

Risks, Bad News, and Good News of Exchange Rate Volatility and National Elections in Nigeria: (Empirical Evidence via Threshold GARCH and GARCH- in-mean Methodologies)

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Abstract

The nature and state of the Nigerian economy could only suggest lack of proficiency in policymaking; tool of the policy makers of Nigeria. It is however a fallacy because Nigeria do not lack right policies but the execution will of these policies. Using monthly series from 1999 to 2014 via the methodologies of Threshold GARCH (*TGARCH*) and GARCH-in-mean (*MGARCH*), National Elections in Nigeria do not only influence significantly the Volatility or swings in the exchange rate of Naira but depreciates Naira further. The more this Risk is absorbed in the economy, the more the naira depreciates. Good news and bad news both significantly affect the exchange rate volatility significantly while bad news influences it more by 66% which is in line with the findings of Dr. Oduh Moses and Ms. M. S. Priscilla, using Exponential GARCH (*EGARCH*) to assess effects of Good and Bad information on exchange rate volatility of Nigeria. We recommend a strict restriction of the buying and selling of foreign currencies by the financial institutions at the appropriate periods concerning election campaign and advices banking campaign fund in domestic financial institutions as the monetary authority tighten their belt on sterilizing shocks on the exchange rate volatility.

Keywords: Elections, Risks, Good and Bad News, Exchange Rates, and Volatility

1.0 Introduction

The 93rd meeting of the Monetary Policy Committee (MPC) on 22nd January 2014 of which the External Reserve and Excess Crude Account (ECA) depletion were matters of concern and succinctly were deliberated upon to map out possible solutions to eradicate this multifaceted

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dragon. However, the ECA balance as at December 2012 was \$11.5billions. Suddenly, it became \$2.5billions by January 2014. Suggesting about \$9billions missing in 2013. This could only mean ***'making hay while the sun shines with respect to 2015 campaign and election'***. Hence, giving back bone to this research work

On the part of our external reserve, \$42.85billions was the balance as at December 2013, denoting 2.23% decline from the balance in 2012 December. The MPC (Monetary Policy Committee) attached this to the drastic fall in Portfolio investment, Foreign Direct Investment (FDI) flows in 2013. They further added that the depletion was also a function of the increased funding of the Foreign Exchange Rate Market by CBN to stabilise Naira. Along the line the former CBN Governor, Sanusi Lamido Sanusi, said "the depletion of the ECA (Excess Crude Account) is a fiscal and not monetary issue". He forecasted further that 2014 would be difficult for the Monetary Authority to maintain the balance needed. Sanusi Lamido Sanusi marshalled plans to control and regulate the public sector spending, such as increasing the Cash Reserve Requirement (CRR) on public sector deposit from 50% to 75% from February 2014, limiting the per week sell of dollar by commercial banks to \$250,000, etc.

Diagnosing these outcomes, one can only say, until the monetary and fiscal Authorities of Nigeria work in harmony towards achieving the same goal, she will not achieve her ends as an Economy. The plans made by the MPC (Monetary Policy Committee) on the public sector was not proactive as sterilization policies ought to be, rather it was reactive and late. Increasing the CRR (Cash Reserve Ratio) of public sector and restricting the dollar sell per week are measures to regulate unnecessary spending and capital flight. These measures were made in 2014 whereas the real flight was in 2013. Given that we do not practice currency substitution and/or dollarization, one would suggest a new restriction on per day/week purchase of dollar by the banks, this is the period for the real spending. It would not be a surprise either if such policy comes by 2016, after the general election.

The CBN (Central Bank of Nigeria) governor Godwin Emefiele on 25th September 2014, at New York, USA, during the African Business Summit, opined that 2015 election will not deplete external reserve while only in September 2014, the CBN spent \$3.1bn. from our external reserve to maintain Naira Exchange Rate. In the same light, it won't deplete because it has already depleted it and more depletion awaits us if we have no plans to maintain the needed balances, except the CBN governor has effective and efficient plans to monitor and curtail the foreign exchange market transactions. He claims our external reserve stands at \$41bn.; highest in Africa. The minister of Industry, Trade and Investment, Mr. Olusegun Aganga (2014), said that the African Summit was meant to enlighten investors and an avenue to portray the image of Nigerian Economy for investment.

