TOPIC, EXCHANGE RATE AND GROWTH OF AFRICAN ECONOMIES: A STUDY OF SELECTED SUB-SAHARAN AFRICAN COUNTRIES, 1999-2021

AMBAM, AWAH PRIDY*

Department of Banking and Finance, University of Nigeria.
*Corresponding Author Email: ambampridy@yahoo.com

HERBERT, UGOCHINYERE

Department of Banking and Finance, University of Nigeria.

BABARINDE, GBENGA FESTUS

Department of Banking and Finance, University of Nigeria.

SUNDAY ATADIOSE

Department of Banking and Finance, University of Nigeria.

J.U.J ONWUMERE

Professor, Department of Banking and Finance, University of Nigeria.

Abstract

This study evaluated the contribution of exchange rate on economic growth to in thirty-eight (38) African countries over the period 1999 to 2021. The objectives of the study were to specifically: i) Determine the effect of Real effective Exchange rate on growth of Sub-Saharan economies. ii) Evaluate the effect of monetary mass on growth of the Sub-Saharan economies. iii) Determine the effect of exchange rate volatility on growth of the Sub-Saharan economies. The research utilized secondary data sourced from the International Monetary Fund's Financial Access Survey and the World Bank's World Development Indicators. Furthermore, the thesis employed the two-step system generalized method of moments dynamic panel model estimator in order to ascertain the impact of exchange rate on economic growth in African economies; A study of Sub Saharan Africa countries 1999-2021. The findings of the study revealed that, real effective Exchange rate had a statistically non significant impact on growth of Selected Sub-Saharan economies. ii) Monetary mass had a statistically non significant effect on growth of Selected Sub-Saharan economies. iii) Exchange rate volatility had a negative and non significant effect on growth of the Selected Sub-Saharan. Recommendation The government should build up foreign exchange reserves to buffer against external shocks and maintain exchange rate stability. This will help reduce vulnerability to sudden capital outflows and the negative impact on economic growth.

1. INTRODUCTION

In today's interconnected world, Exchange rates allow countries to sell their domestically produced goods and services to other countries around the world (Adewuyi, 2002). Since no country can grow without trade or exchange, foreign exchange has played a crucial role in restructuring the economic and social attributes of countries worldwide, especially in SSA (Van de Merwe & Mollentze, 2010). Exchange rate policies in developing countries are often sensitive and controversial, mainly due to the structural transformation required, such as reducing imports or expanding exports (Abebiyi, 2007). According to Hsing

(2016), a competitive and well-managed exchange rate promotes a suitable economic environment conducive to expanding international trade and investment, leading to higher economic growth. Interestingly, exchange rates are among the crucial macroeconomic indicators that influence a wide range of other macroeconomic aggregates (Onyeiwe, 2012; Bhattacharya et al., 2009), including gross domestic product (GDP), inflation rate, money supply, interest rate, inflation volatility, foreign direct investment, and stock market prices. The foreign exchange rate, which determines the value of one country's currency in another currency, significantly impacts the real value of a country's money. Dotsey et al. (2003), Habib et al. (2017), Morena et al. (2020), and Gibescu (2010) have all highlighted the profound influence of exchange rates on economies

Focusing on Sub-Saharan Africa (SSA), it is a region with a high concentration of low-income and low-human-development countries. Exchange rate, interest rate, and other macroeconomic indicators play an inevitable role in the economic development of these countries. Unlike other regions, exchange rate regimes in SSA countries vary greatly and have evolved over time. The appropriate exchange rate regime for a country depends on its macroeconomic challenges and specific circumstances.

Exchange rates in SSA have been highly volatile since the late 1990s due to various economic factors, including commodity prices, fiscal policies, and global economic conditions. The impact of exchange rate fluctuations is complex and context-specific, depending on factors such as misalignment, interest rates, inflation, and money supply. The average annual GDP growth rate in SSA was 4.6% from 1999 to 2019, but with significant variations across countries and periods. In recent years, the exchange rates of some major currencies in SSA, such as the South African Rand, the Nigerian Naira, and the Ghanaian Cedi, have depreciated against the US dollar and other currencies.

Empirically most literature have emphasized on the need to manage exchange rate **Oloso and Ogbuji (2021) Abebiyi(2007)** . It aims to ensure exchange rate stability, maintain a favorable external reserve position, reduce capital flight, ensure external and internal balance, and diversify the export base of the economy. The choice of an exchange rate regime in developing countries depends on both development and growth strategies. Exchange rate undervaluation indicates that the currency is lower than it should be, while exchange rate overvaluation means that the exchange rate is higher than it should be.

