International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. IX, Issue 10, Oct 2021

http://ijecm.co.uk/

EXCHANGE RATE VOLATILITY AND ECONOMIC GROWTH IN ANGLOPHONE COUNTRIES

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Abstract

This study investigates the impact of exchange rate volatility on economic growth within the Anglophone countries, using time series data, spanning from 1980 to 2019. GARCH was adopted to establish the existence of volatility, while panel data analysis was used to examine the relationship between the two variables and Panel ARDL was adopted to assess the magnitude of the effects of exchange rate volatility on output growth. The result of volatility test from GARCH confirmed the presence of volatility in Real Effective Exchange Rate (REER) in Anglophone countries. The ARDL results revealed that, exchange rate volatility shows a direct, but insignificant relationship with economic growth in the same region both in the short-and long-run. The paper recommended that exchange rate policy that would guarantee trade and exchange competitiveness is required. The competitiveness in this area could only be achieved if more values are added to the exportable goods before being exported out of the countries.

Keywords: Exchange Rate, Volatility, Economic Growth, Anglophone

INTRODUCTION

The relationship between exchange rate volatility and economic growth has generated serious debate among scholars all over the world. Economic theory suggests that currency devaluation leads to reduction in the price of goods and services for the country, thereby making their products cheaper at global market. This engenders an increase in the demand for such goods and services from that country and in turn leads to increase in output (Genye, 2011). In line with this theory, several policy measures were taken by various governments in Anglophone zone to ensure increase in output level which includes the adoption of flexible exchange rate that led to the devaluation of their currencies. The aim of this policy was to make their products cheaper at international market, thereby stimulating economic growth. However, after the adoption of this policy by some of the Anglophone countries, the nominal exchange rate becomes more volatile (Suranovic, 2005).

In Nigeria for instance, the value of naira was slightly depreciated against US dollar from N0.77 in 1984 to N0.89 in 1985 accounting about for 14.2 per cent depreciation and economic growth in Nigeria also move from negative 2.0 per cent to 5.1 per cent during the same period. However, the Nigerian currency further falls in value \against US dollar when it fells from N22.07 in 1993 to N21.99 in 1994, representing 0.32 per cent appreciation. During the same period, economic growth declined from 2.1 per cent to 0.9 per cent. Also, Sierra Leonean Leone depreciated against US dollar from le313.8441 in 1981 to 386.6293 in 1982, representing 23.19 per cent depreciation but output growth increased from 2.89 per cent to 4.78 per cent during the same period. However, when Sierra Leonean Leone appreciated against US dollar, from le124.1068 in 2002 to le102.2987 in 2003, accounting for 17.57 per cent, output growth fell from 26.27 to 9.38 per cent in the same period (WDI, 2016). This implies that, devaluation of exchange rate may necessarily lead to economic growth. These developments indicate that there is a link between exchange rate and economic growth in these countries, but in different direction. Hence, to ascertain the direction and the real effect of exchange rate volatility on economic growth, this study examines the impact of exchange rate volatility on economic growth in Anglophone countries.

Several empirical studies have reviewed the impact of exchange rate volatility on economic growth in both developed and developing countries such as: Balswin, Skudely & Taglioni (2005); Korsu & Braima (2006); Klassen (2011); Erldal, Erdal & Esengu (2012); Madesha, Chidoko & Zivanomoyo (2013); Rasaq (2013); Otuori (2013); Akinlo & Lawal (2015); Ismaila (2016) and Olalere & Tawose (2019).

Alagidede, & Ibrahim (2016) employed GARCH and GMM to investigate the impact of exchange rate on economic growth and found out that, real exchange rate volatility has long-run

significant negative impact on economic growth in Ghana. However, Munthanhi, Simwaka & Nwale, (2010) adopt co-integration to examine the impact of devaluation of REER on economic growth in Malawi between 1970 and 2017. The study concludes that devaluation of the REER has positive, but insignificant relationship with economic growth in Malawi. Danladi & Uba (2016) used GARCH to investigate the impact of exchange rate volatility on economic growth in Nigeria, between 1973 and 1996, found that, exchange rate volatility has significant negative impact on economic growth in Nigeria and Ghana. Also, Arize, Osang & Slottje (2000) employed Johansen multivariate method and ECM to determine the effect of volatility on export in thirteen (13) less-developed countries, between 1980 and 2010 and the study concluded that exchange rate volatility has negative impact on export flow in the countries. On the contrary, Sani, Hassan & Azam (2016) using co-integration and ECM to investigate the impact of exchange rate volatility on output in English speaking countries within ECOWAS, between 1991and 2014, submitted that, exchange rate volatility has significant positive relationship with output growth in visually all the Anglophone countries, except Liberia. Olalere & Tawose (2019) employ GARCH and Panel ARDL to examine the impact of exchange rate volatility on economic growth in French speaking countries within ECOWAS sub region and discovered that, exchange rate volatility and economic growth said to have significant positive relationship in the long run.