Moreover, the Boko haram insurgence has not yet been curbed. In 2013, their incessant bombings and killings dwindled investment (FDI inclusive) and resulted to the depletion of our foreign reserve. One may ask 'what makes us think the summit will make investors invest in our economy, when home based Nigerian investors do not invest in some parts of our country because of Boko Haram bombing?'

Depreciation of Naira is not so much an evil, especially for a country such as ours, where we operate at a level below full employment of resources. Yes, "2015 election will not deplete external reserve" if and only if there are laid down plans to curtail, should I say the quantitative easing of the government, in the form of political parties' campaign and election come 2015.

It is said that the completion of a task marks the beginning of another. It ought to be that we export primary product and use the revenue to enhance our manufacturing capacity into transforming primary products to finished products at a globally competitive prices because we produce these inputs our self. Our problem is being comfortable exporting raw materials and importing its finished products. This is shown by how our public funds fly every now and then.

Given that our economy is not yet operating at full employment of resources, this according to the Absorption Approach is the axiom on which devaluation or depreciation of Naira (exchange rate being the ratio of naira to dollar) will increase output in greater proportion than the increase in absorption. Thus a positive current account balance via multiplier processes. It is vital to note that since we have refused to grow and most of our export are primary products, we can count on other countries' capacity to demand our exports and trusting the elasticity of our exportable.

The main concern of policy makers is to maintain equilibrium in every economy, both internal and external via expenditure switching and expenditure changing as Trevor Swan (1956) illustrated, called the Australian model or swan diagram.

As illustrated by Mundell and Fleming Model, under floating and imperfect capital mobility (to be as close to reality as possible), Fiscal policy is relatively not effective to increase the output/income of our economy. On the Assignment problem basis, monetary policy is relatively more effective with respect to depreciation of Naira, to move Nigerian economy forward. Hence, much of the works to be done in other to maintain balances in Nigeria lies in the hands of the monetary authority. If it is gambled as well, then I see a shattered economy after the 2015 election.

Jan Tinbergen model showed the attainment of target policies with the combination of policy instruments given a case of not under-identified, where trade-off becomes the optimal pay-off. However, the real gamble lies between the monetary authority and fiscal authority to work in harmony to maintain proactively, the impact of the expansionary fiscal policy, a function of the 2015 election spending and the depreciatory pressure on Naira exchange rate on Nigerian economy. If this harmony refuses to exist, not even the GDP re-basement will serve our economy. One might ask, why are the macro-economic instruments meant to save our economy, turn into becoming a total independent instrument to do the work of the few, who are opportune to use it? Thus gambling the fate of the whole economy. What will happen, if they work together?

Expenditure changing policies (fiscal and monetary) are meant to maintain equilibrium in an economy and not to take decisions and execute totally independently without having the economy in mind and knowing what the other authority seeks to achieve in the economy. This gamble should stop, for our good.

The Volatility of the exchange rate is one of the key factors that induces changes in every economy and hence attracts attention of policy makers. As most people believe that exchange rates are uncertain and cannot be predicted, we belong to the school of thought that believes it can be predicted with little margin for error.

This is the steadily deviations of the exchange rates from an equilibrium rate. This swing can be as a result of so many activities within, between and amongst countries, but we lay

emphasis on this fluctuation being a function of elections, Nigeria as a case study. We are all tired of this gamble, I believe in the economic sense of our fiscal and monetary authorities. We, together, can turn an evil into working for our favour. We need harmony between these twin policies to move our economy forward. This gamble must stop.

However the exchange rate with dollar on August 5th 2014 was N160.75k per dollar and just as the election campaign is about to begin, the exchange rate as at December 18th 2014 has become N187.84k, showing approximately 17% growth rate, in a space of four months. The fluctuation on our exchange rate just from June till December 2014, being the year to prepare and campaign for the elections come 2015, the volatility is thus graphed below:

