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Full Length Article

The effect of fiscal and monetary policies interaction on stock market performance: Evidence from Nigeria

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Abstract

This study examines the impact of the interactions between fiscal and monetary policies on stock market behaviour (ASI) and the impact of the volatility of these interactions on the Nigerian stock market. The study analysed monthly data using the ARDL and EGARCH models. The results show the interaction between monetary and fiscal policies influence on stock market returns in Nigeria. The ARDL results show evidence of long run relationship between ASI and Monetary-fiscal policies. The results from the volatility estimates show that the ASI volatility is largely sensitive to volatility in the interactions between the two policy instruments. The results suggest calibrating both the monetary and fiscal policies in a single model when formulating stock market policy as their interaction exerts significantly on stock market behaviour, thus both policies should be considered in tandem.

JEL classification: E52; E63

Keywords: Fiscal-monetary policy; Stock market; ARDL; EGARCH; Nigeria

1. Introduction

In recent years, the Nigerian economy has been and is expected to remain a source of great motivation for most emerging economies of the world. For about two decades now, the economy has witnessed tremendous growth with about 6.9% average growth rate. It has smoothly shifted from being an underdeveloped economy to a Global Growth Generator Country (3GC) (PWC, 2015). Nigeria is the largest economy in Africa; it is a lower middle income country with mixed economy. Its financial, service, information and communication technology as well as entertainment sectors are rapidly expanding every day. The economy ranked among the first twenty five largest economies (in term of GDP and PPP) in the world (IMF, 2016). The unusual growth experienced by Nigeria is largely associated with the impact of the capital market on the overall economy. For instance, the capital market capitalization grew to over 12 trillion naira in the year 2008 from less than 4 trillion in year 1996 (NSE, 2011). Being

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the largest economy in Africa, significant changes in her economies can impact on other African economies and of course other emerging economies in the world.

This paper attempt to investigate the impact of the interaction between monetary policy and fiscal policy and volatility of these policy instruments on stock market behaviour using data sourced from the Nigerian economy. Economics and finance literature shows that explaining comprehensively the behaviour of an economic system (stock market inclusive) as a whole or in partial form goes beyond explaining this behaviour from either monetary policy or fiscal policy stance alone, in that both their individual stance as well as their interaction play significant role in the economy. Bulk of the existing literature on stock market behaviour as induced by macroeconomic policy focuses on the impact of the monetary policy (see for instance Bjornland & Leitemo, 2009a, 2009b; Gali & Gertler, 2007; Conover, Jensen, Johnson & Mercer, 1999; Thorbecke, 1997; Patelis 1997; Jensen & Johnson 1995a, 1995b; Afonso and souse, 2011; Afonso and Sousa, 2012; Ajao et al 2015; Gertler and Gilchrist 1993; Fama and French, 1989) with very few on the impact of fiscal policy on the one hand (see for example Agnello and Sousa (2010); Darrat, (1988). Besides, we know of very few (Jansen, Li, Wang & Yang, 2008; Chatziantoniou, Dugft & Fillis, 2013) that examined the effect of the interaction of both policies on stock market.

Furthermore, existing literature that inquire into the interactive relationship between these policies as it affects the stock market mainly focus on advanced economies with very little or none on emerging economies especially the Nigerian economy. This study intends to contribute to literature by examining the impact of the interactions between the two policies as it affects stock market behaviour in an emerging economy with focus on African largest economy – Nigeria – for the study period 1985–2015. Chinazara (2011) observed that literature on the connection between stock market behaviour and the macroeconomic can be best be classified into two broad classes: first moments studies – that examined the connection at first strands using different techniques to establish a sound empirical connection between macroeconomic variables and stock market behaviour using data from different economies at different time with different estimation techniques such as VAR, multivariate cointegration, VEC among others; second moment studies- that extend the first moment studies by focusing on how risk/volatility of the macroeconomic aggregates affect stock market behaviour, based on the fact that the existence of a strong connection between the macroeconomic aggregates and stock market variables implies that any shock in the macroeconomic aggregates will serve as a source of unavoidable risk which will exert on any market portfolio regardless of their degree of diversification. It is generally believed that literature on second moment strands outweighs the first moment strands when policy formation and investment strategy decisions are in view (Chowdhury & Rahman 2004; Chowdhury, Mollik, & Akhter, 2006; Corradi, Distaso, & Mele, 2006, Diebold & Yilmaz, 2007; Atoi, 2014; Chinzara, 2011, Yu (2011)). This is premised on the fact that it is the volatility of macroeconomic variables that make stock market planning difficult. It is on that note that the second strand of this paper deals with the volatility of both the fiscal and monetary policies instruments as they affect stock market behaviour in Nigeria.

The question is what is the nature of the relationship between the two policy instruments and stock market returns in Nigeria? In other words, does the interaction between the two policies impacts on stock market behaviour in Nigeria? If yes, through what channel? Beyond knowing the nature of the relationship among the constructs, the study intends to examine the impact of the volatility of the interactions between fiscal and monetary policies on stock market behaviour in Nigeria as it is established that it is the volatility of macroeconomic variables that make stock market planning difficult. The study also intends to know if either of the policy alone is sufficient to influence the behaviour of stock market returns without the other. In an attempt to answer these questions, this study used the Autoregressive Distributed Lag (ARDL) to examine the nature of the relationship between the policies' instruments and stock market behaviour and the Exponential Generalised Conditional Heteroskedasity (EGARCH) models to examine the impact of the volatility of these policies' instruments on stock market based on monthly data sourced on Nigerian economy from 1985 to 2015.

Answering these questions is important to virtually all the various economic agents especially the market practitioners and the policy makers. Policy makers will find the results interesting as it will help offer polices that will take care of counterproductive effects on stock market where both monetary and fiscal policies go in opposite direction. It is important to know that when there is distortion in fiscal balance and monetary policy operation, investment in the real sector and by extension the stock market is discouraged. The market practitioners will find the study useful as changes in both policies can drive up interest rate which will have a negative effect on stock market returns. Thus understanding the nature of interaction between the two policy strands as they affect stock market will

help investors in making good portfolio choices that guarantee returns and protection from negative distortion in the interaction between the two policies.

Briefly foreshadowing our results, we observed that both fiscal and monetary policies influence the stock market performance in Nigeria via either direct or indirect channels, and that the volatility in both policies impact on stock market behaviour in Nigeria.

The rest of this paper is structured as follows: section two provides the literature review; section three deals with the data set and methodology used; section four presents the result and recommendation and finally; section five provides the conclusion.

2. Literature review

As noted by Mishkin (2001); Iacoviello (2005); Bernanke and Kuttner, (2005); Agnello and Souse, (2010), monetary policy can independently influence the stock market returns through five channels or hypotheses which are (i) the interest rate hypothesis (ii) the credit hypothesis (iii) the wealth effect hypothesis (iv) the exchange rate hypothesis and (v) the monetary hypothesis.

