The Measurement Of Exchange Rate Misalignment And Its Impact On Long Term Economic Growth

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ABSTRACT
In developing nations, economic policymakers aim to establish a nominal exchange rate conducive to growth. This involves identifying the equilibrium exchange rate, evaluating deviations, and understanding their economic impacts. Focusing on Nigeria, this study examines the effects of exchange rate misalignment on economic growth from 1981 to 2020. Analysing using cointegration and error correction, it finds the Nigerian Naira experienced significant undervaluation in recent years. The research explores the impact of misalignment on growth, incorporating factors like government consumption, foreign direct investment, gross capital formation, and openness. Despite adjustments to the model, the exchange rate misalignment remains statistically insignificant, indicating that merely realigning the exchange rate may not guarantee rapid economic growth in Nigeria. The study suggests implementing a market-based exchange rate management system tied to macroeconomic fundamentals for balanced and sustainable growth, emphasizing the influence of government policies on Naira misalignment. Overall, the research underscores the need for a comprehensive economic approach beyond exchange rate adjustments to foster Nigeria's growth effectively.

I.   INTRODUCTION

The Nigerian economy has long been a focal point for policymakers seeking to drive high and sustained economic growth, which, in turn, promises to reduce poverty and accelerate development. Despite witnessing some growth rates between 2017 and 2019, the nation's progress remained below the crucial target required to achieve the Millennium Development Goals. Alarming figures of -1.58%, 0.82%, 1.91%, and 2.27% for GDP growth in 2016, 2017, 2018, and 2019, respectively, with an average growth rate of 0.86% during this period, emphasized the urgency to overcome significant challenges on the path to prosperity.

The Nigerian economy shares similarities with other low-income developing countries, grappling with rural characteristics, dependence on exports, soaring population growth, widespread poverty, and unemployment, and escalating tribal and cultural conflicts Todaro & Smith (2005). While formidable, these challenges are not insurmountable, and Nigeria remains committed to achieving an array of economic objectives, including rapid economic growth, high employment, a balanced Balance of Payments, and equitable income distribution.

Over the years, the Nigerian government has implemented numerous macroeconomic policies in pursuit of growth objectives, with varying degrees of success. Notably, the management of the Naira exchange rate has been a central focus. Research has shown that economic policies exert influence on price incentives through the real exchange rate. Evidence from various regions, including Latin America, Asia, and Africa, further underscores the interconnectedness between real exchange rate behavior and economic performance. Exchange rate misalignment, particularly in African countries, has been a stumbling block to sustainable economic growth (Domac & Shabsign, 1999).

From both macro and microeconomic perspectives, the significance of the exchange rate in any economy becomes evident. On one hand, the macroeconomic aspect relates to financial stability, while the exchange rate serves as a stabilizing force for domestic prices. On the other hand, the microeconomic perspective emphasizes international competitiveness, necessitating economies to open up for a healthy Balance of Payments position. Consequently, the behavior of the real exchange rate has emerged as a crucial factor impacting economic growth.

Real exchange rate misalignment, usually arising from exchange rate, trade, monetary, and fiscal policies, can exert considerable influence on economic growth. It affects both domestic and foreign investments, influencing the capital accumulation process, while also influencing a nation's trade activities with the rest of the world. Misalignment can lead to an overvaluation of the local currency, acting as a tax on tradable goods, potentially leading to unsustainable financial practices and increasing external debt (Omotosho, 2015).

Considering these issues, this research endeavor seeks to investigate recent developments in Nigeria's exchange rate management. The study aims to uncover the impact of exchange rate misalignment on Nigeria's economic growth. Its objectives include studying the Naira's equilibrium exchange rate, estimating the explicit misalignment of the Naira exchange rate during the study period, and understanding how such misalignment affects economic growth. This research will provide valuable insights into the occurrence of exchange rate misalignment in Nigeria, paving the way for evidence-based policies that can unleash the country's true economic potential. As Nigeria stands at a critical juncture in its economic trajectory, this study holds the promise of steering the nation towards a path of prosperity and sustainable growth.

II. LITERATURE REVIEW

In the pursuit of economic growth, countries, especially those in the less developed category, often grapple with multifaceted constraints. Among the prominent theoretical frameworks aiding our understanding is the two-gap theory, introduced by Chenery & Bruno (1962) and Chenery (1967). This model postulates that achieving a target growth rate necessitates addressing two independent constraints: the 'savings gap' and the 'foreign exchange gap.'

The 'savings gap' refers to the disparity between projected savings at the targeted income level and the required investment in absolute terms. On the other hand, the 'foreign exchange gap' involves estimating the difference in foreign exchange needed when growth takes place, either through domestic sourcing or imports. These gaps play a pivotal role in determining the economy's development trajectory, particularly when foreign aid is required to bridge the divide.