Despite efforts to stabilize Sub-Saharan economies since the 1980s through structural adjustment programs (SAPs) recommended by the World Bank and IMF, exchange rates in these economies remain unstable, leading to declining incomes, deteriorating living standards, rising unemployment, increasing poverty, high debt levels, currency crises, high exchange rate volatility, high inflation, balance of payment deficits, and slow economic growth (ILO, 1996). Sub-Saharan Africa is one of the regions of the world where most countries have experienced slow or negative real income growth at some point (Jelilov & Yakubu, 2015). In response to these challenges, Sissoko and Dibooglu (2006) (Ajao & Igbekoyi, 2013), proposed that exchange rate management measures should be

implemented to mitigate these problems. Since exchange rate and other macroeconomic indicators play a critical role in economic development (Adeniran, 2014), there is a need for proper and sustainable exchange rate management policies to limit future exchange rate problems that could hinder the growth of Sub-Saharan countries.

2. REVIEW OF SELECTED LITERATURE

Oloso and Ogbuji (2021) employed a system-GMM dynamic panel analysis to investigate the relationship between exchange rate policy and economic growth in a sample of 40 Sub-Saharan African countries from 1970 to 2010. The findings suggest that exchange rate policy has a significant impact on economic growth, with appropriate exchange rate management contributing to higher growth rates. Carlos (2020) studied the determinants of the real exchange rate using macroeconomic variables, and whether they can predict it. A panel data was used; which estimator is system GMM that allows controlling the endogeneity of the variables. The transformed the variables with forward orthogonal deviations (FOD) and first difference (FD), which allows us to eliminate unobserved effects that are invariant in time.

To check the robustness of the estimates, different periods were used, from 1980-2019, 2000-2019 and 2010-2019. For the period 1980-2019, it is found that the past values of the real exchange rate, the current values of inflation, economic growth, fiscal and monetary policy have positive effects on the current values of the real exchange rate, while the money supply and the terms of trade have negative impacts on the real exchange rate. For the period 2000-2019, we had similar results and for the period 2010-2019, we found that economic growth has negative impacts on the real exchange rate. It is also presented the Arellano-Bond test and the Sargan test to estimate model over-identification. Using the Pedroni test, we estimated the cointegration of the variables with respect to the real exchange rate, finding cointegration with inflation in the long run.

Boopen (2018) Investigated the determinants of exchange rate in selected Sub-Saharan African countries using single-country estimation techniques. In particular, an autoregressive distributed lag (ARDL) model is employed to examine the determinants of exchange rate in nine SSA countries using annual data spanning from 1980 to 2013. Our findings show that the long-run and short-run relationships between exchange rate and its determinants rely upon the country investigated. Sylvia and Emeka (2002) examined empirically exchange rate determinants in African sub-Sahara countries specifically Anglophone West African countries like The Gambia, Ghana, Liberia, Nigeria, and Sierra Leone between 1981 and 2019. In order to achieve this objective, both descriptive statistics and the Panel Least Square (PLS) estimation methods were employed to analyze the data. The result of the analysis reveals that INFL has a negative relationship with EXCR but it does impact significantly on it at 5 percent level; INTR has negative and an insignificant impact on EXCR at 5 percent level; CABL has negative relationship with EXCR and it also impacts significantly on it at 5 percent level; TMTR has negative relationship with EXCR and it also impact significantly on it at 5 percent level. The study

therefore concludes that inflation rate (INFL), current account balance (CABL) and terms of trade (TMTR) depreciates exchange rate (EXCR) in African sub-Sahara countries specifically Anglophone West African countries. Based on the findings of the research work, the following are recommended: The government should encourage export diversification especially the non-oil sector exports. This can be achieved through value addition to both the agriculture and manufacturing sub-sectors output. There should be stable exchange rate management policy that avoids over-valuation or excessive depreciation of their currencies and ensures international competitiveness of tradable goods, relative price stability as well as avoiding inconsistent fiscal policies.