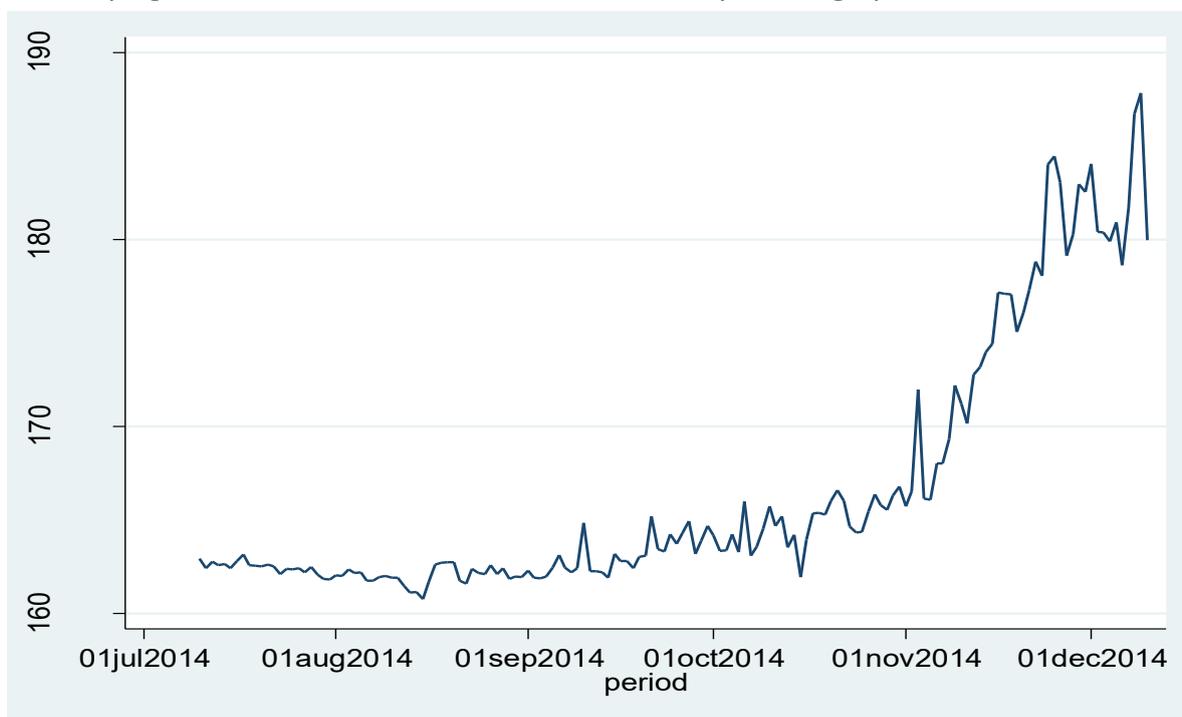


Figure1: Naira Exchange Rate (July-December 2014)

Source: Forex Economic Calendar (economic calendar of MT5 portal)

Just in a space of six months, the exchange rate of naira and dollar has become so volatile and at the same time increasing rapidly. Despite the vast range of volatility measuring methodologies, McKenzie (1999) believes that there are a number of measures that should be taken into consideration ranging from the structural models to the time series equation making use of the ARCH/GARCH approaches. The standard deviation of the first variation of logarithms of the exchange rate is the most widely used in measuring exchange rate volatility. If the exchange rate is on a steady trend, which could easily be forecasted the result will therefore not be a source of uncertainty.

The standard deviation is calculated over a period of one year to point out a short-run volatility and in acquiring long-term variability, a period of five years is used. However, the arch and garch coefficient are added to determine if the exchange rate is highly volatile during election years or not.

2.0 Theoretical Literature

Specie Flow Mechanism

Hume proposed the Specie Flow Mechanism in which he said that changes in domestic prices, as a result of gold (specie) (in)outflows into a country, results to changes in the flow of

goods, inflows of gold leads to inflation while an outflow of gold tends to deflate prices. Thus, changes in domestic price levels, as a result of flows of gold (specie), changes the direction or volume of international flow of goods and services and hence affect the international prices (exchange rates).

✚ **Purchasing Power Parity (Ppp) Theory**

Purchasing Power Parity (PPP) Theory proposed and developed by Cassel 1918, Frenkel, 1978; Genberg, 1978; and Thurow, 1997, posits that a bundle of goods in one country should relatively cost the same in other countries after exchange rates are considered. In other words, the theory asks how much money would be needed to purchase the same goods and services in two countries, and uses that, to calculate an implicit foreign exchange rate.

✚ **The Absolute Purchasing Power Parity**

The law of one price begets this postulation. However, it states that the real price of a good must be the same across all countries. Absolute purchasing power parity postulates that the equilibrium exchange rate between two currencies is equal to the ratio of the price levels in the two nations.

