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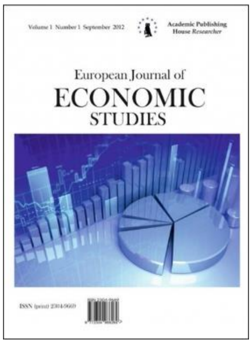

Empirics of Exchange Rate Explosiveness/Overshooting in Sub-Saharan African Countries: Implications for Foreign Exchange Markets

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Abstract

The study estimated conditional explosiveness or volatility of exchange rate for twelve SSA countries from January 1, 2006 to June 29, 2019 using Maximum Likelihood estimator (MLE). The study motivation is deeply rooted on the fact that volatility in exchange rate exposes importers and exporters to exchanges rate risk. Consequently, we became desirous to econometrically estimate degree of volatility persistence in exchange rate of selected SSA countries in relation to the United States of America and its implications for forex markets in SSA. Our empirics reveal that in South Africa, Burkina Faso and Equatorial Guinea, exchange rate volatility is covariance stationary indicating certainty of convergence after perturbation to exchange rate equilibrium. Also, shocks of volatility in exchange rate are explosive and highly persistent in Nigeria, Ghana, Botswana, Mali, Togo, Cote d' Ivoire, Rwanda, Cape Verde, and Mauritius.We so remark the necessity for exercise of healthy control in managing and monitoring guiding principles of foreign exchange markets constantly in Nigeria, Ghana, Botswana, Mali, Togo, Cote d' Ivoire, Rwanda, Cape Verde, and Mauritius in line with global code of forex market conduct to guarantee non-volatile behaviour of local currencies.

Keywords: explosiveness/overshooting, exchange rate regimes, I-GARCH model, sub-Saharan African countries (SSA).

1. Introduction

Overshooting so provides that prior to a long-run rate, exchange rate in response to an economic tremor in macroeconomic aggregates, at the outset explodes beyond the new level to which it ultimately relax. The explosiveness in exchange rate which is on basis of flexibility and presence of official commitments or otherwise to exchange rate paths had mostly be the driver of currency crises in the world, distorting production patterns beside severe depletion in foreign reserves as well as divulging importers and exporters to exchanges rate risk.Volatility in exchange rate is the instability in the rate at which a given currency exchanges for another currency. The higher explosiveness in exchange rate, the higher the currency risk and the riskier it becomes for potential investors to invest in a foreign location as expected returns may not be sufficient to cover for currency risk.

Our inspiration is deeply rooted on the fact that overshooting in exchange rates exposes importers and exporters to exchanges rate risk. Also, most studies of exchange rate overshooting/explosiveness focused on developed economies, hence, countries of SSA have received petite consideration. This present study fills this identified empirical gaps. Besides,

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an exploration of the occurrence or otherwise of exchange rate explosiveness may perhaps explicate exchange rate impulsiveness in SSA. Additionally, our study interprets the configuration and behavior of exchange rates in SSA within the framework of explosiveness/overshooting. The stochastic spread of the global financial crisis of 2008 gave birth to international imbalance which today became a fundamental disturbance to gains from international trade. Such imbalance could be link to volatility in exchange rate. The nexus is that value of a nation's currency is a determinant of output price in line with market forces taking into cognizance economic theory.

Hence, the study estimated conditional explosiveness of exchange rate often referred to as overshooting for sample of sub-Saharan African (SSA) countries from January 1, 2006 to June 29, 2019 using Maximum Likelihood estimator (MLE). We became desirous to econometrically estimate degree of explosive or volatility persistence in exchange rate of selected SSA countries in relation to the United States of America and its implications for forex markets in SSA within the space of 2006 through to 2019. The selected SSA countries include South Africa, Equatorial Guinea, Nigeria, Ghana, Botswana, Mali, Togo, Cote d' Ivoire, Rwanda, Cape Verde, Mauritius and Burkina Faso where data were available. We present next some stylized facts on sub-Sahara countries. The study is structured in such a way that after introduction, we have section for materials and methods where theory and methodology are discussed and results and discussion follows and finally we have conclusion.

With Africa being the world's poorest continent, majority of sub-Sahara countries are highly indebted low income countries as made manifest in low per-capita income together with low economic diversification. These culminates in inadequate gains from trade. Such infinitesimal specialization and diversification constitutes a hindrance to Africa's manufactured export (World Data Atlas, 2000).