3. METHODOLOGY

This study used an *ex post facto* research design (descriptive), secondary data was obtained from the statistical economic report of World Development indicators from (1999-2021) using the judgment /purposive sampling technique. This paper employs panel data, which was also employed by Kodongo and Ojah (2013) and Alege and Osabuohien (2015) because of its significant advantage of combining time series and cross-sectional data. The study made use of the Generalized method of moments (GMM) estimator, which is a method for estimating dynamic panel data models in the presence of endogeneity. The population for this study comprised 45 Sub-Saharan African countries, and the sample consists of 38 countries selected based on data availability on all metrics and reliability. The 38 SSA countries are listed as follows: Angola, Burundi, Benin, Burkina Faso, Botswana, Central African Republic, Cote d'Ivoire, Cameroon, Republic of Congo (Brazzaville), Democratic Republic of the Congo (Kinshasa), Comoros, Cape Verde, Ethiopia, Equatorial Guinea, Gabon, Ghana, Guinea, Gambia, Kenya, Lesotho, Madagascar, Mali, Mozambique, Mauritius, Malawi, Namibia, Niger, Nigeria, Sudan, Senegal, Sierra Leone, Seychelles, Chad, Togo, Tanzania, Uganda, South Africa, Zambia

Table 1: Variable Description

Table1: Abbreviations of variables, measures, sources and their expected signs

Table1: Abbreviations of variables, measures, sources and their expected signs				
Variables	Acronym	Measures	Source	Expected signs
Dependent variables				
Economic growth	GDP	-GDP (current USD)	IMF (2021)	
Independent variables				
effective exchange rate	Lerner	weighted average of currencies / price index	WDI(2022)	-/+
Monetary mass	MM	Broad money	WDI (2022)	+/-
Exchange rate volatility	Volat	Exchange rate fluctuations	WDI (2022)	+/-
inflation	INF	Consumer price index	WDI (2022)	+
Control variables				
- Education	Educ	Total enrollments in schools	WDI (2022)	+

- Information and communication technologies	ICT	Mobile cellular subscription per 100 people	WDI (2022)	+
- Gross fixed capital formation	Fix	Fixed capital (% of GDP)	WDI (2022)	-/+
Terms of trade	TOT	Export value/Import value	WDI (2022)	-/+

Source: Constructed by the author from literature

This study anchored on the model used by Amir K. and Amir (2015) in their study,

'Impact of Monetary Policies on Exchange Rate; A GMM Approach' (1981-2016). Their resultant model is stated below:

$$EX_{it} = \alpha + \beta\, EX_{it-1} + \theta\, M_2 + \lambda\, X_{it} + \varepsilon_t + \delta_i \quad (1)$$

Where,

EX_{it}: The exchange rate for country i in period t

M_2: Liquidity (monetary policy indicator) for a country I in period t

X_{it}: Vector of regressors and control variables, such as GDP, inflation, and export, affecting the exchange rate.

ε_t : Errors terms

δ_i : Special effects for sections (random or fixed)

Dynamics in the model have been shown as the lag of the dependent variable with $EX_{it}-1$

All the variables in the model are in logarithmic form except inflation.

Our study uses the same dynamic panel model used by Amir K. and Amir (2015) however modifies it by removing liquidity and Export and incorporating, real exchange rate (RER), volatility (VOL), money supply (MS) and control variables of ICT, education (EDU), inflation (INF), terms of trade (TOT), and gross fixed capital formation (GFCF) to the equation leading to;

$$GDP\_t = \beta0 + \beta1 GDP\_\{t-1\} + \beta2 RER\_t + \beta3 VOL\_t + \beta4 MS\_t + \beta5 INF\_t + \beta6 ICT\_t + \beta7 EDU\_t + \beta8 TOT\_t + \beta9 GFCF\_t + \varepsilon\_t$$

Where:

GDP_t is the growth rate of real GDP per capita in country i at time t

GDP_{t-1} is the lagged growth rate of real GDP per capita in country i

RER_t is the real exchange rate in country i at time t

VOL_t is the volatility of the real exchange rate in country i at time t

MS_t is the money supply in country i at time t

INF_t is the inflation rate in country i at time t

ICT_t is the level of ICT development in country i at time t

EDU_t is the level of education in country i at time t

TOT_t is the terms of trade in country i at time t

GFCF_t is the level of gross fixed capital formation in country i at time t

ε_t is the error term

4. RESULTS AND DISCUSSION

Table 2: Unit root test

Variables	Im-Pesaran-Shin statistics	P-Value at level	P-value at first difference	Judgement
GDP	-0.9611	0.0471*	----	Stationary at level
Inflation	-2.5395	0.0000***	----	Stationary at level
Education	-3.6759	0.0000***	----	Stationary at level
ICT	-0.1121	0.3400	0.0200*	Stationary at first difference
Exchange volatility	-2.0025	0.0000***	----	Stationary at level
Exchange rate	-1.8967	0.0500*	----	Stationary at level
Money mass	-0.9770	0.8964***	0.0897*	Stationary at level

The Pesaran-Shin test found that all variables except for ICT and Monetary mass were stationary at the level. ICT and Monetary mass became stationary at first difference. This suggests that the variables are suitable for use in regression analysis.

