeted the policy shift that policy maker could pronounce such a sudden decision without resort to the possible outcomes such a pronouncement may have on the financial market in particular and the Nigerian capital market as a whole. `

Despite the fact that a number of views exist on the degree of effects the 25th November, 2014 devaluation announcement might had on DMBs stock prices, none of these views to the best of our knowledge has been empirically proven, therefore, they can at best be adjudged as a mere presumption and not an outcome of empirical investigation. Also, prior to the devaluation announcement, there was a prevailing market price of DMBs shares in the stock market. However, the announcement might have altered the prevailing market price of the shares either positively or negatively depending on the investors' reaction to the announcement in which case giving rise to abnormal return or the market price of the shares remain the same despite the announcement. Therefore, the need to investigate the investors' reaction to the devaluation announcement so as to recommend its appropriateness to DMBs investors and other stakeholders around the announcement period necessitates an empirical research.

1.3 Research Questions

In line with the above statement problem, the study is guided by the following basic questions:

(i) To what extent do share prices of DMBs in Nigeria exhibit significant cumulative abnormal return from fifteen trading days before the announcement day?

(ii) To what extentdo share prices of DMBs in Nigeria exhibit significant cumulative abnormal return on the day of Naira devaluation announcement?

(iii)Do share prices of DMBs in Nigeria exhibit significant cumulative abnormal return fifteen trading days after the announcement day of currency devaluation?

1.4 Objectives of the Study

The primary objective of the study is to empirically examine the impact of currency devaluation announcement on the share prices of DMBs in Nigeria. Specifically, the study seeks to:

(i) Establish the significance of cumulative abnormal return of DMBs fifteen trading days before the announcement of currency devaluation in Nigeria.

(ii) Determine the significance of cumulative abnormal return of DMBs on the announcement date of currency devaluation in Nigeria.

(iii) Ascertain the significance of cumulative abnormal return of DMBs fifteen trading days after the announcement of currency devaluation in Nigeria.

1.5 Statement of Hypotheses

The hypotheses tested in this study are stated in null form as follows:

$H_{01=}$ There is no significant cumulative abnormal return fifteen trading days before the currency devaluation announcement in Nigeria.

$H_{02=}$ There is no significant cumulative abnormal return on the date of currency devaluation announcement in Nigeria.

$H_{03=}$ There is no significant cumulative abnormal return fifteen trading days after the currency devaluation announcement in Nigeria.

1.6 Significance of the Study

This studyempirically revealed the extent of effect the currency devaluation announcement of the 25th November, 2014 has on the share prices of DMBs in Nigeria which no prior studies to the best of our knowledge has placed on record the degree of such effect. The study is alsoof importance to portfolio managers and investors, regulators, policy makers, and researchers. Thus, the study is useful to these stakeholders in a number of ways as discussed below:

Portfolio managers and investors who are eager in maximising their portfolio return and minimising the associated risks would be interested in discovering opportunities for profit making or otherwise by trading around currency devaluation announcement dates in emerging markets like the Nigeria stock market.

For policy makers and regulatory bodies of the stock market, it will avail them an empirical evidence of the appropriateness or otherwise of the announcement event within the period of the study. Likewise, findings from examining stock price changes to currency devaluation announcements in an emerging market like that of Nigeria may empirically bring to light the efficiency or otherwise of these markets. In other words, the study will serve to fill this gap by examining the informational efficiency of the Nigeria stock market with respect to currency devaluation announcement of the 25th November, 2014 so as to assist in policy formulation.

Lastly, it would be of major interest to researchers and academia, as it will contribute to the dearth of literature on the subject matter and act as a source of reference for those that may be interested to carry out researches in the area.

1.7 Scope of the Study

This study is aimed at examining the impact of currency devaluation announcement of the 25th November, 2014 on the share prices through the periods (-15 to +15 days) around the announcement period. That is, the period of the study covered the 32 days event window which constitute 15-days pre-announcement day, the 2-days announcement day and the 15-days post announcement days. The constituent population of the study is made up of the Thirteen (13) listed DMBs that traded on the floor of the Nigerian Stock Exchange on the historic day the announcement was made.

1.8 Limitations of the Study

The study islimited in terms of scope and the methodology adopted. In terms of the scope, only the thirteen sampled listed DMBs that traded on the fateful day the announcement became public were considered. Whereas in terms of methodology, event study methodology depends on the assumption of an efficientmarket. This assumption is not valid in many situations. The length of time required forindividual investors to respond to event signals is random and therefore, the implicationis that markets could exhibit market inefficiencies because prices do not instantly or fullyreflect all available information. Individual stock prices usually increase in series of stepsas investors normally respond in waves(as in the Elliot wave theory).

Also, the methodology provides estimates of the short-run impact on shareholders only and fails to consider many other effects of the event. Concurrent events in different stocks might weaken or reinforce one another, resulting in abnormal returns that are not caused by the specific event of interest.

CHAPTER TWO

Literature Review

2.1 Introduction

This chapter provides a review of related works of other researchers with the aim of discovering the existing state of knowledge on examining the effects of currencydevaluation announcement on share price in the developed and emerging capital market.

Causes of currency devaluation and determinants of stock price reactions in the stock market around the globe were also looked in to.

2.2 Concept of Currency Devaluation

The value of a nation's currency is determined in relation to the value of the other currencies, that is to say, the quantity of the other currency that can be bought by one unit of local currency. In a nutshell, this is the exchange rate of the two currencies and it fluctuates over time with currencies gaining or losing value against each other. When a currency reduces its value against other currencies, this process is called devaluation. It should be noted that in this study, that devaluation of currency is not the same as depreciation of currency.

According to Obadan (2006), devaluation and depreciation are often used interchangeably in that both refer to the reduction in the value of exchange rate of national currency. The difference between the two arises from the method of arriving at the reductions in the foreign exchange value of the national currency. Therefore, in devaluation, the government/monetary authority deliberately reduces the foreign exchange value of the national currency whose rate of exchange was fixed. Accordingly, depreciation applies to currencies that are floating. This

means that the market forces of demand and supply caused the reductions in the foreign exchange values of such currencies. Thus, the domestic currency depreciates (appreciates) whenever less (more) units of the foreign currency are required to purchase a unit of the domestic currency (where exchange rate is $ per N for example). Where the exchange rate is defined as N per $, the naira depreciates (appreciates) whenever more unit of it are required to buy a unit of foreign exchange.

Similarly, Cooper (1971) viewed currency devaluation as a reduction in the dollarprice of a unit of foreign currency or, an increasein the number of units of the foreign currency that can be purchasedfor a dollar. In the same regard, Gafar (1981) stressed that devaluation is usually considered to be the weapon of last resort by policy makers; and it is frequently used before or when the authorities approach the IMF for balance of payments support.

Loto (2011) argued that devaluation is expected to be a useful measure for correcting trade imbalance. It has several effects on major macroeconomic variables. It reduces expenditure and stimulates the level of output through the multiplier effect. At the other extreme, it has an inflationary effect and it increases import cost and if the nation involved is import dependent, the cost of production increases. It also increases the cost of servicing foreign debts.

Accordingly, Loto (2011) further opined that devaluation/depreciation cannot improve the trade balance in the Nigerian economy. Devaluation/depreciation can only benefit countries that are originally export based before the devaluation/depreciation of a currency. Economies that are import dependent can hardy benefit from the devaluation/depreciation of its currency. Nigeria is a typical example of a 90% dependent on imported raw materials into the production process. For an economy that is structured like that of Nigeria, devaluation/depreciation will surely complicate the problem on hand, rather than solving it. However, for the purpose of this study, devaluation can be seen as a sudden and deliberate

reduction in the exchange value of local currency by monetary authority and formally sets a new fixed rate with respect to a foreign reference currency.

2.3 Concept of Share Prices Reaction

Scholars have differing views on the factors influencing share price reaction in the capital market of both developed and emerging market. This may probably be due to the fact that the level of efficiency differs from one market to the other. More so, certain factors which are not within the reach of individual firms (external) as well as other variables which are firm's specific (internal) also exert some influences in shaping the reaction/movement of share prices.

In line with the above, five schools of thought have been identified by Maku and Atanda (2009) on stock price movement/reaction; these are: the fundamentalist school, the technical school, the random walk hypothesis school, the Behavioural School of finance and macro-economic hypothesis school.The fundamentalist holds that expectation regarding future earnings and the precise rate at which those earnings are discounted determine the worth of a firm's stock. Also, in this school of thought, net present value principles are applied using earnings, dividends, assets and interest rate to ascertain stock prices.

Contrary to the fundamentalist submission, the technicalists opined that financial or economic data can be used to predict stock price reaction. They are of the view that stock prices tend to follow a specific pattern and that foregoing prices influence current price; likewise, succeeding prices depend on each other. Unlike the fundamentalist and technical school of thoughts, the random-walk hypothesis views stock price movement in terms of a probability distribution of different possible outcomes. The random-walk hypothesis is anchored on the

presumption of efficient market which posits that securities instantaneously adjust to reflect the effect of all new information. The proponents of this school posited that stock prices are essentially random and thus, any profitable speculations in the stock market seize to exist.

Similarly, the behavioural school posits that there are three conditions under which market might fail to reflect economic fundamental and when all the three apply, it is predicted that pricing biases in financial market can be both significant and persistent. The first behavioural condition is irrational behaviour. It holds that investors behave irrationally when they don't correctly process all the available information while forming their expectations of a company's future performance. The second is systematic patterns of behaviour, which hold that even if individual investors decided to buy or sell without consulting economic fundamentals, the impact on share prices would be limited. Thirdly, limits to arbitrage in financial markets ascertain that when investors assume that a company's recent excellent performance alone is a signal of future performance; they may start bidding for shares and raise the price. Some investors might also expect a company that surprises the market in one quarter to keep on exceeding expectations.

Finally, the macroeconomic approach seeks to examine the sensitivity of stock prices to changes in macroeconomic variables. The approach posits that stock prices are influenced by changes in money supply, interest rate, inflation and other macroeconomic indicators.

2.4 Determinants of Share Prices Reactions

Share price reaction is not self-determining in nature and both extrinsic and intrinsic factors have been documented to exert influence over stock price reactions. Numerous studies have been carried out to identify the determinants of stock prices in different stock markets; i.e.

developed and emerging markets. The existing literature strongly supports the reaction of stock prices as a result of firm specific determinants such as dividend, book value, earnings and so on, all of which are internal to a firm; and a vast number of external determinants (market and economic indicators) which includes: interest rate, money supply, inflation e.t.c as well as hybrid of both internal and external variables. Below is a review of existing literature based on firm specific determinants, external determinants and hybrid of the two.

Collins (1957) was the pioneer to investigate on determinants of share prices for US banks.This study documented net profit, dividend operating earnings and book value as the factors determining share prices in the context of US banking sector.Similarly, Malhotra, and Tandon (2013) investigated factors that influence stock prices in the context of National Stock Exchange (NSE) taking a sample of 95 companies for the period of 2007 to 2012 using Linear Regression Model. It was found that firms' book value, earning pershare and price-earnings ratio are the major determinants of stock price as they significantly and positively influence firm's stock price while dividend yield has an inverse but significant association with the market price of the firm's stock. However, dividend cover and dividend per share were found not significantly influencing share price movement on the Indian NSE.

In a related study, Mondal and Imran (2010) examined factors influencing the share price of some companies listed in Dhaka Stock Exchange (DSE). Their study revealed that price earnings ratio; stock price rumor; demand for the share; changes in government policies; economic conditions are the most influential internal; external; economic; political; and environmental factors respectively regarding stock price. More so, the study further revealed that 65.0 percent of the variation in stock price in Bangladesh is explained by cash flows, leverage, profitability, growth, market capitalization, and dividend.

Wiredu, Suleman and Adjartey (2013) investigated the effect of macroeconomic variables that explains the variation in stock prices using Cocoa price, Broad Money supply (M2), Gold price, 91-day Treasury bill rate and CPI The results showed that Gold price and the 91 day Treasury bill do not contribute significantly to the stock price. The Cocoa price and the CPI were positively related to the stock price. This means that a unit change in these variables will increase the stock price. The M2 was negatively related to the stock price meaning that a unit change in this variable will result in a decrease in the stock price.

In addition, Maku and Atanda (2010) analyzed the long-run macroeconomic determinants of stock market performance in Nigeria between 1984 and 2007. It was documented that the Nigeria Stock Exchange (NSE) all share index is more responsive to changes in exchange rate, inflation rate, money supply, and real output. While, the entire incorporated macroeconomic variables were found to have simultaneous and significant impact on the Nigerian capital market performance in the long-run. It was concluded that investors should pay close attention to exchange rate, inflation, money supply, and economic growth rather than treasury bill rate in the long-run in their investment decision.

In the same vein, Almumani (2014) examined the quantitative factors that influence share prices for the listed banks in Amman Stock Exchange (ASE) over the period 2005-2011. It was established that earning per share, book value per share, price earnings ratio, and size are significant determinants of share prices for all the banks under consideration. Therefore, it was concluded that these factors posse strong explanatory power and thus, can be used to make accurate future forecasts of stock prices. Consequently, investors are advised to take care of accounting variables of company before investing.

In a similar study, Sunde and Sanderson (2009) analyzed determinants of stock prices in Zimbabwe Stock Exchange using interviews and the archival method as a tool for data

collection.It was established that there are economic, political and social factors that determine stock prices in Zimbabwe. However, economic and political factors seem to be the dominant factors in the determination of stock prices. It was concluded that if the stock exchange is to perform well the economic and political situation in the country has to be stable. In other words, the government has to take some deliberate steps to ensure that the economy of the country is well run and also that there is stability politically. This may not be unconnected with the fact that during the time this review was conducted, there were some political tensions in the country, especially emanating from the redistribution of land to the black Zimbabweans who were marginalized by previous racist colonial governments.

In addition, Ozlen and Ergun (2012) investigated the internal determinants of the stock price movement on sector basis in Istanbul Stock Exchange market (ISE) of Turkey. The variables chosen for consideration are total assets, turnover ratio, dept ratio, current ratio, net profit margin, price to earnings ratio and book value. The result revealed that Book value is found to be the most significant internal determinant of the stock price movements for all sectors; while the impacts of other financial ratios vary for different sectors.

Osisanwo and Atanda (2012) analyzed the determinants of stock market returns in Nigeria using the Ordinary Least Square (OLS) method based on the sourced time series variables from the Central Bank of Nigeria (CBN) between 1984 and 2010.It was found that interest rate, previous stock return levels, money supply and exchange rate are the main determinants of stock returns in Nigeria. It was concluded that thechanges in exchange rate of the naira vis-à-vis the US dollar (LEXC) and interest rate (INT) were found to exert significant impact on the growth of the Nigerian Stock Exchange all share index between 1984 and 2010.

Uddin, Rahman and Hossain (2013) studied the determinants of share prices of financial sector companies in the stock market of Bangladesh using data between the years 2005 to

2011. Employing simple and multiple regression analysis, the study revealed Earnings per share (EPS), Net Asset Value (NAV), Net Profit After Tax (NPAT) and Price Earnings ratio (P/E) have strong relationship with stock prices. It can therefore be concluded from the study that EPS, NAV, NPAT and P/E ratio are strong determining factors for price of shares in Bangladesh stock market.

AL- Shubiri (2010) examined factors affecting the equity return of 14 Commercial Banks of Amman Stock Exchange and also identified whether there is a significant relationship between market return of listed commercial banks with some microeconomic factors for the period of 2005-2008. The study employed simple and multiple regression analysis, it documented highly positive significant relationship between market price of stock and net asset value per share; marke (2013)t price of stock, dividend percentage, gross domestic product, and negative significant relationship on inflation and lending interest rate but not always significant on some years of Amman Stock Exchange in Jordan.

Zafar (2013) investigated positive relationship between financial intermediary performance and stock market performance in Pakistan. Using a time series data for the period 1988 – 2008, it was found that foreign direct investment and value traded have positive impact on stock market performance. It was also found that there is a negative relationship between real interest rate and stock market performance, whereas the banking sector development was found to have no significant impact on stock market performance.

Wiredu, Suleman and Adjartey (2013) investigated the effect of macroeconomic variables that explain the variation in stock prices using Cocoa price, Broad Money supply (M2), Gold price, 91-day Treasury bill rate and Cost Price Index (CPI) in Ghanian Stock Exchange. The findings indicated that Gold price and the 91 day Treasury bill do not contribute significantly to the stock price; while the Cocoa price and CPI were positively related to the stock price.

This implies that a unit change in these variables will increase the stock price. The M2 was negatively related to the stock price implying that a unit change in this variable will result in a decrease in the stock price

In the same vein, Naveed and Ramzan (2013) analysed impact of size, dividend, profitability, asset growth of 15 Pakistani banks on share price. Employing fixed effect regression model, it wasfound that just size has a significant impact on share price but coefficient of size and share price is in negative direction. Other variables have statistically insignificant impact on share price. The value of R-square shows that 93% of variance of share price (SP) is explained by these variables, dividend yield (DY), return on asset (ROA), asset growth (AG) and SIZE.

Abdulrahman, Mohammadsidek and Tafri (2009)investigated factors that affect the Malaysian stock market from the macroeconomic perspective. The results revealed that changes in Malaysian stock market index do perform a co integrating relationship with changes in money supply, interest rate, exchange rate, reserves and industrial production index. The lag exclusion test also revealed that all six variables contribute significantly to the co-integrating relationship. This implies that the Malaysian stock market is sensitive to changes in the macroeconomic variables. In addition, considering the variance decomposition analysis, it was further revealed that Malaysian stock market has stronger dynamic interaction with reserves and industrial production index as compared to money supply, interest rate, and exchange rate.

Menike and Prabath (2014)examined the relationship between accounting variables and stockprice on a sample of 100 companies listed in the Colombo Stock Exchange (CSE) in Sri Lanka from 2008 to 2012. Using a single and multiple regressions model; the findings revealed that Earning Per Share (EPS), Dividend Per Share (DPS) and Book Value Per Share

(BVPS) were positive and had a significant impact on the stock price in the CSE. It was however concluded that DPS is the most sensitive variable in explaining the stock price movement in the CSE.

Aduda, Mansila and Onsongo (2014) examined the determinants of development in the Nairobi Stock Exchange. Secondary data for the period 2005-2009 was employed to model the factors influencing the development of the Nairobi Stock Exchange (NSE). The findings established that there is relationship between stock market development and macro-economic factors; such as: stock market liquidity, institutional quality, income per capita, domestic savings and bank development. However, regression analysis indicated that no relationship between stock market development and macroeconomic stability –inflation and private capital flows. Hence, it can be concluded that stock market developments is determined by stock market liquidity, institutional quality, income per capita, domestic savings and bank development.

Sharma (2011) studied the empirical relationship between equity share prices and explanatory variables such as: book value per share, dividend per share, earning per share, price earnings ratio, dividend yield, dividend payout, size in terms of sale and net worth for the period 1993-94 to 2008-09.it was documented that earning per share, dividend per share and book value per share has significant impact on the market price of share. The findings also indicated that dividend per share and earnings per share are the strongest determinants of market price in Indian Stock Exchange. It was therefore concluded that the results of the present study supports liberal dividend policy and suggests companies to pay regular dividends

Kaehler, Weber, and Aref (2013)examined the development of the Iraqi Stock Exchange (ISX). Regression analysis was employed and it was found that t the ISX index is mainly determined by exchange rates, interest rates and the general security situation as measured by

an index for civilian deaths from violence. It was further revealed that the market still lacks efficiency. While the lack of efficiency is no surprise shortly after the opening of a market, it is noteworthy that the market is still inefficient after the introduction of electronic trading and an increase in liquidity.

In a nutshell, from the above conceptual review, it became obvious that a number of studies have been undertaken by different researchers in different countries to identify the determinants/factors that affect stock price reaction. Literature reviewed revealed that movements of stock prices depend on internal/firms' specific/micro factors as well as a divergent of external/ market/macroeconomic fundamental factors. The major internal/firm specific factors reviewed are dividend per share (DPS), earnings per share (EPS) and book value per share (BVPS), dividend yield (DY), return on asset (ROA), asset growth (AG) and firm size (FS), Net asset value (NAV), Net profit after tax (NPAT) and Price earnings ratio (P/E), stock price rumour (SPR); while the major external/macroeconomic factors include: changes in government policies; economic conditions, changes in exchange rate, inflation rate, money supply, and real output, interest rate, previous stock return levels and money supply among others.

In addition, it is worthy to note that the differing views on determinants of share prices reaction holds to the fact that, the level of market complexity and advancement determines in a no small measure factors that drive price reactions and also the social, economic, political and environmental conditions, such as crisis or boom periods dictates to a large extent specific factors that determine share price reactions whether such factors are firm specific or macroeconomic in nature.

2.5 Review of Empirical Studies

This section reviews empirical studies on the influence of devaluation announcement on share price reactions. However, due to the fact that very few empirical studies have been carried out on the subject matter, probably because monetary authorities/policy makers dislike the idea of devaluing their currency due to its likely effects on the economy except when it becomes the last resort. Thus, myriad of empirical works on effects of monetary policy announcement on share prices reactions were reviewed to augment the very few studies on devaluation announcement. More so, we are convinced that issues surrounding currency devaluation announcement stem from one of the numerous issues under monetary policy pronouncement. The studiesreviewed are amalgam of studies from developed and emerging markets with the view of bringing to the forefront what has been documented on the subject matter.

2.5.1 Currency Devaluation Announcement and Share Prices

Conflicting views have been put forward on the influence of currency devaluation announcement on share prices. This may probably be owing to the inconsistent findings from studies carried out on the subject matter. From the theoretical perspective, macroeconomic policies are expected to affect returns on stocks either positively or negatively depending on a number of factors. More so, the observed pattern of the influence of macroeconomic policies on share returns varies from one study to another in different capital markets.

Duran, Ozcanb, Ozlu and Unalmiş (2012) analysed the response of asset prices to monetary policy in Turkey, using the heteroscedasticity-based Generalized Method of Moments (GMM) estimation technique as an alternative to the event study approach. It was documented that increases in the policy rate lead to a decline in stock prices, rises in government bond yields with longer maturities, and an economically insignificant appreciation of the domestic currency. It was concluded that monetary policy transmission in

Turkey, an emerging market and a small open economy, works very similarly to that in advanced economies. Also, the results obtained using the GMM was compared with the more widely applied event study method and found that the event study gives biased results in measuring the responses of short-term bond yields and the Turkish lira/euro exchange rate.

Similarly, Ekanayake, Rance, and Halkides (2008) investigated the effects of Federal Funds target rate changes announcement on the stock performance of 30 companies listed under the Dow Jones Industrial Average (DJIA) over the years 1996-2007. Using event-study methodology, the DJIA 30 individual stocks were grouped into 8 sectors and the reaction of each sector to changes in the Federal Funds target rate was analysed. Event window of 3 days prior to the event and 3 days after the event was utilized for each sector. It was found that the Average Abnormal Returns (AARs) and Cummulative Abnormal Returns (CARs) are mostly positive and significant on the days the Federal Funds target rate was reduced. Likewise, they are mostly negative and significant on the days the Federal Funds target rate was increased. Moreover, When the analysis focused on the event day (AARs and CARs $t = 0$), of the eight sectors, four sectors reacted positively when the Federal Funds target rate was decreased, three sectors reacted positively when there was no change in the funds target rate, while three sectors reacted negatively when the funds target rate was increased. It was therefore concluded that the changes in the Federal Funds target rate are found to have a significant effect on stock prices on and around the event days.

Though the analysis of the study was thoroughly done, however, there is no evidence of any diagnostic test such as unit root test, serial correlation and test for the presence of heteroskedasticity which would have improved the robustness of the result.

In a related study, Forbes (2002) employed a sample of 8 countries with “major devaluation” events out of the fifty eight countries between 1997 and 2000 to examine the effects of

devaluation on the relative costs of labour and capital and their impact on production, profitability, investment and stock return for 1100 firms in ten commodity groups. The study documented that immediately after devaluations; commodity firms in the crisis country have output growth rates of about 10-20% higher and profit growth rate of about 15-25% higher than the competitors in other part of the world. Also, devaluation impact on capital investment and stock returns is correlated with changes in interest rate and capital/labour ratios in the crisis country. The generalization of the findings may not be true for the developing countries as their coverage in the sample taken were grossly inadequate.

In the same vein, Glen (2001), examined stock market performance over a sample of 24 devaluation events for 18 countries' emerging markets from 1980-1999 using boot strapped distribution and monthly return. A significant negative shock on returns was documented in the month prior to the event but the post event return was averagely normal. This shock is statistically significant on average but there is a substantial variation across events and countries. The average statistically significant of the impact could also be as a result of non-consideration of different micro and macroeconomic policies and its implementation across the countries of the study.

In addition, Goldberg and Veitch (2004) employed event study methodology in Brazil to examine the effects of 1999 Brazilian devaluation on a cross-section of publicly traded firms in the Brazilian and Argentine Stock Markets using quarterly time series data. They found that Brazilian export firm outperform Brazilian non-export firms in the months after the event and no differential impact was found on "real" devaluation on Argentine exporters versus non-exporters. A critical observation of the analysis made revealed the absence of unit root test which would have improved the robustness of the findings.