Exchange rate misalignments further complicate the economic dynamics, as emphasized by Mbaye (2013). Regardless of the direction of the misalignment, deviations from the equilibrium exchange rate level trigger macroeconomic disequilibrium. Rodrik (2008) reinforces this notion by linking overvaluation to adverse consequences such as foreign currency shortages, corruption, unsustainable current account deficits, and balance of payment crises, all of which impede economic growth.

While the two-gap model has been instrumental in analyzing resource constraints in developing nations, it does come with limitations that warrant exploration. The assumption that domestic savings cannot be utilized as a substitute for foreign exchange required for investment may overlook potential avenues for sustainable growth. Moreover, the model's mechanistic approach tends to emphasize the role of foreign aid in filling gaps, rather than fostering transformative policies to drive self-sufficiency.

Numerous studies have harnessed the power of the dual-gap model to understand the primary resource constraints limiting growth in developing countries. During the early stages of development, the focus may revolve around bridging the domestic savings-investment gap, reflecting the pre-take-off phase where monetized saving levels remain low. As countries advance into the take-off stage, the foreign exchange gap often takes center stage as a dominant constraint.

The literature presents the intricacies of the two-gap model, particularly in the context of exchange rate misalignment. By addressing its limitations and exploring its applications, the study seeks to uncover a deeper understanding of how countries can leverage this framework to unleash their growth potential. As the quest for sustainable economic growth continues, our examination of the two-gap theory offers valuable insights into charting a path towards self-reliance and prosperity.

Concept of Exchange Rate Misalignment

The concept of exchange rates and exchange rate misalignment remains a pivotal aspect of general economics, as it dictates the prices at which currencies are traded against one another. Within the literature, various approaches have been proposed to gauge real exchange rate misalignment, each shedding light on different dimensions of this complex phenomenon.

One prevalent approach is the method based on purchasing power parity (PPP) principles, as highlighted by Aliyu (2011). Relying on the law of one price, this approach assumes that freely traded commodities should possess the same cost universally under a perfectly competitive market when measured in a common currency. Commonly known as the flow model, the PPP approach traces the flow of goods and services through the current account to determine the exchange rate.

Rodrik's (2008) measure of misalignment introduces the Rodrik undervaluation index, which defines undervaluation as a deviation of the actual real exchange rate from its purchasing power parity value, accounting for per capita income's impact. This index quantifies the extent to which the market exchange rate deviates from the price level of the reference country, the US. The advantage of this index lies in its comparability across countries and over time, as observed by (Berg & Miao, 2010).

The Equilibrium Exchange Rate (FEER) approach models the equilibrium exchange rate as a function of real economic fundamentals, consistent with the traditional macroeconomic balance perspective. It identifies fundamental variables influencing the equilibrium of capital and current account balances, encompassing factors

like domestic and foreign real incomes, as well as investment and national savings dynamics. Clark & MacDonald (1998) and Elbadawi & Soto (1997) present models that incorporate various fundamental variables to estimate exchange rate misalignment.

The Behavioral Equilibrium Exchange Rate (BEER) models focus on variables affecting the relative prices of goods in different countries. Driver & Westaway (2001) and Aliyu (2011) introduce models that categorize as "cyclical equilibrium and current exchange rates," calculating based on existing levels of essential factors. While Iimi (2006) adopts a more concise approach, using fewer fundamental variables, it is crucial to acknowledge the limitations of small sample sizes in arriving at robust conclusions.

The Natural Real Exchange Rate (NATREX) approach, developed by Stein (1996), offers a unique perspective by estimating the equilibrium real exchange rate through prevailing real economic fundamentals. By taking into account micro agents' decisions on private investment, savings, imports, and exports, the NATREX model strives to optimize in the face of significant uncertainty. This model does not assume normative welfare optimization but instead considers government policies as given, providing insights into the real equilibrium exchange rate associated with internal equilibrium.

By critically examining these diverse approaches to measuring exchange rate misalignment, this literature review lays the foundation for a comprehensive understanding of the complexities involved. As researchers and policymakers continue to navigate the intricate landscape of exchange rates and economic growth, the insights gained from these approaches will play a pivotal role in formulating effective strategies for sustainable economic development

Concept of Economic Growth

The concept of economic growth has been subject to diverse interpretations and perspectives within the academic community. While some schools of thought define economic growth simply as an increase in national income per capita, others adopt a broader view, considering the growth of Gross Domestic Product (GDP), Gross National Product (GNP), National Income (NI), and the expansion of production capacity (Haller, 2012). Essentially, economic growth is the process of enlarging national economies, particularly GDP per capita, with positive ramifications for the economic and social sectors.

Mladen (2015) contends that economic growth entails a continuous increase in production volume or GDP in an economy, and it is commonly measured by the growth in output per capita. Additionally, Ilić (2005) highlights labor productivity as a crucial factor influencing economic growth, as it represents the ratio of total output to worker-hours in a specific sector or the entire economy.