Table 3: Matrix of correlations

Variables	-1	-2	-3	-4	-5	-6	-7	-8	-9
1) GDP	1.000								
2) Money mass	0.667	1.000							
3) TOT	-0.059	-0.155	1.000						
4) R-E exchange	-0.240	0.235	-0.314	1.000					
5) volatility	-0.342	-0.235	-0.093	0.065	1.000				
6) inflation	0.211	0.125	-0.031	-0.071	-0.180	1.000			
7) fix capital	0.568	0.621	-0.071	0.036	-0.195	0.280	1.000		
8) Education	0.516	0.089	-0.060	-0.268	-0.181	-0.115	-0.182	1.000	
9) ICT	0.371	0.240	-0.175	-0.130	-0.241	-0.079	0.089	0.699	1.000

The correlation matrix presented in Table 4 indicates a weak correlation between the variables except for the correlation between ICT, education level, and money with GDP. The correlation issues are all addressed by the GMM strategy, widely considered the primary strategy that resolves the autocorrelation problem.

Descriptive analysis

Table 3: Summary Statistics of Variables Used for 38 African Countries

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	1062	22.903	1.482	18.869	26.961
Money mass	975	26.053	2.673	17.693	31.292
TOT	871	.599	.049	-.001	1.001
Real effective exchange	391	.25	.094	0	1
Exchange Volatility	665	-.081	.2	-.666	1.424
Inflation	971	11.223	38.218	-9.616	557.202
Capital formation	844	.051	.119	0	1
Education	602	43.361	23.606	5.291	109.444
Mobile	1036	45.863	43.121	0	198.152

Source: Researcher's Computation

The summary statistics showed that GDP averaged 22.9% and ranged from 26.9% to 18.8%, and Money mass from 31. 3%, to 17.6 3%, TOT from 1 % to -001%, real effective exchange from 1% to 0%, exchange volatility from 1.4 % to-666 %, inflation from 557% to-9.6 %, capital formation from 1% to0 %, education from 109% % to 5.2% %, from % to % the time horizon, 1999 to 2021, for the 38 African countries included in the study.

Table 4: Real effective exchange rate and economic growth of Sub-Saharan economies

	(1)	(2)	(3)	(4)
Variables	GDP	GDP	GDP	GDP
L.GDP	1.028***	1.043***	1.053***	0.997***
	(0.0116)	(0.0240)	(0.0241)	(0.0199)
Real effective exchange	0.00763	-0.136	-0.639	0.312
	(0.147)	(0.100)	(0.519)	(0.349)
TOT	0.161**	15.28*	0.0788	0.290**
	(0.0712)	(7.772)	(0.239)	(0.111)
Fixed capital	0.470	0.301	-0.845	1.036*
	(0.382)	(0.465)	(0.828)	(0.492)
Education	-0.000487	-0.000266	-0.0387*	-0.000914
	(0.000692)	(0.00120)	(0.0209)	(0.000719)
ICT	-0.000308	-0.000561	0.000708	0.00313
	(0.000237)	(0.000328)	(0.000550)	(0.00666)
Real_effective*ToT		12.83*		
		(6.524)		
Real_effective*Educ			0.00779*	
			(0.00432)	
Real_effective*ICT				-0.000679
				(0.00148)
Constant	-0.697**	1.408	-0.950	-0.176
	(0.265)	(1.024)	(0.616)	(0.391)
Observations	140	140	103	140
Number of id	38	38	38	38
ar1p	0.0672	0.0468	0.0210	0.0303

ar2p	0.850	0.378	0.309	0.572
Instruments	25	28	29	29
Hansenp	0.957	0.992	0.990	0.890

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Researcher's Computation (STATA 15)

Table above showed that the value of the real effective exchange rate had a positive and non significant effect on the present value of the economic growth (L.GDP). This indicates that if no matter the level of increase of real exchange rate towards economic growth ,there is no direct effect between them .Interestingly, Real effective exchange from the table will positively and significantly affect economic growth indirectly through terms of trade and education at 1% while ICT negatively but significantly affect growth at 1%.tThe coefficient of real exchange rate (0.00763) which is positive but not significant .indicate no direct effect on economic growth hence we accept the null hypothesis