Furthermore, Jianyu, Jose and Yun (2009), studied abnormal returns to shareholders of bidder firms around the day of M&A announcement for ten emerging Asian markets (China, India, Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand). The study adopts standard event study methodology on a sample of 1,477 M&A deals in the ten emerging Asian markets, for the period 2000-2005. An estimation window of 120 (−125, −6) trading days and two-day, three-day or a five-day event window were applied and it was documented that the stock markets have expected positive cumulative abnormal returns in the three different event windows: a two-day (0,1) window, a three-day (-1,+1) window, and a five-day (-2,+2) window and valuation effects of information leakage about M&A deals are statistically significant.

Kucukkocaoglu, Unalmis and Unalmis (2013) examined the impact of monetary policy committee (MPC) announcements on banks' stock returns in Turkey using the heteroscedasticity-based Generalized Method of Moment (GMM) technique on a sample of the period through January 2005 to January 2013 with 99 policy decisions. Two periods were prominent in the study: the conventional monetary policy era which constitutes all the periods prior to May 2010 that are within the study time frame; and the unconventional monetary policy episode - period after May 2010. The study documented that stock returns of all banks that are listed in Istanbul Stock Exchange react significantly to the monetary policy surprises on Monetary Policy Committee (MPC) meeting days prior to May 2010. It was also found that stock returns of banks for which interest payments constitute an important share in their balance sheets react more assertively to the changes in policy rates. Conclusively, the estimation results suggest that since the Central Bank of the Republic of Turkey has started adopting an unconventional monetary policy regime in May 2010, with various instruments and flexible timing, aggregate and individual bank indices have not responded significantly to the surprises on MPC meeting days.

However, the non-significant response of aggregate and individual bank indices during the unconventional monetary policy may probably be due to a number of macroeconomic variables that are not taken into account during this episode.

Moreover, Marfatia (2014) analysed the impact of uncertainty on estimated response of stock returns to U.S. monetary policy surprise. The study adopts Time Varying Parameter (TVP) mode on high frequency daily data from the Federal funds futures market to estimate the response of S&P 500 stock returns to monetary policy surprises. A significant negative relationship between the level of uncertainty and the time varying response of S&P 500 stock returns to unanticipated changes in the interest rate was documented by the study. Thus, at higher levels of uncertainty the impact of monetary policy shocks on stock markets is lower. It was concluded that the results were robust to different measures of uncertainty. Failure of the study to establish the stationarity (unit root test) of the time series data utilized by the may leads to spurious result.

Additionally, Ogbulu and Uruakpa (2011) examined the nature and magnitude of the relationship between monetary policy and stock prices in the Nigerian capital market and whether changes in monetary policy lead or lag changes in asset prices within the Nigerian context. Employing the techniques of co-integration, error correction mechanism, impulse response function and Granger causality and using quarterly data from 1986:2 to 2011:4.It was found that there is one co-integrating long run dynamic relationship between stock prices and the set of broad money supply, interest rate, foreign exchange rates and inflation. Also, it was documented that broad money supply as an instrument of monetary policy exerts a significant positive impact on stock prices in Nigeria while interest rate reports a weak and insignificant relationship with stock prices.

Besides, a unit-directional causality from stock prices to broad money supply and also from foreign exchange rate to stock prices was also reported. The impulse response and variance decomposition analyses revealed that own shocks from stock prices are the dominant source of variations in the forecast error decomposition. It was concluded that an expansionary monetary policy by way of increasing money supply by the monetary authorities in Nigeria would, all things being equal, lead to a profound impact on asset prices in the stock market.

Patro, Walid and Wu (2009), employed event study methodology using daily data of 85 devaluation events from 27 countries from 1980 to 2004 to analyze the reaction of stock markets around currency devaluations. The study documented a significant negative announcement day, pre and post announcement day, abnormal and cumulative abnormal returns. Evidence of unit root test, serial correlation test and the test for ARCH effects were absence in the study despite the fact that daily stock prices were used.

Similarly, Patro, Walid and Wu (2014), investigated the reaction of stock markets around currency devaluations using 125 devaluations events from 41 countries from 1979 to 2011, the study adopts event study method using daily stock returns. The study found a significant negative announcement day, pre and post announcement day, abnormal and cumulative abnormal returns. Negative trends in stock returns persevere for up toth first quarter subsequent to the first announcement and later become positive, indicating a reversal. The study did not show any evidence of unit root test, serial correlation test and the test for ARCH effects which might have increase the robustness of the findings.

Ricci (2015) employed event study methodology on a sample of 28 European Monetary Union Banks for a period of six years- 1997-2013. The study examined the impact of European Central Bank monetary policy announcements on the stock price of large European Banks. It was found that there is a strong evidence that restrictive measures (CONTR) in the

form of liquidity drain or end/reduction of monetary easing programs caused a significant negative cummulative abnormal return (CARs) in the stock price of large European banks, irrespective of the investigated period. It was also documented that liquidity provision was accompanied by a negative CARs during the global crisis period and a positive one during the sovereign debt crisis. Aside the fact that the sample used by the study was very small taking into consideration countries that constitute European Union; the time period under consideration was also characterized by an unprecedented frequency of policy interventions. This might have led to events overlapping and the filtering applied might not have sufficiently taken care of the presence of confounding effects.

In a related study, Sasidharan (2009) analysed stock market behaviour on the pre and post announcement days of a change in the monetary policy stance. Trading days for the period from 1996 January to 2008 April were used, and a three days event windows was employed. Also, exploratory data analysis and non-parametric test - Wilcoxon rank sum (Mann-Whitney) test and Wilcoxon signed rank test were utilised for the study. The result revealed a negative return during a contractionary policy announcement and a high positive return, compared to a normal trading day, during an expansionary policy announcement. The day preceding an expansionary policy announcement gives the highest positive returns (0.39%). On the day of an expansionary policy announcement, negative returns of -0.05%, which reverts to a positive 0.07% the next day, was documented. Most likely, this is an indication of overreaction during the run-up towards policy, which is corrected for in the subsequent days. In addition, high negative return was recorded during the day prior to a contractionary policy announcement (-0.29%); while the mean return on the day of a contractionary policy announcement is smaller (-0.12%). Like in expansionary policy, a reversal of sign was witnessed after the day of announcement (0.18%).

From the above analysis, the high (low) returns prior to an expansionary (contractionary) policy announcement may indicate that markets anticipate the policy stance. Consequently, rational investors might be taking an investment strategy in which they go long (short) in expectation of an expansionary (contractionary) policy announcement; this may induce them to sell (buy) the day after an expansionary (contractionary) policy announcement is made. Finally, in as much as any investment rule can generate excess returns, then the market is inefficient according the Efficient Markets Hypothesis. More so, the study utilised time series data and failed to provide any evidence of unit root test for the stationarity of the data utilised.

Shehu (2011) examined the reactions of Nigeria's stock market to monetary policy innovations during the period of global financial crisis using monthly data over the period January, 2007 to August, 2011. Specifically, stock market return is regressed against major monetary policy instruments: money stock (M1, and M2) and monetary policy rate (MPR). Using the Generalised Autoregressive Conditional Heteroskedastic (GARCH) and Engle Generalised Autoregressive Conditional Heteroskedastic (EGARCH) methodologies; it was found that the unanticipated component of policy innovations on M2 and MPR exerts destabilising effect on NSE's returns, whereas the anticipated component does not. It was observed that wholesome adoption of macroeconomic policies to measure share price reactions for Nigeria Stock Exchange may constitute a serious weakness. Therefore, the varying macro-economic policies may alter the finding of this study. Besides, result using crisis period may not be applicable to relatively stable period.

Vithessonthi and Techarongrojwong (2012) investigated the effect of monetary policy announcement on stock prices in Thailand using a sample of 50 repurchase rate changes over the period from September 2003 through December 2009. The study employed standard

event study methodology and it was documented that stock prices respond negatively to the expected change in the repurchase rate. But the unexpected change seems to have no effect on stock returns at the aggregate level, and at the firm level the expected change in the repurchase rates has a negative effect on stock returns while the unexpected change has a positive effect on stock returns. In addition, the effect of the unexpected repurchase rate change on stock returns is statistically insignificant and the evidence suggests that stock prices react asymmetrically to the direction of the repurchase rate movements. Surprisingly, the unexpected repurchase rate change has a negative effect on stock returns when it is considered good news but has a positive effect on stock returns when it is considered bad news. It was concluded that the relationship between the surprise component of a monetary policy and stock returns is inconclusive. However, a mere look at the study revealed that survey data which was used to represent market's expectation on the repurchase rate may be grossly inappropriate, instead, data would have been sourced from the secondary source of the appropriate authority; such as the Bank of Thailand.

In the same way, Vithessonthi and Techarongrojwong (2013) examined the effect of monetary policy rate announcements on stock prices in Thailand at the firm level from January 2003 to December 2011. Employing the standard event study methodology, it was found that the mean abnormal return on Day 0 is 0.00% and statistically insignificant. This finding provides an indication that the policy rate announcement tends to have a limited impact on the market. That is, on the event date, there is no evidence of significant abnormal returns following the policy rate announcement for the full sample of all announcements. However, the Cumulative Abnormal Returns (CARs) over the event window tested and it was documented that the average CARs for a five-day event window (i.e. from Day −2 to Day 2) is −0.25% and statistically significant at the 1% level, and that the average CARs for a three-day event window (i.e. from Day −1 to Day 1) is -0.07% but is statistically insignificant. It

was however concluded that the significant average abnormal returns associated with the 33 of the 66 announcements range from −3.18% to 1.50%, suggesting that the impact of the monetary policy announcement on stock prices, when it matters, is economically significant. A critical look at the analysis revealed that a thorough analysis was conducted but the major shortcoming is that no evidence of diagnostic test such as unit root, heteroskedasticity and test for the absence of autocorrelation were presented in the work.

Besides,Wang and Mayes (2012) investigated the responses of aggregate stock price indices of New Zealand, Australia, the UK and the euro area to monetary policy rate announcements using event study methodology for the period of 1999 to 2010. The study established significant negative stock price reactions to monetary policy surprises. Specifically, the period of the study fall within the period of financial crises for the countries involved, it was further documented that the New Zealand (NZ) and Australia (AU) stock market responses are not significantly affected by the financial crisis. However, prior to the crisis, all of the market indices of the four countries/regions (including the ASX200 of AU) react significantly negatively to monetary policy surprises. Conversely, the reactions of the UK and euro area indices to both expected and surprise components become positive during the crisis period rather than serving its original purpose of stimulating the market, a surprise rate cut causes even more pessimism about economic conditions. Looking critically at the findings, it can be deduced that while there are some similarities between the US and Australia, the euro area, New Zealand and the UK in the response of stock prices to monetary policy surprises, there are also important differences as revealed by the study.

Lastly, Wilson, Sounders and Jr (2000) examined the market respond around 1994/95 Mexican Peso devaluation, debt and financial sector crises. Standard event study frame work with daily stock market data was utilized. A statistically significant positive abnormal return

was found and it was concluded that Mexican equity market did not anticipate the devaluation event. A critical look at the analysis of the study which utilized daily stock prices revealed absence of stationarity test, serial correlation and test for heteroskedaticity which would improve the robustness of the result.

2.6 Theoretical Framework

The establishment of relationship between currency devaluation announcement and reaction of share prices would be realized on the basis of Efficient Market Hypothesis (EMH) advocated by Fama (1970, 1991). That is, the underpinning theory for this work is Efficient Market Hypothesis. This theory posited that in an efficient market, making of abnormal return on the basis of arrival of new information is practically impossible. Consequently, "a market in which prices always fully reflect all available information is called efficient." That is to say, prices adjust quickly and, on average, without bias to new information. As a result, the current prices of securities reflect all available information at any given point in time. Thus, there is no reason to believe that prices are too high or too low. Security prices adjust before an investor has time to trade on and profit from a new a piece of information. This theory (EMH) suggests that profiting from predicting price movements on arrival of new information is very difficult and unlikely. That is to say, the main reason behind price changes is the arrival of new information which can negatively or positively impact on securities prices.

In line with the above, an efficient marketcan exist if the following conditions hold (Jones, 1993 & Shleifer, 2000) as cited in (Yalcin, 2010):

i. A large number of rational profit maximizing investors exists whoactively participate in the market, hence value securities rationally.

ii. If some investors are not rational, their irrational trades are cancelling each other out or rational arbitrageurs eliminate their influence without affectingprices.

iii. Information is costless and widely available to market participants atapproximately the same time. Investors react quickly and fully to the newinformation, causing stock prices to adjust accordingly.

This hypothesis as well explains the study due to the fact that the announcement of Naira devaluation may be seen as an effort by the CBN/ policy makers to communicate to the market information at their reach with the expectation that the market will immediately incorporate such information, and stock prices will adjust accordingly. Thus, there will be very low tendency for an investor to make an abnormal return by trading on the basis of such information. Consequently, equity prices of listed companies in the Nigerian stock market will certainly react to the pronouncement; especially, that of Deposit Money Banks who are the major players in the intermediation of the nation's currency.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodological aspect employed for the study; it described the population frame and how the Sample size for the study is determined. It also explained how data were sourced and subsequently described the data analysis method employed using stated measurement variables for the study.

3.2 Research Design

A correlational design was employed for the study.This is due to the fact that the study established relationship between the dependent and independent constructs used for the study. An examination of share price reactions around the period of currency devaluation announcement is referred to as event study. Thus, the event study was employed for carrying out this study. Window estimation period and event windows weredetermined in order to be in line with the convention of conducting research of this nature using event study.

The dependent variable employed in the study is the closing share prices of the sampled banks proxy by the log daily share return and the independent variable is the currency devaluation proxy by the log of daily market return of All Share Index of the Nigeria Stock Exchange.

3.3 Population and Sampling of the Study

The population employed by the study is the 16 registered DMBs with the Nigerian Deposit Insurance Commission that are listed and traded on the floor of the Nigeria Stock Exchange (NSE) on the 25thNovember 2014, which was the day thedevaluation

announcementbecamepublic. However, the need to give equal chance of being represented to the elements of the population, the study utilized the criteria below to revise the population and thus, the revised population became the actual populationused for the study. Hence, for a bankto be part of the revised population, the followingcriteria must be fulfilled:

i. Data on daily stock prices must be available for the bank at least for the 120 trading days before the announcement and the 32 trading days of the event window
ii. The bank did not undergo any technical suspension within the 120 trading days before the announcement day, and the 32 trading days of the event window.

Out the 16 banks, (Eco bank) was dropped because it failed to meet up with the first criterion and two other banks that is (Unity bank and Wema bank)were also dropped from the remaining fifteen banks because they failed to fulfil the second criterion. Though, their stock prices were available for the period indicated in criteria one above, but the nature of the prices indicated the presence of technical suspension from the NSE market. The use of the above criteria therefore,resulted to a revised population of thirteen (13) DMBs. Census sampling was employed and the final sample constitutedthe entire revised population. Table 3.1 below presents the names of the banks that constituted the population employed for the study.

Table 3.1 List of the population employed in the study

SN	Population
1	Access Bank plc
2	Diamond Bank Plc
3	Eco Bank plc
4	Equatorial Trust Bank plc (ETB)
5	First Bank of Nigeria plc
6	First City Monument Bank plc (FCMB)
7	Fidelity Bank plc
8	Guaranty Trust Bank plc (GTB)
9	Sky Bank Plc
10	Stanbic IBTC Bank plc
11	Sterling Bank plc
12	United Bank for Africa plc (UBA)
13	Union Bank of Nigeria plc (UBN)
14	Unity Bank plc
15	Wema Bank plc
16	Zenith Bank plc

Source: Researcher's compilation 2015

3.4 Sources and Method of Data Collection

Secondary sources of data wereused for this study. Particularly, the studyutilised secondary data of the daily stock prices of sample-listed banks for the period under consideration. Likewise, the corresponding Nigeria Stock Exchange (NSE) daily All Share Index (ASI) was collected for the same period. Both the daily series of stock prices of the sample banks and the corresponding NSE ASI were retrieved electronically from the online database of Cashcraft Asset Management Limited for the purpose of analysis in the study.

3.5 Method of Data Analysis

The studyemployed the standard event study methodology advocated by MacKinlay (1997) as reviewed by Rao and Sreejith(2014),where abnormal return is the residual between the observed and predicted return of the event under study within the specific period of time.This methodology establishes whether there is an 'abnormal' stock price effect associated with an unanticipated event. From this analysis, the researcher can infer the significance of the event (McWilliams & Siegel, 1997). In this study, the event is defined as the announcement of Naira devaluation by the Apex bank on the 25th November 2014.

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 employed by the study. This is due to the fact that the study is uncertain if the market was informed before the close of the market on the day of the devaluation announcement; as the announcement became public when it appeared in the media a day after. This is in tandem with MacKinlay (1997) who opined that when the event announcement appears in the media, one may not be certain if the market was informed prior to the close of the market the prior trading day. If the market was informed then the prior day is the event day, if not then the current day is the event day. He concluded that the usual method of handling this problem is to expand the event window to two days; that is,day 0 and day +l. While there is a cost to expanding the event window, the two day event windows are still good suggesting that the costs are worth bearing rather than to take the risk of missing the event.In this regard, Peterson (1989) observed that a typical lengths of the event window range from 21 to 121 days for daily studies and from 25 months to 121 months for monthly studies.

Although, it has been established in the literature that the smallest event window is three days that isday 0 (the announcement day), day -1(pre-announcement day) and day +1(post-announcement day); however,Panayides and Gong (2002) posited that an event window of 11 trading days comprises of five days before the announcement and five days after it is adequate toestablish the effect of an event. The present study however employed a larger event window due to the fact that emerging markets like Nigeria are usually known to be less efficient than developed markets and therefore tend to be more sluggish in incorporating new information in stock prices (Afego 2011). It is thusimperative to choose a reasonably large event window to capture this speed of adjustment.

In addition, the study also employed a parameter estimation window of one hundred and twenty trading days ending -16 days prior to the first event day i.e. 25th November, 2014; over which the parameters for normal return were estimated. What this implies is that the 120 days to 16 days pre-event window have been used to represent a normal return period prior to the announcement. To this end, Peterson (1989) opined that a typical length of the estimation period range from 100 to 300 days for daily studies and from 24 to 60 months for monthly studies. In the same vein, Brown and Warner (1985) posited that a parameter estimation period of 120 days is sufficient when employing daily data to establish normal returns.

The daily stock price data collected were converted to daily continuously compounded stock return using the formula below as suggested byBrooks (2008),Adelegan (2009) and Rao and Sreejith, (2014)

$$R_{i,t} = \ln\left[\frac{P_{i,t}}{P_{i,t-1}}\right] \times 100 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where:

$R_{i,t}$= the return on the security of bank i at time t;

$P_{i,t}$ = the stock price of bank i at time t;

$P_{i,t-1}$ = the stock price of bank i at time t-1; and

ln = the natural logarithm.

The logarithmic conversion of the time series data became imperative in order to keep the effect of outliers under control. The same procedure wasadopted for the NSE ASI to create daily compounded market returns as follows:

$$R_{m,t=} \ln \left[\frac{ASI_t}{ASI_{t-1}}\right] \times 100 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where:

$R_{m,t=}$ = the return on the market at time t;

ASI_t = the NSE ASI at time t;

ASI_{t-1} = the NSE ASI at time t-1; and

ln = the natural logarithm.

The log daily returns of sample banks and those of the NSE ASI were the main constructs used to estimate the model for generating individual bank and market returns. Since the study utilized time series data, and time series data is believed to have an inherent problem of non-stationarity in levels which often produce spurious results. Thus, the need to subject the daily stock and market return to stationarity test using the Augmented Dickey-Fuller (ADF) test to remove the problems of non-stationarity become imperative.

Accordingly, Mohammed (2012) and Mohammed and Nwafor (2014) opined that even when daily bank and market returns werecomputed using the market model, they are not free from inherent statistical bias due to the effect of thin or infrequent trading.

However, MacKinley (1997) observedthat to a large extent, the adjustments for thin trading are not important especially for actively traded securities such as the DMBs' securities.

The study employed the market model advocated by Fama, Fisher, Jensen and Roll (1969) and Brown and Warner (1985) to estimate the abnormal returns in the event window. 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:

$Ri,t = \alpha + \beta Rm,t + \varepsilon t$ ----------*(3)*

Where: R*it*= returns on bank i at time period t
R*mt* = market index returns at time t
α and β = parameters to be estimated
ε*t*= error term

Assuming a constant beta value, the estimated return for bank *i*'s security was arrived at by substituting the estimated values of α*i* and β*i* over the estimation window in equation (3) above as follows:

$$\overline{E}_{i,t} = \widehat{\alpha}_i + \hat{\beta}_i R_{m,t}, \quad \text{.....(4)}$$

Where:
$\overline{E}_{i,t}$=expected return on bank *i*'s security at time t;
$\widehat{\alpha}_i$and_$\hat{\beta}_i$= estimated parameters based on the estimation window; and
$R_{m,t}$= the market return at time *t*.

The abnormal return (AR) isdefined as the difference between equation (3) and equation (4) as shown below:

$$AR = Ri,t - \overline{E}_{i,t} \quad \text{.....(5)}$$

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

$Ri,t= \widehat{\alpha_i}+\hat{\beta}_i Rm,t + \varepsilon i,t.$ ……(6)

Accordingly, the abnormal return on the security of a specific sample bank is simply the residual of the ordinary least square (OLS) after regressing the bank's stock return on the market return. However, for the residuals to be regarded as the abnormal return, the parameters estimated over the estimation windowmust be incorporated into the equation as shown above.

To improve the roboutness of the analysis of abnormal returns, the average of ARs were taken across the observations for all events N, using the model:

$AARt= 1 / N \Sigma ARit$ …… (7)

Where:

AARt = average abnormal return at time t

N = number of observations

In view of the fact that the returns are computed from the residuals of the market model, it becomes imperative to ensure that there is absence of any form of bias from the residuals. To achieve this, the study employedBreusch-Godfrey test for serial correlation (Godfrey, 1988) to check for the presence of first order serial correlation in the residuals series. Gujarati (2003) posited that serial correlation affects the efficiency of estimated coefficients in a regression model.

Despite this, Brown and Warner (1985) argued that estimates from OLS using the market model are usually well specified and exhibit no significant mean bias.Empirical evidence has however shown that the OLS estimation fails to sufficiently capture ARCH effects in returns series.De Medeiros and Matsumoto (2006) and Brooks (2008) observed that estimating a

model that sufficiently captures ARCH effects is imperative as their presence makes the coefficient estimates inefficient and consequently leads to a downward bias in abnormal returns.

In the same vein, Eminieke (2010) submitted that the Nigerian stock market index return shows significant volatility and the presence of ARCH effects. As a result, this study will employ 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 a situation where significant ARCH effects wereidentified, the OLS market model estimation for the affected sample DMBs was re-estimated using ARCH or GARCH models according to their best fits.

Since standard t-test was used to test the significance ofcummulative abnormal returns, it becomes vital to make sure that all postulations concerning the use of the tool are put in place. The standard t-test postulates that individual bank's abnormal returns are normally distributed. Therefore, the normality of residuals is necessary to authenticate t-tests (Agung, 2009). Based on this backdrop, the studyemployedthe Jarque-Bera Normality test (Bera & Jarque, 1981) to test for the normality of the abnormal returns.The cummulative abnormal returns of bank *i* in the sample for a given period will be arrived at by aggregate the abnormal return in a given period. The method used is described by the following formula:$CAR_{i(to,t1)} = \sum_{t=0}^{n} AR_{i,t} = \sum_{t=0}^{n} \varepsilon_{i,t}$

Where:

$CAR_{i(to,t1)}$ = the cumulative abnormal return of bank *i* from time *t*0 to *t*1,

$AR_{i,t}$ = the abnormal return of bank *i* at time *t*,

$\varepsilon_{i,t}$ = *is* the residual of bank *i* at time *t*;

n = the number of observations.

The null hypothesis of no significant cummulative abnormal returns for devaluation announcement on the announcement date, on the fifteen days prior to the announcement day and fifteen days succeeding the announcement day were tested using the t-test for the significance of cumulative abnormal returns. According to Panayides and Gong (2002), 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:

$$\text{t (CAR)} = \frac{CARi(t_o, t_1)}{S(AAR_t)}$$

t(CAR) = the test statistic for cumulative abnormal return,

CAR(*t*0, *t*1) = the cumulative abnormal return of bank *i*from time *t*0 to time *t*1 and

S(AAR*t*) = the standard deviation of average abnormal return over the parameter estimation window.

For the decision criteria, the null hypothesis of no significant cumulative abnormal returns would fail to beaccepted if the computed *t* value is greater than the critical value at a defined alpha level and vice versa.

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the detailed processes followed in the analysis of data employed by the study. It also includes the extracts of findings attained in the course of carrying out the study, with the results presented appropriately.