Sukirno (2017) views economic growth as a barometer of a country's economic activity, while Brito (2015) emphasizes that growth theories explore variables that explain the dynamics of GDP growth. Undeniably, economic growth plays a vital role in enhancing the quality of life in impoverished nations. However, it is essential to recognize that the rate and level of growth do not always accurately reflect the real living standards of a population, even though it remains a primary measure of prosperity. Other indicators, such as income per capita, unemployment rate, and poverty reduction, also serve as benchmarks for gauging economic growth in a country (Sukirno, 2017).

Economic growth is a multi-dimensional concept, encompassing various economic indicators and factors. Its significance in improving the well-being of nations is undeniable, but it is crucial to consider additional metrics beyond GDP per capita to gain a comprehensive understanding of a country's economic health and the impact on its citizens' quality of life. As the field of economics continues to evolve, a nuanced and comprehensive approach to analyzing economic growth becomes imperative for informed policymaking and sustainable development.

Empirical Review

Following the seminal work of Edwards (1989) that discovered that there is a significant and negative relationship existing between economic growth and overvaluation, several studies have tried to test if there is a relationship between exchange rate misalignment and economic growth in Nigeria. For instance, Ali *et al.* (2015) found that one-unit increase in exchange rate misalignment would result to about 0.003reduction in output level. Also, Ibrahim (2016) used the BEER framework to estimate the real exchange rate misalignment; the GMM estimate used found that misalignment of real exchange rate has negative and significant influence on economic growth in the years considered.

Soto et al (2015) explored the relationship between economic growth, foreign aid and exchange rate misalignment in SSA using the BEER approach technique with variables of Exchange rate, GDP, interest rate inflation rate and stock market price. The study used the GMM as model of analysis. The result revealed that aid does not significantly contribute to the overvaluation of exchange rate. Aid also fosters economic growth but with weaker effect in countries whose exchange rates are overvalued. Furthermore, overvaluation reduces the rate of economic growth but the negative effects are enriched by level of financial development.

Nwokoye, et al (2015) investigated the relationship existing between exchange rate misalignment and the agilityof stock market during the pre and post financial liberalization era, using the BEER approach, while the Granger-Causality was used as a tool of analysis.The result indicated that exchange rate misalignment exerted a positively insignificant relationship on stock market agility prior to the time when the financial market was deregulated in Nigeria. They alsonoticed that exchange rate misalignment exerted a negatively insignificant relationship on stock marketin the era of financial liberalization, leading to insignificant impact on the entire economic output from that sector.

Omotosho(2015) examined the extent to which currency misalignment could serve as an early warning signal for currency crisis using Cointegration/ Logit Model. The BEER approach was adopted with GDP, current account GDP ratio, oil price debt/GDP ratio and exchange rate as the variables of interest. The result showed that when there isreal exchange rate misalignment, currency crisis increases, increase in debt to GDP ratio increases, while ratio of balance in current account to GDP contracts with exchange rate becoming agile.

The relationship between certain related macroeconomic variables and effective real exchange rate was examined by Nwachukwu, et al (2016); they used the BEER approach and the ARDL model and his variables includes Exchange rate, nominal and real exchange rate and GDP. His results show that the average real exchange rate was discovered to be overvalued by around 1.40% during the period studied, and he concluded that this has dire consequences for the economy.

Ojegba (2016) examined the relationship existing between balance of payments (BOP) maladjustment and exchange rate misalignment using exchange rate, GDP and balance of payment as variables. The study applied the VECM to determine the equilibrium REER in Nigeria and then calculated the values of misalignment. Exchange rate misalignment was found to impact positively on the balance of payment position of the country. The test results for Granger pairwise causality showed a one directional causality that ran from the misalignment of exchange rate to payments adjustment balance and then GDP at 1% significant level.

Korankye (2016) investigated the effect that exchange rate movement and some other crucial covariates has on the import demand of Ghana using the annual time series data from 1980 to 2013.The author used the GACH model to calculate the movement of real exchange rate. When the ARDL methodology was used, the study discovered the existence of both short run and long run relationship existing between relative price of imports, real effective exchange rate, import demand, real income and exchange rate movements. The studyrevealed that the movement in the rate of exchange negatively impacted the overall import demand of Ghana and that the relative price of import also impacted negatively on the demand of import in Ghana and showed a positive and significant income elasticity of imports.

Nyarko (2016) explored the factors that influence exchange rate movements in Ghana for over thirty-four years (1980 – 2013. An Augmented Dickey-Fuller unit root test was conducted after which the ARDL cointegration analysis was performed. The findings showed that imports, public debt, nominal GDP, and inflation affect exchange rate movement in the Ghanaian economy. Similarly, exchange rate depreciation was found to have significant impacts on the economy as it can trigger inflation, worsen the external debt position of government, and deteriorate the nation's trade balance.