The theoretical framework through which the fiscal policy influences the behaviour of the stock market can be classified into three theoretical stances viz: (i) Keynesian positive effect hypothesis; (ii) the classical crowding out effect hypothesis and (iii) the Richardian neutrality hypothesis. As earlier noted, clinical analysis of the impact of macroeconomic policy framework with focus on the use of monetary and fiscal policies instruments in determining the behaviour of stock market in an economy can best be studied by examining the interaction between these two policies. Existing literature (see for instance Chatziantoniou et al., 2013; Darrat, 2008; Chowdhury, 1994) has identified the two main channels through which these policies interactions influence stock market returns, these channels are through: (i)The impact of government inter-temporal budget constraint on monetary policy; and (ii) The effect of fiscal policy on monetary variables.

The succeeding subsection will briefly examine each of these policies and the transmission mechanism through which they influence stock market behaviour.

2.1. Theoretical framework

2.1.1. Monetary policy and stock market returns

Building on the works of Fama and French (1989); Jensen and Johnson (1995a, 1995b); Bernanke and Gertler (1995); King and Watson (1996); Patelis (1997); and Conover et al. (1999), among others, Mishkin (2001) observed that a bi-directional relationship exist between stock market and monetary policy such that the stock market provides feedback to monetary authorities on issues relating to the private sectors expectation of the future changes in the key macroeconomics fundamentals on the one hand, while the behaviour of stock market is often influenced by shocks in the monetary policy instruments via a five distinguish channels on the other hand. Each of these channels through which monetary policy influences the behaviour of the stock market are briefly explained in this sub-section.

i. Interest rate channel: This channel is also known as the traditional Keynesian hypothesis of the transmission framework of interest rate. It explains that fluctuations in interest rates will impact on firms' corporate cost of capital, thus alter their present value of future net cash flows. This implies that higher interest rates will provoke a fall in the present values of future net cash flows, thereby transmitting into lower stocks prices.
ii. Credit channel: This represents an indirect monetary policy transmission on interest rate adjustment. This approach identified interest rate alteration as the means through which the monetary authority can influence the level of investment and by extension stock market prices in an economy. Under this hypothesis, fluctuation in the level of corporate investment will alter the market value of firms which in turn is influenced by the present values of it future cash flows. In specific, the credit channel explains that higher corporate investment activity is expected to induce higher future cash flows, thereby increasing the firm's market values.
iii. The wealth effect provides another transmission mechanism on how monetary policy affects stock market performance, the core of this approach centres on the ability of interest rate to determine the value of stock prices such that an increase in interest rates will lead to a fall in stock prices.

iv. Another link is found in the exchange rate channel which observed that the impact of monetary policy on stock market is to the impact of interest rate on the exchange rate system. It explains that higher interest rate will provoke an appreciation of the domestic exchange rate; this will lead to higher importation accomplished by lower exports. This scenario will negatively affect the economy export industry which could in turn lead to a fall in her production base and by extension lower asset prices.
v. Finally, the Tobin's Q Theory of investment which observed that higher interest rates will lead to lower stock valuation thereby shifting fund from the stock market to the bond market (assume only these two asset exist in the market) thereby forcing stock price to fall.

2.1.2. Theoretical note on fiscal policy and the stock market behaviour

The theoretical link that connects stock market with the fiscal policy has its foundation in the work of Tobi (1969), Blanchard (1981), Shah (1984) and Darrat (1988). As earlier mentioned, this theoretical framework can be sub-divided into three (3) viz: the Keynesian positive effect hypothesis; the Classical crowding out effect hypothesis; and the Richardian Neutrality hypothesis. Each of these hypotheses will be briefly discussed in this sub section.

1. The Keynesian Positive Effect Hypothesis: The Keynesian hypothesis centres on the use of automatic stabiliser and discretionary measures by fiscal authority in such ways that support aggregate demand, boosts the economy and of course increase stock prices. The hypothesis believed that the effect of fiscal policy instrument on stock market is positive as fiscal policy makers can use budget deficit, tax and other discretionary measure to alter the interest rate thereby improving stock market performance.
2. The Classical Crowding out Effect Hypothesis: This Hypothesis centres on the negative impact of fiscal policy instruments on the real sector and by extension the stock market. It explains that fiscal instruments have the potential to crowd out loanable fund in the market and deter private sector activity, thereby having negative impact on stock market prices.
3. Richardian Neutrality Hypothesis: This Hypothesis takes a mid-point view as it explains that fiscal policy lacks the ability to individually effectively influence the behaviour of both the real and financial sectors, and by extension the stock market in an economy without adequate input from the monetary policy instruments. It explains that fiscal policy ability to influence aggregate demand is deterred by the existence of a disequilibrium position between public borrowing and private saving of rational households.

2.1.3. Fiscal–monetary policies' interaction

The theoretical note on the interaction between fiscal and monetary policies as it affects output, inflation, interest rate and by extension the stock market can be classified into two strands. The first being co-movement effect which centres on the complementary or substitutionability of both policies on each other. The second strand is the conflicting or competing effect which focuses on movement of both policies into opposite direction. This hypothesis focuses on the strategic elements of the interaction between the two policies based on competing situation or game theory framework.

Moving towards any of the direction has a policy implication on the economy as a whole, and the stock market in particular. As noted by Melitz (1997) when both policies move in opposite direction, then one will observe that tightening (easing) of one instrument will imply less tightening (easing) of the other. Similarly, Wyplosz (1999) observed that when both policies move in the same direction such that when we keep inflation in check while we conduct countercyclical policies, the outcome will be that either of the policies will take the lead, while the other complements by following.

As noted by Muscatelli and Tirreli (2005), Sargent and Wallance (1981), Sargent (1999), Buti, Roeger, and Veld (2001), Zoli (2005), Fatas and Mihov, (2001), Dedi and Yavas, (2016), Souse, (2010), Yakubu, Bello, and Shehu (2010), Kyophilavong, Shahbaz, and Uddin (2013), Cem (2012), Chatziantoniou, Dugft and Fillis (2013) the two policies interact through (i) the impact of the government inter-temporal budget constraint on monetary policy which recommends that government should finance her expenditure through tax, debt or seignorage. The danger here is that, when faced with unsustainable fiscal policy, and a complementary relationship exist between fiscal policy and monetary policy, then monetary policy instrument will become weaker when fiscal system become insolvent, thus leading to higher future inflationary pressure on the economy; and (ii) the effect of fiscal policy on monetary variables like inflation, interest rate and exchange rate. For instance, as noted by Chatziantoniou et al. (2013) this

effect can be seen from the perspective where the country debt profile is principally dominated in foreign currency, depreciation of the exchange rate will increase the country's debt burden. Furthermore, exchange rate depreciation will provoke inflation pressure forcing the interest rate to increase with negative impact on the stock prices.