From the empirical studies review in this paper, it is obvious that there are conflicting findings, therefore, the impact of exchange rate volatility on economic growth remain inconclusiveness. There is no consensus on the impact of exchange rate volatility on economic growth and these divergent opinions might be due to economic environment differences and perhaps due to non-inclusion of some important variables in the models. To address this gap, this study includes variables such as; export, international interest rate, inflation rate, real effective exchange rate, as well as, exchange rate volatility into panel ARDL to examine the impact of exchange rate volatility on economic growth in English speaking countries in ECOWAS region.

The study covers the period between 1980 and 2019 and focuses on Anglophone countries. The period between 1980 and 2019 covers both pre-SAP and post-SAP eras. The length of the period allows the study to examine and establish the long run relationship between exchange rate volatility and economic growth in the sub-region and understanding of this concept will enhance economic growth and sustainable development, especially in Anglophone countries. Precisely, the period is long enough to meet the minimum observation requirement for the Panel ARDL estimation technique. Anglophone countries within ECOWAS consist of Nigeria, Ghana, Gambia, Sierra Leone and Liberia. Four countries (Nigeria, Ghana, Sierra Leone and Gambia) were selected for the study. The selection criteria were based on size,

common monetary policy, economic union, gross domestic product, as well as volume of their exports.

METHODOLOGY

Model Specification

This study adopts a single equation to establish a robust relationship between exchange rate volatility and economic growth. The model for the study is in linear form and mirrors the theoretical proposition of Balassa-Samuelson's approach used to establish relationship between economic growth and exchange rate, developed by Balassa (1964) and Samuelson (1964) and employed by Harberger (2003), and Yanping, *et al.,* (2010). The model is stated below.

$$RGDPgr_{it} = f(VOL_{it}, EXP_{it}, INF_{it}, RINT_{it}, REER_{it}) \quad \text{.....3.11}$$

The modified model is explicitly specified as follow:

$$RGDPgr_{it} = \alpha_0 + \alpha_1 VOL_{it} + \alpha_2 EXP_{it} + \alpha_3 INF_{it} + \alpha_4 RINT_{it} + \mu_{it} \quad \text{.....3.14}$$

Where RGDPgr is growth rate of Real Gross Domestic Product, REER is Real Effective Exchange Rate, VOL is Exchange Rate Volatility, EXP is Export, INF is Inflation rate, RINT is Real Interest Rate, i entity or country, t is time or year, $u_{[t}$ is error or stochastic terms, α_0 is the intersect and $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ are the coefficients of the variables.

Sources of Data

The data set for this study consists of annual time series spanning from 1980 to 2019. Data on the growth rate of Real Gross Domestic Product, Real Effective Exchange Rate, Inflation, Real International Interest Rate, as well as, percentage of exports to GDP were sourced from World Development Indicator WDI (2017), while data on volatility in exchange rate was derived from GARCH results.

Estimation Techniques

The estimation techniques employ are GARCH and Panel Auto-regressive Distribution Lag (ARDL). The choice of GARCH is informed by the need to establish the existence or otherwise of exchange rate volatility, while Panel ARDL was employed to determine the impact of exchange rate volatility on economic growth. Unit root test is carried out to determine the time series characteristics of the variables in the model. Panel ARDL technique is also employed to examine both the short- and long-run relationship between exchange rate volatility and output growth in Anglophone countries.