Amoah & Aziakpono (2017) estimated the equilibrium ERER. Based on the BEER approach, the empirical results revealed significant level of misalignment of exchange rate. The study revealed a level of undervaluation during the period that preceded the redenomination exercise which took place in 2007, while overvaluation was detected afterwards. Considering the level of overvaluation at that period, the study suggested that a one-off devaluation of 20% minimum could move the exchange rate close to equilibrium level.

Vaseem & Badri (2017) studied the impact of exchange rate misalignment on the total factor productivity growth of fifteen (15) emerging market economies in the world using the annual time series data from 1990 to 2014. The study discovered the existence of a long term co-integrating relationship between misalignment of RER and growth of TFP. Again, the findings in the study showed that growth of TFP was effected negatively by RER misalignment in most of the countries within the boundaries of EMEs. The study also discovered a two way panel of short and long-run Granger causality between total factor productivity growth and real exchange rate misalignment.

Rafael, et al (2018) reviewed an empirical literature concerning real exchange rate misalignment and economic growth. They considered the debateon the income distribution and economic growth relationship in developing economies. The empirical model they used added to this literature by suggesting that, the direct impact that real exchange rate misalignment has on economic growth becomes non-significant statistically for a representative sample of developing nations once both the functional income distribution and the technological capabilities level that operate as germane features of the economy are taken into account. The result further showed that real exchange rate only affects economic growth indirectly through the impact ithas on technological innovation and functional income distribution. Their research estimates also revealed that undervaluation negatively impacts economic growth in developing countries.

Conrad et al (2018) studied the influence of movements in exchange rate and also exchange rate misalignments on the economic growth of Trinidad and Tobago from 1960 to 2016-time period. The result revealed evidence that the economic growth of Trinidad and Tobago is affected negatively by both exchange rate misalignments and appreciation. They also discovered that exchange rate misalignments had no non-linear effects on the economic growth of the country. They submitted statistical evidence to prove that the economic growth of Trinidad and Tobago is hindered by both overvaluations and under valuation. In conclusion, the authors recommended that a critical reassessment should be carried out concerning the guidelines governing the Heritage and Stabilization Fund (HSF), as there was room for the expenditure of government to follow energy revenues because of its current limitations.

Dibba & Touray (2019) studied exchange rate misalignment for developing countries using the methodology in Gonclaves & Rodriques (2017) that included domestic savings in their model. The findings in the study of sub-Saharan countries reveals that the domestic savings rate was relevant leading to the conclusion that misalignment is good for economic growth in the sub-Saharan Africa.

Cheung &He (2019) conducted a meta-regression analysis using the Bayesian model averaging approach of 69 studies. It was discovered that estimates of misalignment are affected by the selected eight study characteristic types. Most times, these misalignment estimates are different from zero insignificantly. Bosupeng, et al (2019) investigated the impact of exchange rate misalignment on outward capital flight in Botswana using data spanning a period of 1980–2015. The study used the autoregressive distributed lag approach to cointegration and the Toda and Yamamoto (1995) approach to Granger causality. The findings in the study reveal that overvalued currency brings about declines in capital flight via trade misinvoicing and that expanding foreign reserves does not reduce outward capital flight. When the currency is undervalued, the volume of capital flight increases and foreign reserves reduce outward capital flight.

Kreko & Oblath (2020) using pooled OLS and dynamic panel techniques investigated the relationship between economic growth and real exchange rate misalignments within the European Union (EU) during the period of 1995–2016. They found out that over valuations are related to lower growth, while under valuation are related to higher growth that within the EU, as a result of developments in the fixed exchange rate tenure.

Brian (2021) examined how state fragility influences the effect of exchange rate misalignment and economic growth using data from 13 Sub -Sahara countries from 2009 - 2018. He measured misalignments using the dynamic ordinary least square method, after which he used the system of generalized method of moments to examine the interaction between the misalignments and state fragility in a growth specification. His results show a significant negative relationship between exchange rate misalignments and growth which increases with state fragility.

A critical evaluation of the earlier works reviewed above revealed some shortcomings, which this research work intends to address. For instance, the latest work on exchange rate misalignment in Nigeria, which was done byAli et al in 2015, and did not capture recent developments in the management of the exchange rate of the country, especially since the Managed Floating Exchange Rate System was introduced in 2016.This research consequently contributes in substantial measure to already existing literature by extending available dataset to cover developments from that time till2020,so as to ascertain if domestic currency has marginally or overly depreciated from equilibrium level. The research also applies high frequency data in the form of quarterly dataset thereby making it even more relevant for faster monetary policy responses to issues of REER disequilibrium. This study considered all the possible variables that come into play in exchange rate depreciation in the Nigerian context, and employ the appropriate mathematical and statistical techniques in arriving at findings and conclusion.