There is significant variation in SSA in terms of economic performance. Botswana once had 3 % per capita GDP and grew at 6 percent per annum until the late 1980s, Cape Verde and Mauritius surpassed 2 % and somenamely, Cote d'Ivoire, Gabon, Togo, and Nigeria have had high-growth periods. The uproar experienced in world markets in recent times alongside deep-rooted economic problems and incapacitating effects of political turmoil had severe effects on Africa.

Additionally, there is increasing implementation of untimely economic policies, and low level of private investment which has contributed to SSA's poor overall economic performance since the 1990s.The foregoing analysis highlight the fact that enormous instability in economic performance of African countries is such that better performing countries have gone through periods of relatively declining growth.

So, even the fastest growing countries in SSA are yet to activate their recoveries from protracted periods of economic decline. Countries that achieved positive growth rates during 2011 to 2017 reveals that these countries also made progress in the area of inadequate human capital development. The data available at World Bank (2005) showed that annual growth rate of GDP per capita real GDP of SSA was negative (-2.2) through most period of the 1980s. Though per capita real GDP increased in some Africa countries namely, Rwanda, Mali, Congo, Gabon, Nigeria, South Africa and Mauritius, per-capita incomes in Uganda, Bukina Faso, Cote d' Ivoire, Niger and Angola are today less than half their level in 1970 and these countries are yet to catch up with their 1970 level of per-capita GDP notwithstanding ample economic gains since the mid-1990s (World Economic Outlook, 2013).

2. Discussion

Some Literatures

Exchange rate explosiveness or overshooting provides a description of exchange rate behavior following a shockwave in the economy that affects income, employment and prices (see Dornbusch, 1976). Though, empirical estimates of monetary flex-price exchange rate model was validated for Nigerian economy (Umoru, 2013), volatility in exchange rates in relation to its explosiveness is well documented in the sticky-price model of Rudiger Dornbusch. What this implies is that exchange rates are highly explosive compared to prices and interest rates. Theoretically, exchange rate explosiveness/overshooting ascends under the assumptions of an uncovered interest parity, demand for money being in relation to interest rate and national output growth, fixity of prices in short-run with possibility of adjustment in long-run to offset monetary shocks, and flexibility in exchange rates. In effect, rise in money stock would eventually translate to rise in price level and cost of foreign currency.

Some economists had argued that volatility was induced by speculators besides inefficiencies such as asymmetric information and adjustment complications in foreign exchange market. For example, while measuring volatility in terms of variance, Manuelli and Peck (1990) developed an overlapping generation model with stochastic endowments and found many exchange rate processes that are equilibrium processes and thus demonstrated existence of equilibria under flexible exchange rates regime.

Bergin and Tchakarov (2003) found welfare costs to be extremely small on the demand of one tenth of one percent of consumption in relation volatility. Koren and Szeidl (2003) developed an interactive model and found that unconditional volatility as risk measure was not the most germane theoretical issue but what matters most was the determination of trade volume by volatility via covariances of the exchange rate. Bacchetta and Van Wincoop (2000) advanced a two-country general equilibrium uncertainty model to unravel the fact that no strong correlation between trade level and exchange rate regime type.

Others have measured volatility in exchange rate as standard deviation of percentage changes in periodic exchange rates, mean of percentage exchange rate changes, standard deviation of percentage of exchange rate changes, square root of sum of square of the mean of percentage exchange rate and its variance (Ghosh et al., 2003).

Narrowing to IMF's De Facto classification of exchange rate regimes following Bubula and Ötker-Robe (2002), we have the exchange arrangements with no separate legal tender regime. Also, is currency board arrangements. Another classification is the conventional fixed peg arrangements. There is the crawling pegs and managed float. Lastly, is the independent float which defines the market-determined exchange rate management.

The empirical literature on exchange rate explosiveness is enormous but with mixed findings. Amongst the enormous literature are Bahmani-Oskooee & Kara (2000); Goldfajn & Gupta (2001); Rogoff (2002); Dornbusch (2004); Pierdzioch, (2004); Nieh & Wang (2005); and Pratomo (2005); and Bahmani-Oskooee & Panthamit (2006). Authors such as Rogoff (2002) and Dornbusch (2004); Bahmani-Oskooee & Kara (2000), Goldfajn & Gupta (2001), Rogoff (2002), Dornbusch (2004) and Nieh & Wang (2005) upholds the explosiveness/volatility model, Kim & Roubini (2000) contradict such empirical result. For Turkish economy, Bahmani-Oskooee and Kara (2000) found empirical evidence of exchange rate long-run explosiveness in exchange rate of Lira in relation to USD. In 2005, Nieh & Wang's validation of exchange rate overshooting for the Taiwan economy.