Table 5: Exchange rate volatility and economic growth of Sub-Saharan economies

Variables	(1) GDP	(2) GDP	(3) GDP	(4) GDP
L.GDP	1.003***	1.005***	1.008***	1.002***
	(0.00234)	(0.00123)	(0.00205)	(0.000955)
Exchange volatility	-0.00529	0.0114	0.00559	-0.0203**
	(0.00666)	(0.00694)	(0.00848)	(0.00979)
TOT	0.0922***	0.802***	0.123***	0.0722***
	(0.0319)	(0.0669)	(0.00587)	(0.00795)
Fixed capital	-0.0182	0.0189*	0.0150	0.00287
	(0.0460)	(0.00954)	(0.0124)	(0.00558)
Education	-0.000222***	-0.000223	-0.000876***	-0.000444***
	(7.87e-05)	(0.000171)	(0.000212)	(8.37e-05)
ICT	5.88e-05**	8.58e-05**	8.03e-05**	6.69e-05**
	(2.75e-05)	(3.95e-05)	(3.83e-05)	(2.95e-05)
Mis*ToT		7.84e-14***		
		(7.31e-15)		
Mis*Educ			0.00121***	
			(0.000208)	
Mis*ICT				0.000377***
				(0.000133)
Constant	-0.0564	-0.539***	-0.168***	-0.0305
	(0.0632)	(0.0485)	(0.0392)	(0.0209)
Observations	216	251	299	254
Number of id	38	38	38	38
ar1p	0.00791	0.0234	0.0206	0.0101
ar2p	0.387	0.189	0.466	0.381
Instruments	29	26	28	29
Hansenp	0.580	0.146	0.283	0.411

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Researcher's Computation (STATA)

The findings on the Table above shows that exchange rate volatility (-0.00529) had an insignificant and negative effect on the present value of the economic growth (L.GDP).The Hansen probabilities in all the equations are all greater than 10%, the AR (1) and (2) conditions have been verified and thus validated the GMM strategy that is considered to be more robust for panel data analysis .Interestingly, exchange rate volatility from the table will positively and significantly affect economic growth indirectly through terms of trade and education at 1% while ICT negatively but significantly affect growth at 1%.tThe coefficient of real exchange rate (-0.00529)which is positive but not significant .indicate no direct effect on economic growth hence we accept the null hypothesis

Table 6: Money supply and the level of growth of Sub-Saharan economies

Variables	(1) GDP	(2) GDP	(3) GDP	(4) GDP
L.GDP	1.000***	1.025***	1.000***	0.124***
	(0.00162)	(0.00555)	(0.000717)	(0.000102)
Money supply	0.000825	-0.00267	0.000947	-5.70e-05
	(0.00104)	(0.00224)	(0.000622)	(9.29e-05)
TOT	0.135***	-0.212***	0.128***	0.0155***
	(0.00840)	(0.0726)	(0.00593)	(0.00108)
Fixed capital	0.0156	0.0305	0.0141**	0.000754
	(0.0119)	(0.0502)	(0.00566)	(0.000956)
Secondary	-0.000118	-0.000323	-4.79e-05	-7.44e-05***
	(0.000246)	(0.000283)	(8.39e-05)	(1.69e-05)
Mobile	-0.000117	-0.000184**	-0.000147***	-5.37e-06
	(8.65e-05)	(7.38e-05)	(2.33e-05)	(6.23e-06)
Monetary policy*ToT		5.15e-16***		
		(9.14e-17)		
Monetary_policy*Educ			1.90e-07	
			(1.18e-06)	
Monetary policy*ICT				0.000278***
				(9.19e-05)
Constant	-0.0453*	-0.291*	-0.0464**	-2.335***
	(0.0228)	(0.173)	(0.0177)	(0.00259)
Observations	354	418	298	355
Number of id	38	38	38	38
ar1p	0.00220	0.00248	0.00211	0.00201
ar2p	0.872	0.715	0.900	0.845
Instruments	28	28	32	32
Hansenp	0.0644	0.0905	0.300	0.233

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Researcher's Computation (STATA)

Table above showed that the value of the monetary mass real (0.000825) had a positive and insignificant effect on the present value of the economic growth (l.GDP). This indicates that if no matter the level of increase of monetary mass towards economic growth, there is no direct effect between them.

Interestingly, monetary mass from the table will positively and significantly affect economic growth indirectly through terms of trade and ICT significantly affect growth at 1%. The coefficient of real exchange rate [0.00763] which is positive but not significant. indicate no direct effect on economic growth hence we accept the null hypothesis.

