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# A COMPARATIVE ANALYSIS ON THE RELATIONSHIP BETWEEN EXCHANGE RATE AND SELECTED MACROECONOMIC VARIABLES IN NIGERIA AND TURKEY

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**Abstract**

The main objective of this study is to examine the causality between exchange rate and other selected macroeconomic variables in Nigeria and Turkey between 1980 and 2017. This study employs the Toda-Yamamoto Var Granger causality test on Exchange rate, GDP, Inflation. Export, Import and Foreign Direct Investment. For Nigeria, the results show that only IMP and EXP Granger cause REER, with no feedback causal effect, implying that there is a unidirectional causality running from imports and exports to exchange rate. Also, REER and the remaining variables (GDP, INF, and FDI) do not Granger cause each other.

In the case of Turkey, REER and GDP indicates absence of causality and this suggests that there is no causality between exchange rate and economic growth. The result also revealed that the causality between exchange rate and inflation, exports, and imports is bidirectional. Lastly, REER does not Granger cause FDI, but FDI and GDP Granger cause REER and this implies that there is a unidirectional causality running from foreign direct investment and Gross Domestic Product to exchange rate.

From the empirical results, this study concludes that exchange rate cannot predict the movement of GDP, Foreign Direct Investment, inflation, export and import in Nigeria. However, policy makers can employ the rate of import and export in the economy to stabilize exchange rate in Nigeria. As a result of the bidirectional causality between exchange rate, inflation, export and import in Turkish economy except GDP and Foreign Direct Investment, the study also concludes that, exchange rate can predict or cause significant changes in macroeconomic performances of the economy. Therefore, it's recommended that exchange rate should be used to ensure sound performances of the macroeconomic variables in the Turkish economy

**Keywords:** Exchange rate, Macroeconomic variables, Causality, Nigeria and Turkey

**Jel Classification:** F3, F31

## 1.0 Introduction

Demburg and McDougall (1980) explained exchange rate as the domestic price of a country's currency which can be controlled by the market forces of supply and demand through foreign transactions of imports and exports in the foreign exchange market. Exchange rate volatility has caused many countries of the world to embark on different exchange rate system and reforms due to economic losses. These reforms assisted most countries to either achieve sustainable

Vol. 5, No.07; 2021

ISSN: 2456-7760

growth rate and development or otherwise (Bakare, 2011). Rasaq (2013) added that one of the essential macroeconomic variables used as a measure to determine the level of competitiveness of an economy in the international front is the rate of exchange.

Several emerging markets have introduced different exchange rate policy in order to ensure sustainable development and macroeconomic performance. For instance, in January 2000, Turkish economy introduced a programme known as exchange rate based stabilization (ERBS) to stabilize its exchange rate until November of the same year, when the economy experienced an unexpected attack on their currency. Moreover, Turkish currency had the second attack after muddling through for stability for few months. This latter led to the implementation of a floating exchange rate regime in Turkey till date. However, this was not the first time experience with the ERBS. In fact, since 1980 authorities have been using exchange rate in order to stabilize the economy even if such an announcement has been avoided most of the time.

Similarly, in Nigeria, significant transformation has been imposed on exchange rate policy since post independence era when fixed exchange rate system was the order of the day but in early 1986, structural adjustment took over when a market based exchange rate was introduced. Before 1973, the exchange rate policy of Nigerian economy was in line with the IMF par value or fixed exchange system and was mainly controlled and managed administratively since it was not a traded currency. The Nigerian currency was determined by the British Pound Sterling till 1967 which was later devalued to the Dollar. In December of 1971, there was a breakdown of the IMF par value system which brought about the adjustment of the currency (naira) to dollar. At a time, precisely in 1978, the Nigerian currency was pegged to a basket of 12 currencies that constitute the main trading partners resident in Nigeria which was abolished in 1985 in order for naira to be quoted against the dollar.

The idea behind the frequent changes in the exchange rate policy was mainly to maintain a stable exchange rate, preserve the value of foreign reserve and ensure equilibrium in the balance of payment. Although, a number of ad-hoc measures were adopted to realize the policy objectives, it can be also be said that economic objectives played a major role in determining the exchange rate. Thus, throughout the 1970s, except 1976 and 1977, the nominal exchange rate appreciated every year. The policy encouraged heavy reliance on imports which ultimately led to balance of payments problems and depletion of external reserves. Nevertheless, up to the time of SAP, exchange rate policy encouraged the overvaluation of the naira as reflected in real exchange rate appreciation, particularly in the 1970s (Obadan, 1993b, 1994 and 1995).