4.2 Data Presentation

The data used in this study and the variouspre-estimation and post-estimation diagnostic test resultsare attached as Appendices A – F. The data used are of two different categories. That is, the event window data whichcomprised the daily closing stock prices and the corresponding market index (All Share Index) of the thirteen sampled bankswhich were collected for the thirty two days of the event window.Likewise, the estimation period data which is made up of theclosing stock prices of the thirteen sampled banks and the corresponding market index (All Share Index) which were retrieved for the One Hundred and Twenty days of the estimation window period used in the study.

Also, the residual values of the regression of each bank's share return and market index return of NSE for the event window and parameter estimation window, as well as the hypotheses test result and Descriptive statistic result are also appended as Appendices G – J. The residual values were obtained after the share returns data of the banks were subjected to various diagnostic tests and regressed on the market returns to be used for testing of hypotheses and drawing up inferences and conclusions.

4.3 Data Analysis

Data analysis was carried out to test for the impact of currency devaluation announcement on share prices reaction of DMBs, employing the market model as described in the methodology. The daily share returns and market returns were computed for each day of the One Hundred and Twenty (120) days' parameter estimation period and the Thirty Two days (32) testing periods – the event window.Ascertaining the stationarity of the respective bank and market return series marked the commencement of the data analysis. Conducting the test became essential so as to avoid dealing with non-stationary variables that may give rise to spurious results. Table 4.1gives a summary of the results for the unit root test carried out on the thirteen bank stock return series and the thirteen market return series for the respective sample banks using the ADF test.

4.1. Test of Data Stationarity

Table 4.1.ADF Test for Naira Devaluation Announcement Event window and Parameter estimation Period

Variables	Event Window Stationarity Test		Estimation Window Stationarity Test	
	ADF Test Statistic	Order of Integration	ADF Test Statistic	Order of Integration
Access BankShareReturns	-3.607577**	I(0)	-12.08001***	I(0)
Diamond BankShare Returns	-3.756865***	I(0)	-9.700743***	I(0)
EquatorialTrust BankShare Returns	-5.684754***	I(0)	-11.31675***	I(0)
First BankShare Returns	-6.075115***	I(0)	-8.024482***	I(0)
FCMBShare Returns	-7.672332***	I(0)	-8.053218***	I(0)
Fidelity BankShare Returns	-6.412219***	I(0)	-10.46649***	I(0)
GTB Share Returns	-3.767281***	I(0)	-12.39442***	I(0)
Skye Bank Share Returns	-4.711523***	I(0)	-10.39495***	I(0)
Stanbic IBTC Share Returns	-5.541822***	I(0)	-11.47039***	I(0)
Sterling Bank Share Returns	-4.324757***	I(0)	-13.73548***	I(0)
UBA Share Returns	-4.210496***	I(0)	-9.4340764***	I(0)
UBN Share Returns	-4.57972***	I(0)	-10.18123***	I(0)
Zenith Bank Share Returns	-3.194099**	I(0)	-11.24601***	I(0)

Source: Eviews8.0 Output, 2015
****** and ** connote significance at the 1% and 5% levels respectively.***
NB: All ADF regressions contain an intercept and one lagged difference. D(X) connotes first difference of a variable X

Table 4.1 depicts the summary results obtained from the stationarity test carried out on the variables. It is glaring from the table that all the thirteen banks stock returns series were found to be stationary at level. The proof of the stationarity of these thirteen series can be seen from the significance of their respective ADF statistics. Thus, the null hypothesis of the existence of unit root in the stock returns series of all the thirteen sampled banks was rejected at the one and five percent levels respectively. This is because the t-statistic coefficients of all the banks were more than -2.614. This signifies that the return series of these banks were stationary and integrated of the order I(0). For the estimation window, all the return series were also found to be stationary at one percent level.This is because the t-statistic coefficients of all the thirteen banks exceeded -3.484. This implies that all the thirteen banks return series have no unit root problem and are integrated of the order I(0).

As pointed out earlier under the methodology, the abnormal return in the event window for each of the sampled banks was estimated by substituting parameters estimated over the estimation window using the OLS technique. Therefore, abnormal return for each sampled bank is the residual arrived at from the estimation of equation three (3) over the event window. In line with the assumption of OLS, the residuals estimated for each of the sampled DMBs using the market model were subjected to a number of diagnostic tests such as test for heteroskedastic effects and serial correlation among others.

4.3.2 Test for Serial Correlation

To ensure that the estimated coefficients in the regression model are very efficient and unbiased, theBreusch-Godfrey test for serial correlation was carried out on the residuals of the estimated market model for each bank in order to certify that the coefficient estimated over the estimation window and the event window are efficient and unbiased. Table 4.2

presents the summary of serial correlation test foe both event window and parameter estimation period.

Table 4.2 Summary ofBreusch-Godfrey Serial Correlation Test for Event Window and Parameter Estimation Period

Sampled Banks	Event Window Serial Correlation Test		Estimation Window Serial Correlation Test		Null-hypothesis
	F-statistic	Prob. F(5,29)	F-statistic	Prob. F(5,29)	
Access Bank ShareReturns	1.049449	0.4081	1.141274	0.3426	Failed to be rejected
Diamond Bank Share Returns	1.497136	0.2214	1.409282	1.409282	Failed to be rejected
EquatorialTrust Bank Share Returns	0.746609	0.5952	0.160378	0.9764	Failed to be rejected
First BankShare Returns	1.886096	0.1327	1.535187	0.1845	Failed to be rejected
FCMBShare Returns	1.371596	0.2638	2.026846	0.0800	Failed to be rejected
Fidelity Bank Share Returns	2.239220	0.0818	0.943501	0.4558	Failed to be rejected
GTB Share Returns	1.035306	0.4157	0.944184	0.4553	Failed to be rejected
Skye Bank Share Returns	0.174836	0.9699	1.089875	0.3697	Failed to be rejected
Stanbic IBTC Share Returns	1.623522	0.1852	1.052473	0.3905	Failed to be rejected
Sterling Bank Share Returns	1.693239	0.1678	0.331919	0.8928	Failed to be rejected
UBA Share Returns	1.178162	0.3438	0.913972	0.4746	Failed to be rejected
UBN Share Returns	0.198277	0.9606	0.523054	0.7584	Failed to be rejected
Zenith Bank Share Returns	0.942225	0.4687	0.728951	0.6031	Failed to be rejected

Source: Eviews8.0 output, 2015 and researcher's compilation 2015

Table 4.2 revealed thatthe residuals of two out of the thirteen banks in the event window showed evidence of significant serial dependence, while the remaining eleven had no traces of autocorrelation. The presence of serial correlation in the residuals of First bank and Fidelity Bank were corrected after an autoregressive model of two lag was introduced [AR(2)]. Thus, the null hypotheses for the absence of serial correlation was failed to be rejected at the five percent (5%) level of significance threshold set for the study.

Similarly, the test for the parameter estimation window models revealed the presence of autocorrelation in seven banks out of the thirteen banks. The evidence of serial correlation in the residuals of Diamond, First and Fidelity banks were rectified after an autoregressive model of two lag was introduced [AR(2)]. While the presence of serial correlation in the residuals of GTB, Sterling bank, FCMB and Zenith bank were also corrected after an autoregressive model of one lag was introduced [AR(1)]. Hence,the null hypotheses for the lack of serial correlation was failed to be rejected at5% level of significance threshold set for the study.

4.3.3 Test for Heteroskedaticity

As discussed under the methodology, estimating a model that sufficiently captures ARCH effects is essential in order to estimate efficient coefficients in the abnormal returns. Engle (1982) test of ARCH effects were conducted in the residuals of the market model over the parameter estimation window and the event window. Table 4.3 presented the summary result of the heteroskedascity test conducted.

Table 4.3 depicts the summary of Heteroskedaticity Testfor both event window and parameter estimation period.

Event Window Heteroskedaticity Test			Estimation Window Heteroskedaticity Test		
Sampled Banks	**F-statistic**	**Prob. F(5,29)**	**F-statistic**	**Prob. F(5,29)**	**Null-hypothesis**
Access Bank ShareReturns	0.872730	0.5133	0.225783	0.9507	Failed to be rejected
Diamond Bank Share Returns	2.019232	0.1105	0.572574	0.7209	Failed to be rejected
EquatorialTrust Bank Share Returns	1.114785	0.3779	1.832560	0.1121	Failed to be rejected
First BankShare Returns	1.694494	0.1760	1.749237	0.1293	Failed to be rejected
FCMBShare Returns	0.417986	0.8317	0.320367	0.8998	Failed to be rejected
Fidelity Bank Share Returns	1.376772	0.2695	0.229306	0.9490	Failed to be rejected
GTB Share Returns	0.263195	0.9289	1.272577	0.2808	Failed to be rejected
Skye Bank Share Returns	1.059360	0.4060	1.390266	0.2332	Failed to be rejected
Stanbic IBTC Share Returns	0.736910	0.6029	1.075916	0.3776	Failed to be rejected
Sterling Bank Share Returns	1.753890	0.1592	0.586038	0.7106	Failed to be rejected
UBA Share Returns	1.710374	0.1690	1.149688	0.3385	Failed to be rejected
UBN Share Returns	0.053748	0.9980	0.181684	0.9690	Failed to be rejected
Zenith Bank Share Returns	1.488990	0.2289	1.020021	0.4094	Failed to be rejected

Source: Eviews8.0 output, 2015 and researcher's compilation 2015

Table 4.3presents the ARCH test carried out on the residuals of the sampled banks within the event window. The testrevealed the absence of significant ARCH effects in all but one of the banks. This signifies that for the twelve banks, the OLS model was able to suitably estimate the returns. Therefore, the residuals of twelve banks did not show any sign of ARCH effects. Nevertheless, significant ARCH effects were noticed in the residuals of Sterling Bank in the

event window; thus the initial OLS model was replaced with ARCH/GARCH models in order to correct the anomaly. Evidence for re-estimation of the market model for Sterling Bank revealed that ARCH(1) fitted better than the estimate under GARCH(1,1) using the Akaike Information Criterion. Consequently, the residuals from the estimate of the ARCH (1) model were considered as the abnormal return of the bank within the event window.

Similarly, the ARCH test carried out on the residuals of the sample banks within the estimation period revealed the absence of significant ARCH effects ineight (8) out of the thirteen sampled banks. This connotes that for the eight banks, the OLS model was able to adequately estimate the returns. Thus, the residuals of eight banks did not show any sign of ARCH innovations. However, significant ARCH effects were detected in the residuals of FCMB, UBA, UBN, Zenith and Diamond banks Bank in the estimation window; therefore, the initial OLS model was reinstated with ARCH/GARCH models in order to rectify the anomaly. Evidence for re-estimation of the market model for FCMB, UBA, UBN and Zenith bank revealed thatGARCH(1,1) fitted better than the estimate under ARCH(1) using the Akaike Information Criterion. Consequently, the residuals from the estimate of the GARCH(1,1) model were considered as the abnormal return of the aforementioned banks within the estimation window. Whereas, for Diamond bank, ARCH(1) fitted better than the estimate under GARCH(1,1) using the Akaike Information Criterion. Accordingly, the residuals from the estimate of the ARCH (1) model were considered as the abnormal return of the bank within the estimation window.

Having completed all the diagnostic tests, the individual sample bank abnormal returns were then aggregated across banks to arrive at the abnormal return. Similarly, the abnormal return (AR) was aggregated across time to give cummulative abnormal return (CAR). Knowing the

characteristics of the abnormal and cumulative abnormal returns is very vital and this led to the conduct of descriptive statistics of the returns. Table 4.4 presents the summary descriptive statistics for the event window abnormal return, cummulative abnormal return and estimation window average abnormal return for the thirteen sample banks employed by the study.

Table 4.4 Summary Descriptive Statistics of Event Window Abnormal Return, Cummulative Abnormal Return and Estimation Window Average Abnormal Return

Measures	**AR**	**CAR**	**AAR**
Mean	0.000968	0.001246	-8.85E-05
Maximum	0.048583	0.046335	0.020252
Minimum	-0.040811	-0.037668	-0.03
Std. Dev.	0.021194	0.016201	0.008456
Skewness	0.220994	0.309711	-0.101965
Kurtosis	3.063936	4.453098	3.756592
Jarque-Bera	0.265922	3.326903	3.070097
Probability	0.875499	0.189484	0.215445
Observation	32	32	120

Source: E-views 8.0 output 2015
Notes: CAR – event window cumulative abnormal return, AR - event window abnormal return, AAR – parameter estimation window average abnormal return

The results for the various descriptive statistic items for abnormal return and cumulative abnormal return could be seen from Table 4.4 above. It can be seen that the mean or average values for the Abnormal Return (AR) and Cumulative Abnormal Return (CAR) series are approximately 0.000968 (or 0.097 percent) and 0.001246(0.125 percent) respectively. In addition, the standard deviation, whichmeasures the dispersion around the mean, stood at 0.021194for AR and 0.016201for CAR. The table equally documented minimum AR and CAR values of -0.040811 (or –4.08 percent) and -0.037668 (or –3.77 percent) in that order. Conversely, the maximum value documented for AR was 0.048583(or 4.9 percent), while that of CAR stood at0.046335(or 4.63 percent). The comparative margin betweenthe

minimum and maximum values of AR and CAR is indicative of the rate of variability among the returnseries.

Table 4.4 also depicts the skewness of the distribution of AR and CAR. Skewness, which measures the length of the tail of the distribution; the skewness value of 0.220994signifies thatthe distribution of AR is positively skewed, and thus has alonger right tail. Similarly, the skewness value of 0.309711for the distribution of CAR is also evidence that the distribution is positively skewed and thus has a longer right tail. From the table, the kurtosis value of AR was approximately3.064 which are above the threshold of three (3) and thus indicating that the distribution exhibits peakedness at the surface and is therefore leptokurtic. In the same vein, the CAR series kurtosis value stood at4.453 which as well indicate leptokurtosis or peakedness of the distribution at the surface, since thevalue is alsogreater than the threshold of three.

As postulated by Brown and Warner (1985) and Ball and Brown (1968), the normality of AR and cumulative abnormal return is a prerequisite for the *t*-test for the significance of CAR. In this regard,the study employed the Jarque-Bera normality test. For the AR series, the table reports an approximate Jarque-Bera value of 0.266 which is not significant at all the conventional levels of significant. This leads to the failure to reject the null hypothesis which states that the abnormal return series is normally distributed. Therefore, results from the Jarque-Bera test shows that the AR series is normally distributed.Likewise, Jarque-Bera value of 3.327 of CAR series was also statistically non-significant at all the conventional levels, leading to the failure to reject the null hypothesis. This signifies that the CAR series is also normally distributed. In short, it can be concluded that the descriptive statistics proved that

the two variables of interest; AR and CAR are normally distributed and thus, can be suitably used for the t-test as explained under the methodology.

Also the summary statistics for the parameter estimation window is important because the standard deviation of the AAR is crucial for the test of hypotheses using *t*-test. From table 4.4 it is obvious that the mean or average value for the average abnormal return is approximately -8.85E-05 and the standard deviation, which measuresthe dispersion around the mean, stood at 0.008456. The table also documented minimum average abnormal return of -0.03 (or –3.0 percent). Conversely, the maximum value stoodat0.020252(or 2.03 percent).The comparative margin betweenthe minimum and maximum values of abnormal return and cumulativeabnormal return is suggestive of the rate of variability among the returnseries.

It could also be seen from the table that the skewness of the distribution of average abnormalreturn was -0.101965signifying that the distributionof average abnormal return is negatively skewed, and therefore, has a longer left tail. The table also documented a kurtosis of approximately3.757 which is greater than the threshold of three; this isindicating that the distribution showspeakedness at thesurface and is therefore leptokurtic.On the other hand, the AAR Jarque-Bera test for the normality of AAR reports an approximately value of 3.07which is not statistically significant at all the conventional levels of significant. This leads to the failure to reject the null hypothesis which states that the average abnormal return series is normally distributed. Hence, result from the normality tests shows that the average abnormal return series is normally distributed.

4.3.5 Abnormal and Cumulative Abnormal Returns for Estimation and Event Windows

To establish the total impact of an event/announcement over a particular period of time, the average abnormal returns for the sample banks is aggregated to obtain the daily CARs. To evaluate abnormal returns, the CAR for daily returns is computed by summing the CAR of the previous day with prevailing day AR. The first cumulative abnormal return (CAR) is just equal to the abnormal return on day -15. The CAR on day -14 is the sum of the first two abnormal returns; the CAR on day -13 is the sum of the first three and so on. By examining CARs, we can see if there was an over or under reaction to an announcement or not. Table 4.5 presents the abnormal return and cummulative abnormal return over the thirty two days' event window.

Table 4.5 Event Window Abnormal Return and Cummulative Abnormal Return

DAY	AR	CAR	DAY	AR	CAR
-15	-0.0377	-0.0377	**+1**	-0.0018	**0.0069**
-14	0.0442	0.0066	**+2**	-0.0205	-0.0137
-13	-0.0088	-0.0022	**+3**	0.0047	-0.0090
-12	0.0486	0.0463	**+4**	0.0132	0.0042
-11	-0.0187	0.0276	**+5**	-0.0018	0.0024
-10	-0.0353	-0.0077	**+6**	0.0002	0.0026
-9	0.0013	-0.0064	**+7**	-0.0038	-0.0012
-8	0.0100	0.0036	**+8**	-0.0076	-0.0089
-7	-0.0027	0.0010	**+9**	0.0184	0.0096
-6	-0.0027	-0.0017	**+10**	-0.0408	-0.0312
-5	-0.0031	-0.0048	**+11**	0.0325	0.0013
-4	0.0264	0.0216	**+12**	-0.0108	-0.0095
-3	-0.0201	0.0014	**+13**	0.0020	-0.0075
-2	0.0112	0.0126	**+14**	-0.0093	-0.0168
-1	-0.0036	**0.0091**	**+15**	0.0183	0.0015
0	-0.0004	0.0087	**+16**	0.0295	**0.0310**

Source: **Microsoft excel, 2007 and researcher's computation**
NOTES; AR – event window abnormal return, CAR – event window cumulative abnormal return.

Table 4.5 revealed that the value of average abnormal return was negative for 8 days and cumulative abnormal return was negative for 6 days before the announcement date. The negative abnormal return persists two days post the announcement day before it become

positive which implies that two day after the announcement investors still react negatively to the devaluation announcement. Conversely, the CAR was positive on the announcement day and a day after which signifies that investors of DMBs in the NSE react positively to the announcement. Though, the positive CARs did not persist as they become negative in day three and four following the announcement and thereafter, positive CARs persist for three days. In a nutshell, the table revealed that the ARs and CARs for the pre and post event day demonstrate a mixed reaction.

4.3.6 Test of Hypotheses

To independently assess the impact of the announcement which is tailored along the hypotheses of the study, the hypotheses of the study were tested using the non-parametric*t*-test for the significance of abnormal return over three periods. In each of the cases, the*t*-statistic intended to ascertain whether the cumulative abnormal return over the period of interest is significantly different from zero. Therefore, the three points at which the significance of cumulative abnormal return was tested include pre-announcement day cumulative abnormal return, announcement day cumulative abnormal return and post-announcement day cumulative abnormal return.

Table 4.6 presents the abnormal returns and cumulative abnormal returns for the fifteen trading daysbefore the announcement day.

Table 4.6AR and CAR before announcement date

Days	AR%	CAR%
-15	-3.7668	-3.7668
-14	4.4231	0.6563
-13	-0.8811	-0.2249
-12	4.8583	4.6335
-11	-1.8706	2.7629
-10	-3.5347	-0.7719
-9	0.1324	-0.6394
-8	1.0034	0.3639
-7	-0.2661	0.0978
-6	-0.2689	-0.1711
-5	-0.3126	-0.4837
-4	2.6403	2.1566
-3	-2.0142	0.1424
-2	1.1203	1.2628
-1	-0.3550	**0.9078**

Source: Microsoft excel, 2007

In order to test for hypothesis $\mathbf{H_{01}}$**:** that there is no significant cumulative abnormal (CAR) return fifteen trading days before the announcement date. Table 4.7 presents the summary of the test statistics for the hypothesis.

Table 4.7 Result for the Test of Hypothesis before the devaluation announcement

Details	Value
Cummulative Abnormal Return (Day -15 to Day -1)	0.9078
Estimation Window standard Deviation of Average Abnormal Return	0.008456
t-Statistic	-0.922743
Probability	0.3718

Source: e-views 8.0 output 2015

It is evident from table 4.7 that the null hypothesis of no significant cummulative abnormal returns fifteen trading before the announcement day was tested for the period of day -15 to day -1. It could also be seen from the table that cumulative abnormal return over the period of

interest is approximately 0.91 percent and the standard deviation of the average abnormal return over the parameter estimation window is 0.008456. Also, the reported t-statistic of -0.922743 was statistically not significant at all the conventional levels of significant. The result thus, indicated that we have nobasis to reject the null hypothesis which stated that the cumulative abnormal return exhibited by stock prices of DMBs in Nigeria on the fifteen trading days prior to the announcement of the Naira devaluation is not significantly different from zero. Hence, we failed to reject the null hypothesis.

In the same vein, table 4.8 presents the summary of AR and CAR on the currency devaluation announcement day.

Table 4.8Date of Announcement AR and CAR

Days	**AR%**	**CAR%**
0	-0.0384	0.8695
+1	-0.1844	**0.6851**

Source: Microsoft excel, 2007

Table 4.8 showed a negative abnormal return and a positive cumulative abnormal return both on the announcement day of currency devaluation. Similarly, to test for **H_{02}:** that there is no significant CAR on the date of currency devaluation announcement in Nigeria. Table 4.9 presents the summary result for the hypothesis tested.

Table 4.9 Result for the Test of Hypothesis on the devaluation announcement day

Details	Value
Cummulative Abnormal Return (Day -15 to Day +1)	0.6851
Estimation Window standard Deviation of Average Abnormal Return	0.008456
t-Statistic	-2.623572
Probability	0.0184**

Source: e-views 8.0 output 2015

` and ** connote significance at the 1% and 5% levels respectively

It can be seen from table 4.9 that the null hypothesis of no significant cummulative abnormal returns on the announcement day was tested for the period of -15 to day +1. The table also revealed that cumulative abnormal return over the period of interest is approximately 0.69 percent and the standard deviation of the average abnormal return over the parameter estimation window is 0.008456. Also, the reported t-statistic of -2.623572was statistically significant at the five percent level of significant. The result thus, indicated that we have enough evidence to reject the null hypothesis which stated that the cumulative abnormal return exhibited by stock prices of DMBs in Nigeria on the announcement day of the Naira devaluation is not significantly different from zero. Hence, the null hypothesis is hereby rejected.

Furthermore, table 4.10 depicts the abnormal returns and cumulative abnormal returns for the fifteen trading days after the announcement day.

Table 4.10: **AR and CAR after the announcement date**

Days	AR%	CAR%
+2	-2.0502	-1.3651
+3	0.4687	0.4687
+4	1.3208	0.4244
+5	-0.1773	0.2471
+6	0.017	0.2641
+7	-0.3827	-0.1186
+8	-0.7673	-0.8859
+9	1.8437	0.9578
+10	-4.0811	-3.1233
+11	3.255	0.1312
+12	-1.0795	-0.9483
+13	0.2025	-0.7458
+14	-0.9346	-1.6804
+15	1.8286	0.1482
+16	2.9500	**3.0982**

Source: Microsoft excel, 2007

Similarly, table 4.11 presents the key statistics from the test of hypothesis three (H_{03}) which stated that there is no significant cumulative abnormal return fifteen trading days after currency devaluation announcement in Nigeria.

Table 4.11 Result for the Test of Hypothesis on the fifteen trading day after the devaluation announcement day

Details	Value
Cummulative Abnormal Return (Day -15 to Day +16)	3.0982
Estimation Window standard Deviation of Average Abnormal Return	0.008456
t-Statistic	-10.00333
Probability	0.0000***

Source: e-views 8.0 output 2015

****** and ** connote significance at the 1% and 5% levels respectively***

Table 4.11 depicted that cumulative abnormal return for the fifteen trading day after the announcement became public isapproximately 3.0982 percent and the standard deviation of the average abnormal return over the parameter estimation window still remained as 0.008456. Also, the table reported a computed t-value of -2.623572 which is statistically significant at the one percent level. Hence, thisindicated that the null hypothesis which stated stock prices of DMBs in Nigeria did not exhibit significant cumulative abnormal return fifteen trading days after the announcement day of the currency devaluation is hereby rejected.

4.4 Discussion of Findings

This study empirically investigated currency devaluation announcement and DMBs stock prices in Nigeria. Findings from the test of the first hypothesis documented the presence of positive and statistically non-significant cumulative abnormal return of 0.9078 percent, fifteen trading day before the announcement became public. This signified that the stock prices of DMBs that traded on the fifteen trading day prior to the announcement reacted positively to the announcement of the currency devaluation, and investors of these banks added 0.9078 percent to the value of their investmentsand thus considered the announcement as positive news. The finding of statistically non-significant positive cumulative abnormal return prior to the announcement day is consistent with the finding of existing studies on currency devaluation/monetary policy announcement such as Sasidharan (2009), Jianyu, Jose and Yun (2009), Wilson, Sounders and Jr (2000) and contradicts the findings ofPatro, Walid and Wu (2014),Kucukkocaoglu, Unalmis and Unalmis (2013),Wang and Mayes (2012) andGlen (2001).