III. RESEARCH METHOD

This section presents the methods that will be used in this study. The type and nature of data was discussed. The models that will be used in the study were also presented: The model of equilibrium real exchange rate of the naira and the misalignment of the RER model. The section further presents the methods of computing the real exchange rate misalignment as well as an overview of the data and variables used in the study.

An Empirical Model of Naira Equilibrium Real Exchange Rate

Following Ofair (1997), Edwards (1988) and Cottani, et al. (1990), the equilibrium real exchange rate of the Naira will be allowed to be a function of carefully selected economic fundamentals. These essential/fundamental determinants are strictly selected based on their contextual, empirical and theoretical relevance to the Naira real exchange rate determination. The functional form of the model, which contains factors affecting the RER both in the short and long run, is stated as:

RER = (OPEN, PRO, TOT, FDI, GNER, EXL, et)………………………………(1)

Where:

OPEN   = Degree of Openness

PRO   = Productivity
TOT   = Terms of Trade
FDI   = Foreign Direct Investment
GNER   = Nominal Exchange Rate
EXL   = Excess Liquidity
e_t = Stochastic Disturbance Term

The EXL and GNER are short run predictors while TOT, OPEN, PRO and FDI are the long run variables are

   This methodology rests on Granger's representation theorem which explains that co-integration among variables means that, even though non-stationary properties are exhibited by the individual time series, their linear combinations still exhibits stable properties. Therefore, when there is co-integration between Y_t and X_t, then an associated error correction mechanism (ECM) is existingand may take the following form:

$$\Delta Y_t = \beta_1 + S \sum_{i=0} \beta_{2ij} \Delta X_{t-j} + q \sum_{t-1} \beta_{3ij} \Delta Y_{t-1} + \beta_4 EC\beta M_{t-1} \qquad (2)$$

   Where the first difference operator is denoted by Δ, the estimated residual of the co-integrating regression is ECM, the number of lag lengths are s and q, the dependent variable is Y while the vector of exogenous variables is X. for the purpose of this work, only one period lag will be used in order to maintain reasonable degrees of freedom. The coefficient β4 will be negative and statistically significant if the system is stable. The value of β4 measures the speed of adjustment of the dependent variable to the value implied by the long run equilibrium relationship.

Computation of Real Exchange Rate Misalignment (RERM)
   After generating the equilibrium real exchange rate series, the study shall then proceed by following Edwards and Montiel (1989) in using the term "misalignment" to denote the percentage difference existing betweenthe equilibrium RER (e*) and the actual real exchange rate (e) at any given point in time and this is measured as the variance between estimated ERER using sustainable fundamentals values and the actual RER. The "fitted RER" is the one that was estimated from the co-integrating regression using actual values of fundamentals.
   In the context of the model-based measure of equilibrium exchange rate to be determined by this study, real exchange rate misalignment (RERM) shall consequently be computed using the formula given below:

$$RERM = (e^* - e) \times 100 \qquad (3)$$

The above formula implies the following:
$e^* - e > 0$ ………Overvaluation
$e^* - e < 0$ ……….Undervaluation
$e^* - e = 0$ ………...Equilibrium

The Rerm-Growth Model
   The growth analysis in some countries has focused on the long run standard model that is based on the Harrod-Domar (H-D) theory of growth (Nnanna, Englama & Odoko, 2004). However, the endogenous growth theory,the gap models and the Solow's neoclassical growth model have all offered some forms of improvements over the traditional theory of growth that was enunciated by Harrod & Domar.
   The RERM-Growth model specified in this study includes the traditional variables affecting growth as well as some policy indicators such as M2 (monetary policy), GEXP (fiscal policy) and OPEN (trade policy). Other variables that are germane to Nigeria's economic growth are also invoked. In order to achieve the study objectives, the real exchange rate misalignment (RERM) measure obtained in the previous model is added to the right hand side variables. The functional form that was used in this study is explicitly specified as follows:

GDP= f (M2GDP, RERM, GCF, GCGDP, FDIGDP, DOO, LBFORCE, et) ….…… (4)

Where,
GDP   = Gross Domestic Product
M2GDP   = Money Supply/GDP
RERM = Real Exchange Rate Misalignment
GCF   = Gross Capital Formation
GCGDP   = Government Consumption/GDP
FDIGDP   = Foreign Direct Investment/GDP
DOO   = Degree of Openness
LBFORCE = Labor Force/GDP
e_t = Stochastic Disturbance Term (this term possesses the properties of zero mean and non-serial correlation)

IV. RESULTS AND DISCUSSION OF FINDINGS

This section presents the results obtained based on the econometric procedures enumerated in the preceding section. It discusses the time series properties of the variables included in the models as well as the co-integrating properties in the models. In addition, the results of the equilibrium real exchange rate as well as the empirical results are discussed in this section.