According to Rogoff (2002), with explosiveness in exchange rates the predicted forward exchange rate falls short of the spot rate. In effect, explosiveness affects behaviour of both spot and forward rates. Pratomo (2005) obtains evidence of exchange rate long-run explosiveness in Indonesia with Rupiah as official currency, together with some structural changes in the exchange rate of the Rupiah in relation to USD. Nevertheless, Kim & Roubini (2000) only found a delayed explosiveness. Other studies conducted by Mungule (2004); Kustra (2005); Heinlein & Krolzig (2011) found no such proof of exchange rate explosiveness as propounded by Dornbusch.

Theoretical framework and model estimation

The fundamental theory is the exchange rate overshooting theorem which explains high levels of volatility in exchange rates (Dornbusch, 1976). We recall the general framework of GARCH *(p,q)* model which allows current conditional variance to depend on first p-past conditional variances together with q-past squared residuals:

$$\sigma_t^2 = a + \sum_{j=1}^{q} \delta_j e_{t-j}^2 + \sum_{i=1}^{p} \theta_i \sigma_{t-i}^2 \qquad [1]$$

$$\Rightarrow \sum_{j=1}^{q} \delta_j + \sum_{i=1}^{p} \theta_i \geq\leq 1 \; (volatility\ persistence) \qquad [2]$$

Impact of conditional volatility shocks leaves endlessly in I-GARCH model and hence persistence will be high when the sum ≥1. In effect, the persistence of σ_t^2 is established by $(\theta + \delta)$ and covariance stationarity is conditioned by $(\theta + \delta) < 1$. The degree of volatility determination was determined through the I-GARCH model which is integrated in variance having restricted the parameters of general GARCH *(p,q)* model to sum up to unity and simultaneously omitting nuisance parameter. This is given as:

$$1=\sum_{i=1}^{p}\theta_i\sigma_{t-1}^2+\sum_{j=1}^{q}\delta_j e_{t-1}^2 \qquad [3]$$

$$\sum_{i=1}^{p}\theta_i\sigma_{t-1}^2+\sum_{j=1}^{q}\delta_j e_{t-1}^2 \geq 1 \qquad [4]$$

$$\sum_{i=1}^{p}\theta_i\sigma_{t-1}^2+\sum_{j=1}^{q}\delta_j e_{t-1}^2 < 1 \qquad [5]$$

(a) If sum of ARCH effect and the GARCH effect ≥ 1, then volatility shock is explosive,

(b) Similarly, if sum of ARCH effect and the GARCH effect <1, then GARCH course is covariance stationarity.

The study examined residuals of exchange rate series for evidence of heteroskedasticity using LM test as demonstrated with the following equations. Firstly, we estimated an AR exchange rate equation:

$$E_t=\alpha_0+\sum_{i=1}^{q}\alpha_1 E_{t-i}+u_t \qquad [6]$$

Secondly, we generated regression residuals and regress the squares of the residuals on a constant and on q lagged values of the residuals as follows:

$$e_t^2=d_0+\sum_{i=1}^{q}d_1 e_{t-i}^2+\varepsilon_t \qquad [7]$$

The next step was that we calculated LM statistic from the regression of squares of residuals as nR²·. The decision rule was to accept $H_0: d_1=d_2=\ldots=d_q=0$ that there are no ARCH effects up to order *q* iff LM statistic was lesser than the Chi-square critical value, that is, $nR^2 < \text{X}_{(n-1)}^2$ while *Ho* was to be rejected and $H_1: d_1\neq d_2\neq\ldots\neq d_q\neq 0$ accepted if LM statistic exceeded the Chi-square critical value $nR^2 < \text{X}_{(n-1)}^2$, where *n* is number of observations.

The variables used in the study include,

Exchange rate is the rate at which unit(s) of local currencies are traded in exchange for US dollars, exchange rate volatility(σ_t^2) was calculated as the variance of the weighted average of the squares of past values of residuals from the mean regression of daily exchange rate.

- Our research data which were principally exchange rates of selected SSA countries in relation to US dollar were collected from the sources below for various years and ranged from January 1, 2006 to June 29, 2019.
- IMF database, www.oanda.com/currency/realtime series and World Economic Outlook (WEO).