In addition, the second hypothesis of the study further ascertained the presence of positive and statistically significant cumulative abnormal return of 0.6851 percent for the banks on the day the announcement of the currency devaluation became public. This implied 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 0.6851 percent increase in the market value of his/her investment and therefore, considered the announcement as a good news. The evidence of statistically significant announcement day positive cummulative abnormal return corroborates with previous studies on currency devaluation/monetary policy announcement such as: Jianyu, Jose and Yun (2009), Ekanayake, Rance, and Halkides (2008), Wilson, sounders and Jr (2000) and negates the findings of Ricci (2015), Patro, Walid and Wu (2014), Marfatia (2014), Vithessonthi and Techarongrojwong (2013), Vithessonthi and Techarongrojwong (2012) andSasidharan (2009)

Also, the third hypothesis of the study established evidence of the persistence of positive cumulative abnormal return for the fifteen trading days after the announcement day. A statistically significant cumulative abnormal return of approximately 3.0982 percent was ascertained over the period after the announcement day. This result is an indicator towards the persistence of positive market trend in the Nigerian stock market with respect to the DMBs stock prices even after the information became public. Thus, this suggests that the cumulative abnormal return of 3.0982 percent for the period of interest is significantly different from zero at the one percent level. The implication of this, is that market participants who held stock of DMBs in the NSE still experienced positive return even fifteen trading days after the announcement became public and thus, earned an increase of 3.1 percent to the value of their share holding

Previous studies on currency devaluation/ monetary policy announcement such as Jianyu, Jose and Yun (2009), Glen (2001), Wilson, sounders and Jr (2000)have as well documented evidence of persistence positive cumulative abnormal return for the period succeeding the announcement day. On the contrary, the finding is inconsistent with those of Ricci (2015), Patro, Walid and Wu (2014), Marfatia (2014), Vithessonthi and Techarongrojwong (2013) and Wang and Mayes (2012).

4.5 Policy Implication of the Findings

The implication of this study to policy makers and regulatory bodies of the stock market is that the findings of the study will provide them with an empirical parameters as to the suitability or otherwise of the event announcement. Also, the findings of this study would empirically reveal the efficiency or otherwise of the Nigeria market announcement.

Similarly, investors and portfolio managers who are keen in achieving optimal investment mix would be interested in discovering opportunities for maximising returns by trading around currency devaluation announcement dates in emerging markets like the Nigeria stock market.

4.6 Theoretical Implication of the Findings

The theoretical implication of the study is the fact that the study documented a positive investors' reaction to the announcement which led to the abnormal return of 0.9078, 0.6851 and 3.0982 before the announcement day, on the announcement day and after the announcement day respectively. This is contrary to the underpinning theory upon which the study was anchored which assumed that investors are rational and the market is efficient thus, making of abnormal return is virtually impossible. This implied that the efficient market hypothesis is not applicable in all circumstances.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Currency devaluation announcement have been investigated in the study, with the eventual aim of documenting the probable effects of the announcement on the DMBs listed on the NSE who traded fifteen trading days prior to the announcement, on the announcement day and fifteen trading days succeeding the devaluation announcement.

Findings from the first, second and third hypotheses of the study revealed that investors who held stocks of DMBs in the NSE react positively to the announcement, and thus, considered the announcement as favourable news. These investors earned approximately 0.91%, 0.68% and 3.0% respectively to the value of their share holdings in the NSE.

5.2 Conclusions

The study was set out to empirically examined Naira devaluation announcement on the share prices of Deposit Money Banks in Nigeria. Having made a thorough analysis, it can be concluded that the evidence of positive cumulative abnormal return on the date of, before and after the announcement day signified that investors and market participantsof the Nigerian banking sector in the Nigerian Stock Exchange considered the sudden announcement of the Naira devaluation as good news. Anticipation of improved market condition due to increased capital inflow from within and international arena which would translate to increase return on investment may have accounted for the positive cumulative abnormal return even before the devaluation announcement became public. In addition,the persistence ofpositive cumulative abnormal return for days after the announcement date substantiates that policy makers provide adequate information on the need to devalue the Naira and market participants fully understood the profound benefits associated with the devaluation announcement and this

assist in sustaining the prevailing up-ward trend in the market. This implies that DMBs investors in the NSE sustained the gain in their share prices' return up to fifteen trading days succeeding the announcement. This may be one of the reasons why policy makers sought for further devaluation of the nation's currency.

5.4 Recommendations

In line with the findings of the study, the study recommends as follows:

Firstly, since the pre-announcement positive CAR is non-significant, monetary authority alongside policy makers should precede future announcement with release of information that would showcase to investors enormous economic and social benefit associated with the devaluation.

Secondly, import substitution policy should be implemented to ensure persistent of the positive returns as this would encourage an upsurge in the foreign portfolio and increase the liquidity base of the Deposit Money Banks and the Nigerian Stock Exchange. This would enhance their readiness to lend to the real sector of the nation's economy.

Lastly, Deposit Money Banks' investors are encouraged to trade around devaluation announcement periods in emerging market like Nigeria in order to make positive abnormal returns and add to the value of their investment holdings in the stock market.

5.5 Suggestions for Further Study

This study empirically examined stock reactions around currency devaluation announcement in Nigeria. However, the findings of the studycannot be generalized to the entire firms listed on the Nigerian Stock Exchange(NSE) due to the fact that the study is specific to the Nigerian banking sector and this constitutes a limitation to the study. Future studies should be

conducted on the same phenomenon and the entire firms listed on the NSE should be employed as a domain rather than a specific sector. Furthermore, other related models such as Mean Adjusted Returns, Market Adjusted Returns and Conditional Risk Adjusted Returns among other can also be employed by future researchers on the same issue so as to see if different outcomes would be generated. These therefore constitute a research gap to be filled by future researchers.

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APPENDIX A

EVENT WINDOW DATA

Day	Date	ShareDPrice													Market Index
		Access	Diamond	ETI	FBNH	FCMB	Fidelity	GTB	Skyebnk	Stanbic	STERLING	UBA	UBN	ZENITH	
day+21	12/24/2014	7.18	5.7	18	9.3	2.78	1.6	25.01	2.89	29.18	2.33	5	7.8	19.47	34428.82
day+20	12/23/2014	6.99	5.79	17.96	8.92	2.72	1.58	24.52	2.64	29.18	2.43	4.56	7.87	19.5	32786
day+19	12/22/2014	6.66	5.29	17.2	8.5	2.73	1.5	23.36	2.4	29.18	2.32	4.15	7.5	17.98	31371.93
day +18	12/19/2014	6.05	4.99	17.4	8.29	2.78	1.55	22.05	2.29	28.99	2.27	3.78	7.16	16.32	30306.51
day +17	12/18/2014	5.5	4.76	16.96	7.99	2.75	1.48	21	2.19	28.38	2.23	3.43	7.15	15.37	29311.25
day +16	12/17/2014	5.7	4.85	17.1	7.79	2.89	1.44	20.4	2.09	27.08	2.19	3.44	7.22	15.62	28961.67
day +15	12/16/2014	6	5	18	8.2	2.85	1.45	21.45	2.19	28.5	2.24	3.62	7.22	16.44	29789.59
day +14	12/15/2014	6.13	4.97	18.25	8.58	2.95	1.43	22.05	2.3	28.5	2.3	3.8	7.6	17.02	30492.3
day +13	12/12/2014	6.13	4.89	18.21	8.63	3	1.5	22.49	2.33	28.5	2.32	4.08	7.6	17.25	30763.38
day + 12	12/11/2014	6.43	4.84	18.2	8.64	2.98	1.52	22.8	2.45	28.21	2.34	4.18	8	17.48	32203.62
day + 11	12/10/2014	6.76	5.09	18.05	9	3.07	1.6	23.31	2.51	29.69	2.4	4.39	8.1	18.4	32203.62
day + 10	12/9/2014	6.9	5.35	18.1	8.88	3.09	1.54	23.95	2.55	29	2.4	4.51	8.17	18.33	32932.41
day + 9	12/8/2014	7.03	5.59	18	8.96	3.09	1.54	24	2.5	29	2.4	4.74	8.6	18.5	33075.71
day + 8	12/5/2014	7.07	5.6	17.6	8.98	3.1	1.54	24	2.5	30	2.4	4.76	8.85	18.77	33228.29
day + 7	12/4/2014	7.15	5.7	17.8	9.08	3.09	1.52	23.12	2.41	29.93	2.35	4.91	8.43	19.11	33175.78
day + 6	12/3/2014	7.4	5.7	17.65	9.14	3.06	1.53	24.02	2.48	28.53	2.42	5	8.37	19.11	33255.67
day + 5	12/2/2014	7.4	5.7	17.56	9.14	3.1	1.53	24.1	2.37	29.21	2.35	5	8.3	19.47	33550.73
day + 4	12/1/2014	7.52	6	17.5	9.5	3.14	1.55	25.04	2.47	30.74	2.35	4.81	8.33	20.33	33914.25
day + 3	11/28/2014	7.61	6.2	17.5	9.95	3.3	1.6	25	2.48	31	2.36	5.13	8.43	20.52	34543.05
day + 2	11/27/2014	7.5	6.06	18	10.4	3.3	1.55	25.2	2.6	30.45	2.35	5.14	8.42	20.9	34705.48
day +1	11/26/2014	7.85	6.03	17.99	9.97	3.36	1.62	25	2.61	29	2.33	4.84	8.05	20.85	34583.29
day 0	11/25/2014	8	5.76	17.2	9.53	3.2	1.63	24.7	2.46	28.47	2.38	4.65	8.11	20.85	34115.84
day - 1	11/24/2014	7.97	5.49	17.05	9.4	3.2	1.66	23.66	2.47	28.25	2.3	4.45	8.15	20.75	33875.26
day -2	11/21/2014	7.83	5.5	17.05	9.32	3.25	1.7	23.4	2.47	28.2	2.3	4.37	8.35	20.95	33926.18
day -3	11/20/2014	7.46	5.57	17	9.1	3.13	1.62	23.12	2.47	28.2	2.33	4.3	8.12	21	33926.18
day -4	11/19/2014	7.25	5.84	17.2	9.04	3.29	1.7	23.1	2.59	27.5	2.31	4.43	8.05	21.07	34145.79
day -5	11/18/2014	7.5	5.81	17.01	9.5	3.37	1.7	23.37	2.63	28	2.31	4.55	8.06	21	34896.5
day -6	11/17/2014	7.55	6	17.2	9.6	3.45	1.78	23.26	2.51	28	2.3	4.34	8.25	20.95	35488.8
day -7	11/14/2014	7.68	6.1	17.2	9.36	3.4	1.78	23.12	2.57	28	2.3	4.33	8.07	20.8	35381.02
day -8	11/13/2014	8	6	17.23	9.88	3.41	1.7	24	2.55	27.6	2.31	4.7	8.05	20.6	34515.47
day -9	11/12/2014	8	6.02	17.3	10.51	3.35	1.69	24.43	2.66	27.64	2.31	5.16	8.05	21	33967.48
day -10	11/11/2014	8.15	5.84	18	10.54	3.42	1.69	24.6	2.68	27.3	2.39	5.18	7.67	21.07	37343.85
day -11	11/10/2014	7.77	5.57	17.1	9.57	3.26	1.65	24.25	2.47	26.5	2.31	4.71	7.31	21	37550.24
day -12	11/7/2014	7.4	5.31	16.72	9.26	3.22	1.65	24	2.36	26.74	2.2	4.3	6.97	20.11	33225.75
day -13	11/6/2014	7.6	5.51	17.58	9.96	3.38	1.8	25	2.5	28.14	2.18	4.21	6.82	20.5	37343.85
day-14	11/5/2014	8.08	5.8	18.5	10.48	3.34	1.89	25.3	2.58	28.14	2.41	4.66	7.17	21	37343.85
day -15	11/4/2014	8.08	5.8	18.5	10.48	3.34	1.89	25.3	2.58	28.14	2.41	4.66	7.17	21	36744.46

APPENDIX B
ESTIMATION PERIOD DATA

	SHARE PRICE													Market Index
	ACCESS	Diamond	ETI	FCMB	FIDELITY	FBNH	GTB	SKYEBNK	STERLIN	STANBIC	UBA	UBN	ZENITH	
5/5/2014	9.01	6.25	12.81	3.5	1.9	13.03	26.8	3.5	2.22	23	6.76	9.85	22.55	38452.1
5/6/2014	9.01	6.19	12.81	3.54	1.91	13	26.5	3.55	2.19	22.6	6.75	10	22.5	38480.1
5/7/2014	9	6.24	13	3.54	1.85	13	26.49	3.54	2.18	22.57	6.75	10	22.9	38586
5/8/2014	9.01	6.31	13	3.6	1.9	13	26.8	3.67	2.18	22.57	6.75	10	23	38640.4
5/9/2014	9.08	6.53	13	3.7	1.9	13.03	26.85	3.66	2.2	22	6.77	10.19	22.63	38554.2
5/12/2014	9.19	6.4	13.01	3.74	1.95	13.17	26.85	3.7	2.2	21.2	6.8	10	22.74	38560.7
5/13/2014	9.5	6.47	13.3	3.92	2	13.5	27.99	3.8	2.3	22	6.99	10.02	22.91	38955
5/14/2014	9.8	6.5	13.35	4.09	2.09	13.6	27.5	3.72	2.3	22.5	7.25	10.1	23.3	39139
5/15/2014	9.85	6.5	14.3	4.19	2.03	13.1	27.52	3.45	2.29	22.04	7.24	10.18	23.5	38957.5
5/16/2014	9.55	6.52	14	4.3	2.05	13.17	27.1	3.46	2.3	22.04	7.11	10.06	22.95	39018.3
5/19/2014	9.4	6.5	14.11	3.99	2.05	12.9	27	3.32	2.24	22.04	7.17	10.2	22.99	39007.4
5/20/2014	9.29	6.59	14.81	3.8	2.03	13.07	27.49	3.3	2.25	22.8	7.16	10.2	23.3	39162.5
5/21/2014	9.04	6.42	15.5	3.81	2.05	13.21	27.5	3.31	2.25	22.41	7.19	10.2	22.9	39237.9
5/22/2014	9.1	6.39	15.34	3.81	2.05	13.65	28.15	3.26	2.25	22.41	7.19	10.2	23.25	39344.4
5/23/2014	9.3	6.5	15.13	3.96	2.08	13.9	27.68	3.33	2.27	22.41	7.2	10.2	23.41	39831.8
5/26/2014	9.33	6.38	15.25	3.9	2.05	14	27.8	3.4	2.25	22.41	7.2	10.25	23.11	39755.5
5/27/2014	9.7	6.48	15.7	3.97	2.05	14.15	27.8	3.44	2.28	22.8	7.22	10.4	23.36	40061.2
5/28/2014	9.7	6.5	16	4.18	2.06	14.5	28.49	3.54	2.3	22.8	7.35	10.6	24.03	40061.2
5/30/2014	10.1	6.7	16.8	4.3	2.1	15.3	29.92	3.53	2.4	23.77	7.67	10.56	25.4	41474.4
6/2/2014	10	6.77	17.99	4.14	2.07	15.98	29.3	3.54	2.38	24.8	7.65	10.5	25.01	41501.4
6/3/2014	9.86	6.82	17.2	4	2.07	15.21	29.8	3.42	2.34	24.7	7.47	10.11	24.55	41397.7
6/4/2014	9.95	6.74	17.5	4.01	2.05	15.03	29.81	3.38	2.29	24.7	7.5	10.1	25	41627.4
6/5/2014	9.75	6.7	16.85	4.17	2	15.2	30.06	3.33	2.3	24.71	7.5	10.43	25.02	41570.1
6/6/2014	9.75	6.8	16.4	4.17	2.06	15.36	30	3.4	2.36	25	7.55	10.3	25	41529.1
6/9/2014	9.76	6.79	16.7	4.05	2.06	15.53	31.5	3.32	2.37	25.31	7.75	10.3	25	41609.4
6/10/2014	9.86	6.85	16.65	4.05	2.01	15.6	30.5	3.38	2.34	25.32	7.9	10.3	25.2	41521.4
6/11/2014	9.91	6.7	16.6	4.05	2.07	15.55	30.91	3.42	2.33	25.35	8.03	10.06	25.3	41642.6
6/12/2014	9.83	6.72	16.76	4.13	2.08	15.5	31.25	3.4	2.36	25.35	8.14	10.26	25.3	41228.7
6/13/2014	9.8	6.7	16.7	4.13	2.07	15.51	31.26	3.4	2.37	25.9	8.12	10.22	25.3	41642.6
6/16/2014	9.8	6.6	15.87	4.15	2.05	15.6	31.6	3.44	2.35	24.83	8.01	10.22	25.19	41449.5
6/17/2014	9.52	6.27	14.82	4.2	2.05	15.5	30.2	3.47	2.34	24.92	7.95	10.1	24.9	41135.4
6/18/2014	9.79	6.11	15.29	4.2	2.03	15.46	30	3.4	2.33	25	8	10	24.8	41231.7
6/19/2014	9.8	6.3	15.32	4.25	2.03	15.41	29.7	3.4	2.34	25.25	8.03	9.95	24	41069
6/20/2014	9.8	6.47	15.99	4.25	2.07	15.39	28.83	3.36	2.42	25.8	8	10	23.8	41132.9
6/23/2014	9.8	6.59	16	4.27	2.03	15.1	28.9	3.34	2.34	26.81	7.9	10	24.7	41577.5
6/24/2014	9.57	6.4	15.96	4.27	2.03	15.42	28.5	3.33	2.34	26.8	7.77	10	25	41740.5
6/25/2014	9.7	6.4	16.49	4.25	2.02	15.8	28.94	3.3	2.32	26	7.85	10	25	41987.6
6/26/2014	9.61	6.35	16.32	4.14	2.03	15.6	28.9	3.27	2.3	26	7.91	10	25	41729.6
6/27/2014	9.7	6.3	16.24	4.2	2.04	15.6	29.02	3.3	2.3	26	7.81	9.97	25	42187.6
6/30/2014	9.55	6.4	16.89	4.2	2.07	15.6	28.95	3.3	2.35	26	7.7	9.97	25.05	42482.5
7/1/2014	9.8	6.4	16.49	4.3	2.04	15.95	28.76	3.33	2.33	26.45	8.05	10	25.5	42611.3
7/2/2014	9.71	6.3	16.5	4.4	2.01	16.12	29.06	3.36	2.34	27.2	7.99	9.95	25.15	42634.5
7/3/2014	9.7	6.28	16.5	4.37	2	16	29.21	3.26	2.28	27	7.89	10	25.11	42686.9
7/4/2014	9.71	6.4	17.32	4.36	2	15.8	29.6	3.34	2.3	26.73	7.9	9.6	25.1	42187.6
7/7/2014	9.75	6.3	17.1	4.25	2	16.01	29.44	3.33	2.3	26.73	7.9	9.77	25.3	42758
7/8/2014	9.8	6.32	17.1	4.24	1.99	16	29.57	3.28	2.3	27	7.8	9.7	25.3	42861.8
7/9/2014	9.81	6.23	17.24	4.15	2.03	16.01	30	3.23	2.29	27.03	7.81	9.7	25.2	43039.4
7/10/2014	9.8	6.25	17.22	4.15	1.99	16.14	30	3.27	2.3	27.05	7.81	9.7	25.3	42758
7/11/2014	9.8	6.3	17.44	4.15	2	16.23	29.97	3.27	2.31	27.05	7.85	9.65	25.3	42758
7/14/2014	9.76	6.27	17.5	4.15	1.96	16.29	31	3.21	2.32	27.5	7.85	9.51	25.15	42930.6
7/15/2014	9.74	6.29	17.39	4.15	1.95	16.25	31	3.27	2.32	27.5	8.09	9.54	25.16	42971.6
7/16/2014	9.68	6.27	17.39	4.19	1.96	16.05	31	3.22	2.31	27.5	8.09	9.54	25.2	43030.3
7/17/2014	9.95	6.3	17.23	4.19	1.98	16	30	3.28	2.32	27.26	8	9.54	25.2	42918.5
7/18/2014	9.8	6.32	16.85	4.26	1.94	15.9	30	3.4	2.38	27.26	8.06	9.23	25.22	42891.8