✚ **Elasticity Approach**

The Marshall-Lerner (1923) condition is at the back bone of the elasticity approach. The approach is related to the price effect of devaluation, the extent to which it will succeed depends on the country's price elasticity of domestic demand for imports and foreign demand for exports. If the sum of price elasticity of demand for exports and imports in absolute terms is greater than unity, devaluation will improve the country's balance of payment".

✚ **Absorption Approach**

The Absorption approach offered and developed by Alexander (1952 and 1959) and (Johnson, 1958; 1972, 1973, 1976, 1977a, 1977b, 1977c) emphasizes the role of the exchange rate (or relative prices) in the balance of payments by considering imports and exports as being dependent on the exchange rate. It posits that devaluation would only have positive effects on the balance of trade if the propensity to absorb is lower than the rate at which devaluation would increase the national income/output of goods and services.

✚ **The Mundell-Fleming Model**

Mundell and Fleming (1962, 1963) model postulates that the behaviour of any small open economy depends on whether the exchange rate is floating or fixed given the (im)-perfectness of capital mobility, a function of interest rate differentials. However, the model illustrates the difficulty of the unholy matrimony of achieving perfect capital mobility, independent monetary authority while practising fixed exchange rate.

Other theories on exchange rates includes Asset Approach, Portfolio Balance Approach, Monetarist Approach, etc.

2.1 Empirical Literature

Kiyota and Urata (2004) studied the link between exchange rate, volatility of exchange rate and foreign direct investment in the industrial sector of Japan. Employing ARCH model methodology and time series from 1970 to 2001. Discovered that currency depreciation of the host country attract the FDI, while on the other hand uncertainty and volatility of exchange rate affects negatively the FDI. Recommendations included that, to attract FDI, countries must maintain a stable flexible exchange rate and avoids its overvaluation. On the other hand, some other studies indicated a positive relationship.

Bernardina (2004) investigated the impacts of the real exchange rate, real non-oil GDP, and the world income on Russian non-oil export by using an Error Correction Model over the period 1994-2001. He finds that there is a robust and negative long run cointegration relationship between the real exchange rate and Russian non-oil exports.

Furthermore, the world income has positive effect on Russian non-oil export while real non-oil GDP causes a decline in non-oil export.

Husain et al. (2004) investigated the relationship between exchange fluctuations and economic growth in 15 developing countries in the Middle East, from 1975 to 2002, using GARCH model, they found in their study that little access to international capital is available for the weaker and less developed countries, so low rate of inflation and higher level of durability is associated with fixed exchange rate regime in those countries. However, they found no robust relationship between economic performance and exchange rate regime in the developing economies. They also found that advanced economies may experience durable and slightly higher level of growth rate without higher level of inflation in flexible exchange rate regime.

Adubi and Okunmadewa (1999) used ARIMA model to estimate the effect of exchange rate volatility on imports and exports of agricultural products, using sampled data from 1986 to 1996 in Nigeria. Their findings revealed that; exchange rate volatility has a negative effect on agricultural exports, while price volatility has a positive effect.

Oriavwote and Omojimate (2008) investigated the strength and length of the relationship between exchange rate pass-through and domestic prices in Nigeria using the Vector Error Correction Model. Using data covering 1970 to 2007. The result showed a long run relationship among the variables. Contrary to some other studies, they recommended that exchange rate volatility should be given important consideration when implementing policies on stabilizing domestic inflation.

3.0 Methodology

This work will adopt the methodologies of **TGARCH** (Threshold GARCH); to ascertain the intricacies of good and bad news (information), **MGARCH** (GARCH-in-mean); to ascertain impacts of risks, and finally, **GARCH** [p, q] will be used to show the exchange rate volatility in the presence of Elections in Nigeria.

Elections started in 1959 in Nigeria and due to the fact it was just a new economy and was beginning to enjoy independence, it was also doomed to have a lot of ill behaviours which made it impossible to have a well-defined and steady election periods, which may include Coup-de-tat, civil war, running away from the seat of presidency, etc. however, this study will zero emphasis on the election years and the year before elections. This is done because of the fact campaigns are done in magnificently a year before election and victory is celebrated after the election. All these activities involve spending home and foreign currencies which thus affects the exchange rate as this study tends to evaluate. Moreover, National elections have been held in the following years: 1959, 1964, 1979, 1983, 1999, 1999, 2003, 2007, 2011, and hopefully 2015. Because of the nature of the data sets, election years between 1990 till 2014 will be considered and these years form the key periods of analysis