The study adopted MLE estimation method in estimating volatility persistence in an innovative multivariate I-GARCH model with corrections for non-standard errors. The log-likelihood function (LLF) given in equation (12) was computed from the product of all conditional densities of the prediction errors.

$$l=\sum_{t=1}^{N}\frac{1}{2}\left[-\ln(2\pi)-\ln(\sigma_t^2)-\frac{e_t^2}{(\sigma_t^2)}\right] \qquad [8]$$

where $e_t^2 = y_t - X_t^{'}\beta - \delta\sqrt{\sigma_t^2}$ and σ_t^2 is the conditional variance, the LLF for the conditional Student's t distribution is:

$$t = \sum_{t=1}^{N}\left[\log\left(\Gamma\left(\frac{v+1}{2}\right)\right) - \log\left(\Gamma\left(\frac{v}{2}\right)\right) - \frac{1}{2}\log\left(\Gamma(v-2)\sigma_t^2\right)\right] \quad [9]$$

where $\Gamma(.)$ is the gamma function and v is degree of freedom. The LLF for conditional t distribution converges to LLF of the conditional normal GARCH model as $(1/v) \to 0$.

We maximized the likelihood function using the dual Quasi-Newton which approximates the Hessian matrix that was used to estimate the variance-covariance matrix such that autoregressive parameters in the model, were obtained as Yule-Walker estimates. The choice of MLE derived from it theoretical property of point estimation plus that MLE of σ^2 is unbiased (Green, 2008). In what follows, we maximized the log likelihood function by Marquardt numerical iterative algorithm to evaluate asymptotically normal and efficient parameter estimates. The Eviews package was utilized in estimation.

3. Results

According to Table 1, real exchange rate volatility have tendency of becoming maximum under managed floats and lowest under horizontal bands and crawling pegs and crawling bands.

Table 1. Standard deviation of exchange rate regime

Regime(s)	Episodes	Standard deviation of real exchange rate level
Regimes altogether	209	7.93
Independent float	28	5.42
Managed float	49	5.86*
Crawling pegs/Crawling bands	23	2.93
Horizontal bands	20	2.56
Exchange arrangements with no separate legal tender regime/currency board	29	5.24

Note: * maximum volatility

In Table 2, we regress volatility measures on the length of the episode and a dummy for sub-Saharan Africa countries. As shown, this dummy is significantly different from zero implying a remarkably high volatility in exchange rate in sub-Saharan Africa. The episode length which is shorter than four quarters in length also passes the test of significance. Figures in parentheses are heteroscedasticity-robust t-statistics.

Table 2. Regression results for real effective exchange rate volatility

Regressors	Volatility Measure		
	Mean absolute change in REER	Standard deviation of change in REER	Standard deviation of level in REER
Constant	0.039a (16.542)	0.976a (11.529)	0.052a (19.647)
Regression error	0.005	0.004	0.007
R-bar squared	0.390	0.782	0.390
SSA dummy	0.056a (9.372)	0.084aa (2.269)	1.092aa (2.376)
Episode length (quarters)	-1.182aa (-2.137)	-0.025a (-7.639)	0.009 (0.586)

Note: a(aa) denotes significantly different from zero at 1 % (5 %) level

Table 3 shows the results of dummy for each regime. Accordingly, the F-test shows that they are jointly significant at the 1 % level. However, it worth noting that, only the dummies for a crawling pegs/crawling bands, managed float and independent float. Going by the coefficient sign, it implies that managed float suggestively reduces volatility at a given inflation rate while independent float significantly increases it. By implication, volatility is significantly higher for a market determined exchange rate while volatility is significantly lower for crawling pegs and crawling bands. Lastly, SSA countries tend to have more volatile real effective exchange rates.

Table 3. Regression results of regime effects

Regressors	Volatility Measure		
	Mean absolute change in REER	Standard deviation of change in REER	Standard deviation of level in REER
Constant	0.237a (3.04)	1.579 (1.326)	0.752a (3.264)
R-bar squared	0.596	0.453	0.568
Regression error	0.035	0.0298	0.029
F-test of regime dummies F(6, 262)	5.493a [0.000]	5.372a [0.000]	11.294a [0.001]
Independent float	0.238aa (2.579)	0.026a (3.791)	0.325aa (1.968)
Managed float	-0.001aa (-2.193)	-0.137aa (-2.521)	-0.931aa (-2.054)
Crawling pegs/ Crawling bands	1.923aa (3.567)	0.125a (3.098)	0.359aa (1.876)
Horizontal band	-0.279 (-0.642)	0.024 (1.287)	0.135 (0.965)
Conventional fixed pegs	0.137 (1.465)	0.001 (0.113)	0.034a (9.125)
Exchange arrangements with no separate legal tender regime	0.005 (1.462)	0.002 (0.736)	0.942 (1.354)
SSA dummy	0.239a (6.924)	0.0233aa (2.260)	1.756a (6.289)
Episode length (quarters)	-0.079 (-0.92)	0.004 (1.530)	0.036a (9.052)