The Augmented Dickey-Fuller (ADF) test conducted on the relevant variables for the Equilibrium Real Exchange Rate model indicated that the alternative hypothesis of a unit root was not retained for almost all the variables, with the exception of PRO and GNER that were stationary at level. Consequently, all the other variables, namely, RER, OPEN, EXL, TOT and FDI were differenced once while the ADF regressions were re-estimated. In each case of the re-estimated ADF regressions, the ADF test statistics improved considerably, while the unit root test was rejected. In summary, five of the variables included in the real exchange rate model were integrated of order one while the remaining two were integrated of order zero (Table 1).

Table 1: Unit Root Test for the Variables used Models

Unit Root Test							
Table 1: Economic Growth Model				Table 2: Real Exchange Rate Model			
Variables	Order of Integration	ADF Test Statistics	Critical Values (1%)	Variables	Order of Integration	ADF Test Statistics	Critical Values (1%)
DLGDP	I (I)	-3.5554	-2.9499**	DRER	I (I)	-4.8206	-4.2733*
DLM2	I (I)	-4.0995	-3.6353*	DOPEN	I (I)	-5.2185	-4.2733*
DLRERM	I (I)	-5.938	-4.0681*	PRO	I (0)	-4.4233	-4.2627*
DLGCF	I (1)	-3.0318	-2.9499**	DEXL	I (1)	-8.2459	-4.2733*
DLGC	I (I)	-3.176	-2.9499**	DTOT	I (I)	-5.6777	-4.2627*
DFDI	I (1)	-4.7703	-3.6422**	DFDI	I (I)	-16.703	-4.2733*
DDOO	I (1)	-3.2267	-2.9499*	GNER	I (0)	-6.7983	-4.2733*
DLLBFORCE	I (1)	-3.75	-3.6353*				
Note: * is significant at 1%; ** is significant at 5%							

In the case of the the variables used for the economic growth model, the Augmented Dickey Fuller (ADF) test shows that the null hypothesis of a unit root cannot be rejected for all the variables. The variables were differenced and the ADF regressions re-estimated. It was found that the eight variables were integrated of order one I(1) (Table 2).

The Empirical Model Of Equilibrium Real Exchange Rate

The results of the multivariate cointegrating regression between ERER and its determinants are presented in this section. With the exception of excess liquidity (EXL), the exogenous variables explained about 90 per cent of movements in the Naira real exchange rate. As expected, the results revealed that RER in Nigeria was influenced by both short run and structural factors. Productivity entered the regression with a negative sign implying that an improvement in productivity appreciates the RER. Also, FDI appreciated the RER. As in Agu (2002), an increase in terms of trade depreciated the RER showing that the substitution effect outweighed the income effect in Nigeria.

The country's degree of openness (DOO) was associated with a depreciating ERER. The error correction coefficient (ECM) is negative (-0.17) and statistically significant. This implies that about 17% of the changes from the long run equilibrium condition in the previous year is corrected in the current year (Table 3). This model was used to generate the RER equilibrium by replacing the sustainable values of the right hand side variables of the model equation. The departure of the actual real exchange rate from the equilibrium is interpreted as real exchange rate misalignment in the next section.

Result of the Economic Growth Model

Table 4 presents the results of the long run multivariate Growth – RERM model. In line with apriori expectation, the prime variable (RERM- Real Exchange Rate Misalignment) was negatively related to economic growth, though it turned out statistically insignificant. The indicators of monetary policy (LM2), trade policy (DOO) and human capital (LLBFORCE) were statistically significant while Gross Capital Formation (LGCF), Government Consumption (LGC) and Foreign Direct Investment (FDI) were statistically insignificant. All the variables were correctly signed except LGC and LLBFORCE, which turned out a negative sign. The negative relationship between LGC and economic growth could be an indication of the crowding out effect of government consumption on the private sector.

The test of multicolinearity in table 5 shows high Variance inflation factor (VIF) reveals that money supply (M2) and Labour force are highly correlated. There is need therefore, to recursively remove the highly correlated variables one after the other till the VIFs are relatively small. The money supply (M2) and labour force were eventually were removed and replaced with real interest rate.