7/21/2014	9.8	6.4	16.62	4.21	1.95	15.62	30.01	3.28	2.37	27.13	8.01	9.23	24.95	42971.6
7/22/2014	9.9	6.6	16.8	4.2	1.96	15.7	30.13	3.25	2.36	27.13	8	8.99	25	42665
7/23/2014	10	6.72	16.9	4.21	2.04	15.51	30.1	3.2	2.32	27.5	7.85	9.01	24.95	42544.3
7/24/2014	9.88	6.3	16.94	4.2	2.01	14.79	29.15	3.11	2.21	30	7.48	8.25	25	41801.5
7/25/2014	9.72	6.7	16.9	4.2	1.98	15.22	31	3.2	2.26	29.09	7.9	8.91	25.23	42285.8
7/30/2014	9.8	6.7	16.7	4.29	2	15	30	3.16	2.24	30.54	7.7	8.61	25.6	42369
7/31/2014	10	6.37	16.5	4.26	2	14.48	29.9	3.05	2.32	31.24	7.7	8.61	25.08	42097.5
8/1/2014	9.98	6.35	16.87	4.23	2.01	14.4	28.8	3.01	2.3	31	7.49	8.45	25.06	41934.4
8/4/2014	9.88	6.3	16.94	4.2	2.01	14.79	29.15	3.11	2.21	30	7.48	8.25	25	41801.5
8/5/2014	9.9	6.4	16.8	4.25	2.05	14.97	29.45	3.06	2.26	30	7.64	8.18	25	42292.9
8/6/2014	9.9	6.38	17.52	4.2	2.02	15.25	29.99	3.1	2.21	29.3	7.8	8.2	25.1	42339.8
8/7/2014	10	6.44	18.33	4.3	2.04	15.31	30.4	3.16	2.2	29.3	7.9	8.61	24.99	42612.3
8/8/2014	9.9	6.4	18.33	4.25	2.02	15.42	30.4	3.17	2.2	30	7.9	9	25	42598.5
8/11/2014	9.8	6.3	17.9	4.27	2	15.35	30	3.14	2.24	29.2	7.9	9	24.9	42012.7
8/12/2014	9.9	6.3	17.9	4.25	2.05	15.49	29.5	3.1	2.16	30	7.6	8.72	24.59	42092.7
8/13/2014	9.6	6.33	17.45	4.25	2	15.5	29.53	3.11	2.16	30.01	7.5	8.3	24.34	41753.2
8/14/2014	9.74	6.28	17.25	4.25	2.04	15	29.12	3.1	2.14	29	7.45	8.11	24.15	41750.4
8/15/2014	9.74	6.21	17.22	4.25	2.03	14.85	29.1	3.12	2.1	29.15	7.2	8.11	23.9	41380.1
8/18/2014	9.78	6.2	17.2	4.28	1.98	14.63	28.85	3.05	2.12	29.7	7.13	8.18	24.1	41370.6
8/19/2014	9.79	6.2	16.8	4.26	1.97	14.8	29.19	2.99	2.17	30.3	7.2	8.49	24.5	41812.1
8/20/2014	9.74	6.15	16.8	4.25	1.97	14.8	29.5	3.01	2.22	30	7.27	8.26	24.5	41789.6
8/21/2014	9.75	6.26	16.6	4.33	1.97	14.71	28.88	2.95	2.26	30	7.27	8.26	24.98	41767.3
8/22/2014	9.64	6.2	16.5	4.3	1.96	14.61	28.53	2.9	2.28	30	7.22	8.17	24.7	41564.2
8/25/2014	9.74	6.2	16.55	4.33	2	14.43	28.5	2.97	2.3	30	7.23	8.17	24.3	41339.5
8/26/2014	9.8	6.1	16.5	4.3	1.98	14.1	28.06	2.9	2.21	30	7.23	8.1	24.25	41235.3
8/27/2014	10	6.1	16.5	4.3	1.98	14.1	28.88	2.93	2.32	30	7.19	8.1	24.3	41121.1
8/28/2014	9.84	6.05	16.4	4.28	2	14.49	29.87	2.95	2.37	30	7.44	8.1	24.75	41359.9
8/29/2014	9.9	6.1	16.9	4.25	1.98	15.04	29.9	2.9	2.26	30	7.6	8.1	24.6	41532.3
9/1/2014	9.77	6	16.95	4.25	1.96	15.17	29.51	2.88	2.26	30	7.3	8.1	24.01	41398.1
9/2/2014	9.29	6	16.63	4.25	1.98	15	29.35	2.86	2.19	30.01	7.39	8.15	24.6	41264.7
9/3/2014	9.26	6	16.62	4.25	1.96	14.63	30	2.8	2.19	30.5	7.2	8.2	24.19	41207.8
9/4/2014	9.27	6.11	17.01	4.24	1.95	14.5	29.31	2.7	2.18	30.4	7.25	8.16	24.2	41017.5
9/5/2014	9.33	6.15	17.86	4.26	1.96	15	29.82	2.78	2.24	30.4	7.27	8.56	24.25	41160.6
9/8/2014	9.4	6.2	18.19	4.25	1.99	15	30	2.86	2.2	30	7.4	9.42	24.21	41214.8
9/9/2014	9.2	6.2	18.19	4.2	1.98	14.88	30.01	2.94	2.2	30	7.22	9.89	24	40868
9/10/2014	9.6	6.2	18.2	4.15	2	14.8	30	2.93	2.2	30	7.3	10	24	40885.4
9/11/2014	9.8	6.2	18.4	4.18	1.98	14.52	29.8	2.93	2.25	30	7.2	9.79	24	40757.2
9/12/2014	9.59	6.3	19.32	4.18	2	14.52	29.15	2.88	2.3	30	7.19	10.27	24.6	40672.9
9/15/2014	9.59	6.39	19.82	4.2	1.95	14.57	28.26	2.83	2.19	30	7.08	10.75	24.2	40769
9/16/2014	9.59	6.47	19.2	4.15	1.95	14.6	28.45	2.75	2.2	30	7.03	10.25	24.2	40648.2
9/17/2014	9.59	6.23	19.2	4.18	1.95	14.5	28.61	2.76	2.17	30	6.8	9.71	24.25	40729.5
9/18/2014	9.59	6.23	18.97	4.19	1.95	14.43	28.48	2.69	2.16	30.62	6.78	9.52	24.6	40683.5
9/19/2014	9.59	6.2	19	4.14	1.95	14.22	28.95	2.65	2.17	30.62	6.96	9.7	24.65	41049.3
9/22/2014	9.59	6.24	18.1	4.15	1.95	14	28.51	2.7	2.14	31.2	6.82	9.8	24.7	40984.1
9/23/2014	9.59	6.12	18.84	4.09	1.95	13.77	28	2.67	2.11	31.2	6.69	9.8	23.8	40537.2
9/24/2014	9.59	6.2	18.02	4.2	1.95	13.9	28.9	2.66	2.14	31.2	6.52	9.32	24	40809.3
9/25/2014	8.76	6.16	18	4.3	1.98	13.9	28.8	2.61	2.15	31.5	6.75	8.86	24.05	40780
9/26/2014	8.9	6.18	18.16	4.45	1.98	13.9	29.4	2.64	2.15	32	6.69	9.1	24	40780
9/29/2014	8.94	6.19	17.9	4.3	1.96	13.7	29.73	2.69	2.2	32	6.66	9	24.4	41105.4
9/30/2014	8.99	6.28	18.7	4.3	1.99	13.41	29.75	2.64	2.25	33.6	6.62	8.69	24.5	41210.1
10/2/2014	9.1	6.25	18.4	4.25	2.08	13.5	30.4	2.7	2.25	35	6.65	8.95	24.49	41135.6
10/3/2014	9.02	6.25	18.7	4.51	2.05	13.48	30.01	2.87	2.3	35	6.65	9.39	24.3	41103.9
10/8/2014	9	6.25	18.74	4.55	2.02	13.42	30.5	3	2.31	33.25	6.51	9.1	24.14	40995
10/9/2014	8.9	6.25	18.75	4.33	2.01	13.29	30	2.85	2.31	33	6.52	9.1	23.51	40572.3
10/10/2014	8.77	6.2	18.9	4.3	2.05	12.91	29.57	2.77	2.32	32.03	6.35	9.06	22.8	40444.4
10/13/2014	8.71	6.12	18.78	4.2	1.96	12.61	29.5	2.87	2.4	32.38	6.18	9.01	22.5	40051.3
10/14/2014	8.62	6.11	18.76	4.26	1.93	12.06	29.14	2.83	2.33	32	5.88	9	21.38	40051.3
10/15/2014	8.5	5.85	18.52	4.12	1.92	11.28	27.89	2.78	2.34	31.11	5.59	9.02	22.1	39278.5
10/16/2014	8.35	5.57	18.05	4.17	1.95	11	26.9	2.65	2.33	30	5.32	8.71	21.08	38490.7
10/17/2014	8.3	5.84	18.25	4.2	1.94	11.8	26.6	2.66	2.35	31	5.29	8.6	21.4	38197.7
10/20/2014	8.71	6.13	18.19	4.19	1.95	12.58	27.14	2.77	2.33	31	5.77	9.03	22	38662.7
10/21/2014	8.65	6.15	18.15	4.07	1.95	12.68	27.14	2.8	2.35	31.25	5.9	9.03	22.2	38776.7
10/22/2014	8.46	6.32	19	4.08	1.95	12.6	27.41	2.73	2.32	31.15	5.98	9.06	22.6	39278.5
10/23/2014	8.76	6.63	18.26	4.1	2.02	12.36	27.12	2.77	2.34	32	5.75	9.06	22.61	39098.7

10/24/2014	8.6	6.3	18.26	4.09	1.95	12.32	27.3	2.75	2.23	31	5.66	9.06	22.59	39087.1
10/27/2014	8.51	5.99	18.5	4.06	1.95	12.34	27.25	2.66	2.34	30.5	5.55	8.83	22.75	38724.2
10/28/2014	8.5	5.98	18.6	4	1.95	11.82	26.69	2.54	2.33	29.92	5.34	8.25	22	38724.2
10/29/2014	8.51	6.15	18.55	3.82	1.99	11.85	26.16	2.51	2.31	29.01	5.01	8.26	22	38148.2
10/30/2014	8.5	6.12	18.9	4	1.95	11.7	26.08	2.5	2.33	30.4	5	8.2	21	37980
10/31/2014	8.5	6	19	3.89	1.95	11.58	25	2.4	2.36	29.6	4.75	7.9	21.2	37550.2
11/3/2014	8.4	5.85	19	3.88	1.9	11.3	25.2	2.64	2.3	29.67	5	7.9	22.26	37343.9
11/4/2014	8.08	5.8	18.5	3.34	1.89	10.48	25.3	2.58	2.41	28.14	4.66	7.17	21	36744.5

APPENDIX C
EVENT WINDOWSTATIONARITY TEST OUTPUT

ACCESS BANK Plc

Null Hypothesis: ACCESSMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ACCESSMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 08:53
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ACCESSMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(ACCESSMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: ACCESSSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.607577	0.0107
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ACCESSSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 08:57
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ACCESSSHRRTN(-1)	-0.556568	0.154277	-3.607577	0.0010
C	0.264415	0.593453	0.445554	0.6588

R-squared	0.282837	Mean dependent var	0.076625
Adjusted R-squared	0.261104	S.D. dependent var	4.068660
S.E. of regression	3.497381	Akaike info criterion	5.397351
Sum squared resid	403.6453	Schwarz criterion	5.486228
Log likelihood	-92.45364	Hannan-Quinn criter.	5.428031
F-statistic	13.01461	Durbin-Watson stat	1.733424
Prob(F-statistic)	0.001009		

DIAMOND BANK Plc

Null Hypothesis: DIAMONDMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIAMONDMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 08:58
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIAMONDMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(DIAMONDMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: DIAMONDSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.756865	0.0073
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIAMONDSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 08:59
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIAMONDSHRRTN(-1)	-0.596506	0.158778	-3.756865	0.0007
C	-0.015120	0.569998	-0.026526	0.9790

R-squared	0.299572	Mean dependent var	-0.044760
Adjusted R-squared	0.278347	S.D. dependent var	3.969184
S.E. of regression	3.371829	Akaike info criterion	5.324233
Sum squared resid	375.1847	Schwarz criterion	5.413110
Log likelihood	-91.17408	Hannan-Quinn criter.	5.354913
F-statistic	14.11404	Durbin-Watson stat	1.498067
Prob(F-statistic)	0.000667		

EQUITORIAL TRUST BANK (ETB) Plc

Null Hypothesis: ETIMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ETIMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:00
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETIMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(ETIMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: ETISHRRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.684754	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ETISHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:04
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETISHRRTN(-1)	-1.301550	0.228954	-5.684754	0.0000
D(ETISHRRTN(-1))	0.350813	0.171575	2.044665	0.0495
C	0.185645	0.382734	0.485050	0.6311

R-squared	0.568262	Mean dependent var	0.127170
Adjusted R-squared	0.540408	S.D. dependent var	3.287976
S.E. of regression	2.229024	Akaike info criterion	4.525102
Sum squared resid	154.0250	Schwarz criterion	4.659781
Log likelihood	-73.92673	Hannan-Quinn criter.	4.571031
F-statistic	20.40143	Durbin-Watson stat	1.972369
Prob(F-statistic)	0.000002		

FIRST BANK OF NIGERIA (FBN) Plc

Null Hypothesis: FBNHMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FBNHMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:04
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FBNHMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(FBNHMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: FBNHSHRRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.075115	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FBNHSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:05
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FBNHSHRRTN(-1)	-1.056411	0.173892	-6.075115	0.0000
D(FBNHSHRRTN(-1))	0.516354	0.151495	3.408394	0.0018
C	0.501985	0.546989	0.917725	0.3658

R-squared	0.543575	Mean dependent var	0.141852
Adjusted R-squared	0.514129	S.D. dependent var	4.540538
S.E. of regression	3.164959	Akaike info criterion	5.226254
Sum squared resid	310.5259	Schwarz criterion	5.360933
Log likelihood	-85.84632	Hannan-Quinn criter.	5.272184
F-statistic	18.45960	Durbin-Watson stat	1.862735
Prob(F-statistic)	0.000005		

FIRST CITY MOLUMENT BANK (FCMB) Plc

Null Hypothesis: FCMBMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FCMBMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:05
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FCMBMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(FCMBMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: FCMBSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.672332	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FCMBSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:06
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FCMBSHRRTN(-1)	-1.264915	0.164867	-7.672332	0.0000
C	0.725589	0.421160	1.722834	0.0943

R-squared	0.640776	Mean dependent var	0.062340
Adjusted R-squared	0.629890	S.D. dependent var	4.008382
S.E. of regression	2.438565	Akaike info criterion	4.676141
Sum squared resid	196.2377	Schwarz criterion	4.765018
Log likelihood	-79.83248	Hannan-Quinn criter.	4.706822
F-statistic	58.86467	Durbin-Watson stat	2.024375
Prob(F-statistic)	0.000000		

FIDELITY BANK Plc

Null Hypothesis: FIDELITYMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FIDELITYMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:06
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIDELITYMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(FIDELITYMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: FIDELITYSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.412219	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FIDELITYSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:07
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIDELITYSHRRTN(-1)	-1.105736	0.172442	-6.412219	0.0000
C	0.562185	0.570697	0.985085	0.3318

R-squared	0.554755	Mean dependent var	0.035939
Adjusted R-squared	0.541263	S.D. dependent var	4.933101
S.E. of regression	3.341195	Akaike info criterion	5.305979
Sum squared resid	368.3983	Schwarz criterion	5.394856
Log likelihood	-90.85464	Hannan-Quinn criter.	5.336660
F-statistic	41.11655	Durbin-Watson stat	1.949584
Prob(F-statistic)	0.000000		

GUARANTY TRUST BANK (GTB) Plc

Null Hypothesis: GTMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GTMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:08
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GTMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(GTMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: GTSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.767281	0.0071
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GTSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:08
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GTSHRRTN(-1)	-0.593095	0.157433	-3.767281	0.0006
C	0.076069	0.422216	0.180167	0.8581

R-squared	0.300735	Mean dependent var	0.056533
Adjusted R-squared	0.279545	S.D. dependent var	2.942609
S.E. of regression	2.497675	Akaike info criterion	4.724043
Sum squared resid	205.8666	Schwarz criterion	4.812920
Log likelihood	-80.67075	Hannan-Quinn criter.	4.754723
F-statistic	14.19240	Durbin-Watson stat	2.045611
Prob(F-statistic)	0.000648		

SKYE BANK Plc

Null Hypothesis: SKYEMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SKYEMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:09
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SKYEMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(SKYEMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: SKYESHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.711523	0.0006
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SKYESHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:09
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SKYESHRRTN(-1)	-0.737199	0.156467	-4.711523	0.0000
C	0.019513	0.669288	0.029156	0.9769

R-squared	0.402157	Mean dependent var	0.258507
Adjusted R-squared	0.384041	S.D. dependent var	5.030603
S.E. of regression	3.948172	Akaike info criterion	5.639828
Sum squared resid	514.4061	Schwarz criterion	5.728705
Log likelihood	-96.69699	Hannan-Quinn criter.	5.670508
F-statistic	22.19845	Durbin-Watson stat	2.128206
Prob(F-statistic)	0.000043		

STANBIC IBTC BANK Plc

Null Hypothesis: STANBICMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STANBICMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:10
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STANBICMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(STANBICMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: STANBICSHRRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.541822	0.0001
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STANBICSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:11
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STANBICSHRRTN(-1)	-1.353298	0.244197	-5.541822	0.0000
D(STANBICSHRRTN(-1))	0.317001	0.170342	1.860966	0.0723
C	-0.144451	0.445697	-0.324100	0.7480

R-squared	0.562640	Mean dependent var	5.15E-17
Adjusted R-squared	0.534424	S.D. dependent var	3.802245
S.E. of regression	2.594392	Akaike info criterion	4.828679
Sum squared resid	208.6570	Schwarz criterion	4.963358
Log likelihood	-79.08754	Hannan-Quinn criter.	4.874608
F-statistic	19.93994	Durbin-Watson stat	2.059236
Prob(F-statistic)	0.000003		

STERLING BANK Plc

Null Hypothesis: STERLINGMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STERLINGMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:11
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STERLINGMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(STERLINGMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: STERLINGSHRRTN has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.324757	0.0017
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STERLINGSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:12
Sample (adjusted): 5 37
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STERLINGSHRRTN(-1)	-1.729927	0.400006	-4.324757	0.0002
D(STERLINGSHRRTN(-1))	0.615516	0.318977	1.929654	0.0635
D(STERLINGSHRRTN(-2))	0.255520	0.214668	1.190305	0.2436
C	0.031661	0.453120	0.069874	0.9448

R-squared	0.585779	Mean dependent var	0.066022
Adjusted R-squared	0.542929	S.D. dependent var	3.784895
S.E. of regression	2.558855	Akaike info criterion	4.830209
Sum squared resid	189.8844	Schwarz criterion	5.011604
Log likelihood	-75.69845	Hannan-Quinn criter.	4.891243
F-statistic	13.67034	Durbin-Watson stat	2.025471
Prob(F-statistic)	0.000010		

UNITED BANK FOR AFRICA (UBA) Plc

Null Hypothesis: UBAMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBAMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:13
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBAMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(UBAMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: UBASHRRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.210496	0.0023
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBASHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:13
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBASHRRTN(-1)	-0.691035	0.164122	-4.210496	0.0002
D(UBASHRRTN(-1))	0.316050	0.173305	1.823666	0.0779
C	0.141165	0.803422	0.175704	0.8617

R-squared	0.364697	Mean dependent var	0.277101
Adjusted R-squared	0.323710	S.D. dependent var	5.657436
S.E. of regression	4.652498	Akaike info criterion	5.996783
Sum squared resid	671.0177	Schwarz criterion	6.131462
Log likelihood	-98.94531	Hannan-Quinn criter.	6.042712
F-statistic	8.897811	Durbin-Watson stat	1.959356
Prob(F-statistic)	0.000883		

UNION BANK OF NIGERIA (UBN) Plc

Null Hypothesis: UBNMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBNMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:14
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBNMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(UBNMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

Null Hypothesis: UBNSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.579732	0.0008
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBNSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:14
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBNSHRRTN(-1)	-0.775132	0.169253	-4.579732	0.0001
C	-0.212041	0.501328	-0.422959	0.6751

R-squared	0.388594	Mean dependent var	-0.025527
Adjusted R-squared	0.370066	S.D. dependent var	3.724524
S.E. of regression	2.956094	Akaike info criterion	5.061060
Sum squared resid	288.3702	Schwarz criterion	5.149937
Log likelihood	-86.56855	Hannan-Quinn criter.	5.091740
F-statistic	20.97394	Durbin-Watson stat	1.867578
Prob(F-statistic)	0.000063		

ZENITH BANK Plc

Null Hypothesis: ZENITHSHRRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.194099	0.0288
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ZENITHSHRRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:15
Sample (adjusted): 3 37
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ZENITHSHRRTN(-1)	-0.472366	0.147887	-3.194099	0.0031
C	0.097696	0.457008	0.213774	0.8320

R-squared	0.236151	Mean dependent var	-0.004399
Adjusted R-squared	0.213004	S.D. dependent var	3.040233
S.E. of regression	2.697076	Akaike info criterion	4.877658
Sum squared resid	240.0492	Schwarz criterion	4.966535
Log likelihood	-83.35902	Hannan-Quinn criter.	4.908339
F-statistic	10.20227	Durbin-Watson stat	1.414914
Prob(F-statistic)	0.003081		

Null Hypothesis: ZZENITHMKTRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.114407	0.0000
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ZZENITHMKTRTN)
Method: Least Squares
Date: 11/02/15 Time: 09:15
Sample (adjusted): 4 37
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ZZENITHMKTRTN(-1)	-1.540794	0.251994	-6.114407	0.0000
D(ZZENITHMKTRTN(-1))	0.264598	0.162247	1.630833	0.1130
C	0.633913	0.622637	1.018111	0.3165

R-squared	0.654333	Mean dependent var	0.082080
Adjusted R-squared	0.632032	S.D. dependent var	5.935170
S.E. of regression	3.600297	Akaike info criterion	5.484007
Sum squared resid	401.8264	Schwarz criterion	5.618686
Log likelihood	-90.22812	Hannan-Quinn criter.	5.529937
F-statistic	29.34082	Durbin-Watson stat	1.953613
Prob(F-statistic)	0.000000		

APPENDIX D
ESTIMATION WINDOWSTATIONARITY TEST OUTPUT

ACCESS BANK Plc

Null Hypothesis: ACCESSMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ACCESSMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:21
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ACCESSMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: ACCESSSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.08001	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ACCESSSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:22
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ACCESSSHARRTN(-1)	-1.095072	0.090652	-12.08001	0.0000
C	0.000615	0.001589	0.387077	0.6994

R-squared	0.546692	Mean dependent var	9.62E-05
Adjusted R-squared	0.542945	S.D. dependent var	0.026054
S.E. of regression	0.017614	Akaike info criterion	-5.224106
Sum squared resid	0.037541	Schwarz criterion	-5.178380
Log likelihood	323.2825	Hannan-Quinn criter.	-5.205532
F-statistic	145.9266	Durbin-Watson stat	2.002164
Prob(F-statistic)	0.000000		

DIAMOND BANK Plc

Null Hypothesis: DIAMONDMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIAMONDMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:23
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIAMONDMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: DIAMONDSHARRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.700743	0.0000
Test critical values:	1% level	-3.484653	
	5% level	-2.885249	
	10% level	-2.579491	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIAMONDSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:24
Sample (adjusted): 4 125
Included observations: 122 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIAMONDSHARRTN(-1)	-1.242117	0.128044	-9.700743	0.0000
D(DIAMONDSHARRTN(-1))	0.233605	0.089948	2.597098	0.0106
C	0.000571	0.001809	0.315905	0.7526

R-squared	0.526452	Mean dependent var	0.000273
Adjusted R-squared	0.518493	S.D. dependent var	0.028789
S.E. of regression	0.019977	Akaike info criterion	-4.964176
Sum squared resid	0.047491	Schwarz criterion	-4.895224
Log likelihood	305.8147	Hannan-Quinn criter.	-4.936170
F-statistic	66.14726	Durbin-Watson stat	2.019855
Prob(F-statistic)	0.000000		

EQUITORIAL TRUST BANK Plc

Null Hypothesis: ETIMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ETIMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:25
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETIMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: ETISHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.31675	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ETISHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:25
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETISHARRTN(-1)	-1.028381	0.090872	-11.31675	0.0000
C	-0.003296	0.002179	-1.512670	0.1330

R-squared	0.514190	Mean dependent var	2.12E-19
Adjusted R-squared	0.510175	S.D. dependent var	0.034218
S.E. of regression	0.023948	Akaike info criterion	-4.609719
Sum squared resid	0.069396	Schwarz criterion	-4.563992
Log likelihood	285.4977	Hannan-Quinn criter.	-4.591145
F-statistic	128.0688	Durbin-Watson stat	1.996550
Prob(F-statistic)	0.000000		

FIRST BANK of NIGERIA Plc

Null Hypothesis: FBNHMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FBNHMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:26
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FBNHMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: FBNHSHARRTN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.024482	0.0000
Test critical values:	1% level	-3.484653	
	5% level	-2.885249	
	10% level	-2.579491	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FBNHSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:26
Sample (adjusted): 4 125
Included observations: 122 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FBNHSHARRTN(-1)	-0.840159	0.104699	-8.024482	0.0000
D(FBNHSHARRTN(-1))	0.235432	0.089600	2.627602	0.0097
C	0.000982	0.001738	0.564889	0.5732

R-squared	0.373305	Mean dependent var	0.000201
Adjusted R-squared	0.362773	S.D. dependent var	0.024011
S.E. of regression	0.019167	Akaike info criterion	-5.046972
Sum squared resid	0.043717	Schwarz criterion	-4.978020
Log likelihood	310.8653	Hannan-Quinn criter.	-5.018966
F-statistic	35.44257	Durbin-Watson stat	2.009879
Prob(F-statistic)	0.000000		

FIRST CITY MULUMENT BANK Plc

Null Hypothesis: FCMBMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FCMBMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:27
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FCMBMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: FCMBSHARRTN has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.053218	0.0000
Test critical values:	1% level	-3.485115	
	5% level	-2.885450	
	10% level	-2.579598	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FCMBSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:28
Sample (adjusted): 5 125
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FCMBSHARRTN(-1)	-1.227719	0.152451	-8.053218	0.0000
D(FCMBSHARRTN(-1))	0.280150	0.123386	2.270521	0.0250
D(FCMBSHARRTN(-2))	0.234662	0.092506	2.536727	0.0125
C	-0.000794	0.001832	-0.433270	0.6656

R-squared	0.499743	Mean dependent var	0.000160
Adjusted R-squared	0.486916	S.D. dependent var	0.028065
S.E. of regression	0.020103	Akaike info criterion	-4.943382
Sum squared resid	0.047284	Schwarz criterion	-4.850959
Log likelihood	303.0746	Hannan-Quinn criter.	-4.905846
F-statistic	38.96000	Durbin-Watson stat	1.987039
Prob(F-statistic)	0.000000		

FIDELITY BANK Plc

Null Hypothesis: FIDELITYMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FIDELITYMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:28
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIDELITYMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: FIDELITYSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-14.32787	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FIDELITYSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:29
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIDELITYSHARRTN(-1)	-1.268850	0.088558	-14.32787	0.0000
C	-1.41E-05	0.001400	-0.010071	0.9920

R-squared	0.629162	Mean dependent var	0.000254
Adjusted R-squared	0.626097	S.D. dependent var	0.025389
S.E. of regression	0.015525	Akaike info criterion	-5.476642
Sum squared resid	0.029163	Schwarz criterion	-5.430916
Log likelihood	338.8135	Hannan-Quinn criter.	-5.458068
F-statistic	205.2878	Durbin-Watson stat	1.984916
Prob(F-statistic)	0.000000		

GUARANTY TRUST BANK Plc

Null Hypothesis: GTBMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	

	5% level	-2.885051
	10% level	-2.579386

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GTBMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:29
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GTBMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: GTSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.39442	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GTSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:30
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GTSHARRTN(-1)	-1.118274	0.090224	-12.39442	0.0000
C	0.000476	0.001693	0.280969	0.7792

R-squared	0.559394	Mean dependent var	-0.000156
Adjusted R-squared	0.555753	S.D. dependent var	0.028165
S.E. of regression	0.018773	Akaike info criterion	-5.096708
Sum squared resid	0.042642	Schwarz criterion	-5.050981
Log likelihood	315.4475	Hannan-Quinn criter.	-5.078134
F-statistic	153.6217	Durbin-Watson stat	1.970737
Prob(F-statistic)	0.000000		

SKYE BANK Plc

Null Hypothesis: SKYEMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SKYEMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:31
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SKYEMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: SKYESHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.39495	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SKYESHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:32
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SKYESHARRTN(-1)	-1.015546	0.097696	-10.39495	0.0000
C	0.002456	0.002181	1.126066	0.2624

R-squared	0.471742	Mean dependent var	-0.000660
Adjusted R-squared	0.467377	S.D. dependent var	0.032824
S.E. of regression	0.023955	Akaike info criterion	-4.609138
Sum squared resid	0.069436	Schwarz criterion	-4.563411
Log likelihood	285.4620	Hannan-Quinn criter.	-4.590564
F-statistic	108.0549	Durbin-Watson stat	1.867774
Prob(F-statistic)	0.000000		

STANBIC IBTC BANK Plc

Null Hypothesis: STANBICMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STANBICMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:32
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STANBICMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: STANBICSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.47039	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STANBICSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:33
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STANBICSHARRTN(-1)	-1.038177	0.090509	-11.47039	0.0000
C	-0.002291	0.001886	-1.214685	0.2269