The general model consisting of all the above variants of GARCH model is thus specified as

$GARCH[p, m, q, t] \equiv [ARCH \text{ term}, MGARCH \text{ term}, GARCH \text{ term}, TGARCH \text{ term}]$

$$\sigma_t = \alpha_0 + \theta E_t + \beta_i \sum_{i=1}^p \varepsilon_{t-i}^2 + \gamma \sigma_t + \vartheta \sum_{j=1}^q \delta_{t-j} + \delta \pi_{t-1} + u_t \dots \dots (1)$$

$$\pi_{t-1} = [d_{t-1} \cdot \varepsilon^2_{t-1}] \dots \dots (2)$$

$$d_t = 1, u_t < 0 \text{ and } 0, u_t \geq 0 \dots \dots (3)$$

$u_t < 0$, signifies bad news and $u_t \geq 0$ signifies good news
 $E_t = 1$, election years within 1999 till 2014, and 0, other years.

Taking into account eqn(1) to eqn(3), we will thus estimate equation (4) with order 1 arch and garch terms below:

$$\sigma_t = \alpha_0 + \theta E_t + \beta \varepsilon^2_{t-1} + \gamma \sigma_t + \vartheta \delta_{t-1} + \delta d_{t-1} \cdot \varepsilon^2_{t-1} + u_t \dots \dots (4)$$

θ = election dummy term, β = ARCH term parameter, γ = MGARCH term parameter, δ = GARCH term parameter, and ϑ = TGARCH term parameter.

Employing monthly series of exchange rate from 1999month1 to 2014month12. Average annual series were elicited from the central bank of Nigeria statistical bulletin and was converted into monthly series using the cubic-match last mechanism.

4.0 Results Analysis And Interpretation

Table1:

Arch Mean Equation Result

Ex. Rate	Coefficient	OPG S.E	Z-value	P-value	CI[95%]
Constant	130.3721	2.261349	57.65	0.000	125.9399 134.8043
σ^2	763.041	60.22041	12.67	0.000	645.0112 881.0709

Source: Researchers' Estimation via Stata12.

So long as the variables of interest are stationary at level form, the estimations are therefore robust. From the result of the mean equation, one can observe the statistical significance of the sample variance. This suggests a significant volatility of the exchange rate of Nigeria. However the variance and GARCH equations results below confirms this suggestion of the mean equation. It is important to note that the Gaussian or Normal distribution was used to execute all the estimations because it produces estimate results that are serially uncorrelated, normally distributed and no ARCH effect.

Table2:

Arch Variance Equation Result

Ex. Rate	Coefficient	OPG S.E	Z-value	P-value	CI[95%]
Constant	130.3028	.1514101	860.60	0.000	130.0061 130.5996
ARCH_{t-1}	1.103319	.1688621	6.53	0.000	.772355 1.434282
constant	.2071646	.3812308	0.54	0.587	-.540034 .9543632

Source: Researchers' Estimation via Stata12.

Given that the Arch term is statistically significant in the equation, previous exchange rate information can affect present exchange rate volatility. This however suggests that exchange rate information should critically be analysed because it can influence future exchange rate volatility.

Table3:

Garch [1, 1] Equation Result

Ex. Rate	Coefficient	OPG S.E	Z-value	P-value	CI[95%]
Constant	128.6333	.0268288	4794.60	0.000	128.5807 128.6859
ARCH_{t-1}	.9754667	.1926668	5.06	0.000	.5978466 1.353087
GARCH_{t-1}	.1758217	.0495025	3.55	0.000	.0787986 .2728448
constant	.0034181	.0027593	1.24	0.215	-.00199 .0088262

Source: Researchers' Estimation via Stata12.

The GARCH term is also statistically significant, which denotes that previous exchange rate volatility can influence present volatility. However, the exchange rates of Nigeria is therefore volatile, empirically proven. Therefore, our exchange rate volatility is influence by its own ARCH and GARCH terms (family shocks), hence the exchange rates information and volatility should be given priority in maintain a stable exchange rate in Nigeria.

It is important to note that election is also significant statistically in the model (see appendix3). This implies heavily that the National elections in Nigeria and outside shocks can influence the exchange rate volatility.