Table 6: Long Run Growth Model variables				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RIR	0.000203	0.006061	0.033460	0.9735
RERM	0.002876	0.002212	1.299779	0.2033
LOG(GCF)	-3.016884	0.379948	-7.940257	0.0000
LOG(GC)	1.666172	0.314135	5.304001	0.0000
FDI	-1.70E-10	5.20E-11	-3.273482	0.0026
DOO	0.039390	0.007669	5.136078	0.0000
C	-12.45142	10.39722	-1.197573	0.2402
R-squared	0.968756	Mean dependent var		29.26801
Adjusted R-squared	0.962709	S.D. dependent var		2.351234
S.E. of regression	0.454042	Akaike info criterion		1.423568
Sum squared resid	6.390778	Schwarz criterion		1.725229
Log likelihood	-20.04779	Hannan-Quinn criter.		1.530896
F-statistic	160.2008	Durbin-Watson stat		1.284892
Prob(F-statistic)	0.000000			
Source: E-views version 10 output				

Table 6 presents the result for the long run model of exchange rate misalignment on GDP after removing the money supply and labour force that were highly correlated and replaced with the real interest rate. The result gave a better model compared to the one in table 4a, even though the exchange rate misalignment was still insignificant but with a lower p-value. The result further reveals that government consumption (GC), foreign direct investment (FDI),gross capital formation and degree of openness have significant impact on economic growth. The real exchange rate misalignment was still not significant even after removing highly correlated variables and substituting with real interest rate. The VIF results in table 7 shows that the level of multicolinearity among predictor variables are within limit. A simple rule of thumb is that the VIF value must be less than 10, indicating that the variables are not highly correlated. The result indicates that the high R-square of approximately 96.88% may be indicative of high contributions of the predictor variables as captured in the modeland not a consequence of any fundamental issue in the model.

The negative coefficient of DLGC (a proxy for government size) supports the general belief that an increase in government size crowds out private sector and thus erode entrepreneurial efforts, which ultimately retards growth. Furthermore, this outcome could be attributable to the inherent leakages within the system.

Table 9: Short Run Growth Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLRERM	-0.016432	0.007636	-2.151805	0.0636
DLM2(-1)	-0.051894	0.043252	-1.199819	0.2645
DLRERM(-1)	-0.001865	0.005804	-0.321372	0.7562
DLGCF	0.082744	0.027955	2.959857	0.0182
DLGC(-1)	-0.049640	0.022387	-2.217325	0.0574
DFDI	0.032624	0.012543	2.600913	0.0316
DDOO	0.003742	0.001255	2.981448	0.0176
DLLBFORCE	-0.767728	0.101940	-7.531206	0.0001
ECM2(-1)	-0.859158	0.250278	-3.432822	0.0089
C	0.035751	0.008495	4.208581	0.0030
R-squared	0.948271	Mean dependent var		0.033657
Adjusted R-squared	0.890076	S.D. dependent var		0.058353
S.E. of regression	0.019347	Akaike info criterion		-4.752404
Sum squared resid	0.002994	Schwarz c7riterion		-4.257753
Log likelihood	52.77164	F-statistic		16.29475
Durbin-Watson stat	2.583575	Prob(F-statistic)		0.000311
Source: E-view version 10 output				

The degree of openness of the domestic economy to the rest of the world (DOO) has significant positive impact on economic growth. As expected, the model revealed that DLGCF (Gross Capital Formation) and DFDI (Foreign Direct Investment) impact positively on economic growth. Contrary to apriori expectation, DLM2 (a proxy for monetary supply) was negatively related to economic growth and this might be explained in terms of the weak link between the monetary and real sectors of the economy. Similarly, the finding that human capital is negatively related to economic growth is contrary to expectation. This may point to the issues regarding the quality (productivity) of human capital available in the country.

As required, the coefficient of the residual term (ECM2) is negative and statistically significant. Furthermore, the estimated value of the error correction term (ECM2) shows that about 86.0 per cent of disequilibrium is corrected each year. In other words, 86.0 per cent of adjustment towards the long run occurs within a year through changes in the growth rate of the economy occasioned by the included variables. The R-squared statistics showed a tight fit at 94 per cent (Table 6).

V.   CONCLUSION AND RECOMMENDATION
The study measured the extent of exchange rate misalignment in Nigeria between the periods of 1981 and 2020 and analyzed empirically, the impact of such misalignment on the country's growth path. This study employed cointegration and error correction methodologies to empirically investigate the relationship between real exchange rate misalignment and economic growth in Nigeria. This study provides answer to the important question of whether the Naira has suffered from sustained misalignments over the period.

It was found that the Naira was misaligned during the review period, with substantial undervaluation recorded in recent years. The study found that the extent of misalignment during the pre SAP period (8.0%) was higher than the one recorded during the post SAP period (5.2%). The empirical results confirmed the existence of misalignment and investigated the impact of such misalignment on Nigeria's economic growth during 1981-2020. This study also found that exchange rate policies adopted by the country over the years contributed to the misalignment of the Naira. A negative short run relationship was established between real exchange rate misalignment and economic growth during the review period. Overall, empirical results confirmed the existence of real exchange rate misalignment and provided evidence of such misalignment on Nigeria's economic growth in the presence of money supply and labour force.