RESULTS

Descriptive Statistics

Table 1: Descriptive Statistics of Variables

Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
RGDPgr	156	3.5210	6.2817	-20.4909	33.7358
REER	156	216.6013	375.0188	49.7773	3660.639
RINT	156	3.6175	16.8857	-51.6175	33.4668
EXPT	156	27.0216	11.7752	3.3383	59.9027
INF	156	22.4364	27.1320	-35.8367	48.7003

In the Table 1, the results of the estimated mean value which show the distribution of data, indicates that REER recorded the highest mean value of 216.60, followed by 27.0216 for EXPT, while INF, RINT and RGDPgr have the mean value of 22.44, 3.62 and 3.52, respectively. Standard deviation which measures the variability are all positive. Variable like REER (375.02) has highest standard deviation which indicates highest variability, while other variables like INF (27.1320), RINT (16.89), EXPT (11.78) and RGDPgr (6.28) have low standard deviations with low variability.

Volatility Test

This section employs ARCH/GARCH method to test for the existence of volatility in exchange rate or otherwise among English speaking countries. The results of the ARCH/GARCH are presented in Table 2.

Table 2: ARCH/GARCH Volatility Test

Dependent Variable: REER				
Method: ML ARCH - Normal distribution (OPG - BHHH / Marquardt steps)				
Pre-sample variance: backcast (parameter = 0.7)				
GARCH = C(4) + C(5)*RESID(-1)^2 + C(6)*GARCH(-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
GARCH	0.0009	0.0003	3.5276	0.0004
Variance Equation				
C	300720.2	119125	2.5244	0.0116
RESID(-1)^2	0.6383	0.3537	1.8046	0.0711
RESID(-2)^2	0.9343	0.1473	6.3438	0.0000
GARCH(-1)	0.8794	0.5055	-1.7394	0.082
GARCH(-2)	0.6511	0.2340	-2.7820	0.0054
R-squared	0.5662	Mean dependent var	358.8342	
Adjusted R-squared	0.5662	S.D. dependent var	714.5036	
S.E. of regression	470.6228	Akaike info criterion	14.4186	
Sum squared resid	7752005	Schwarz criterion	14.6826	
Log likelihood	-253.536	Hannan-Quinn criter.	14.5107	
Durbin-Watson stat	1.2067			

The GARCH ε_{t-1}^2 term is the volatility from previous period measures as the lag of the square residual from the mean equation is 0.93 and the GARCH term σ_{t-1}^2 is the last period forecast variance is 0.65 (Table 1.2). They are both significant at 5% level.

The rule of thumb here is that: If $\alpha + \beta$ is less than 0.5, there is no volatility, If $\alpha + \beta$ falls between 0.5 and 1, there is volatility and If $\alpha + \beta$ is greater than 1, this is a case of overshooting.

The sum of the two coefficients is 0.93 is between 0.5 and 1. This confirms the existence of volatility in real effective exchange rate across Anglophone countries.

Panel Unit Root Test

The methods of panel unit root test adopted for this study are Im, Pesaran & Shin (IPS) and Augmented-Dickey Fuller (ADF) tests. These tests have been proved to be suitable in verifying stationary of variables in panel data (Maddala & Wu, (1999) and Im, Pesaran & Shin, (2003)). For comparison and clarification, the ADF Fisher unit root test was also used. The results are presented in Table 3.

Table 3: Panel Unit Root Test

	AT LEVEL				FIRST DIFFERENCE				
Variable	**IPS Statistic**	**Prob.**	**ADF-Fisher Chi^2**	**Prob.**	**IPS Statistic**	**Prob.**	**ADF-Fisher Chi^2**	**Prob.**	
RGDPgr	-5.7657	0.0000	48.2077	0.0000	____	____	____	____	I(0)
VOL	-4.2372	0.0000	24.2819	0.0000	____	____	____	____	I(0)
REER	-1.3388	0.0903	13.8809	0.0849	-8.7979	0.0000	53.2174	0.0000	I(1)
RINT	-3.3997	0.0003	27.2104	0.0007	-18.9660	0.0000	150.6380	0.0000	I(1)
EXPT	-02236	0.415	11.0902	0.1966	-6.1349	0.0000	109.2010	0.0000	I(1)
INF	-2.8571	0.0021	22.6499	0.0038	-9.3498	0.0000	82.3331	0.0000	I(1)

The results of panel unit root test on table 3 examine the statistical prosperities of all the variables using the Im, Peseran & Shin (IPS) and ADF- Fisher Chi-square panel unit root model. The null hypothesis tested for the IPS and ADF is $H_0 : \alpha_1 = 0$ for all countries, while the alternative hypothesis is $H_1 : \alpha_1 < 0$, for at least one country. The lag lengths are selected using the Akaike Information Criterion. The results of the test of all the variables are stationary at first difference except RGDPgr and VOL which were found to be stationary at their levels. The rule of thumb is that, the null hypothesis should be accepted, if the IPS and ADF statistics are negative, meaning that, greater than the critical value at any chosen level of significance. The

results of IPS and ADF in Table 3 indicate that RGDPgr and VOL were found to be integrated of order zero, that is, *I(0)*while REER, RINT, EXPT and INF were found to be integrated of order one, that is, *I(1)*.