2.2. Empirical literature

Kuralbayewa (2013) used data sourced from some selected developing economies of Latin America and the G-7 developed economics using Dynamic Stochastic General Equilibrium (DSGE) model to examine the choice of optimal fiscal policy on economic growth and stock market development for these economies with focus on the impact of government expenditure and the combination of both public consumption and public investment on stock market development. The study introduced the concept of inelastic to the study of fiscal policy- stock market behaviour such that when the supply of foreign capital is elastic, as in the case of developed economics the stock market returns is enhanced by borrowing from abroad and both the public expenditure and taxes are adjusted to meet this development. On the other hand, in an emerging economy characterized with inelastic supply of foreign capital, the optimal fiscal policy is to adjust the public expenditure regime upward so as to attract fund to the stock market thus altering its return system.

Chatziantoniou et al. (2013) studied the interaction between monetary policy and fiscal policy as it affect the stock market behaviour for the developed economies of Germany, UK and US using quarterly data sourced from 1991 (1) to 2010(4). The result from the structural VAR shows that the interaction between the policies influences the stock market for the economies under view either through direct or indirect channels. From their study, evidence abound that the individual stance of the two policies as well as their interaction have a direct effect on the UK stock market behaviour. For Germany, the result shows that money supply has a positive impact on the stock market, and this impact is not filtered through the interest rate channel. The result from Germany also shows no evidence of a direct effect exist from fiscal policy strand on stock market movement, and that innovation in the Germanys' stock market (DAX30) is induced by the interaction between fiscal policy and interest rate – a monetary policy instrument. For the US economy, the result shows that the impact of money supply on stock market is through the interest rates channel; and that no direct significant relationship exist between the fiscal policy instruments and the stock market (Dow Jones), however, the stock market reacts to the level of interaction between fiscal expenditure and monetary policy variables. The authors emphasised the importance of incorporating both policies in a single model when building a stock market behaviour framework.

Cevik, Di booglu, and Kutan (2014) used a Markov – regime –switching model to examine the interactions between monetary policy represented by the Taylor 1993s monetary policy rule and fiscal policy represented by David and Leepers 2007' hypothesis as well as the effect of these interactions on economic growth and by extension the stock market. The study used data sourced on quarterly bases from 1995(1) to 2010(4) from some selected emerging European economies of Czech Republic, Estonia, Hungary, Poland, Slovenia and Slovak Republic in the post transition period. Their results show that the interactions between the policies in the economies studied was characterized by movement between passive and active regimes up to year 2000 when it becomes passive in all the countries studied as a result of European Union enlargement. The study concluded that when the two policies interacts, for most economies fiscal policy becomes more active, while monetary policy becomes more passive especially for Estonia, Hungry, Poland and Slovenia. This implies that stock market like other sub-sector of the economy responds more to the manipulation of the fiscal policy instruments than the monetary policy instrument in such economies.

Yuan and Chen (2015) examined the impact of policy transmission as induced by the interaction between fiscal policy, monetary policy, exchange rates and external balances as they affect economic growth and inflation for the economies of Brazil, Russia, India, China and South Africa (BRICS). The results from a panel VAR estimates shows that monetary policy shocks significantly impact on real economic activity though the effect from fiscal policy shocks is relatively weak especially from a cross – country point of view. The impact of policy interaction between fiscal and monetary policies on stock market behaviour is seen from the positive interaction between inflation and interest rates channel. Their finding is in line with that of Di Giorgio and Nistico (2008) for the Italian economy.

For Turkey, Cem (2012) examined the interaction between the fiscal and monetary policy using a small scale New Keynesian open economy DSGE model as defined by a Bayesian estimation technique for the period 2002Q1 – to

2009Q3. His results identified inflation rate as the key variable that connects both policy (see also Fragetta and Kirsanora 2010); Akta, Kaya, and Ozlale (2010); Sanchez (2012)).

Matthieu, Flaschel, Hartman, and Proano (2011) identified the importance of using a combination of both monetary and fiscal policies instruments in averting financial market collapse and counteract the global recession. The authors recognized the place of policy intervention that ended the Great Depression and prevented the second global depression that succeeded the global financial market meltdown of the 2007–2008. The authors used an integrated macro model that adopts the use of Tobin –like macroeconomic portfolio approach to emphasize the place of policy combination in advancing stock market performance in particular and economic growth as a whole. Their finding support earlier studies like Asada et al. (2010) who identified the role of interest rate in transmitting the effect of the interactions between fiscal and monetary policies on stock market (see also Louis and Eldomiaty, (2010)).

Similarly, existing literature on the relationship between the volatility of macroeconomic aggregates and stock market behaviour majorly focused on advanced economies with little or none on emerging economies, Nigeria inclusive. This paper intends to fill this gap by inquiring into the connection between the volatility of both the fiscal and monetary policies instruments as they affects stock market prices using data on the Nigerian Economy.

The finding of the existing literature on the connection between fiscal-monetary policy instruments volatility and stock market volatility is at best mixed. For instance Chowdhury et al. (2006) used GARCH and VAR models to document the existence of a weak relationship between the dual for Bangladesh and that stock market volatility exerts on inflation rate volatility. For the Finnish economy, Teresiene et al. (2008) used Univariate GARCH and VAR models to establish the existence of a bi –directional relationship between the two constructs.

For South Africa, Chinzara (2011) used AR-GARCH and VAR models to show that macroeconomic uncertainty significantly influences stock market volatility with volatility in short term interest rate and exchange rates playing the most important role. Yu (2011) used EGARCH to show that volatilities in the real GDP, the ratio of money supply to GDP, interest rates, nominal effective exchange rate, inflation rate and USA government bond yield significantly exert on stock market behaviour for the South Africa.

Moore and Wang (2014) examined the sources of the dynamic relationship between real exchange rate, trade balances, interest rate differentials and stock return differentials using comparative analysis for the economics of some selected Asian emerging economies and the US. Using the Dynamic Conditional Correlation (DCC), the study observed that trade balance is the source of the volatility for the Asian economies while volatility for the US economy is interest rate differential induced.

For India, Alin, Ihrlatov, and Tiwari (2014) used Cross-Wavelet Power, the Cross-Wavelet Coherency and the Phase Difference methodologies to show that stock market lagged behind macroeconomic variables and co-movement exist between stock market and macroeconomic aggregate (see also Aloui and Hkiri (2014); Inci and Lee (2014)).