The findings in this study have been presented in previous section. It was found that the Naira was misaligned during the review period, with substantial undervaluation recorded in recent years. It was also found that the extent of misalignment during the pre SAP period (8.0%) was higher than the one recorded during the post SAP period (5.2%). Thus, our empirical results confirmed the existence of misalignment; and investigated the impact of such misalignment on Nigeria's economic growth during 1981-2020. It was also noted that exchange rate policies adopted by the country over the years contributed to the misalignment of the Naira. Consequently, the study advocates a market based exchange rate management system that will ensure that real exchange rate move in tandem with relevant macroeconomic fundamentals in the economy. These will enhance the country's growth prospects.

It was found that the Naira was misaligned during the review period, with substantial undervaluation recorded in recent years and that the extent of misalignment during the pre SAP period (8.0%) was higher than the one recorded during the post SAP period (5.2%). In exchange rate equilibrium, the natural borrowing constraints in a bond economy depend on real exchange rate misalignment as exchange rate movements drive differences in national wealth by affecting the relative value of a country's output, Since the relative value of output reflect misalignment when financial markets are incomplete, real exchange rate movements induce an inefficient wealth wedge across countries. On how monetary policy should respond to capital inflows that can widen the current account deficit, appreciate the currency and cause domestic overheating, Corsetti, Dedola & Leduc (2020) argued that the optimal monetary stance should be contractionary if the exchange rate pass-through on import prices is incomplete and expansionary if exchange rate pass-through is complete. This implies that exchange rate volatility and misalignment are higher in economies where incomplete pass through contains the effects of exchange rates on price competitiveness. (Corsetti, et al, 2020).

The empirical results confirmed the existence of misalignment and investigated the impact of such misalignment on Nigeria's economic growth during 1981-2020. This is in line with the findings of several studies: Anigbogu, et al (2014) found that real exchange rate misalignment and volatility impacted the economic growth negatively in Nigeria; similar results was also found in Trinidad & Tobago (Conrad et al , 2018)and found that the economic growth of the country is affected negatively by both exchange rate misalignments and appreciation. It was also found that exchange rate policies adopted by the country over the years contributed to the misalignment of the Naira. Exchange rate stability remains one of the major source of economic growth. It is therefore important that monetary authorities and government should adopt an exchange rate policy that leads to stable exchange rates.

A negative short run relationship was established between real exchange rate misalignment and economic growth during the review period .However, it was also discovered that exchange rate realignment alone would not guarantee the much desired rapid economic growth in Nigeria. Therefore, other complementary policies were advocated namely, a more liberalized trade regime, a reduction in the size of government (privatization), sustained efforts in infrastructural provisioning, an effective monetary policy stance that is capable of curtailing excess liquidity in the system as well as policies for improving the quality (productivity) of human capital in the economy. Overall, our empirical results confirmed the existence of real exchange rate misalignment and provided evidence of an impact of such misalignment on Nigeria's economic growth

Based on the findings of the study with regards to the extent of Naira real exchange rate misalignment as well as its impacts on economic growth, a number of recommendations are offered as follows: given that the study showed that five variables affect the real exchange rate, namely, terms of trade, productivity, trade policy, capital inflow and the nominal exchange rate. It is therefore advised that the nature of the relationship between each of these relevant variables and the real exchange rate should be considered when formulating policies targeted at any of them.

An average Naira exchange rate misalignment to the tune of about 22 per cent undervaluation was estimated for the period 1970-2020, with an overvaluation of 6.4 per cent recorded prior to the 2008/09 global financial crisis. It is therefore recommended that a realignment of the Naira exchange rate towards sustainable equilibrium be pursued in order to enhance the growth prospects of the nation. Also, policymakers should keep inflation and interest rates under control since they help to mitigate the negativity of volatility on growth, since the contribution to economic growth is tightly connected to international trade and investments

In order to enhance economic growth in Nigeria, the size of government should reduce while private sector led growth should further be encouraged. The due process mechanism in the award of government contracts should be sustained and strengthened. Government should also divest its holdings in businesses that the private sector can manage.

A further liberalization of the nation's trade policy is advocated. However, the government must create enabling environment for domestic firms to operate profitable and competitively. The necessary institutional arrangements and legal reforms should be put in place. Also, the current infrastructural decay in the country should be reversed as this would help in alleviating the problems of domestic producers as well as encourage foreign investors.

This study presented an up to date empirical findings on naira exchange rate misalignment and its attendant impact on the growth of Nigerian economy. The study provided more reliable findings as it made use of a wider period for the exchange rate misalignment compared to existing studies in Nigeria. This research also contributed in substantial measure to extant literature in the area of exchange rate misalignment and economic growth by using a more recent and wide range of dataset to ascertain if domestic currency has marginally or overly depreciated from equilibrium level.

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