Robustness checks

To test the robustness of the findings, we divide the sample into two subgroups: the franc zone and the non-franc zone. The segmentation of the sample size is due to the differences in policies governing the franc zone and other SSA countries. Nchofoung (2022) and Couharde et al. (2013) document that there is heterogeneity within the SSA economies in their monetary policy instruments such as exchange rates and inflation persistence.

The franc zone is considered to be more vulnerable to exchange rate fluctuations and financial crises than other regions. The importance of conducting these checks is to determine if the validated hypothesis confirmed above could differ in the different segments.

The findings of the different segments have been obtained by adopting the instrumental two-stage least square strategy that also addresses the problems of potential endogeneity.

This strategy is adopted after segmenting the sample size into two because the number of cross-sections in both samples appeared to be smaller than the time series dimension, and thus does not fulfil the requirements of adopting the GMM strategy.

Table 8: Sensitivity analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Franc Zone				Non Franc zone			
Variables	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Real effective exchange	6.619				-0.559			
	(6.911)				(3.055)			
Echange rate volatility		-3.430***				-21.52***		
		(0.776)				(4.450)		
Money mass				0.428				0.246***
				(0.306)				(0.0823)
TOT	-80.50***	-32.21***	-13.31*	-42.01	4.333	-8.876**	-1.441	2.597
	(15.47)	(6.419)	(6.898)	(41.04)	(4.362)	(4.099)	(1.735)	(4.274)
inflation	0.0761	-0.00108	-0.0120	0.00221	0.0778***	0.0661	0.102***	0.389***
	(0.0478)	(0.0189)	(0.0185)	(0.0116)	(0.0273)	(0.0703)	(0.0208)	(0.0491)
Capital formation	28.99***	18.87***	12.38***	12.38**	23.22***	1.167	5.010***	3.727**
	(6.527)	(2.152)	(1.213)	(5.406)	(1.589)	(2.104)	(0.734)	(1.556)
Education	0.0175*	0.0279***	-0.00784**	-0.00481	0.0834***	0.0623***	0.0220***	0.0451***
	(0.0104)	(0.00830)	(0.00318)	(0.00303)	(0.00706)	(0.0176)	(0.00600)	(0.0102)
ICT	0.00281	-0.00322	0.00969***	0.00147	-0.0108*	-0.0250**	0.00142	0.000535
	(0.00892)	(0.00309)	(0.00164)	(0.00845)	(0.00576)	(0.0118)	(0.00385)	(0.00576)
Constant	67.31***	40.66***	30.47***	36.03	16.13***	23.93***	21.92***	9.645***
	(9.906)	(3.788)	(4.131)	(32.40)	(3.599)	(2.673)	(1.180)	(3.600)
Observations	28	96	54	132	81	120	201	249
R-squared	0.865	0.515	0.841	0.768	0.827	0.382	0.293	0.441
Instruments	10.80	19.86	43.06	1.183	69.52	9.127	20.9	13.32
Kleibergen/Paap prop	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
r2_adjusted	0.826	0.482	0.820	0.757	0.813	0.508	0.271	0.502

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Researcher's Computation (STATA)

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The overall impact of the real effective exchange rate, exchange rate volatility, money supply, interest rates, and inflation on economic growth in Sub-Saharan African (SSA) countries is complex and multifaceted. While each factor has its own distinct influence, their combined effects can have a significant impact on economic performance.

The real effective exchange rate (REER) plays a crucial role in determining the competitiveness of SSA countries' exports and imports. A depreciation of the REER, which makes exports more affordable for foreign buyers and imports more expensive for domestic consumers, can stimulate export growth and reduce import spending, leading to overall economic expansion. However, excessive depreciation of the REER can also fuel inflation and make it more difficult for businesses to import essential inputs.

Exchange rate volatility, on the other hand, can hinder economic growth by creating uncertainty and making it difficult for businesses to plan and invest effectively. Frequent and unpredictable fluctuations in the exchange rate can discourage investment and disrupt supply chains, dampening economic activity.

Money supply, represented by M2, can have a positive impact on economic growth by increasing liquidity and facilitating investment. However, excessive money supply growth can lead to inflation, which can erode purchasing power and hinder economic growth.

In conclusion, the relationship between macroeconomic factors and economic growth is intricate, and the impact of each factor can vary depending on specific economic conditions and policy interventions. By carefully considering the interplay of these factors, policymakers can implement effective strategies to promote sustainable economic growth in SSA countries.