From the foregoing, it can be observed that existing literature on stock market volatility in Nigeria are majorly on inherent factors in the stock market that induced volatility with little or no relationship with the macroeconomic variables. For instance Atoi (2011), Onakoya (2013) Emenike (2010) all focused on the stock return volatility of the Nigerian stock exchange returns without inquiring into it effects as induced by either or both fiscal and monetary policies instrument. This creates a gap on the link between the stock market and macroeconomic fluctuations. This study tends to fill this gap.

3. Data and methodology

We used monthly data sourced from the Central Bank of Nigeria Statistical Bulletin (various issues) from January, 1985 to December, 2015 on the Nigerian economy. Following Chatziantoniou et al. (2013), the variables under consideration are Consumer Price Index (CPI), Real Gross Domestic Product (RGDP), Government Expenditure (GE) (as proxy for fiscal policy stance); Money supply as a percentage of the GDP (M2), interest rate (INT), exchange rate (EXC) (as proxy for monetary policy stance); and All share index (ASI). We followed Alege, (2008) and Ajao, (2015) to use Gandalfo Algorithms to disaggregate annual data set on RGDP and GE that are not available in monthly form to monthly form. Some of the variables (ASI, M2, RGDP and GE) were expressed in real and seasonally adjusted form.

The model is as specified below

$$SM = f(MP,\ FP) \tag{1}$$

Where SM equal to stock market behaviour proxy by All Share Index (ASI); MP represents monetary policy instruments which are proxy by money supply (M2), interest rate (INT), exchange rate (EXC); FP represents fiscal policy instruments which are proxy by Real Gross Domestic Product (RGDP) government expenditure (GE); consumer price index (CPI).

We expand equation (l) such that we can express ASI as a function of all the variables as follows

$$InASI = \beta_0 + \beta_1 InM2 + \beta 2\ INT + \beta_3 EXC + \beta_4 InRGDP + \beta_5 InGE + \beta_6 CPI + \varepsilon_t \tag{2}$$

Where β_0 is the drift component, the term, $\beta_1 \ldots . \beta_6$ are the coefficients of the model, the variables are as explained earlier and μ_t represents the error term. In order to capture the effects of semi-elasticity (short run) and elasticity (long run) as well as reducing heteroscedasticity while focusing on the growth rate of the variables, the study adopts a double-log functional specification of the ARDL

3.1. Methodology

As earlier stated, the core objectives of this study deals with examining the short and long run equilibrium relationship between stock market behaviour proxy by All Share Index (ASI) and the interaction of both monetary and fiscal policies and investigating the impacts of the volatility of the monetary and fiscal policies on stock market behaviour (second moment strands) in Nigeria. In other to achieve these objectives we used two estimation techniques: Autoregressive Distribution Lag (ARDL) for achieving the first objective: and the Exponential Generalized Autoregressive Conditional Heteroskedascity (EGARCH) to achieve the second objective.

3.1.1. Unit root test

Theoretically, in order to avoid spurious regression, it is expected that time series data should be stationary for results validity to hold. In conducting a unit root test, traditional unit root tests techniques like Augmented Dickey-Fuller test (ADF) and the PP have been extensively used. However, recent evidences have shown that ADF and PP unit root tests results could be biased in the case of the null hypothesis being rejected, as a result of one time permanent change in data (Murthy & Okunade, 2016; Lawal, Nwanji, Asaleye & Ahmed, 2016a; Bai & Perron, 2003; Pesaran, Shin & Smith, 2001; Pesaran & Shin, 1998). In order to accommodate structural break endogenously into the models, rather than an exogenous element, Zivot and Andrews, 1992; 2002 proposed the ZA unit root test to capture one structural break in the series. In this paper, for a robustness check, we employed the ZA unit root test to test for stationarity of the data while accommodating single structural break in the series.

3.1.2. The autoregressive distribution lag (ARDL) bound testing approach

Several estimation techniques such as Engle and Granger (1987), Johansen and Juselius (1990) and Gregory and Hansen (1996) among others have been used in economics and finance literature to estimate the co-integration between macroeconomic variables and the ASI. A core requirement for these techniques is that all variables (regressors) in the equation should be stationary and should have equal order of integration which is not always the case with time series data. In order to overcome this challenge, Pesaran et al. (2001) developed a model that introduced a surrogate co-integration technique called the autoregressive distribution lag (ARDL) bound approach. The ARDL is applicable irrespective of whether the underlying regressor are purely 1 (0), purely 1(1) or mutually co – integrated. This informed our choice of using the ARDL estimation techniques. Other advantages that the ARDL has over other estimation techniques includes: it allows the variables to have different optimal lags which is practically impossible with other conventional co-integration techniques; it is more appropriate when faced with small sample size unlike other estimation techniques that requires large data set for validity (see also Ozturk & Acaravci (2010), (2011); Bekhet & Matar (2013); Marashdeh (2005); Odhiambo (2010); Odhiambo (2009), Babajide et al. (2016b); Babajide & Lawal (2016)). The ARDL framework is as follows:

$$\Delta \mathrm{InASI}_t = \beta_{01} + \sum_{i=1}^{n1} \beta_{11} \Delta \mathrm{In}ASI_{t-i} + \sum_{i=0}^{n2} \beta_{12} \Delta InM2_{t-i} + \sum_{i=0}^{n3} \beta_{13} \Delta \mathrm{INT}_{t-i} + \sum_{i=0}^{n4} \beta_{14} \Delta \mathrm{EXC}_{t-i}$$

$$+\sum_{i=0}^{n5}\beta_{15}\Delta InRGDP_{t-i}+\sum_{i=0}^{n6}\beta_{16}\Delta InGE_{t-i}+\sum_{i=0}^{n7}\beta_{17}\Delta CPI_{t-i}+\phi_{11}\mathrm{InASI}_{t-1}+\phi_{12}InM2_{t-1}$$
$$+\phi_{13}InINT_{t-1}+\phi_{14}InEXC_{t-1}+\phi_{15}InRGDP_{t-1}+\phi_{16}InGE_{t-1}+\phi_{17}InCPI_{t-1}+\varepsilon_{t1} \quad (3)$$

where *In* is the log of the variables, CPI, ASI, RGDP, EXC, INT, GE and M2 are as earlier defined. Δ represents the first difference operator. β_{01} is the constant term; β_{11} ….$\beta 1_7$ represents the short run coefficients, ϕ_{11} ….ϕ_{17} are the long run coefficients, n_1 ….n_7 are the lag length and ε_{t-1} represents the white noise error terms. The null hypothesis in the equation is H_0:$??_{11} = ??_{12} = ??_{13} = ??_{14} = ??_{15} = ??_{16} = ??_{17} = 0$. This implies nonexistence of long run relationship while the alternative hypothesis is H_1:$??_{11} \neq ??_{12} \neq ??_{13} \neq ??_{14} \neq ??_{15} \neq ??_{16} \neq ??_{17} \neq 0$. As noted by Pesaran et al. (2001), the decision to reject or accept the null hypothesis H_0 (no co-integration among the variables) is as follows:

If (F-statistics) F_s ˃ upper bound, we reject the H_0 and conclude that the variables are co-integrated;
If F_s ˂ lower bound, we accept the H_0 and conclude that the variables are not co-integrated;
But if $F_s \geq$ lower bound and $\leq$ upper bound, the decision is inconclusive.