R-squared	0.520924	Mean dependent var	-0.000162
Adjusted R-squared	0.516965	S.D. dependent var	0.029954
S.E. of regression	0.020818	Akaike info criterion	-4.889872
Sum squared resid	0.052440	Schwarz criterion	-4.844146
Log likelihood	302.7271	Hannan-Quinn criter.	-4.871298
F-statistic	131.5697	Durbin-Watson stat	2.004727
Prob(F-statistic)	0.000000		

STERLING BANK Plc

Null Hypothesis: STERLINGMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STERLINGMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:33
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STERLINGMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: STERLINGSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.73548	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STERLINGSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:34
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STERLINGSHARRTN(-1)	-1.223958	0.089109	-13.73548	0.0000
C	-0.000510	0.001698	-0.300192	0.7645

R-squared	0.609253	Mean dependent var	9.88E-05
Adjusted R-squared	0.606024	S.D. dependent var	0.029996
S.E. of regression	0.018828	Akaike info criterion	-5.090867
Sum squared resid	0.042892	Schwarz criterion	-5.045140
Log likelihood	315.0883	Hannan-Quinn criter.	-5.072293
F-statistic	188.6635	Durbin-Watson stat	2.018377
Prob(F-statistic)	0.000000		

UNITED BANK FOR AFRICA Plc

Null Hypothesis: UBAMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBAMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:34
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBAMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: UBASHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.434076	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBASHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:35
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBASHARRTN(-1)	-0.871126	0.092338	-9.434076	0.0000
C	0.002070	0.002060	1.004705	0.3170

R-squared	0.423814	Mean dependent var	-0.000429
Adjusted R-squared	0.419053	S.D. dependent var	0.029732
S.E. of regression	0.022662	Akaike info criterion	-4.720143
Sum squared resid	0.062141	Schwarz criterion	-4.674417
Log likelihood	292.2888	Hannan-Quinn criter.	-4.701569
F-statistic	89.00179	Durbin-Watson stat	1.957236
Prob(F-statistic)	0.000000		

UNION BANK OF NIGERIA Plc

Null Hypothesis: UBNMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBNMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:35
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBNMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: UBNSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.18123	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UBNSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:36
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UBNSHARRTN(-1)	-0.921087	0.090469	-10.18123	0.0000
C	0.001775	0.002356	0.753365	0.4527

R-squared	0.461402	Mean dependent var	0.000123
Adjusted R-squared	0.456951	S.D. dependent var	0.035373
S.E. of regression	0.026067	Akaike info criterion	-4.440172
Sum squared resid	0.082218	Schwarz criterion	-4.394445
Log likelihood	275.0706	Hannan-Quinn criter.	-4.421598
F-statistic	103.6574	Durbin-Watson stat	1.990905
Prob(F-statistic)	0.000000		

ZENITH BANK Plc

Null Hypothesis: ZENITHMKTRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.46649	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ZENITHMKTRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:36
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

ZENITHMKTRTN(-1)	-0.952426	0.090998	-10.46649	0.0000
C	0.000234	0.000659	0.356066	0.7224

R-squared	0.475162	Mean dependent var	5.07E-05
Adjusted R-squared	0.470825	S.D. dependent var	0.010037
S.E. of regression	0.007301	Akaike info criterion	-6.985384
Sum squared resid	0.006451	Schwarz criterion	-6.939657
Log likelihood	431.6011	Hannan-Quinn criter.	-6.966810
F-statistic	109.5474	Durbin-Watson stat	2.009998
Prob(F-statistic)	0.000000		

Null Hypothesis: ZENITHSHARRTN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.24601	0.0000
Test critical values:	1% level	-3.484198	
	5% level	-2.885051	
	10% level	-2.579386	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ZENITHSHARRTN)
Method: Least Squares
Date: 11/16/15 Time: 20:37
Sample (adjusted): 3 125
Included observations: 123 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ZENITHSHARRTN(-1)	-1.059719	0.094231	-11.24601	0.0000
C	0.000117	0.001493	0.078467	0.9376

R-squared	0.511057	Mean dependent var	-0.000415
Adjusted R-squared	0.507016	S.D. dependent var	0.023573
S.E. of regression	0.016551	Akaike info criterion	-5.348619
Sum squared resid	0.033146	Schwarz criterion	-5.302892
Log likelihood	330.9400	Hannan-Quinn criter.	-5.330045
F-statistic	126.4726	Durbin-Watson stat	1.917625
Prob(F-statistic)	0.000000		

APPENDIX E
EVENT WINDOW SERIAL CORRELATION TEST OUTPUT

ACCESS BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.049449	Prob. F(5,29)	0.4081
Obs*R-squared	5.515798	Prob. Chi-Square(5)	0.3562

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/14/15 Time: 23:24
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000235	0.005716	-0.041170	0.9674
ACCESSMKTRTN	-0.095043	0.161211	-0.589559	0.5601
RESID(-1)	0.334412	0.192321	1.738823	0.0927
RESID(-2)	-0.129097	0.210789	-0.612447	0.5450
RESID(-3)	-0.154853	0.233156	-0.664161	0.5118
RESID(-4)	-0.072503	0.236431	-0.306654	0.7613
RESID(-5)	0.010910	0.226581	0.048152	0.9619

R-squared	0.153217	Mean dependent var	-2.65E-18
Adjusted R-squared	-0.021980	S.D. dependent var	0.033799
S.E. of regression	0.034169	Akaike info criterion	-3.742338
Sum squared resid	0.033858	Schwarz criterion	-3.434431
Log likelihood	74.36208	Hannan-Quinn criter.	-3.634870
F-statistic	0.874541	Durbin-Watson stat	1.889331
Prob(F-statistic)	0.525500		

DIAMOIND BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.497136	Prob. F(5,29)	0.2214
Obs*R-squared	7.386033	Prob. Chi-Square(5)	0.1935

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:10
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000365	0.005450	-0.066912	0.9471
DIAMONDMKTRTN	-0.081073	0.156630	-0.517608	0.6087
RESID(-1)	0.296778	0.187087	1.586309	0.1235
RESID(-2)	0.036088	0.189969	0.189966	0.8507

RESID(-3)	-0.244083	0.195167	-1.250635	0.2211
RESID(-4)	-0.187768	0.196234	-0.956856	0.3465
RESID(-5)	0.212477	0.195446	1.087140	0.2859

R-squared	0.205168	Mean dependent var	7.23E-19
Adjusted R-squared	0.040720	S.D. dependent var	0.033263
S.E. of regression	0.032579	Akaike info criterion	-3.837640
Sum squared resid	0.030780	Schwarz criterion	-3.529733
Log likelihood	76.07751	Hannan-Quinn criter.	-3.730172
F-statistic	1.247613	Durbin-Watson stat	1.858182
Prob(F-statistic)	0.311728		

EQUITORIAL TRUST BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.746609	Prob. F(5,29)	0.5952
Obs*R-squared	4.105626	Prob. Chi-Square(5)	0.5343

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:13
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001058	0.003587	-0.294832	0.7702
ETIMKTRTN	0.032102	0.102070	0.314512	0.7554
RESID(-1)	-0.136352	0.196186	-0.695015	0.4926
RESID(-2)	-0.099577	0.209493	-0.475325	0.6381
RESID(-3)	-0.315216	0.207856	-1.516512	0.1402
RESID(-4)	-0.167076	0.220205	-0.758728	0.4541
RESID(-5)	0.184675	0.235562	0.783979	0.4394

R-squared	0.114045	Mean dependent var	1.45E-19
Adjusted R-squared	-0.069256	S.D. dependent var	0.020055
S.E. of regression	0.020738	Akaike info criterion	-4.741053
Sum squared resid	0.012472	Schwarz criterion	-4.433147
Log likelihood	92.33895	Hannan-Quinn criter.	-4.633585
F-statistic	0.622174	Durbin-Watson stat	2.001395
Prob(F-statistic)	0.710989		

FIRST BANK OF NIGERIA Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.886096	Prob. F(5,25)	0.1327
Obs*R-squared	9.312572	Prob. Chi-Square(5)	0.0972

Test Equation:
Dependent Variable: RESID
Method: Least Squares

Date: 11/15/15 Time: 05:16
Sample: 4 37
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001908	0.004664	0.409025	0.6860
FBNHMKTRTN	-0.020527	0.127892	-0.160505	0.8738
AR(1)	-0.899206	0.605891	-1.484106	0.1503
AR(2)	1.272362	0.530284	2.399396	0.0242
RESID(-1)	0.884153	0.583375	1.515583	0.1422
RESID(-2)	-0.882581	0.438381	-2.013273	0.0550
RESID(-3)	-1.020627	0.394742	-2.585553	0.0159
RESID(-4)	0.197110	0.265686	0.741890	0.4651
RESID(-5)	0.221533	0.280055	0.791031	0.4364

R-squared	0.273899	Mean dependent var	1.51E-15
Adjusted R-squared	0.041547	S.D. dependent var	0.029611
S.E. of regression	0.028990	Akaike info criterion	-4.021823
Sum squared resid	0.021010	Schwarz criterion	-3.617787
Log likelihood	77.37100	Hannan-Quinn criter.	-3.884035
F-statistic	1.178810	Durbin-Watson stat	2.026701
Prob(F-statistic)	0.350150		

FIRST CITY MOLUMENT BANK (FCMB) Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.371596	Prob. F(5,29)	0.2638
Obs*R-squared	6.885144	Prob. Chi-Square(5)	0.2293

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:20
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.94E-05	0.003844	-0.007656	0.9939
FCMBMKTRTN	0.100225	0.111474	0.899093	0.3760
RESID(-1)	-0.378666	0.195541	-1.936504	0.0626
RESID(-2)	0.089090	0.184432	0.483052	0.6327
RESID(-3)	0.048125	0.189870	0.253465	0.8017
RESID(-4)	-0.294923	0.184811	-1.595808	0.1214
RESID(-5)	-0.231372	0.210304	-1.100183	0.2803

R-squared	0.191254	Mean dependent var	5.00E-19
Adjusted R-squared	0.023927	S.D. dependent var	0.023275
S.E. of regression	0.022995	Akaike info criterion	-4.534414
Sum squared resid	0.015334	Schwarz criterion	-4.226508
Log likelihood	88.61946	Hannan-Quinn criter.	-4.426947
F-statistic	1.142997	Durbin-Watson stat	1.928867
Prob(F-statistic)	0.363081		

FIDELITY BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.239220	Prob. F(5,25)	0.0818
Obs*R-squared	10.51681	Prob. Chi-Square(5)	0.0618

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:24
Sample: 4 37
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004381	0.005286	-0.828808	0.4151
FIDELITYMKTRTN	0.082293	0.147154	0.559231	0.5810
AR(1)	-0.669041	0.663315	-1.008632	0.3228
AR(2)	-0.058753	0.669347	-0.087777	0.9308
RESID(-1)	0.600268	0.678668	0.884480	0.3849
RESID(-2)	-0.040471	0.676542	-0.059820	0.9528
RESID(-3)	-0.223387	0.245693	-0.909210	0.3719
RESID(-4)	-0.606312	0.236448	-2.564252	0.0167
RESID(-5)	0.073849	0.239299	0.308604	0.7602

R-squared	0.309318	Mean dependent var	2.80E-16
Adjusted R-squared	0.088300	S.D. dependent var	0.029388
S.E. of regression	0.028061	Akaike info criterion	-4.086946
Sum squared resid	0.019685	Schwarz criterion	-3.682909
Log likelihood	78.47808	Hannan-Quinn criter.	-3.949158
F-statistic	1.399513	Durbin-Watson stat	1.903732
Prob(F-statistic)	0.244942		

GUARATY TRUST BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.035306	Prob. F(5,29)	0.4157
Obs*R-squared	5.452721	Prob. Chi-Square(5)	0.3632

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:27
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000179	0.003986	0.044990	0.9644
GTMKTRTN	-0.093664	0.129794	-0.721639	0.4763
RESID(-1)	0.328473	0.193569	1.696925	0.1004
RESID(-2)	0.061679	0.196481	0.313917	0.7558
RESID(-3)	-0.286936	0.188986	-1.518292	0.1398

RESID(-4)	0.144515	0.201830	0.716026	0.4797
RESID(-5)	-0.123540	0.199151	-0.620335	0.5399

R-squared	0.151464	Mean dependent var	-1.66E-18
Adjusted R-squared	-0.024095	S.D. dependent var	0.023531
S.E. of regression	0.023813	Akaike info criterion	-4.464530
Sum squared resid	0.016444	Schwarz criterion	-4.156623
Log likelihood	87.36154	Hannan-Quinn criter.	-4.357062
F-statistic	0.862755	Durbin-Watson stat	1.947898
Prob(F-statistic)	0.533597		

SKYE BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.174836	Prob. F(5,29)	0.9699
Obs*R-squared	1.053433	Prob. Chi-Square(5)	0.9581

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:30
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000341	0.006517	-0.052254	0.9587
SKYEMKTRTN	-0.022718	0.209319	-0.108533	0.9143
RESID(-1)	0.028263	0.220117	0.128400	0.8987
RESID(-2)	0.000322	0.187176	0.001720	0.9986
RESID(-3)	-0.086009	0.189000	-0.455073	0.6524
RESID(-4)	-0.136563	0.190472	-0.716973	0.4791
RESID(-5)	0.077409	0.208173	0.371847	0.7127

R-squared	0.029262	Mean dependent var	-1.88E-18
Adjusted R-squared	-0.171580	S.D. dependent var	0.035932
S.E. of regression	0.038893	Akaike info criterion	-3.483344
Sum squared resid	0.043867	Schwarz criterion	-3.175438
Log likelihood	69.70019	Hannan-Quinn criter.	-3.375877
F-statistic	0.145696	Durbin-Watson stat	1.896586
Prob(F-statistic)	0.988490		

STANBIC IBTC BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.623522	Prob. F(5,29)	0.1852
Obs*R-squared	7.873188	Prob. Chi-Square(5)	0.1634

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:32

Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000592	0.004115	-0.143957	0.8865
STANBICMKTRTN	-0.019167	0.112863	-0.169824	0.8663
RESID(-1)	-0.088572	0.185542	-0.477369	0.6367
RESID(-2)	-0.368408	0.182971	-2.013484	0.0534
RESID(-3)	-0.264735	0.194147	-1.363580	0.1832
RESID(-4)	0.038147	0.194198	0.196433	0.8456
RESID(-5)	-0.318117	0.192802	-1.649969	0.1097

R-squared	0.218700	Mean dependent var	-8.67E-19
Adjusted R-squared	0.057051	S.D. dependent var	0.025146
S.E. of regression	0.024419	Akaike info criterion	-4.414281
Sum squared resid	0.017292	Schwarz criterion	-4.106375
Log likelihood	86.45706	Hannan-Quinn criter.	-4.306814
F-statistic	1.352935	Durbin-Watson stat	1.932292
Prob(F-statistic)	0.266491		

STERLING BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.693239	Prob. F(5,29)	0.1678
Obs*R-squared	8.134882	Prob. Chi-Square(5)	0.1490

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:36
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002616	0.004325	-0.604899	0.5500
STERLINGMKTRTN	-0.046421	0.114424	-0.405692	0.6879
RESID(-1)	-0.421575	0.184387	-2.286363	0.0297
RESID(-2)	-0.376079	0.238289	-1.578246	0.1254
RESID(-3)	-0.519467	0.245457	-2.116320	0.0430
RESID(-4)	-0.446451	0.269586	-1.656060	0.1085
RESID(-5)	-0.222849	0.265395	-0.839687	0.4080

R-squared	0.225969	Mean dependent var	9.64E-20
Adjusted R-squared	0.065825	S.D. dependent var	0.026039
S.E. of regression	0.025167	Akaike info criterion	-4.353890
Sum squared resid	0.018368	Schwarz criterion	-4.045984
Log likelihood	85.37002	Hannan-Quinn criter.	-4.246422
F-statistic	1.411033	Durbin-Watson stat	1.765213
Prob(F-statistic)	0.244136		

UNITED BANK FOR AFRICA (UBA) Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.178162	Prob. F(5,29)	0.3438
Obs*R-squared	6.078082	Prob. Chi-Square(5)	0.2987

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:39
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000457	0.008943	0.051126	0.9596
UBAMKTRTN	-0.357663	0.284441	-1.257427	0.2186
RESID(-1)	0.403981	0.199966	2.020245	0.0527
RESID(-2)	0.052812	0.217434	0.242885	0.8098
RESID(-3)	-0.295525	0.251401	-1.175510	0.2494
RESID(-4)	0.003126	0.242284	0.012904	0.9898
RESID(-5)	0.085888	0.230832	0.372078	0.7125

R-squared	0.168836	Mean dependent var	1.93E-19
Adjusted R-squared	-0.003129	S.D. dependent var	0.053258
S.E. of regression	0.053342	Akaike info criterion	-2.851537
Sum squared resid	0.082514	Schwarz criterion	-2.543630
Log likelihood	58.32766	Hannan-Quinn criter.	-2.744069
F-statistic	0.981802	Durbin-Watson stat	1.685219
Prob(F-statistic)	0.455381		

UNION BANK OF NIGERIA (UBN) Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.198277	Prob. F(5,29)	0.9606
Obs*R-squared	1.190003	Prob. Chi-Square(5)	0.9458

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:42
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.87E-05	0.005267	0.018738	0.9852
UBNMKTRTN	0.001953	0.154452	0.012643	0.9900
RESID(-1)	0.154672	0.187427	0.825237	0.4160
RESID(-2)	0.004015	0.207690	0.019333	0.9847
RESID(-3)	0.049412	0.220352	0.224243	0.8241
RESID(-4)	-0.098100	0.208603	-0.470271	0.6417
RESID(-5)	-0.018837	0.216846	-0.086870	0.9314

R-squared	0.033056	Mean dependent var	-2.00E-18
Adjusted R-squared	-0.167002	S.D. dependent var	0.029098
S.E. of regression	0.031434	Akaike info criterion	-3.909170
Sum squared resid	0.028655	Schwarz criterion	-3.601263
Log likelihood	77.36505	Hannan-Quinn criter.	-3.801702
F-statistic	0.165231	Durbin-Watson stat	1.984166
Prob(F-statistic)	0.984034		

ZENITH BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.942225	Prob. F(5,29)	0.4687
Obs*R-squared	5.030994	Prob. Chi-Square(5)	0.4121

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 05:45
Sample: 2 37
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000228	0.004581	0.049824	0.9606
ZENITHMKTRTN	-0.106381	0.138893	-0.765920	0.4499
RESID(-1)	0.361178	0.190855	1.892422	0.0685
RESID(-2)	-0.010902	0.203981	-0.053447	0.9577
RESID(-3)	-0.174493	0.218295	-0.799345	0.4306
RESID(-4)	-0.031548	0.208786	-0.151103	0.8809
RESID(-5)	0.052441	0.193195	0.271441	0.7880

R-squared	0.139750	Mean dependent var	-7.47E-19
Adjusted R-squared	-0.038233	S.D. dependent var	0.026902
S.E. of regression	0.027411	Akaike info criterion	-4.183048
Sum squared resid	0.021790	Schwarz criterion	-3.875142
Log likelihood	82.29487	Hannan-Quinn criter.	-4.075581
F-statistic	0.785187	Durbin-Watson stat	1.814866
Prob(F-statistic)	0.588596		

APPENDIX F

ESTIMATION WINDOW SERIAL CORRELATION TEST OUTPUT

ACCESS BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.141274	Prob. F(5,117)	0.3426
Obs*R-squared	5.766530	Prob. Chi-Square(5)	0.3296

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 18:03
Sample: 2 125
Included observations: 124
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.43E-05	0.001506	0.016140	0.9872
ACCESSMKTRTN	0.010500	0.209986	0.050004	0.9602
RESID(-1)	-0.111786	0.092232	-1.212004	0.2280
RESID(-2)	-0.096653	0.092132	-1.049077	0.2963
RESID(-3)	-0.023619	0.092179	-0.256234	0.7982
RESID(-4)	-0.169793	0.091846	-1.848683	0.0670
RESID(-5)	-0.077615	0.092624	-0.837955	0.4038

R-squared	0.046504	Mean dependent var	4.20E-20
Adjusted R-squared	-0.002393	S.D. dependent var	0.016736
S.E. of regression	0.016756	Akaike info criterion	-5.285317
Sum squared resid	0.032850	Schwarz criterion	-5.126108
Log likelihood	334.6897	Hannan-Quinn criter.	-5.220643
F-statistic	0.951062	Durbin-Watson stat	2.037413
Prob(F-statistic)	0.461635		

DIAMOIND BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.409282	Prob. F(5,113)	0.2263
Obs*R-squared	7.161083	Prob. Chi-Square(5)	0.2089

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 18:47
Sample: 4 125
Included observations: 122
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000113	0.001288	0.088063	0.9300
DIAMONDMKTRTN	0.000540	0.222163	0.002429	0.9981

AR(1)	5.405759	3.616288	1.494837	0.1377
AR(2)	1.650463	1.614681	1.022160	0.3089
RESID(-1)	-5.431077	3.619369	-1.500559	0.1363
RESID(-2)	-1.250446	1.454360	-0.859792	0.3917
RESID(-3)	1.179710	0.878786	1.342431	0.1821
RESID(-4)	0.172120	0.300582	0.572621	0.5680
RESID(-5)	-0.461898	0.225550	-2.047877	0.0429

R-squared	0.058697	Mean dependent var	-5.22E-17
Adjusted R-squared	-0.007943	S.D. dependent var	0.018391
S.E. of regression	0.018464	Akaike info criterion	-5.075092
Sum squared resid	0.038523	Schwarz criterion	-4.868238
Log likelihood	318.5806	Hannan-Quinn criter.	-4.991074
F-statistic	0.880801	Durbin-Watson stat	2.008196
Prob(F-statistic)	0.535048		

EQUITORIAL TRUST BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.160378	Prob. F(5,117)	0.9764
Obs*R-squared	0.844080	Prob. Chi-Square(5)	0.9741

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 18:57
Sample: 2 125
Included observations: 124
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.00E-06	0.002142	-0.002335	0.9981
ETIMKTRTN	0.031969	0.301651	0.105981	0.9158
RESID(-1)	-0.081276	0.093194	-0.872115	0.3849
RESID(-2)	-0.017153	0.093092	-0.184258	0.8541
RESID(-3)	-0.004129	0.093250	-0.044277	0.9648
RESID(-4)	-0.010946	0.093592	-0.116954	0.9071
RESID(-5)	0.009216	0.092787	0.099322	0.9211

R-squared	0.006807	Mean dependent var	2.44E-19
Adjusted R-squared	-0.044126	S.D. dependent var	0.023326
S.E. of regression	0.023836	Akaike info criterion	-4.580483
Sum squared resid	0.066471	Schwarz criterion	-4.421274
Log likelihood	290.9900	Hannan-Quinn criter.	-4.515809
F-statistic	0.133648	Durbin-Watson stat	2.002294
Prob(F-statistic)	0.991728		

FIRST BANK OF NIGERIA Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.535187	Prob. F(5,113)	0.1845
Obs*R-squared	7.760154	Prob. Chi-Square(5)	0.1700

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 19:01
Sample: 4 125
Included observations: 122
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.74E-05	0.001741	-0.021467	0.9829
FBNHMKTRTN	0.141063	0.230261	0.612624	0.5414
AR(1)	9.722774	7.630996	1.274116	0.2052
AR(2)	-6.737526	6.082593	-1.107673	0.2704
RESID(-1)	-9.782749	7.628678	-1.282365	0.2023
RESID(-2)	4.438742	5.249189	0.845605	0.3996
RESID(-3)	2.490096	2.064559	1.206115	0.2303
RESID(-4)	-0.171536	0.577846	-0.296855	0.7671
RESID(-5)	-0.537330	0.431108	-1.246393	0.2152

R-squared	0.063608	Mean dependent var	4.44E-15
Adjusted R-squared	-0.002685	S.D. dependent var	0.017747
S.E. of regression	0.017771	Akaike info criterion	-5.151610
Sum squared resid	0.035686	Schwarz criterion	-4.944756
Log likelihood	323.2482	Hannan-Quinn criter.	-5.067592
F-statistic	0.959492	Durbin-Watson stat	2.007157
Prob(F-statistic)	0.471326		

FIRST CITY MONUMENT BANK (FCMB) Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.026846	Prob. F(5,115)	0.0800
Obs*R-squared	9.961387	Prob. Chi-Square(5)	0.0763

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 19:07
Sample: 3 125
Included observations: 123
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.71E-05	0.001894	0.019572	0.9844
FCMBMKTRTN	0.022264	0.247841	0.089830	0.9286
AR(1)	-0.211978	1.958173	-0.108253	0.9140
RESID(-1)	0.187617	1.959910	0.095727	0.9239

RESID(-2)	-0.040746	0.152994	-0.266327	0.7905
RESID(-3)	-0.253752	0.093717	-2.707642	0.0078
RESID(-4)	-0.059814	0.098947	-0.604506	0.5467
RESID(-5)	0.089021	0.098639	0.902492	0.3687