The sum of the ARCH and GARCH term is 1.15, suggesting that the exchange rate of Nigeria is highly volatile and persistent, hence cannot easily be forecasted with an average degree of accuracy but is empirically noted that elections in Nigeria contributes significantly to its volatility. Given the nature of volatility, the exchange rate of Nigerian Naira with respect to American dollar will skyrocket come 2015, denoting depreciation of Naira.

Table4:

Threshold Garch Equation Result

<i>Ex. Rate</i>	<i>Coefficient</i>	<i>OPG S.E</i>	<i>Z-value</i>	<i>P-value</i>	<i>CI[95%]</i>	
Constant	124.917	2.76406	45.19	0.000	119.4996	130.3345
$TARCH_{t-1}$.6606511	.3018664	2.19	0.029	.0690038	1.252298
constant	496.2264	47.18901	10.52	0.000	403.7376	588.7152

Source: Researchers' Estimation via Stata12.

Good news and bad news are both statistically significant and positively related to exchange rate volatility in the model, signifying that both good news and bad news with respect to exchange rate influences the volatility of exchange rate significantly. This is however more true in the case of spot and future prices of currency in the currency exchange market or foreign exchange market (FOREX).

However, bad news on the exchange rate increases the exchange rate volatility by an additional 66%, taking the expected value approach as good news is the omitted category. On the other hand, good news on the average influences the exchange rate volatility by the intercept term coefficient.

Table5:

Garch-In-Mean Equation Result

<i>Ex. Rate</i>	<i>Coefficient</i>	<i>OPG S.E</i>	<i>Z-value</i>	<i>P-value</i>	<i>CI[95%]</i>	
Constant	130.3204	.1520693	856.98	0.000	130.0224	130.6185
$ARCHM\sigma^2$	-.0005779	.0024172	-0.24	0.811	-.005315	-.005315
$ARCH_{t-1}$	1.105237	.1688551	6.55	0.000	.774287	1.436187
constant	.2045182	.3871717	0.53	0.597	-.554324	-.554324

Source: Researchers' Estimation via Stata12.

The GARCH-in-mean term is negatively related to the exchange rate volatility, denoting that higher risks in form of higher variances will result to a decrease in the average or expected returns. Suggesting that more risks leads to less returns.

Simply put, more the variances (risks) will definitely result to less returns in the exchange rate. Which could only suggest more risk, more depreciation (less returns). Time has shown this to be true in Nigeria because in 1960, a dollar was exchanged for N0.71k (seventy kobo) on the average. A decade later it was relatively constant. The next decade (1980), Naira appreciated

and a dollar was exchanged for N0.55K (Fifty-five kobo). The country's real sector was so active and efficient, leading in this sector was the Agricultural sector. In 1986, the exchange rate became in units, 1992, became tens and in 2000, became hundreds. We can no more ask what happened because we know and have refused to go back to it, for we believe that all hands must be equal and all fingers be put in the mouth at the same time, even if force has to be applied.

[ARCH, GARCH, MGARCH, and TGARCH]