In examining the existence of a long run relationship among the variables, we selected the ARDL model through the R^2 criterion, Hannan Quinn Criterion, Akaike Information Criterion (AIC) and Schwarz Criterion (SBC).

The Error Correction Model (ECM) representation of the ARDL approach is as follows:

$$\Delta\mathrm{InASI}_t=\beta_{01}+\sum_{i=1}^{n1}\beta_{11}\Delta\mathrm{In}ASI_{t-i}+\sum_{i=0}^{n2}\beta_{12}\Delta In\mathrm{M2}_{t-i}+\sum_{i=0}^{n3}\beta_{13}\Delta\mathrm{INT}_{t-i}+\sum_{i=0}^{n4}\beta_{14}\Delta\mathrm{EXC}_{t-i}$$
$$+\sum_{i=0}^{n5}\beta_{15}\Delta InRGDP_{t-i}+\sum_{i=0}^{n6}\beta_{16}\Delta InGE_{t-i}+\sum_{i=0}^{n7}\beta_{17}\Delta CPI_{t-i}+\alpha ECM_{t-1} \quad (4)$$

The essence of the Error Correction Model is to show the speed of adjustment back to long run equilibrium after a short run shock. In order to ensure the goodness of fit of the model, we conduct a number of diagnostic tests. Specifically, these tests examined the serial correlation, functional form, normality and heteroscedasticity associated with the selected model. As noted by Lawal et al. (2016a), Lawal, Babalola, Otekunrin, and Adeoti (2016b), Pesaran and Pesaran (2009), stability test (CUSUMQ and CUSUM) are useful in checking the stability of the coefficients of the regression. The tests are updated recursively and plotted against the break points. If the plot lies within the critical bounds of 5% level of significance, then the null hypothesis of all coefficients in the given regression is stable and cannot be rejected.

3.1.3. Exponential generalized autoregressive conditional heteroskedascity (EGARCH)

In order to examine the impact of the volatility of the interactions of both the fiscal and monetary policies instruments on the stock market, this study followed Lawal, Oloye, Otekunrin, and Ajayi (2013), Lawal, Awonusi, and Oloye (2015) and Babajide et al. (2016a) to use EGARCH estimation techniques developed by Nelson (1991) to analyse our data. The choice of EGARCH over other GARCH models was induced as a result of the fact that EGARCH does not require non-negative constraints, allows for leverage effect, allows for more natural interpretation of the size and persistence of shock because it is a unit-free measure; and the conditional variance equation is a log-linear form, this implies that regardless of the magnitude of *In(ht)*, the implied value of *ht* can never be negative, thus it is permissible for the coefficient to be negative Enders (2010).

The EGARCH model is specified as follows:

$$\mathrm{Log}\ h^2{}_t=\alpha_0+{}^q\textstyle\sum_t={}_1\alpha_l\left(u_{t-1}/h_{t-1}\right)+{}^q\textstyle\sum_l={}_1\alpha_l\left(|u_{t-l}/h_{t-l}|-\ddot{E}\right)+{}^q\textstyle\sum_l={}_1\varphi_l\ \log\ h^2{}_{t-l} \quad (5)$$

where $\mu = \mathrm{E}\ (|u_t/h_t|)$

Following Lawal et al. (2015) we modified the EGARCH model to effectively capture the impact of the policies' instruments as provided for in our theoretical framework such that:

$$logh_t=w+\beta logh_{t-1}+\gamma\frac{\epsilon_{t-1}}{h_{t-1}^{1/2}}+\alpha\left[\frac{|\epsilon_{t-1}|}{h_{t-1}^{1/2}}-\sqrt{\frac{2}{\pi}}\right] \quad (6)$$

Where h_t connotes the conditional variance for year *t*; $h_t^{1/2}$ represents the conditional volatility prediction for year *t;*

$\frac{\epsilon_t}{h_t^{1/2}}$ is the standardized shock for year t. It represents the number of standard deviation that ϵ_t has deviated from its mean and ϵ_t represents the error term of a prediction model of a time series.

As noted by Narayan, Liu and Westerlund, (2016) and Andreou and Ghysels (2002), time series data suffers from heteroskedasticity and structural breaks, hence there is the need to accommodate both the heteroskedasticity and structural breaks simultaneously when modelling time series data. It has been observed that if the problem of heteroskedasticity is not properly solved, the results on mean reversion can be potentially bias (Salisu, Ndako, Oloko & Akanni, 2016; Engle, 1982; Bollerslev, 1986).

In order to accommodate both heteroskedasticity and structural breaks into our volatility model, we followed Narayan et al., (2016) and Prateek and Vipul, (2016) to capture two endogenous structural break based on a GARCH (1, 1) procedure by adjusting the Nelson, (1991) EGARCH model such that:

Because we do not have a pre-knowledge of the break time, we adopted the sequential procedure using maximum absolute t-value of the break dummy coefficients D_1, i.e., $\hat{T}_{B1}$

$$\hat{T}_{B1} = \underset{\check{T}_{B1}}{argmax} \left| t_{\check{D}1}(T_{B1}) \right| \tag{7}$$

By imposing the first break estimates $\hat{T}_{B1}$, the second break date is estimated using

$$T_{B2} = \underset{\check{T}_{B2}}{argmax} \left| t_{\check{D}2}(T_{B1}, T_{B2}) \right| \tag{8}$$

4. Empirical findings and discussions

The descriptive statistics of the data used in this paper are presented in Table 1 above, the results from the Jarque-Bera, Skewness and Kurtosis test show the normality of the data analysed. The results from standard deviation with lower results also indicate that the data series is consistence over time.

Before we conduct the bounds tests for co-integration, the study applied the ZA unit root test with structural break to ensure that the variables used are not integrated at I(2), because F-test would be spurious if the variables are stationary at second difference, as the critical bounds are based on the assumption that the variables are I(0) or I(1) or both. The results from the ZA unit root tests are presented in Table 2. From the results, it can be deduced that single break points are identified in the series. The results show that the series: *In*ASI, *In*RGDP, *In*M2, EXC, INT, CPI and *In*GE are stationary at first difference with time breaks in 2002, 1997, 2004, 1999, 1995, 2000, 1991 respectively. All of these break dates are significant for Nigeria. For instance, Nigeria introduced a major reform into the public sector funding in the year 1991.