R-squared	0.080987	Mean dependent var	4.22E-18
Adjusted R-squared	0.025047	S.D. dependent var	0.019846
S.E. of regression	0.019596	Akaike info criterion	-4.964132
Sum squared resid	0.044161	Schwarz criterion	-4.781226
Log likelihood	313.2941	Hannan-Quinn criter.	-4.889836
F-statistic	1.447747	Durbin-Watson stat	1.955381
Prob(F-statistic)	0.193117		

FIDELITY BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.943501	Prob. F(5,113)	0.4558
Obs*R-squared	4.889126	Prob. Chi-Square(5)	0.4296

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 19:30
Sample: 4 125
Included observations: 122
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.61E-05	0.000967	0.037370	0.9703
FIDELITYMKTRTN	0.014338	0.177135	0.080941	0.9356
AR(1)	-0.423934	0.475670	-0.891236	0.3747
AR(2)	0.017290	0.471872	0.036641	0.9708
RESID(-1)	0.447701	0.484287	0.924453	0.3572
RESID(-2)	-0.158794	0.450968	-0.352118	0.7254
RESID(-3)	-0.086302	0.176255	-0.489645	0.6253
RESID(-4)	0.151068	0.099030	1.525485	0.1299
RESID(-5)	-0.124422	0.098961	-1.257286	0.2112

R-squared	0.040075	Mean dependent var	1.12E-16
Adjusted R-squared	-0.027885	S.D. dependent var	0.014967
S.E. of regression	0.015175	Akaike info criterion	-5.467484
Sum squared resid	0.026020	Schwarz criterion	-5.260630
Log likelihood	342.5165	Hannan-Quinn criter.	-5.383466
F-statistic	0.589688	Durbin-Watson stat	1.986970
Prob(F-statistic)	0.784649		

GUARATY TRUST BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.944184	Prob. F(5,115)	0.4553
Obs*R-squared	4.850223	Prob. Chi-Square(5)	0.4344

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 19:36
Sample: 3 125
Included observations: 123
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.24E-05	0.001081	-0.020764	0.9835
GTBMKTRTN	-0.019563	0.195384	-0.100125	0.9204
AR(1)	0.760672	1.225984	0.620458	0.5362
RESID(-1)	-0.727628	1.227859	-0.592599	0.5546
RESID(-2)	0.334083	0.393515	0.848973	0.3977
RESID(-3)	-0.152329	0.152094	-1.001546	0.3187
RESID(-4)	-0.084682	0.102299	-0.827793	0.4095
RESID(-5)	0.116365	0.095965	1.212569	0.2278

R-squared	0.039433	Mean dependent var	-5.52E-17
Adjusted R-squared	-0.019037	S.D. dependent var	0.015541
S.E. of regression	0.015689	Akaike info criterion	-5.408924
Sum squared resid	0.028306	Schwarz criterion	-5.226017
Log likelihood	340.6488	Hannan-Quinn criter.	-5.334628
F-statistic	0.674417	Durbin-Watson stat	1.981556
Prob(F-statistic)	0.693336		

SKYE BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.089875	Prob. F(5,117)	0.3697
Obs*R-squared	5.518382	Prob. Chi-Square(5)	0.3559

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 19:40
Sample: 2 125
Included observations: 124
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000150	0.002127	0.070332	0.9440
SKYEMKTRTN	-0.027458	0.303408	-0.090500	0.9280
RESID(-1)	-0.039435	0.101381	-0.388981	0.6980
RESID(-2)	-0.124327	0.100020	-1.243027	0.2163
RESID(-3)	0.039317	0.100407	0.391579	0.6961

RESID(-4)	-0.077450	0.100275	-0.772380	0.4414
RESID(-5)	-0.166167	0.101376	-1.639127	0.1039

R-squared	0.044503	Mean dependent var	-2.01E-18
Adjusted R-squared	-0.004497	S.D. dependent var	0.023586
S.E. of regression	0.023639	Akaike info criterion	-4.597035
Sum squared resid	0.065380	Schwarz criterion	-4.437825
Log likelihood	292.0162	Hannan-Quinn criter.	-4.532360
F-statistic	0.908229	Durbin-Watson stat	1.938372
Prob(F-statistic)	0.491609		

STANBIC IBTC BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.052473	Prob. F(5,117)	0.3905
Obs*R-squared	5.337156	Prob. Chi-Square(5)	0.3761

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 21:57
Sample: 2 125
Included observations: 124
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.83E-05	0.001830	-0.020959	0.9833
STANBICMKTRTN	0.107073	0.258201	0.414688	0.6791
RESID(-1)	-0.113574	0.092182	-1.232073	0.2204
RESID(-2)	-0.040213	0.092001	-0.437096	0.6628
RESID(-3)	-0.061748	0.093792	-0.658348	0.5116
RESID(-4)	-0.008601	0.094230	-0.091278	0.9274
RESID(-5)	-0.175995	0.095020	-1.852186	0.0665

R-squared	0.043042	Mean dependent var	6.99E-21
Adjusted R-squared	-0.006033	S.D. dependent var	0.020300
S.E. of regression	0.020361	Akaike info criterion	-4.895598
Sum squared resid	0.048505	Schwarz criterion	-4.736389
Log likelihood	310.5271	Hannan-Quinn criter.	-4.830924
F-statistic	0.877061	Durbin-Watson stat	2.016674
Prob(F-statistic)	0.514092		

STERLING BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.331919	Prob. F(5,115)	0.8928
Obs*R-squared	1.749793	Prob. Chi-Square(5)	0.8826

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 22:01

Sample: 3 125
Included observations: 123
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.56E-05	0.001359	-0.011492	0.9909
STERLINGMKTRTN	-0.061584	0.237909	-0.258856	0.7962
AR(1)	0.522111	1.264876	0.412777	0.6805
RESID(-1)	-0.541016	1.267768	-0.426747	0.6704
RESID(-2)	0.074739	0.337614	0.221375	0.8252
RESID(-3)	-0.099132	0.125117	-0.792312	0.4298
RESID(-4)	-0.067332	0.099410	-0.677323	0.4996
RESID(-5)	-0.037531	0.094620	-0.396645	0.6924

R-squared	0.014226	Mean dependent var	1.84E-16
Adjusted R-squared	-0.045778	S.D. dependent var	0.018446
S.E. of regression	0.018863	Akaike info criterion	-5.040368
Sum squared resid	0.040920	Schwarz criterion	-4.857462
Log likelihood	317.9826	Hannan-Quinn criter.	-4.966072
F-statistic	0.237085	Durbin-Watson stat	1.989673
Prob(F-statistic)	0.975278		

UNITED BANK FOR AFRICA (UBA) Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.913972	Prob. F(5,117)	0.4746
Obs*R-squared	4.661209	Prob. Chi-Square(5)	0.4586

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 22:05
Sample: 2 125
Included observations: 124
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.39E-05	0.001766	0.007881	0.9937
UBAMKTRTN	0.036520	0.260818	0.140021	0.8889
RESID(-1)	-0.090526	0.100277	-0.902759	0.3685
RESID(-2)	0.075452	0.096159	0.784658	0.4342
RESID(-3)	-0.062126	0.096473	-0.643970	0.5209
RESID(-4)	-0.144645	0.098011	-1.475796	0.1427
RESID(-5)	-0.077729	0.100613	-0.772560	0.4413

R-squared	0.037590	Mean dependent var	-7.83E-19
Adjusted R-squared	-0.011764	S.D. dependent var	0.019532
S.E. of regression	0.019646	Akaike info criterion	-4.967082
Sum squared resid	0.045158	Schwarz criterion	-4.807872
Log likelihood	314.9591	Hannan-Quinn criter.	-4.902407
F-statistic	0.761643	Durbin-Watson stat	1.969149
Prob(F-statistic)	0.601505		

UNION BANK OF NIGERIA (UBN) Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.523054	Prob. F(5,117)	0.7584
Obs*R-squared	2.711136	Prob. Chi-Square(5)	0.7444

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 22:10
Sample: 2 125
Included observations: 124
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.90E-05	0.002289	-0.008313	0.9934
UBNMKTRTN	-0.019966	0.317664	-0.062854	0.9500
RESID(-1)	0.081302	0.092618	0.877824	0.3818
RESID(-2)	-0.055916	0.093119	-0.600483	0.5493
RESID(-3)	-0.064296	0.092736	-0.693316	0.4895
RESID(-4)	0.097150	0.093064	1.043903	0.2987
RESID(-5)	-0.006104	0.096315	-0.063378	0.9496

R-squared	0.021864	Mean dependent var	-1.01E-18
Adjusted R-squared	-0.028297	S.D. dependent var	0.025118
S.E. of regression	0.025471	Akaike info criterion	-4.447730
Sum squared resid	0.075908	Schwarz criterion	-4.288521
Log likelihood	282.7593	Hannan-Quinn criter.	-4.383056
F-statistic	0.435878	Durbin-Watson stat	1.992295
Prob(F-statistic)	0.853603		

ZENITH BANK Plc

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.728951	Prob. F(5,115)	0.6031
Obs*R-squared	3.778549	Prob. Chi-Square(5)	0.5817

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/15/15 Time: 22:14
Sample: 3 125
Included observations: 123
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000124	0.001008	0.123033	0.9023
ZENITHMKTRTN	0.053895	0.182712	0.294974	0.7685
AR(1)	-2.249321	4.424519	-0.508376	0.6122
RESID(-1)	2.205517	4.428165	0.498066	0.6194
RESID(-2)	-0.819671	1.451029	-0.564889	0.5732
RESID(-3)	0.148166	0.485896	0.304933	0.7610
RESID(-4)	-0.217235	0.186205	-1.166646	0.2458

RESID(-5)	0.054819	0.117170	0.467862	0.6408

R-squared	0.030720	Mean dependent var	-2.05E-15
Adjusted R-squared	-0.028280	S.D. dependent var	0.014564
S.E. of regression	0.014768	Akaike info criterion	-5.529875
Sum squared resid	0.025081	Schwarz criterion	-5.346969
Log likelihood	348.0873	Hannan-Quinn criter.	-5.455579
F-statistic	0.520679	Durbin-Watson stat	1.872999
Prob(F-statistic)	0.817398		

APPENDIX G
EVENT WINDOW HETEROSKEDATICITY TEST OUTPUT

ACCESS BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.731532	Prob. F(5,24)	0.6068
Obs*R-squared	3.967431	Prob. Chi-Square(5)	0.5541

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:05
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000907	0.000323	2.804710	0.0098
RESID^2(-1)	-0.014132	0.220392	-0.064122	0.9494
RESID^2(-2)	-0.248653	0.167365	-1.485694	0.1504
RESID^2(-3)	0.249029	0.154951	1.607142	0.1211
RESID^2(-4)	-0.222488	0.150250	-1.480785	0.1517
RESID^2(-5)	0.088667	0.132039	0.671521	0.5083

R-squared	0.132248	Mean dependent var	0.000804
Adjusted R-squared	-0.048534	S.D. dependent var	0.001007
S.E. of regression	0.001032	Akaike info criterion	-10.73863
Sum squared resid	2.55E-05	Schwarz criterion	-10.45839
Log likelihood	167.0795	Hannan-Quinn criter.	-10.64898
F-statistic	0.731532	Durbin-Watson stat	1.947324
Prob(F-statistic)	0.606848		

DIAMOIND BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.848498	Prob. F(5,24)	0.1413
Obs*R-squared	8.340973	Prob. Chi-Square(5)	0.1384

Test Equation:

Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:17
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001876	0.000485	3.871713	0.0007
RESID^2(-1)	-0.000391	0.202436	-0.001933	0.9985
RESID^2(-2)	-0.454884	0.194177	-2.342624	0.0278
RESID^2(-3)	-0.215118	0.206210	-1.043201	0.3073
RESID^2(-4)	0.002194	0.157168	0.013957	0.9890
RESID^2(-5)	-0.319266	0.169857	-1.879609	0.0724

R-squared	0.278032	Mean dependent var	0.000940
Adjusted R-squared	0.127623	S.D. dependent var	0.001094
S.E. of regression	0.001022	Akaike info criterion	-10.75760
Sum squared resid	2.51E-05	Schwarz criterion	-10.47736
Log likelihood	167.3639	Hannan-Quinn criter.	-10.66794
F-statistic	1.848498	Durbin-Watson stat	2.020904
Prob(F-statistic)	0.141321		

EQUITORIAL TRUST BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.039490	Prob. F(5,24)	0.4174
Obs*R-squared	5.340314	Prob. Chi-Square(5)	0.3758

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:21
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000434	0.000253	1.716358	0.0990
RESID^2(-1)	-0.144306	0.223669	-0.645178	0.5249
RESID^2(-2)	-0.046195	0.225139	-0.205185	0.8392
RESID^2(-3)	0.410219	0.226047	1.814747	0.0821
RESID^2(-4)	-0.106179	0.324355	-0.327355	0.7462
RESID^2(-5)	-0.280988	0.321628	-0.873641	0.3910

R-squared	0.178010	Mean dependent var	0.000405
Adjusted R-squared	0.006763	S.D. dependent var	0.000761
S.E. of regression	0.000759	Akaike info criterion	-11.35324
Sum squared resid	1.38E-05	Schwarz criterion	-11.07300
Log likelihood	176.2986	Hannan-Quinn criter.	-11.26359
F-statistic	1.039490	Durbin-Watson stat	1.742913
Prob(F-statistic)	0.417448		

FIRST BANK OF NIGERIA Plc

F-statistic	1.526611	Prob. F(5,22)	0.2223
Obs*R-squared	7.212403	Prob. Chi-Square(5)	0.2053

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:26
Sample (adjusted): 9 36
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001368	0.000511	2.676739	0.0138
RESID^2(-1)	-0.013516	0.215378	-0.062755	0.9505
RESID^2(-2)	-0.228299	0.198426	-1.150548	0.2623
RESID^2(-3)	0.193960	0.199838	0.970587	0.3423
RESID^2(-4)	-0.405183	0.225270	-1.798655	0.0858
RESID^2(-5)	-0.142698	0.241553	-0.590752	0.5607

R-squared	0.257586	Mean dependent var	0.000862
Adjusted R-squared	0.088855	S.D. dependent var	0.001141
S.E. of regression	0.001089	Akaike info criterion	-10.61888
Sum squared resid	2.61E-05	Schwarz criterion	-10.33341
Log likelihood	154.6644	Hannan-Quinn criter.	-10.53161
F-statistic	1.526611	Durbin-Watson stat	1.959694
Prob(F-statistic)	0.222337		

FIRST CITY MONUMENT BANK (FCMB) Plc

Heteroskedasticity Test: ARCH

F-statistic	0.465273	Prob. F(5,24)	0.7982
Obs*R-squared	2.650989	Prob. Chi-Square(5)	0.7536

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:30
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000666	0.000318	2.098887	0.0465
RESID^2(-1)	-0.086196	0.188108	-0.458229	0.6509
RESID^2(-2)	-0.145295	0.188204	-0.772004	0.4476
RESID^2(-3)	0.085232	0.190002	0.448582	0.6578
RESID^2(-4)	0.066451	0.215677	0.308104	0.7607
RESID^2(-5)	-0.169534	0.216087	-0.784566	0.4404

R-squared	0.088366	Mean dependent var	0.000528
Adjusted R-squared	-0.101557	S.D. dependent var	0.000788
S.E. of regression	0.000827	Akaike info criterion	-11.18019

Sum squared resid	1.64E-05	Schwarz criterion	-10.89995
Log likelihood	173.7028	Hannan-Quinn criter.	-11.09054
F-statistic	0.465273	Durbin-Watson stat	2.058011
Prob(F-statistic)	0.798165		

FIDELITY BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.459168	Prob. F(5,22)	0.2432
Obs*R-squared	6.973123	Prob. Chi-Square(5)	0.2226

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:34
Sample (adjusted): 9 36
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000251	0.000452	0.555211	0.5844
RESID^2(-1)	0.235845	0.194473	1.212737	0.2381
RESID^2(-2)	-0.013534	0.222693	-0.060775	0.9521
RESID^2(-3)	0.147821	0.217438	0.679831	0.5037
RESID^2(-4)	-0.082042	0.220321	-0.372374	0.7132
RESID^2(-5)	0.543746	0.221203	2.458133	0.0223

R-squared	0.249040	Mean dependent var	0.000871
Adjusted R-squared	0.078367	S.D. dependent var	0.000894
S.E. of regression	0.000858	Akaike info criterion	-11.09685
Sum squared resid	1.62E-05	Schwarz criterion	-10.81138
Log likelihood	161.3559	Hannan-Quinn criter.	-11.00958
F-statistic	1.459168	Durbin-Watson stat	1.807054
Prob(F-statistic)	0.243152		

GUARATY TRUST BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.262226	Prob. F(5,24)	0.9293
Obs*R-squared	1.554018	Prob. Chi-Square(5)	0.9068

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:38
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000619	0.000251	2.467527	0.0211
RESID^2(-1)	-0.069581	0.200438	-0.347147	0.7315

RESID^2(-2)	0.004138	0.196691	0.021040	0.9834
RESID^2(-3)	0.010932	0.181435	0.060252	0.9525
RESID^2(-4)	-0.014856	0.181277	-0.081952	0.9354
RESID^2(-5)	-0.192455	0.177673	-1.083196	0.2895

R-squared	0.051801	Mean dependent var	0.000473
Adjusted R-squared	-0.145741	S.D. dependent var	0.000618
S.E. of regression	0.000662	Akaike info criterion	-11.62654
Sum squared resid	1.05E-05	Schwarz criterion	-11.34630
Log likelihood	180.3982	Hannan-Quinn criter.	-11.53689
F-statistic	0.262226	Durbin-Watson stat	2.049846
Prob(F-statistic)	0.929260		

SKYE BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.933425	Prob. F(5,24)	0.4770
Obs*R-squared	4.884122	Prob. Chi-Square(5)	0.4302

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:43
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000803	0.000563	1.428272	0.1661
RESID^2(-1)	0.037481	0.192359	0.194851	0.8471
RESID^2(-2)	0.259265	0.198107	1.308712	0.2030
RESID^2(-3)	-0.177399	0.196828	-0.901291	0.3764
RESID^2(-4)	-0.203385	0.245470	-0.828553	0.4155
RESID^2(-5)	0.408577	0.234135	1.745053	0.0938

R-squared	0.162804	Mean dependent var	0.001190
Adjusted R-squared	-0.011612	S.D. dependent var	0.001373
S.E. of regression	0.001381	Akaike info criterion	-10.15462
Sum squared resid	4.58E-05	Schwarz criterion	-9.874378
Log likelihood	158.3193	Hannan-Quinn criter.	-10.06497
F-statistic	0.933425	Durbin-Watson stat	1.904759
Prob(F-statistic)	0.477048		

STANBIC IBTC BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.718350	Prob. F(5,24)	0.6160
Obs*R-squared	3.905243	Prob. Chi-Square(5)	0.5631

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:46

Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000514	0.000350	1.465714	0.1557
RESID^2(-1)	-0.062979	0.188450	-0.334193	0.7411
RESID^2(-2)	-0.025918	0.188327	-0.137621	0.8917
RESID^2(-3)	-0.057519	0.186068	-0.309127	0.7599
RESID^2(-4)	0.077399	0.185194	0.417937	0.6797
RESID^2(-5)	0.323286	0.183593	1.760885	0.0910

R-squared	0.130175	Mean dependent var	0.000662
Adjusted R-squared	-0.051039	S.D. dependent var	0.000879
S.E. of regression	0.000901	Akaike info criterion	-11.00902
Sum squared resid	1.95E-05	Schwarz criterion	-10.72878
Log likelihood	171.1353	Hannan-Quinn criter.	-10.91937
F-statistic	0.718350	Durbin-Watson stat	1.948036
Prob(F-statistic)	0.615974		

STERLING BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.399834	Prob. F(5,24)	0.8440
Obs*R-squared	2.306808	Prob. Chi-Square(5)	0.8053

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:51
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.980654	0.732506	1.338766	0.1932
WGT_RESID^2(-1)	0.018658	0.256651	0.072697	0.9426
WGT_RESID^2(-2)	-0.179719	0.270414	-0.664606	0.5126
WGT_RESID^2(-3)	0.254037	0.265895	0.955406	0.3489
WGT_RESID^2(-4)	0.071341	0.312169	0.228534	0.8212
WGT_RESID^2(-5)	-0.078074	0.307794	-0.253656	0.8019

R-squared	0.076894	Mean dependent var	1.051470
Adjusted R-squared	-0.115420	S.D. dependent var	1.494168
S.E. of regression	1.578042	Akaike info criterion	3.927103
Sum squared resid	59.76520	Schwarz criterion	4.207343
Log likelihood	-52.90655	Hannan-Quinn criter.	4.016754
F-statistic	0.399834	Durbin-Watson stat	1.768053
Prob(F-statistic)	0.844040		

UNITED BANK FOR AFRICA (UBA) Plc

Heteroskedasticity Test: ARCH

F-statistic	1.675387	Prob. F(5,24)	0.1789
Obs*R-squared	7.761948	Prob. Chi-Square(5)	0.1699

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 00:54
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000798	0.000986	0.809545	0.4262
RESID^2(-1)	0.176031	0.212578	0.828077	0.4158
RESID^2(-2)	0.324119	0.210490	1.539829	0.1367
RESID^2(-3)	0.140842	0.227677	0.618606	0.5420
RESID^2(-4)	-0.229580	0.235567	-0.974582	0.3395
RESID^2(-5)	0.382819	0.232105	1.649331	0.1121

R-squared	0.258732	Mean dependent var	0.002653
Adjusted R-squared	0.104301	S.D. dependent var	0.003381
S.E. of regression	0.003200	Akaike info criterion	-8.474677
Sum squared resid	0.000246	Schwarz criterion	-8.194438
Log likelihood	133.1202	Hannan-Quinn criter.	-8.385026
F-statistic	1.675387	Durbin-Watson stat	2.014146
Prob(F-statistic)	0.178891		

UNION BANK OF NIGERIA (UBN) Plc

Heteroskedasticity Test: ARCH

F-statistic	0.114056	Prob. F(5,24)	0.9881
Obs*R-squared	0.696302	Prob. Chi-Square(5)	0.9832

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 01:00
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000606	0.000456	1.326746	0.1971
RESID^2(-1)	0.005591	0.215837	0.025905	0.9795
RESID^2(-2)	0.096691	0.213818	0.452210	0.6552
RESID^2(-3)	0.036732	0.210515	0.174486	0.8629
RESID^2(-4)	0.100091	0.219068	0.456893	0.6519
RESID^2(-5)	0.126083	0.253906	0.496573	0.6240

R-squared	0.023210	Mean dependent var	0.000865
Adjusted R-squared	-0.180288	S.D. dependent var	0.001072

S.E. of regression	0.001164	Akaike info criterion	-10.49654
Sum squared resid	3.25E-05	Schwarz criterion	-10.21630
Log likelihood	163.4481	Hannan-Quinn criter.	-10.40689
F-statistic	0.114056	Durbin-Watson stat	1.896474
Prob(F-statistic)	0.988097		

ZENITH BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.369734	Prob. F(5,24)	0.2705
Obs*R-squared	6.660257	Prob. Chi-Square(5)	0.2472

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/16/15 Time: 01:03
Sample (adjusted): 7 36
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000328	0.000141	2.319715	0.0292
RESID^2(-1)	-0.075163	0.198468	-0.378713	0.7082
RESID^2(-2)	-0.094673	0.183932	-0.514717	0.6115
RESID^2(-3)	0.095338	0.109233	0.872792	0.3914
RESID^2(-4)	0.140486	0.106064	1.324542	0.1978
RESID^2(-5)	-0.094217	0.088376	-1.066094	0.2970

R-squared	0.222009	Mean dependent var	0.000363
Adjusted R-squared	0.059927	S.D. dependent var	0.000590
S.E. of regression	0.000572	Akaike info criterion	-11.91863
Sum squared resid	7.85E-06	Schwarz criterion	-11.63839
Log likelihood	184.7794	Hannan-Quinn criter.	-11.82898
F-statistic	1.369734	Durbin-Watson stat	1.946067
Prob(F-statistic)	0.270536		

APPENDIX H
ESTIMATION WINDOW HETEROSKEDATICITY TEST OUTPUT

ACCESS BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.225783	Prob. F(5,113)	0.9507
Obs*R-squared	1.177098	Prob. Chi-Square(5)	0.9471

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 18:04
Sample (adjusted): 7 125
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000348	9.91E-05	3.510274	0.0006
RESID^2(-1)	-0.013740	0.093832	-0.146427	0.8838
RESID^2(-2)	-0.044654	0.093787	-0.476122	0.6349
RESID^2(-3)	-0.042311	0.093795	-0.451096	0.6528
RESID^2(-4)	-0.034812	0.093746	-0.371344	0.7111
RESID^2(-5)	-0.074757	0.093796	-0.797015	0.4271