Note: a(aa) denotes significantly different from zero at the 1 % (5 %) level

The volatility persistence as estimated with I-GARCH model is reported in Table 4. The persistence coefficient is 1.048 for Nigeria, 0.089 for South Africa, 1.132 for Togo, 1.189 for Ghana, 1.189 for Rwanda, 1.056 for Botswana, 1.093 for Mali, 0.334 for Equatorial Guinea, 0.015 for the Cape Verde, 0.144 for Burkina Faso and 1.258 for Mauritius. In effect, the coefficients of volatility determination are statistically significant for Nigeria, Ghana, Rwanda, Botswana, Mali, Cote d' Ivoire, cape Verde and Mauritius. This degree of persistence which exceeded one was obtained as the sum of θ and δ in the I-GARCH model.

Thus, volatility risk effect of exchange rate is extremely boundless in Nigeria, Ghana, Ethiopia, Botswana, Mali, Cote d' Ivoire, Cape Verde and Mauritius. Hence, foreign exchange markets in these countries are branded by explosive volatility which implies that volatility in exchange rate is boundless in these countries and hence exits for a longer period. Nevertheless, in other SSA countries namely, South Africa, Equatorial Guinea and Burkina Faso, exchange rate volatility is covariance stationary. This implies that high shocks of volatility in exchange rate in South Africa, Equatorial Guinea and Burkina Faso is temporary as it dies off gradually.

Table 4. Estimates of volatility persistence based on I-GARCH model

Variables	Nigeria	S/Africa	Togo	Ghana	Rwanda	Botswana
θ	0.592 (0.001)	0.021 (0.467)	0.883 (0.000)	1.037 (0.000)	0.462 (0.045)	1.097 (0.000)
δ	0.456 (0.001)	0.148 (0.001)	0.249 (0.001)	0.152 (0.001)	0.594 (0.001)	0.162 (0.001)
Persistence	1.048a	0.089	1.132a	1.189a	1.056a	1.259a
$\lvert\theta+\delta 1\rvert<1$	Explosive	Stationary	Explosive	Explosive	Explosive	Explosive
AIC	-7.034	-6.134	-9.834	-1.034	-1.834	-7.214
SC	-0.160	-1.260	-1.360	-0.260	-1.160	-1.360
HQC	-1.793	-3.493	-3.293	-3.290	-1.293	-3.295
Log-Likelihood	18.524	126.74	9.574	22.574	1.574	6.572
Variables	Mali	E/Guinea	Cote d' Ivoire	Cape Verde	Burkina Faso	Mauritius
θ	0.015 (0.002)	0.170 (0.000)	0.194 (0.022)	0.233 (0.000)	0.592 (0.001)	1.116 (0.000)
δ	1.078 (0.000)	0.164 (0.024)	1.803 (0.056)	0.782 (0.000)	0.031 (0.005)	0.142 (0.007)
Persistence	1.093a	0.334	1.997a	1.015a	0.623	1.258a
$\lvert\theta+\delta 1\rvert<1$	Explosive	Stationary	Explosive	Explosive	Stationary	Explosive
AIC	-5.092	-6.554	-2.837	-5.831	-2.839	-2.855
SC	-4.365	-0.260	-1.365	-2.362	-9.362	-7.361
HQC	-3.256	-4.916	-3.291	-5.292	-7.294	-1.293
Log-Likelihood	6.574	4.573	12.578	4.576	46.579	11.574

Note: "a" indicate volatility persistence is significant

Tables 5 and 6 reported the I-GARCH model summary statistics with the ARCH-LM test statistics for Nigeria, Ghana, Mali, Cote d 'Ivoire, Rwanda, Cape Verde and Mauritius statistically significant at 5 % level but at 10 % level for South Africa, Togo, Benin Republic and Equatorial Guinea. The colossal values of skewness and kurtosis for standardized residuals of volatility in exchange rate of some SSA countries points to a superfluous nature which indicate departure from normality.