The Nigerian Capital Market fully adopted the Central Security Clearing System (CSCS) accounting framework in the year 2002, the Banking sector consolidation exercise which attracts large volume of money into the capital market was introduced in 2004, the dual exchange rate regime was abolished in 1999, and the privatization of the

Table 1
Descriptive statistics table. Source: Author's Computation (2017)

Variables	*In*ASI	*In*RGDP	*In*M2	EXC	INT	CPI	*In*GE
Mean	6.756	5.080	4.477	4.289	3.611	2.956	3.998
Median	6.642	5.031	4.332	4.198	3.647	3.064	4.018
Maximum	7.762	5.433	6.255	4.787	4.033	3.977	4.477
Minimum	6.143	4.786	3.118	3.986	3.451	2.065	3.225
Std. Dev.	0.443	0.165	0.898	0.308	0.289	0.812	0.478
Skewness	0.752	0.966	0.457	0.612	-0.142	0.119	-0.310
Kurtosis	2.581	2.707	2.343	2.055	1.542	1.278	1.671
Jarque-Bera	4.372	6.800	2.268	4.299	4.514	5.418	4.010
Probability	.0112	0.033	0.322	0.117	0.102	0.068	0.139
Sum	301.99	228.413	195.488	185.422	154.854	127.688	172.769
Sum sq. dev.	8.325	2.127	33.965	3.943	3.476	28.566	5.968

Table 2
ZA unit root test with structural break. Source: Author's Computation (2017).

Variables	Level			First difference		
	t- statistics	Time break	Decision	t-statistics	Time break	Decision
*In*ASI	-2.645(1)	2003:02	Unit root	-5.424*(0)	2002:03	Stationary
*In*RGDP	-2.702(1)	2004:05	Unit root	-5.219**(0)	2000:04	Stationary
*In*M2	-3.604(2)	1996:10	Unit root	-5.621*(0)	2004:10	Stationary
EXC	-3.120(0)	1999:07	Unit root	-5.144**(1)	1999:07	Stationary
INT	-4.644**(0)	2008:04	Stationary	-8.298**(0)	1995:11	Stationary
CPI	-11.311*(0)	2010:05	Stationary	-7.235*(0)	2000:02	Stationary
*In*GE	-5.7028*(2)	2011:09	Stationary	-7.401*(1)	1991:11	Stationary

Note: *, ** represent 1%, 5% level of significant respectively, Lag order is shown in parenthesis based on AIC. The critical values for Zivot and Andrews test are -5.57, -5.08 and -4.82 at 1%, 5% and 10% levels of significance respectively. * denotes statistical significance at 5% level. ** denotes statistical significance at 10% level.

Table 3
F- statistic for testing the evidence of long run relationship among variable. Source: Author's Computation (2017)

Models	Coefficients	Decision
F_{ASI} (*In*ASI/*In*M2, INT, EXC, CPI, *In*RGDP, *In*GE)	5.4892*	co- integration
F_{M2} (*In*M2 / *In*ASI, INT, EXC, CPI, *In*RGDP, *In*GE)	5.6850*	co-intergration
F_{INT} (INT/ *In*ASI, EXC, *In*M2, CPI, *In*RGDP, *In*GE)	10.926**	co- intergration
F_{EXC} (EXC/ *In*ASI, *In*M2, INT, CPI, *In*RGDP, *In*GE)	3.0200	No co-integration
F_{CPI} (CPI/ *In*ASI, *In*M2, INT, EXC, CPI, *InRGDP*, *InGE*)	2.7745	No co-integration
F_{InRGDP} (*In*RGDP/ *In*ASI, *In*M2, INT, EXC, CPI, *In*GE)	3.0023	No co-integration
F_{InGE} (*In*GE/ *In*ASI, *In*M2, INT, EXC, CPI, *In*RGDP)	5.7685*	co-intergration

Note: *, ** represent 1%, 5% level of significant respectively.

government enterprises with significant changes on the economic growth rate took place in the year 2000. The identified time break connotes that the economy had witnessed significant policy shocks at a particular point of time which results into permanent shift in the series. The results also show that the coefficients of the t-statistics are significant at 1% level of significant except for EXC, INT and *In*RGDP with 5% level of significant. The values in the parentheses against each t-statistics show the lag order based on AIC. As earlier stated the ZA unit root test presents an unbiased result and establishes the readiness of the stationary time series for cointegration analysis.

Table 3 above show the results of the ARDL bound tests. From the results, it can be deduced that when ASI is the dependent variable, a compelling long run relationship is established among the variables. Following the recommendation of Alkhathlan (2013), Lawal et al., (2016a); Dhaoui and Bacha, (2017); Murthy and Okunade, (2016); Babajide and Lawal, (2016); Babajide, Lawal, and Somoye (2016), that Eq. (2) should be re-estimated such that each of the variables is used as the dependent variable so as to avoid the problem of endogeneity. The results show that when we conducted the bound tests specifying M2, *In*GE and INT as the dependent variables, we reject the null hypothesis of no cointegration at 1%, 1% and 5% respectively. However, when we modelled EXC, CPI and *In*RDGP as the dependent variable, we fail to reject the null hypothesis of no cointegration. In conclusion, the results present statistical evidence to show that there is a long run relationship among *In*ASI, *In*M2, EXC, CPI, *In*RGDP and *In*GE. The results are in line with the financial accelerator theory propounded by Bernanke and Gertler, (1999) and Bernanke, Gertler, and Gilchrist (1999). Given that there is an established existence of a cointegration among the

Table 4
Estimated long run and short run coefficients using ARDL model (2, 0, 5, 1) selected based on SBC depending variable: In ASI. Source: Authors' computation (2017)

Long run Coefficients			**Short run Coefficients**		
Regressors	**Coefficients**	**T. Ration**	**Regressors**	**Coefficients**	**T. Ration**
α_0	- 0.3684	- 1.0735	α_0	-0.0944	0.1079
L RGDP	0.3979	3.0922*	ΔL RGDP	0.1020	2.7988*
L CPI	1.4353	6.1912*	ΔL CPI	O.3679	4.4233
L GE	0.7502	3.5918**	ΔL GE	0.1923	3.0198
L M2	1.4782	1.8959**	ΔL M2	- 0.4315	-1.7198*
L INT	2.5054	- 2.4879***	ΔL INT	0.2066	0.66953**
L EXC	- 0.2213	-0.4797	ΔL EXC	-0.567	-0.4971*
			CONSTANT	-2.238	-5.466*
Diagnostic tests			ECM t-1	-03728	-4.5325**
Adjusted R^2	0.89				
JB normality test	1.652 (0438)				
Breusch-Godfrey serial correlation F-Test	0.589 (0.578)				
Breusch-Pagan-Godfrey heteroscedasticity F-test	0.842 (0.609)				
Wald test on the coefficient of ASI = 1	25.407 (X^2, $DF = 1$)				