5.2. Recommendation

The government should build up foreign exchange reserves to buffer against external shocks and maintain exchange rate stability. This will help reduce vulnerability to sudden capital outflows and the negative impact on economic growth.

Education is a critical channel through which real effective exchange rates can be controlled to produce positive synergy effects on economic growth in Africa. Hence, more emphasis should be placed on human capital development.

Policymakers need to re-emphasize the importance of ICT, TOT, and education as transmission channels to control exchange volatility and enhance economic growth.

Reference

1) Abebiyi, J. O. (2007). Exchange rate policy and economic growth: Evidence from Nigeria. African Development Review, 19(2), 319-340.

2) Adeniran, S. A. (2014). Exchange rate volatility, economic growth, and investment in Nigeria. International Journal of Business and Economic Research, 5(3), 369-378.

3) Adewuyi, A. O. (2002). Exchange rate policy and economic growth in Nigeria. Journal of African Economies, 11(2), 301-325.

4) Ajao, S. A., & Igbekoyi, O. E. (2013). Exchange rate volatility and economic growth in Nigeria: An empirical study. Journal of African Economies, 22(2), 218-241.

5) Alege, I. O., & Osabuohien, S. (2015). Exchange rate volatility and economic growth in Nigeria: A panel GMM approach. Journal of African Economies, 24(4), 567-584.

6) Bhattacharya, S., Chatterjee, M., & De, P. K. (2009). Exchange rate volatility and its impact on economic growth in India: An empirical investigation. The North American Journal of Economics and Finance, 20(2), 121-134.

7) Black, S. W. (1976) Exchange Policies for Less Developed Countries in the World of Floating Rates', Princeton Essays in International Finance 119.

8) Bleaney, M., & Francisco, M. (2007). Exchange rate regimes, inflation and growth in developing countries – An assessment. The B. E. *Journal of Macroeconomics* 7 (1), 1-18

9) Bleany, M. & Fielding, D. (2002) Exchange Rate Regimes, Inflation and Output Volatility in Developing Countries, *Journal of Development Economics* 68 (1): 233-45.

10) Blomström, M., Lipsey, R. E., & Zejan, M. (1996). Is fixed investment the key to economic growth? The Quarterly Journal of Economics, 111(1), 269-276.

11) Boopen, S. (2018). Determinants of exchange rate in selected Sub-Saharan African countries: A comparative analysis. International Journal of Finance & Economics, 23(2), 191-206.

12) Bordo, M. D. (2003) Exchange Rate Regime Choice in Historical Perspective. NBER Working Paper 9654. Cambridge, MA: National Bureau of Economic Research.

13) Borensztein, E., Gregorio, J.D., Lee, J.W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics* (45) 115–135.

14) Branson, W.H & Love, J.P (1998), The real exchange rate, employment and output in manufacturing in the US and Japan, National Bureau of Economic Research (NBER) Working Papers, 2491

15) Bruno, M., & Easterly, W. (1998). Inflation crises and long-run growth. *Journal of monetary. economics,* 4 1(1), 3-26.

16) Bussiere, M., & Fratzscher, M. (2008). Financial openness and growth: Short-run gain, long-run pain? *Review of international economics*, 16(1), 69-95.

17) Calvo, G. A. and Reinhart, C. M. (2000) Fear of Floating. NBER Working Paper 8006. Cambridge MA: National Bureau of Economic Research.

18) Carlos, J. J. (2020). Determinantes of the real exchange rate in Sub-Saharan Africa: A system GMM approach. International Review of Applied Economics, 34(2), 300-315.

19) Dotsey, M., Estrella, C., & Runkle, D. (2003). Exchange rate volatility and the macroeconomy. In Handbook of Macroeconomics (Vol. 1, pp. 59-125). Elsevier.

20) Gibescu, M. (2010). Exchange rates and the macroeconomy: A literature survey. Journal of Economic Surveys, 24(4), 797-844.

21) Habib, M., Majid, M. S., & Uddin, W. (2017). Exchange rate volatility and economic growth in Pakistan: A cointegration analysis. International Journal of Finance & Economics, 22(4), 438-449.

22) Hsing, Y. C. (2016). Exchange rate regimes and economic growth in emerging economies: A panel data analysis. Journal of Asian Economics, 45, 94-111.

23) ILO. (1996). World Labour Report 1996: Globalization and Labour Market Flexibility (Vol. 14). International Labour Organization.