Also, with Jarque-Bera (J-B) statistics of 1795.241 for Nigeria, 1895.335 for Ghana, 1555.233 for Rwanda, 1456.003 for Mali, 1720.049 for Cote d' Ivoire, 1576.200 for Cape Verde and 12475.100 for Mauritius respectively, the J-B test reject normality even at 1 % significant level for Nigeria, Togo, Ghana, Mali, Cote d' Ivoire, Rwanda, Gambia, Botswana,Mauritius and Burkina Faso rrespectively. Indeed, evidence of heteroskedasticity exists in the I-GARCH model while same cannot be denoted for E-GARCH model. In effect, the standardized residuals are enormous and as such do not conform to normal distribution.

Table 5. I-GARCH model summary statistics

Variables	Nigeria	S/Africa	Togo
ARCH-LM (N^*R^2)	139.0274 (0.000)a	112.014 (0.040)aa	119.071 (0.023)aa
Skewness	1110.179	127.361	119.562
Kurtosis	1200.286	114.116	116.186
J. B. Stat	1795.241a	10.220aaa	15.112aa

Variables	Mali	E/Guinea	Cote d' Ivoire
ARCH-LM (N^*R^2)	0.067 (0.000)a	101.573 (0.000)a	0.134 (0.000)a
Skewness	1124.267	181.369	1426.069
Kurtosis	1156.971	123.267	1315.286
J. B. Stat	1456.003a	132.548aa	1720.049a

Note: p-value are reported in parenthesis a(aa)(aaa) indicates significance @ 1 %, 5 % (10 %)

Table 6. I-GARCH model summary statistics

Variables	Ghana	Rwanda	Botswana
ARCH-LM (N^*R^2)	145.055 (0.000)a	139.600 (0.000)a	113.0222 (0.000)a
Skewness	1123.065	1145.779	1113.095
Kurtosis	117.006	1100.331	147.552
J. B. Stat	1895.335a	1555.233a	11.345aaa
Variables	Cape Verde	Burkina Faso	Mauritius
ARCH-LM (N^*R^2)	0.026 (0.000)a	163.027 (0.000)a	0.001 (0.000)a
Skewness	117.569	1410.161	1012.345
Kurtosis	138.186	1110.186	1119.286
J. B. Stat	1576.200a	162.000aaa	12475.100a

Note: p-value are reported in parenthesis a(aa)(aaa) indicates significance @ 1 %, 5 % (10 %)

Consequently, volatility in exchange rate rises absolutely pointing to high degree of abnormality in exchange rate market distribution in Nigeria, Togo, Ghana, Mali, Cote d' Ivoire, Rwanda, Cape Verde, Mauritius and Burkina Faso. This is further buttressed by the skewness and kurtosis statistics which are excessive in value and by implication reflecting that the foreign exchange markets in Nigeria, Togo, Ghana, Mali, Cote d' Ivoire, Rwanda, Cape Verde, Mauritius and Burkina Faso are branded by instability. In sum, our empirical distribution validates existence of high conditional volatility in Nigeria, Togo, Ghana, Mali, Cote d' Ivoire, Rwanda, Cape Verde, Mauritius and Burkina Faso.

The colossal values of skewness and kurtosis for standardized residuals of volatility in exchange rate series of some SSA countries points to a superfluous nature which indicate departure from normality. In effect, a highly leptokurtic distribution is observed for the aforementioned SSA countries.

5. Conclusion

This paper offers evidently that in SSA countries like South Africa, Burkina Faso and Equatorial Guinea, shocks of volatility in exchange rate are temporary and hence dies off gradually. Basically, in South Africa, Burkina Faso and Equatorial Guinea, the exchange rate volatility is covariance stationary indicating certainty of convergence after perturbation to exchange rate equilibrium. Specifically, evidence of high volatility shocks in exchange rate gradually dies off in South Africa, Burkina Faso and Equatorial Guinea.

Conversely, high shocks of volatility in exchange rate are explosive and highly persistent in some SSA countries namely, Nigeria, Ghana, Botswana, Mali, Togo, Cote d' Ivoire, Rwanda, Cape Verde, and Mauritius. This points to high degree of abnormality in exchange rate market distribution in the aforementioned SSA countries. Nonetheless, the study accordingly remark the requisite for exercise of dynamic control in management and monitoring of foreign exchange markets constantly in the aforesaid SSA in line with global code of forex market conduct to ensure a non-volatile behavior of the local currencies. This would aid in damping exchange rate speculations. Also, African governments have to apply concerted policy efforts in eliminating external constraints facing SSA countries in conduct of forex policies.

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