*,**,*** represent 1%; 5%; 10% respectively

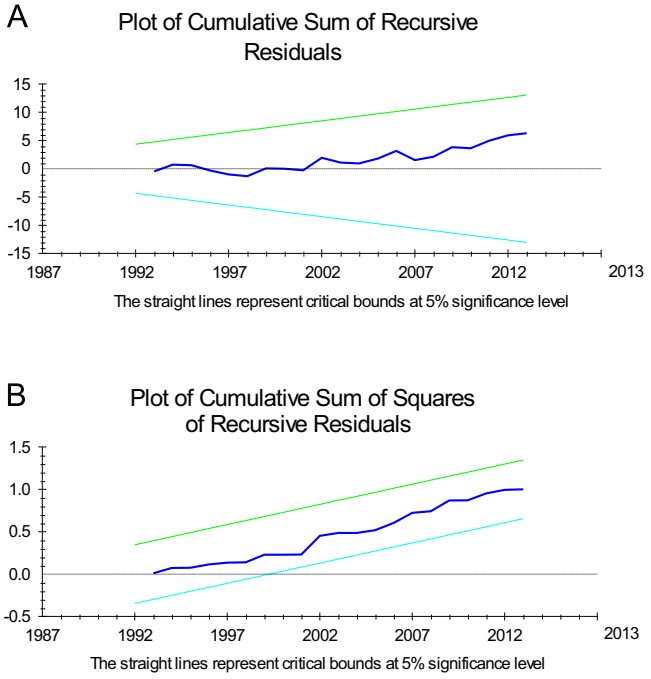

Fig. 1.

variables, we proceed by estimating the long run and short run ARDL model for the study using Schwartz Bayesian Criteria (SBC).

The results of both the long run and short run co-integration relationship among the variables in the model are reported in Table 4 above. The Akaike Information Criteria (AIC) was used, and the unrestricted constant was specified as the deterministic term, given that the restricted trend term included in the model initially was not

significant. The result as shown in the table indicates that the RGDP, GE, M2 and INT are positive and significant at least 10% level. The Wald test result as indicated by the coefficient of the ASI shows that income elasticity of the ASI is statistically different from unity, this implies that over the years, the impact of macroeconomic variables on stock market have been significant. This is in line with the findings of Osamwonyi and Evbayiro-Osagie (2012) and the theoretical note of the monetary policy channels hypothesis by Mishkin (2001) and that of the Keynesian positive effect hypothesis (Tobin, 1969; Blanchard, 1981; Chatziantoniou et al., 2013). Chatziantoniou et al., (2013) focused on the interaction between the two policies for advanced economies. The present study focused on an emerging economy, besides, it extends literature by focusing on the volatility of the two policies instruments.

The diagnostic test results of the ARDL (2, 0, 5, 1) as presented in the table shows that the adjusted R^2 is at 89% indicating that both fiscal and monetary policies' instruments jointly explain a significant part of the variations in the ASI. The JB test for normalities indicates that the residuals are not normally distributed. The results of the Breusch-Godfrey serial correlation F-test fail to reject the null hypothesis of no serial correlation, and the result of the Breusch-Pagan-Godfrey heteroscedasticity F- test does not reject the null hypothesis of no heteroscedasticity of the residuals.

The results of the ARDL short run error correction model as presented in Table 4 shows that the intercept (constant) term and the coefficients of the ΔASI(-1), ΔRGDP, ΔINT and ΔGE are positive and significant. The short run interest rate elasticity is less than one; this implies that in the very short run, interest rate policy play significant role in influencing the behaviour of the ASI. The existence of a positive relationship between the ASI and the GE both at the long and short run implies that increase in government expenditure (fiscal deficit) will create more income in the capital market. This is in line with the Keynesian positive effect hypothesis that emphasized the possibilities of using fiscal policy instruments like budget deficit and other discretionary measures to alter interest rate thereby improving the stock market performance. Our findings is in line with that of Ardagna (2009), Van Aarle, Garretsen, and Gobbin (2003) and Laopodis, (2010), who have documented positive impact of fiscal policy instrument on stock market. The result also shows that a negative relationship exist between money supply and ASI. The implication is that shocks in money supply will negatively affect interest rates which will in turn impact negatively on stock market. Theoretically, an indirect relationship exists between money supply and interest rate Chatziantoniou et al., (2013).

The ECM_{t-1} indicates a negative sign as expected by theory and is significant. This implies the speed of adjustment of about 37.3% back from the short term disequilibrium to the long-term equilibrium.

Following Bahmani-Oskooee and, Ng (2002), Lawal et al., (2016b) and Lawal, Babajide, and Somoye (2016c); the study employed the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares (CUSUMQ) to test the stability of each of the ARDL models, the findings are shown in Fig. 1a and b, if the plots lie within the 5% level of significance, then the coefficients of the Error Correction Models (ECM) are stable and the null hypothesis cannot be rejected, if otherwise, we reject the null hypothesis of the constancy of the coefficients. From the figures, it can be deduced that both the plots of CUSUM and CUSUMQ statistics stay within the critical boundaries, thus we conclude that we cannot reject the null hypothesis. In other words, our models are stable.

Interpretation of results of the volatility estimates:

For the All Share Index (ASI), from Table 5 it can be seen that the coefficients of α is positive and significant, this indicates that volatility of the stock price returns is sensitive to large shocks in the macroeconomic variables and that large innovations of both positive and negative signs of the macroeconomic variables will provoke a rise in volatility of stock returns. This is further supported by the signs and the insignificant level of the γ, this can be traced to the Arbitrage pricing theory and the Complementary and Strategic Substitutability theory of monetary-fiscal policies' instruments nexus as they exert on stock market behaviour. It also stressed the impact of macroeconomic variables in determining stock market behaviour in Nigeria.

The result on the volatility of the fiscal –monetary policies' nexus as it affects the All Share Index through the *In*RGDP shows that the α is positive and significant, while the γ is negative and significant at 1% level of significance. This implies that both the asymmetric impact of innovation as well as the absolute size of the innovation are significant in examining the impact of *In*RGDP volatility as it exert on stock market return. The results also show that the short run persistent test is stable while the long run persistence test like that of the ASI is not stable. Theoretically, this suggests that stock market volatility in Nigeria is largely mean reverting.