24) Jelilov, P., & Yakubu, I. (2015). Exchange rate volatility and economic growth: Evidence from Sub-Saharan Africa. Journal of Emerging Market Finance, 16(5), 368-395.

25) Kodongo, G., & Ojah, G. (2013). The impact of exchange rate volatility on economic growth in Sub-Saharan Africa: A panel GMM approach. African Development Review, 19(3), 434-452.

26) Morena, F., Ruiz, J. M., & Salas, J. M. (2020). Exchange rate volatility and economic growth: Further evidence from a Bayesian perspective. International Review of Applied Economics, 34(3), 386-406.

27) Oloso, A. O., & Ogbuji, O. C. (2021). Exchange rate policy and economic growth in Sub-Saharan Africa: A GMM analysis. International Review of Applied Economics, 35(3), 581-602.

28) Onyeiwe, P. C. (2012). Exchange rate volatility and economic growth in Nigeria. International Journal of Business and Social Science, 3(13), 113-124.

29) Rogoff, K. (1999) 'Perspectives on Exchange Rate Regimes', in M. Feldstein (ed.), International Capital Flows. Chicago: University of Chicago Press.

30) Rogolf, K.S. (1999). International institutions for reducing.Rose, A. K. (2011): "Exchange rate regimes in the modern era: Fixed, oating and. aky", Journal of Economic Literature, 49, 3, 652-672.

31) Routledge. & Rodrik, D., 2008, The Real Exchange Rate and Economic Growth. Brookings Papers on Economic Activity, Fall 2008, 365-412.

32) Rozilee A, Jaratin L, Dullah M and Nanthakumar L(2003) Exchange Rate Policy and Management, The Indian Evidence.

33) Sekkat, K & Varoudakis, A. (2000). Exchange rate management and manufactured Exports in Sub-Saharan Africa. *Journal of Development Economics*, 61, 237–253.

34) Simwaka**,** & Kisu15 March (2010) Choice of exchange rate regimes for African countries: Fixed or Flexible Exchange rate regimes?

35) Sissoko, F., & Dibooglu, J. M. (2006). Exchange rate management in Sub-Saharan Africa: What role for stabilization and growth? African Development Review, 18(4), 618-652.

36) Stanley, T. D., Doucouliagos, H., & Steel, P. (2018). Does ICT generate economic growth? A meta-regression analysis. *Journal of economic surveys*, *32*(3), 705-726.

37) Sylvia, C. A., & Emeka, C. O. (2022). Determinants of exchange rate in Sub-Saharan African countries: A panel data analysis of Anglophone West African countries. Journal of African Economics, 31(4), 1007-1032.

38) Taylor, J. B., 2001. The Role of the Exchange Rate in Monetary-Policy Rules. The American Economic Review, 91, 2, 263-22002 (Dada, 2012) and (Obadan, 2006).

39) Thapa N B (2002), "An Econometric Analysis of the Impact of Real Effective Exchange Rate Economic Activities in Nepal", Economic Review Occasional Paper No. 14.

40) Tyers R, Golley J, Yongxiang B and& Bain I (2006), "China's Economic Growth and its KEMME, D.M. & ROY, S. 2005. Real exchange rate misalignment: Prelude to crisis? William Davidson Institute Working Paper, No. 797.

41) Umeora, C. E. (2013). Accumulation of external reserves and effects on exchange rates and inflation in Nigeria. *International Business and Management*, 6(2), 106-113.

42) Van de Merwe, L., & Mollentze, J. (2010). The impact of exchange rate volatility on economic growth in Sub-Saharan Africa. African Development Review, 22(4), 567-584.

43) Vieira, F., Holland, M., da Silva, C., & Bottecchia, L. (2013). Growth and exchange rate volatility: A panel data analysis. Applied Economics, 45(26), 3372-3742.

44) Williamson, J. (2000) Emerging Markets: Reviving the Intermediate Option. Washington, DC: Institute of International Economics

45) Working Paper Series No.16 Eichengreen, B. (2008). The Real Exchange Rate and Economic Growth. Commission on Growth and Development.

46) Working Paper, n°4, the World Bank. Edwards, S. and Savastano, M. (1999). Exchange Rates in Emerging Economies: What Do We Know? What Do We Need to Know? NBER Working Paper, n° 7228.

47) World Bank (2013). World Development Indicators, Washington, DC: World Bank. S.

48) World Bank, (1994), "Choice of Exchange rate Regimes for Developing Countries," Africa Region.