Table 4: Bound Test Result for Anglophone

ARDL Bounds Test		
Included observations: 142		
Null Hypothesis: No long-run relationships exist		
Test Statistic	**Value**	**K**
F-statistic	18.4153	4
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	2.45	3.52
5%	2.86	4.01
2.50%	3.25	4.49
1%	3.74	5.06

Table 5: Bound Test for Cointegration

	5% Critical Value		**1% Critical Values**	
	Lower	Upper	Lower	Upper
Restricted Intercept No trend	2.27	3.28	2.88	3.99
Unrestricted Intercept No trend	2.45	3.16	3.15	4.43

The rule says that, if the computed F-statistics falls below the lower bound value I(0), the null hypothesis is (no cointegration) is accepted. Also, if the computed F-statistics exceeds the upper bound value I(1), the null hypothesis is rejected thus, there is existence of long-run relationship. If the computed result falls between the lower and upper bounds, then the test is inconclusive. Based on this, the result of bound test from Table 4 shows that, the null hypothesis of no cointegration is rejected since the F-statistic value of 18.42, higher than the upper bound critical value of 3.28 (restricted) at 5% level of significance from Table 5.

Panel ARDL Long Run and Short Run Analyses for Anglophone

Table 6: Panel ARDL Long Run and Short Run Results for Anglophone

Dependent Variable: D(RGDPgr)				
Dynamic regressors (4 lags, automatic): VOL RINT INF EXPT				
Selected Model: ARDL(1, 1, 1, 1, 1)				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
Long Run Equation				
VOL	2.66E-05	0.001426	0.018638	0.9852
RINT	0.015928	0.050036	0.318324	0.7508
INF	-0.071345	0.030501	-2.339080	0.0210**
EXPT	0.054110	0.033571	1.611818	0.1097

Table 6…

Short Run Equation				
COINTEQ01 (ECM)	-0.897131	0.128335	-6.990517	0.0000***
D(VOL)	0.000688	0.008535	0.080649	0.9359
D(RINT)	0.049388	0.044365	1.113220	0.2679
D(INF)	0.036484	0.021626	1.687016	0.0094
D(EXPT)	0.094008	0.143158	0.656670	0.5127
C	3.020977	0.240687	12.55148	0.0000***
Akaike Info Criterion	5.839009			
Schwarz Criterion	6.416473			
Hannan-Quinn Criterion	6.073658			

*Note: * 10 % level significance, ** 5% level of Significance and *** 1% level of significance*

From Table 6 above, long run equation indicates that, exchange rate volatility, real interest rate and export show a positive but insignificant relationship with economic growth in Anglophone countries. This implies that an increase in exchange rate volatility, real international interest rate and export lead to about 0.003, 1.59 and 5.41 per cent increase in output growth respectively, in Anglophone countries. However, this positive impact is found not to be significant in the long run. This finding may be due to peculiar challenges, such as, corruption, policy inconsistency, improper implementation of formulated policies, as well as, bureaucratic bottleneck often confront most Anglophone countries within ECOWAS region. The result is supported by Azeez, *et al.*, (2002); Rasaq, (2012); and Huchet-Bourdon, *et al.,* (2013) by concluding that, exchange rate volatility has direct impact on economic growth. However, Inflation shows a negative, but significant relationship at 5% level with economic growth. This suggests that, a unit increase in rate of inflation will lead to about 7.14 per cent decrease in economic growth. This implies that, high price level of goods and services discourages consumptions thereby leading to the reduction in output level. This result is in line with the a prior expectation and supported by the findings of Danladi (2013), who submits that, inflation has negative impact on economic growth in West African countries. The result shows that exchange rate volatility though has positive relationship with economic growth does not have any significant impact on economic growth in the long run. This may be due to low value of tradable goods and services coming from English speaking countries to other countries of the world.