The results also show that α of the EXC and *In*GE are positive and significant while their γ are negative but significant. For CPI, the results show that the α is positive and significant, while the γ, though negative is not

Table 5
Results of the volatility of the fiscal-monetary policies' variables instruments as it exerts on ASI. Source: Author's computation (2017)

	*In*RGDP	Prob.	*In*M2	Prob.	*In*INT	Prob.	*In*EXC	Prob.	*In*ASI	Prob.	*In*CPI	Prob.	*In*GE	Prob.
ω	-0.151040	0.3550	-0.120210	0.4591	-0.168256	0.2815	-0.131498	0.4213	0.366933	0.0132	-0.127227	0.4318	-0.133401	0.4085
α	0.708057	0.0000	0.734938	0.0000	0.742013	0.0000	0.179124	0.0000	0.65892	0.0000	0.717481	0.0000	0.713105	0.0000
γ	-0.162828	0.0179	-0.153537	0.0335	0.159310	0.0187	-0.150567	0.0323	-0.035261	0.6121	-0.150429	0.0315	-0.146560	0.0354
β	0.881057	0.0000	0.867377	0.0000	0.879450	0.0000	0.874207	0.0000	0.738340	0.0000	0. 872965	0.0000	0.875834	0.0000
B_1	2006:06		2002:02		1993:04		1992:12		2001:02		2010:03		1999:01	
B_2	20010:07		2006:02		2002:05		2009:05		2009:02		2012:10		2005:01	

Table 6
Results of both the long and short run volatility stability. Source: Authors computation (2017)

Variables	Short Run Coefficients	Long Run Coefficients
*In*ASI	0.6413	1.3796
*In*RGDP	0.626648	1.507705
CPI	0.6423	1.5146
*In*GE	0.639825	1.5152
INT	0.8173	1.6967
EXC	0.6438405	1.5180425
*In*M2	0.6581695	1.3931075

significant. The implication is that large shocks in inflation are transmitted into the All Share price Index. This also connotes that the impact of volatility of inflation rate on stock market is direct.

Interest rate result shows that both the α and γ are positive and significant, this simply connotes that interest rate volatility influences ASI through asymmetric impact and size innovation. It also implies that direct relationships exist between interest rate volatility and the All Share Index such that increase in volatility of interest rate will provoke more than proportionate impact on stock market.

A look at the result of the money supply shows that a negative relationship exists between money supply and the ASI. This implies that a money supply shocks negatively impact on interest rate, which will in turn impact on stock market. The implication is that the impact of money supply shocks on ASI is indirect. This is supported by the interest rate channel of the monetary policy channel hypothesis. Our finding is similar to the findings of Bernanke and Gertler, (1999), Bjornland and Leitemo (2009a, 2009b), but contradicts Castelnuovo and Nistico (2010), and Castro and Sousa (2010).

The Government Expenditure result shows that α is positive and significant while γ is negative but significant. The implication is that once we account for the asymmetric impact of innovation, we are expected to account for the absolute size of innovation. The result further shows that the Keynesian positive effect hypothesis holds for GDP-ASI nexus in Nigeria. The structural break results show that for *In*RGDP, the first structural break occurred in the sixth month of the year 2006 while a notable structural break occurred for the second time in the seventh month of the year 2010. For the All Share Index, the first structural break occurred in February, 2001 and the second structural break occurred in February, 2009, just after the global financial crisis that affected the whole world. Other breaks are reported in Table 5 above.

On the stability of the volatility over time, it can be seen from Table 6 that the ASI volatility stability coefficient is less than 1 in the short run as required by theory, this implies that stock returns volatility is stable, however, the coefficient is more than 1 in the long run, an indication that stock market volatility as induced by the innovations in the interaction of both monetary and fiscal policies instruments is not stable in the long run. This could be a result of state of development of the economy.

5. Conclusion

This study examined the impact of the interaction between fiscal and monetary policies on stock market behaviour on the one hand, and the impact of the volatility of the interaction of both the monetary and fiscal policies instrument on stock market volatility on the other hand. We employed the use of ARDL and EGARCH estimation to analyse data sourced from January, 1985 to December, 2015 on the Nigerian economy. Our results show that the interaction between monetary policy and fiscal policy instruments exerts on stock market returns in Nigeria, either directly or indirectly. The ARDL results show evidence of the existence of a long run equilibrium relationship between *In*ASI and Monetary-fiscal policies. It can also be deduced from the result, that compelling short run relationships exist between the ASI and the interaction between fiscal and monetary policies. Our results reveal that monetary policy exerts on stock market behaviour directly through the interest rate channel. A change in interest rate will alter the present value of firms' future net cash flows through the corporate cost of capital. Our study also provide an indirect impact of macroeconomic policy on stock market behaviour through credit channel, wealth effect channel, exchange rate channel and the Keynesian automatic stabilizer channel. The credit channel opined that monetary policy can

influence the level of investment in the economy by manipulating the interest rates. This will affects the market value of firms by altering the level of corporate investment. It is believed that higher corporate investment activity will lead to higher future cash flows, thereby increasing firms' market value.

The wealth effect on the other hand suggests that increase in interest rate will dampens the value of stock prices. For the exchange rate channel, higher interest rate will result to an appreciation of the domestic exchange rate, which could lead to higher imports with a fall in exports. This will indirectly affect the competitiveness of the country resulting into a fall in production, and of course lower stock prices. The result of the error correction model shows the expected negative sign and is significant at 5% level of significance (i.e -0.3728, 0.05), indicating that the speed of adjustment of about 37% back from the short –term disequilibrium to the long- term equilibrium.

The results from the volatility estimates show that the *In*ASI volatility is largely sensitive to volatility in the interactions between fiscal and monetary policies' instruments. It shows that the monetary policy channels hypothesis as well as the Complementary and strategic substitutability hypothesis of fiscal and monetary policies' nexus holds for stock market volatility in Nigeria. The result through RGDP channel shows that both the asymmetric impact of the innovation as well as the absolute size of the innovation are significant in examining its impact on stock market return. The result from the interest rate channel establishes existence of direct relationship between interest rate volatility and ASI index. For all the variables, the result shows that volatility is stable only over short term and are mean fleeing over the long run.

From policy perspective, our result suggests the importance of incorporating both the monetary and fiscal policies in a single model when formulating stock market policy as their interaction exerts significantly on stock market behaviour, thus both policies should be considered in tandem and not in isolation. Our findings are in line with Chatziantoniou et al. (2013) who observed that the US stock market reacts to both monetary policy and fiscal policy interaction through both direct and indirect channels. Our results differ from that of Yuan and Chen (2015) who observed that monetary policy instruments have greater impact on stock market behaviour than fiscal instruments for the BRICS economies. Theoretically, our results suggest that the Keynesian positive effect hypothesis which suggests that fiscal policy instruments exert positively on stock market holds for Nigeria. We can also deduce that the Complementary hypothesis framework holds for Nigeria as both policies instruments significantly affect stock market behaviour in Nigeria.

In conclusion, it is worth noting to state that the impact of both the interactions and volatilities of fiscal and monetary policies instruments on stock market investigated in this paper is innovative and novel but not inclusive, this implies that there remain avenues for further research on stock market development. Further study may examine causality among the variables used. Research could also be extended to accommodate cross-country analysis.

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