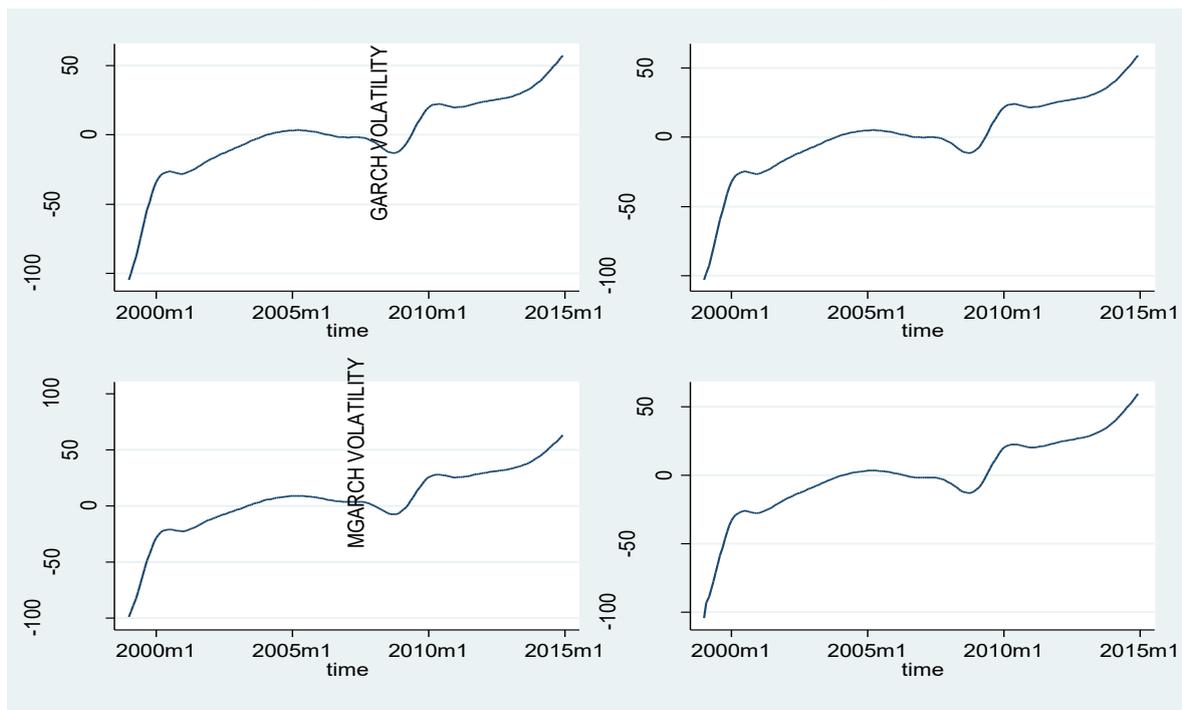


Figure2: Combined Volatility Graphs

It is striking and however marvellous that the volatility charts from the four variant of volatility methodologies have the same trend pattern, even at having different values. This therefore confirms that the exchange rate of Nigeria with respect to dollar is not only hyper-volatile both explosive, diverging outwardly. However, our focus is on the election years.

From the charts above, in 1999, Gen. Obasanjo won the national election, the exchange rate of Nigeria was upwardly volatile. Around 2007 as Gen. Yar'adua won the National Election, the volatility was more or less stable, which suggests that the then Governor of Central Bank of Nigeria, Professor Charles Soludo, sterilized the economy of the effect of alterations in the foreign market, hence the effect on the exchange rate was minimal. In 2011, when Dr. Goodluck Ebele Jonathan (GEJ) won the election, the volatility also became much and explosive.

All these however suggest that the national elections in Nigeria makes the exchange rates highly volatile and explosive at the same time have been empirically proven. The monetary Authority should however look into this.

5.0 Conclusion And Recommendation

For the love of economics, equilibrium, and pareto optimality. This research work has set out to investigate this suspicion and at the same time, empirically validate the happenings in Nigeria with respect to national elections and the exchange rate volatility of Nigeria.

In Nut shell, the National Elections are therefore one of the external causes of a high and explosive volatility of the exchange rate of Nigeria, besides its family shocks. The more Nigeria take and accommodates this risks (higher risks), the more our currency depreciates. Information (news) whether good or bad significantly influence the volatility of the exchange rate while the bad news seems to have more influence.

Billions of Dollars are spent to bribe and make way for successes during National elections in Nigeria. Recently, almost the whole community was given a whooping some of money by an aspirant of the 2015 Presidency Election, only to mention but a few. These money are stolen from us from known and unknown means and banked abroad, only to be used during the national elections to buy their ways through. These supply of and demand for foreign currency during these periods however makes our exchange rates more volatile and increases the risks which in-turn depreciates our currency more and on the other hand good and bad news also influences this volatility.

To recommend policies is but only to fulfil all righteousness, because thousands of policies have been recommended in the past and little or less have been implemented. Suggesting no need to recommending policies. Moreover, we recommend that buying and selling of foreign currencies by the financial hoses to be strictly restricted and manage at the appropriate time; to tighten the purchase of foreign currency during election campaign periods as they cannot spend dollars in Nigeria because we do not practise currency substitution or dollarization. Its wen the financial institutions purchase these foreign currencies with Naira, they empower them to bribe and spend irrelevantly just to buy their way through. On the other hand, at least a year to the election year, sell of foreign currencies should as well be thoroughly restricted as it is the period of fund flight to be banked abroad, waiting to be spent on campaign. Both activities have been shown empirically to have adverse effect on our economy.

If corruption cannot allow this to happen, we therefore solicit that this missing funds should be kept or banked in Nigeria so that it will not directly affect the forex market so as to affect adversely the exchange rate of Naira, for the benefits of the future Generations to come.

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