Furthermore, short run results confirm the presence of co-integration among the variables adopted in the equation. The results show that, the first difference of exchange rate volatility D(VOL), real international interest rate D(RINT), inflation D(INF) and export D(EXPT) exhibit a direct relationship with economic growth in Anglophone countries. This result is in-line with the finding of Rasaq (2013); Akinlo & Lawal (2015) and Olalere & Tawose (2019) who

submit that exchange rate volatility exhibit positive relationship with economic growth. However, only inflation is found to be significant, while other variables in the model are not found to be significant in the short run. This implies that a unit increase in exchange rate volatility will lead to about 0.07 per cent increase in economic growth. Similarly, a unit increase in real international interest rate will lead to about 4.94 per cent increase in economic growth in the short run. Again, a unit increase in the level of inflation will lead to about 3.65 per cent increase in economic growth. In the same direction, a unit increase in export will result in about 9.40 per cent increase in output growth.

This finding is in tandem with Erdal, Erdal, & Esengu,, (2012) submission that a long run positive relationship exists between REER volatility and Agricultural export in Turkey. Although, first difference of Exchange Rate Volatility (VOL), Real International Interest Rate (RINT), Inflation D(INF) and Export (D(EXPT) seems to have a positive relationship with economic growth in the sub-region, but not significant at 5% level in short run. The coefficient of ECM which measures the speed of adjustment back to equilibrium is -0.897131. This is significant at 1% level with a negative sign, indicating that about 89.71% of previous disequilibrium is adjusted in the model in the short run within the Anglophone countries.

DISCUSSION OF FINDINGS

In line with the objective of this study, various econometric tests including GARCH model were conducted in this study. The result shows the presence of volatility in REER across all the selected countries within Anglophone countries. This result agreed with the findings of Olimov, *et al.*, (2008) and Olalere & Tawose (2019) who submitted that, there is existence of volatility in the rate of exchange rate. Again, stationary test was conducted first to detect spurious regression, using Im, Pesaran and Shin (IPS) and Augmented-Dickey Fuller (ADF Fisher). The results revealed that all the series are not integrated of the same order. While REER, EXP, RINT, and INF are stationary at first difference, RGDPgr and VOL are said to be stationary at their levels. The condition for panel co-integration has not been met, therefore, the study proceeds to Panel Autoregressive Distributed Lag (ARDL). Before adopting panel ARDL, Bound test was conducted to know if the variables co-integrate in the long run. The result of bound test confirms the existence of a long run relationship among the variables within the region. The panel data analysis was then conducted to analyze the impact of exchange rate volatility on economic growth.

The short run ARDL results show that, exchange rate volatility, real international interest rate, inflation and export exert positive impacts on economic. This indicates that, increase in these variables lead to an increase in the level of economic growth in the short run. However,

these impacts are found to be insignificant in the short run. This might be because of low transmission mechanism of monetary policies in the region. In the same region, the long run results indicate that most of the variables impacted positively. Again, this suggests that, an increase in exchange rate volatility, international interest rate and export lead to an increase in economic growth in the long run. However, inflation is found to have a negative impact on economic growth. Therefore, an increase in the level of inflation results to a reduction in the level of output growth in the long run in Anglophone countries. It means that, higher price level discourages consumption, thereby leading to the reductions in output growth. This result is in-line with our a prior expectation and supported some literature who submitted that, inflation has negative impact on economic growth in West African sub-region.

CONCLUSION AND POLICY RECOMMENDATIONS

Sequel to the findings of this study which shows that, exchange rate volatility has positive but insignificant impact on Economic growth in Anglophone countries both in the short run and in the long run. This might be as a result of inability of policy makers to formulate policies gear towards achieving the needed economic reforms such as harmonization of monetary and fiscal policies which are necessary vehicles to drive the needed Economic growth in English speaking countries. This may be attributed to lack of institutional frameworks and high quality of public investment. In view of the aforementioned, the paper therefore recommends that, monetary authorities in Anglophone Countries should formulate exchange rate policies that will guarantee competitiveness among the exporters. Also, governments in this sub-region should encourage producers in their various countries to add more value to their products before exporting them to international market. This innovation will open-up more markets for the products coming from Anglophone countries and consequently increases the level of economic growth within the English speaking countries within ECOWAS sub region.

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