R-squared	0.009892	Mean dependent var	0.000287
Adjusted R-squared	-0.033919	S.D. dependent var	0.000815
S.E. of regression	0.000829	Akaike info criterion	-11.30454
Sum squared resid	7.76E-05	Schwarz criterion	-11.16441
Log likelihood	678.6200	Hannan-Quinn criter.	-11.24764
F-statistic	0.225783	Durbin-Watson stat	2.000451
Prob(F-statistic)	0.950673		

DIAMOIND BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.572574	Prob. F(5,111)	0.7209
Obs*R-squared	2.941749	Prob. Chi-Square(5)	0.7090

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 11/15/15 Time: 18:53
Sample (adjusted): 9 125
Included observations: 117 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.990549	0.260530	3.802053	0.0002
WGT_RESID^2(-1)	-0.075650	0.094865	-0.797452	0.4269
WGT_RESID^2(-2)	-0.010617	0.094782	-0.112011	0.9110
WGT_RESID^2(-3)	0.069794	0.094747	0.736635	0.4629

WGT_RESID^2(-4)	-0.067065	0.091607	-0.732090	0.4657
WGT_RESID^2(-5)	0.080330	0.091599	0.876981	0.3824

R-squared	0.025143	Mean dependent var	0.987646
Adjusted R-squared	-0.018769	S.D. dependent var	1.560106
S.E. of regression	1.574679	Akaike info criterion	3.795900
Sum squared resid	275.2372	Schwarz criterion	3.937550
Log likelihood	-216.0602	Hannan-Quinn criter.	3.853409
F-statistic	0.572574	Durbin-Watson stat	1.999434
Prob(F-statistic)	0.720867		

EQUITORIAL TRUST BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.832560	Prob. F(5,113)	0.1121
Obs*R-squared	8.925573	Prob. Chi-Square(5)	0.1121

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 18:58
Sample (adjusted): 7 125
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000500	0.000130	3.848256	0.0002
RESID^2(-1)	0.256569	0.093833	2.734309	0.0073
RESID^2(-2)	-0.147466	0.096887	-1.522037	0.1308
RESID^2(-3)	0.081807	0.097486	0.839164	0.4031
RESID^2(-4)	-0.012145	0.096887	-0.125348	0.9005
RESID^2(-5)	-0.069291	0.093765	-0.738981	0.4615

R-squared	0.075005	Mean dependent var	0.000561
Adjusted R-squared	0.034076	S.D. dependent var	0.000920
S.E. of regression	0.000904	Akaike info criterion	-11.12968
Sum squared resid	9.24E-05	Schwarz criterion	-10.98955
Log likelihood	668.2157	Hannan-Quinn criter.	-11.07278
F-statistic	1.832560	Durbin-Watson stat	1.994272
Prob(F-statistic)	0.112059		

FIRST BANK OF NIGERIA Plc

Heteroskedasticity Test: ARCH

F-statistic	1.749237	Prob. F(5,111)	0.1293
Obs*R-squared	8.545605	Prob. Chi-Square(5)	0.1286

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 19:02
Sample (adjusted): 9 125
Included observations: 117 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000250	7.92E-05	3.159602	0.0020
RESID^2(-1)	0.164549	0.094859	1.734665	0.0856
RESID^2(-2)	0.067690	0.095628	0.707840	0.4805
RESID^2(-3)	0.158989	0.094372	1.684716	0.0949
RESID^2(-4)	-0.134243	0.095366	-1.407658	0.1620
RESID^2(-5)	-0.035505	0.098261	-0.361334	0.7185

R-squared	0.073039	Mean dependent var	0.000323
Adjusted R-squared	0.031284	S.D. dependent var	0.000650
S.E. of regression	0.000640	Akaike info criterion	-11.82017
Sum squared resid	4.55E-05	Schwarz criterion	-11.67852
Log likelihood	697.4800	Hannan-Quinn criter.	-11.76266
F-statistic	1.749237	Durbin-Watson stat	1.982864
Prob(F-statistic)	0.129290		

FIRST CITY MONUMENT BANK (FCMB) Plc

Heteroskedasticity Test: ARCH

F-statistic	0.320367	Prob. F(5,112)	0.8998
Obs*R-squared	1.663850	Prob. Chi-Square(5)	0.8934

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 11/15/15 Time: 19:10
Sample (adjusted): 8 125
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.932276	0.252065	3.698554	0.0003
WGT_RESID^2(-1)	0.073306	0.092893	0.789147	0.4317
WGT_RESID^2(-2)	-0.065546	0.092932	-0.705306	0.4821
WGT_RESID^2(-3)	0.020397	0.093181	0.218900	0.8271
WGT_RESID^2(-4)	0.061713	0.102305	0.603229	0.5476
WGT_RESID^2(-5)	-0.032138	0.102237	-0.314353	0.7538

R-squared	0.014100	Mean dependent var	0.989462
Adjusted R-squared	-0.029913	S.D. dependent var	1.542158
S.E. of regression	1.565053	Akaike info criterion	3.783225
Sum squared resid	274.3317	Schwarz criterion	3.924108
Log likelihood	-217.2103	Hannan-Quinn criter.	3.840428
F-statistic	0.320367	Durbin-Watson stat	2.011717
Prob(F-statistic)	0.899836		

FIDELITY BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.229306	Prob. F(5,111)	0.9490
Obs*R-squared	1.196152	Prob. Chi-Square(5)	0.9452

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 19:31
Sample (adjusted): 9 125
Included observations: 117 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000204	4.74E-05	4.301970	0.0000
RESID^2(-1)	0.011781	0.078796	0.149517	0.8814
RESID^2(-2)	-0.065143	0.078535	-0.829474	0.4086
RESID^2(-3)	-0.028868	0.077612	-0.371954	0.7106
RESID^2(-4)	-0.006742	0.078109	-0.086314	0.9314
RESID^2(-5)	0.031953	0.077750	0.410969	0.6819

R-squared	0.010224	Mean dependent var	0.000192
Adjusted R-squared	-0.034361	S.D. dependent var	0.000336
S.E. of regression	0.000342	Akaike info criterion	-13.07228
Sum squared resid	1.30E-05	Schwarz criterion	-12.93063
Log likelihood	770.7286	Hannan-Quinn criter.	-13.01478
F-statistic	0.229306	Durbin-Watson stat	1.972436
Prob(F-statistic)	0.949031		

GUARATY TRUST BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.272577	Prob. F(5,112)	0.2808
Obs*R-squared	6.343378	Prob. Chi-Square(5)	0.2742

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 19:37
Sample (adjusted): 8 125
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000280	6.52E-05	4.296682	0.0000
RESID^2(-1)	-0.008404	0.093965	-0.089433	0.9289
RESID^2(-2)	-0.171233	0.093503	-1.831315	0.0697
RESID^2(-3)	0.125508	0.094357	1.330135	0.1862
RESID^2(-4)	-0.107434	0.093570	-1.148171	0.2533
RESID^2(-5)	0.002802	0.094081	0.029778	0.9763

R-squared	0.053757	Mean dependent var	0.000242
Adjusted R-squared	0.011514	S.D. dependent var	0.000377
S.E. of regression	0.000375	Akaike info criterion	-12.88961

Sum squared resid	1.58E-05	Schwarz criterion	-12.74872
Log likelihood	766.4868	Hannan-Quinn criter.	-12.83240
F-statistic	1.272577	Durbin-Watson stat	1.996531
Prob(F-statistic)	0.280755		

SKYE BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.390266	Prob. F(5,113)	0.2332
Obs*R-squared	6.896200	Prob. Chi-Square(5)	0.2285

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 19:41
Sample (adjusted): 7 125
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000330	0.000161	2.047804	0.0429
RESID^2(-1)	0.272923	0.148753	1.834741	0.0692
RESID^2(-2)	0.091737	0.150387	0.610002	0.5431
RESID^2(-3)	-0.173465	0.153115	-1.132907	0.2597
RESID^2(-4)	0.199419	0.149312	1.335591	0.1844
RESID^2(-5)	0.095220	0.151696	0.627700	0.5315

R-squared	0.057951	Mean dependent var	0.000560
Adjusted R-squared	0.016268	S.D. dependent var	0.001129
S.E. of regression	0.001120	Akaike info criterion	-10.70230
Sum squared resid	0.000142	Schwarz criterion	-10.56217
Log likelihood	642.7867	Hannan-Quinn criter.	-10.64540
F-statistic	1.390266	Durbin-Watson stat	1.417570
Prob(F-statistic)	0.233239		

STANBIC IBTC BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.075916	Prob. F(5,113)	0.3776
Obs*R-squared	5.407774	Prob. Chi-Square(5)	0.3682

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 21:58
Sample (adjusted): 7 125
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000296	0.000113	2.609879	0.0103
RESID^2(-1)	0.113225	0.093312	1.213402	0.2275

RESID^2(-2)	0.147383	0.093655	1.573681	0.1184
RESID^2(-3)	-0.019232	0.096095	-0.200130	0.8417
RESID^2(-4)	-0.072404	0.094960	-0.762477	0.4474
RESID^2(-5)	0.088532	0.094582	0.936037	0.3513

R-squared	0.045443	Mean dependent var	0.000403
Adjusted R-squared	0.003206	S.D. dependent var	0.000964
S.E. of regression	0.000963	Akaike info criterion	-11.00455
Sum squared resid	0.000105	Schwarz criterion	-10.86443
Log likelihood	660.7709	Hannan-Quinn criter.	-10.94765
F-statistic	1.075916	Durbin-Watson stat	1.990903
Prob(F-statistic)	0.377564		

STERLING BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	0.586038	Prob. F(5,112)	0.7106
Obs*R-squared	3.008458	Prob. Chi-Square(5)	0.6987

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/15/15 Time: 22:02
Sample (adjusted): 8 125
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000270	7.94E-05	3.395232	0.0009
RESID^2(-1)	0.119670	0.091822	1.303280	0.1952
RESID^2(-2)	0.043030	0.092093	0.467250	0.6412
RESID^2(-3)	-0.003126	0.092170	-0.033914	0.9730
RESID^2(-4)	-0.046528	0.092111	-0.505133	0.6145
RESID^2(-5)	0.082406	0.091707	0.898580	0.3708

R-squared	0.025495	Mean dependent var	0.000337
Adjusted R-squared	-0.018009	S.D. dependent var	0.000506
S.E. of regression	0.000511	Akaike info criterion	-12.27225
Sum squared resid	2.92E-05	Schwarz criterion	-12.13137
Log likelihood	730.0626	Hannan-Quinn criter.	-12.21505
F-statistic	0.586038	Durbin-Watson stat	1.955189
Prob(F-statistic)	0.710627		

UNITED BANK FOR AFRICA (UBA) Plc

Heteroskedasticity Test: ARCH

F-statistic	1.149688	Prob. F(5,113)	0.3385
Obs*R-squared	5.760616	Prob. Chi-Square(5)	0.3302

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 11/15/15 Time: 22:07
Sample (adjusted): 7 125
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.250731	0.248705	5.028967	0.0000
WGT_RESID^2(-1)	0.025544	0.093691	0.272643	0.7856
WGT_RESID^2(-2)	0.027402	0.093050	0.294483	0.7689
WGT_RESID^2(-3)	0.086890	0.092888	0.935425	0.3516
WGT_RESID^2(-4)	-0.111377	0.093146	-1.195725	0.2343
WGT_RESID^2(-5)	-0.166706	0.093546	-1.782081	0.0774

R-squared	0.048409	Mean dependent var	1.109274
Adjusted R-squared	0.006303	S.D. dependent var	1.487740
S.E. of regression	1.483045	Akaike info criterion	3.675176
Sum squared resid	248.5346	Schwarz criterion	3.815300
Log likelihood	-212.6730	Hannan-Quinn criter.	3.732076
F-statistic	1.149688	Durbin-Watson stat	2.019741
Prob(F-statistic)	0.338533		

UNION BANK OF NIGERIA (UBN) Plc

Heteroskedasticity Test: ARCH

F-statistic	0.181684	Prob. F(5,113)	0.9690
Obs*R-squared	0.949028	Prob. Chi-Square(5)	0.9666

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 11/15/15 Time: 22:11
Sample (adjusted): 7 125
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.955272	0.286842	3.330300	0.0012
WGT_RESID^2(-1)	0.034242	0.094213	0.363456	0.7169
WGT_RESID^2(-2)	-0.004944	0.093912	-0.052644	0.9581
WGT_RESID^2(-3)	-0.032320	0.093737	-0.344793	0.7309
WGT_RESID^2(-4)	0.063722	0.093863	0.678889	0.4986
WGT_RESID^2(-5)	0.040293	0.100804	0.399716	0.6901

R-squared	0.007975	Mean dependent var	1.059080
Adjusted R-squared	-0.035920	S.D. dependent var	2.039218
S.E. of regression	2.075519	Akaike info criterion	4.347404
Sum squared resid	486.7792	Schwarz criterion	4.487528
Log likelihood	-252.6706	Hannan-Quinn criter.	4.404304
F-statistic	0.181684	Durbin-Watson stat	1.999557
Prob(F-statistic)	0.968999		

ZENITH BANK Plc

Heteroskedasticity Test: ARCH

F-statistic	1.020021	Prob. F(5,112)	0.4094
Obs*R-squared	5.139300	Prob. Chi-Square(5)	0.3991

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 11/15/15 Time: 22:16
Sample (adjusted): 8 125
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.019700	0.269351	3.785773	0.0002
WGT_RESID^2(-1)	-0.069316	0.101872	-0.680430	0.4976
WGT_RESID^2(-2)	0.199012	0.100981	1.970773	0.0512
WGT_RESID^2(-3)	0.007664	0.104629	0.073245	0.9417
WGT_RESID^2(-4)	-0.054737	0.104532	-0.523638	0.6016
WGT_RESID^2(-5)	-0.090907	0.107594	-0.844912	0.4000

R-squared	0.043553	Mean dependent var	1.019406
Adjusted R-squared	0.000855	S.D. dependent var	1.796271
S.E. of regression	1.795503	Akaike info criterion	4.057957
Sum squared resid	361.0693	Schwarz criterion	4.198839
Log likelihood	-233.4195	Hannan-Quinn criter.	4.115160
F-statistic	1.020021	Durbin-Watson stat	1.885407
Prob(F-statistic)	0.409374		

APPENDIX I
PARAMETER ESTIMATION WINDOW RESULTS REPRESENTATIONS
ESTIMATION WINDOW COEFFICIENTS

Access	ACCESSSHARRTN = 0.000393550046614 + 0.728429423841*ACCESSMKTRTN	OLS
Diamond	DIAMONDSHARRTN = 0.000740503467834 + 0.696238171398*DIAMONDMKTRTN + [AR(1)=-0.359636382779,AR(2)=-0.0307094530992] GARCH = 9.00897445406e-05 + 1.08668377024*RESID(-1)^2	ARCH/GARCH
Eti	ETISHARRTN = -0.00332680086629 + 0.626098020049*ETIMKTRTN	OLS
FBNH	FBNHSHARRTN = 0.000904530207829 + 0.970240148267*FBNHMKTRTN + [AR(1)=0.239489964876,AR(2)=-0.167445912032]	OLS
FCMB	FCMBSHARRTN = -0.000348413445576 + 0.362813504184*FCMBMKTRTN + [AR(1)=-0.136899751368] GARCH = 9.3040422122e-06 + 0.236561946749*RESID(-1)^2 + 0.756486260368*GARCH(-1)	ARCH/GARCH
Fidelity	FIDELITYSHARRTN = -0.000290211972658 + 0.344804433945*FIDELITYMKTRTN + [AR(1)=-0.294779036885,AR(2)=-0.136090585097]	OLS
GT	GTSHARRTN = 0.000115987582839 + 1.42573292158*GTBMKTRTN + [AR(1)=-0.312680511157]	OLS
SKYE	SKYESHARRTN = 0.00216839178269 + 0.448053402092*SKYEMKTRTN	OLS
STANBIC	STANBICSHARRTN = -0.00219170353248 + 0.585700990969*STANBICMKTRTN	OLS
STERLING	STERLINGSHARRTN = -0.000523591405921 + 0.450112123968*STERLINGMKTRTN + [AR(1)=-0.25597437156]	OLS
UBA	UBASHARRTN = 0.00088334178714 + 1.17297039606*UBAMKTRTN GARCH = 6.3374619075e-06 - 0.0787679596642*RESID(-1)^2 + 1.08348998603*GARCH(-1)	ARCH/GARCH
UBN	UBNSHARRTN = 0.00335111434086 + 0.85465222411*UBNMKTRTN GARCH = 0.000458398151198 + 0.492796527965*RESID(-1)^2 - 0.253354678657*GARCH(-1)	ARCH/GARCH

ZENITH	ZENITHSHARRTN = -0.000191872287592 + 0.999067623673*ZENITHMKTRTN + [AR(1)=-0.227659577273] GARCH = 5.6997566005e-05 + 0.340280411613*RESID(-1)^2 + 0.435276043206*GARCH(-1)	ARCH/GARCH

APPENDIX J

HYPOTHESES TEST OUTPUT FOR THE DATE, BEFORE AND AFTER THE ANNOUNCEMENT.

ANNOUCEMENT DAY CAR RESULT:

Hypothesis Testing for ANNOUNCEMET DAY CAR
Date: 11/17/15 Time: 18:58
Sample: 1 17
Included observations: 17
Test of Hypothesis: Mean = 0.006851
Assuming Std. Dev. = 0.008456

Sample Mean = -0.001728
Sample Std. Dev. = 0.013483

Method	Value	Probability
Z-statistic	-4.183103	0.0000
t-statistic	-2.623572	0.0184

POST ANNOUNCEMENT DAY CAR RESULT (day+16):

Hypothesis Testing for ANNOUNCEMETDAYPOSTCAR
Date: 11/17/15 Time: 19:00
Sample: 1 17
Included observations: 17
Test of Hypothesis: Mean = 0.030982
Assuming Std. Dev. = 0.008456

Sample Mean = -0.001728
Sample Std. Dev. = 0.013483

Method	Value	Probability
Z-statistic	-15.94962	0.0000
t-statistic	-10.00333	0.0000

PRE- ANNOUNCEMENT DAY CAR RESULT (day -1):

Hypothesis Testing for PREANNOUNCEMENTCAR
Date: 11/16/15 Time: 19:10
Sample: 1 15
Included observations: 15
Test of Hypothesis: Mean = 0.009078
Assuming Std. Dev. = 0.016201

Sample Mean = 0.004617
Sample Std. Dev. = 0.018722

Method	Value	Probability
Z-statistic	-1.066354	0.2863
t-statistic	-0.922743	0.3718

APPENDIX K
AR, CAR, AND AAR DESCRIPTIVE STATISTICS OUTPUT

	AAR	AR	CAR
Mean	-8.85E-05	0.000968	0.001246
Median	-0.001174	-0.001808	0.001368
Maximum	0.020252	0.048583	0.046335
Minimum	-0.03	-0.040811	-0.037668
Std. Dev.	0.008456	0.021194	0.016201
Skewness	-0.101965	0.220994	0.309711
Kurtosis	3.756592	3.063936	4.453098
Jarque-Bera	3.070097	0.265922	3.326903
Probability	0.215445	0.875499	0.189484
Sum	-0.010621	0.030982	0.039878
Sum sq. Dev.	0.008510	0.013924	0.008137
Observation	120	32	32

APPENDIX L
EVENT WINDOW BANKS' ABNORMAL RETURN

AccessbnkAR	DiamondAR	EtbAR	FirsbnkAR	FcmbAR	FidelityAR	GTbnkAR	SkybnkAR	StanbicAR	SterlingbnkAR	UBAAR	UBNAR	ZenithbnkAR
-0.05375	-0.045752	-0.04588	-0.01559	0.015812	-0.0454	-0.00665	-0.03875	0.002251	-0.09673	-0.0933	-0.04807	-0.01787
0.089872	0.055658	0.039024	0.016718	-0.03237	-0.00936	0.010513	-0.01987	-0.03396	0.135688	0.184932	0.087156	0.050996
-0.037988	-0.000125	-0.00576	-0.01482	0.003489	0.020938	-0.02976	0.050694	0.006901	-0.01223	-0.05801	-0.00578	-0.03211
0.059253	0.044525	0.07038	0.080862	0.066277	0.070756	0.046851	0.023905	0.057286	0.012505	0.071661	0.017051	0.010271
-0.024111	0.014568	-0.06183	-0.0483	-0.04718	-0.00653	0.008808	-0.01534	-0.00434	-0.04793	-0.05151	0.011986	0.028539
-0.033964	-0.073007	-0.00069	-0.03926	0.011874	-0.01673	-0.04831	0.031578	-0.03009	0.010589	-0.14876	-0.06302	-0.05973
-0.045165	0.016537	-0.00074	-0.04472	-0.02276	0.03665	-0.02277	0.059418	0.014421	-0.00634	0.00628	0.001154	0.025249
0.033859	-0.025566	0.008671	0.076908	0.022775	-0.05381	0.050531	-0.10435	-0.01133	0.009047	0.095493	0.022279	0.005933
0.019699	-0.008769	-0.00475	0.010565	-0.03327	-0.02253	0.005237	-0.02777	0.002811	0.008894	0.055236	-0.04287	0.002913
-0.025045	0.038939	0.02371	-0.0523	0.000633	0.022806	-0.01481	0.037613	-0.01738	-0.00289	-0.07162	0.022601	0.002774
0.055085	-0.058046	-0.02793	0.039171	-0.02948	-0.02467	0.007182	-0.03185	0.040828	0.005617	-0.0115	0.00777	-0.01282
0.01665	0.032238	0.012378	0.0242	0.085951	0.081044	0.008832	0.072212	-0.02618	-0.02279	0.042166	0.018291	-0.00175
-0.030126	0.011188	-0.00259	-0.00114	-0.05274	-0.07268	-0.00065	-0.07203	0.001886	0.013447	0.002459	-0.05211	-0.00676
-0.018187	0.046612	0.005798	-0.00925	0.01347	0.010167	0.028896	-0.01873	0.004619	0.032445	0.020896	0.018051	0.010861
-0.025952	-0.004708	0.033842	-0.01257	0.047249	-0.00897	-0.03334	0.024366	0.009611	-0.05682	-0.00778	-0.00352	-0.00755
-0.022078	-0.037467	-0.04122	0.033923	-0.06437	-0.01117	-0.00089	-0.01029	0.031702	0.032021	0.025093	0.053539	0.006215
0.06391	0.020616	-0.02619	-0.08233	0.020012	0.065323	-0.01333	0.078652	-0.02979	-0.00236	-0.05804	-0.04281	-0.01764
-0.02011	-0.050932	0.032516	0.016988	-0.0464	-0.05819	0.014041	-0.07223	-0.02441	-0.00523	-0.05546	-0.01144	0.014324
-0.007911	-0.021334	0.000816	-0.01364	0.035076	0.019918	-0.04256	0.062482	-0.04383	0.002922	0.098821	0.007212	-0.03704
0.015031	0.050453	0.000921	0.038676	-0.00061	0.007851	0.034134	-0.02628	0.02712	0.029199	-0.04008	0.011629	0.023664
-0.037556	-0.002438	0.001109	-0.00068	0.021222	-0.00355	-0.03719	0.033644	0.07042	-0.05988	-0.02191	-0.00223	0.015988
0.021074	-0.019284	-0.02122	-0.0129	-0.00746	0.016372	0.074031	-0.05766	-0.04626	0.049695	-0.01533	0.040815	-0.01967
0.008356	0.017933	0.035648	0.025682	-0.00496	-0.01819	-0.03543	0.01724	-0.03544	-0.01954	0.029781	-0.0766	0.005761
-0.013259	-0.042351	-0.01716	-0.04716	0.003191	0.023426	-0.00233	0.025759	0.033763	0.00015	-0.04599	-0.0228	0.005016
0.00658	0.000308	-0.00253	0.07377	-0.00215	0.018151	-0.01905	0.037203	0.026064	0.004234	0.032109	0.044949	0.020045
-0.040281	-0.008619	0.003594	-0.08387	-0.02861	-0.07981	-0.00274	-0.07707	-0.07802	-0.0299	-0.03428	-0.00689	-0.06407
0.023828	0.076724	0.007129	0.033426	0.047434	0.033718	0.02376	0.009958	0.067981	0.027107	0.048965	-0.03294	0.056013
0.030201	-0.007235	-0.01052	0.001014	-0.03233	-0.03143	-0.01864	-0.01279	-0.0157	-0.00762	-0.06679	0.04634	-0.01485
-0.014707	-0.005225	-0.01138	0.00031	-0.01419	0.059453	-0.00308	0.062534	0.002031	-0.01429	0.030013	-0.0495	-0.01565
-0.027656	-0.03487	-0.03601	-0.02995	0.049609	-0.0173	-0.02107	0.003775	-0.05047	0.005379	-0.00011	0.051841	-0.01467
-0.003595	-0.002659	0.029795	0.060244	-0.07321	0.036358	0.065458	-0.0291	0.092021	0.032187	0.026354	-0.01516	0.019028
0.1207	0.05812	0.026645	0.023774	0.055403	-0.0155	0.012363	-0.02786	-0.02889	-0.00509	0.088231	0.008146	0.067472