Following the history of exchange rate management in the two countries, it's pertinent to note that the performances of macroeconomic variable could be attributed to exchange rate volatilities. Also, exchange rate management can be successful when the macroeconomic variables are efficient in making the economic environment conducive and receptive to changes in their relationship with other countries of the world.

Therefore, its on this premise that this paper attempts to improve on existing literature by investigating empirically the causal relationship between some selected macroeconomic

Vol. 5, No.07; 2021

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indicators and exchange rate in Nigeria and Turkey. Also, there is paucity of literatures on comparison of these macroeconomic variables and exchange rate between the two countries.

## 2.0 Literature Review

### 2.1. The Concept of Exchange Rate

Exchange rate can be referred to as the value or price of a particular country currency against another. It can also be referred to as a ratio that appears between a unit of currency and the amount of another country currency it could purchase or be exchange with at a given point in time (Ngerebo and Ibe, 2013). Exchange rate could be practiced on two basic different bases which could be either fixed or floating. A change from fixed exchange rate to managed floating exchange rate has occurred systematically after the breakdown of the Bretton Woods system in 1973. This caused many developing economies to peg their exchange rate into a single currency, such as French Franc, US dollar or a basket of currencies (this became common peg in $1970_s$).

### 2.1.1. The Floating Exchange Rate Regime in Turkey

The first implementation of floating exchange rate in Turkey led to the over depreciation of the Turkish exchange rate scheme which is about 28.5% against the US dollar. This depreciation can happen in any country until the exchange rate reaches the natural balance value of the market (Arat, 2003). The Turkish central bank advocated that the country will be employing a unique floating exchange rate system, which implies that the market supply and demand will be the determinant of the exchange rate system without any realizable target being set by the central bank of the country. The CBT (Central Bank of Turkey) also announced that it will not interfere in the market until there is a case of excess volatility which will affect the long run equilibrium of the level of exchange rate (Gormez and Yilmaz 2007; Yilmaz 2008).

The Central Bank of Turkey intends to build its foreign currencies reserves with the aid of buying up auctions to build up her reserves. This act was carried out to suppress the negative effect of the external and internal shock to the country and to build the country economic confidence. During the post floating period, the Central Bank of Turkey did not interfere in the affairs of the foreign exchange market unnecessarily, it only intervened when expecting a significant volatility increase in this market.

### 2.1.2. Foreign Exchange Rate Management in Nigeria

The system of exchange rate adopted in Nigerian as undergone series of changes such as developing from a fixed parity in 1960 (British Pound Sterling) to US dollar in 1972 as a result of the devaluation of the pound sterling value. This act was carried out to reduce the effect of devaluation of a single individual currency. Hence, the Nigerian currency was affirmed to both pound and dollar. Throughout year 1970 the international market for crude oil was performing well which led to a gradual rise of the nominal exchange rate. To this effect, the country over reliance on import gradually cruised down the value of agriculture in the country and gave rise to capital flight of Non-oil producing firm in the country while the balance of payment deterioration was not also left out of the effects (Osaka, Mashe, and Adamgbe 2003).

Vol. 5, No.07; 2021

ISSN: 2456-7760

Prior to 1986 the excellent performance of the exchange rate system has brought about over reliance on the home currency (naira) which later constituted part of Nigeria problem. To provide solution to this encountered by the country, it was decided by the government of the country to initiate the Structural Adjusted Programme which was brought into reality on the 16th of September 1986 coupled with the introduction of the second-tier foreign exchange market (SFEM). These were expected to enhance the mechanism for exchange rate determination and allocation in other to boost a long term balance of payment in the country.

After the creation of the second-tier foreign exchange market several modifications was carried out to achieve the objective of the second-tier security market objectives. This modification includes the creation of the foreign exchange market (FEM) which later transformed into the Autonomous foreign exchange market (AFEM), thereafter it changes to Dutch Action System (DAS), from DAS it became wholesale Dutch Auction System and in a bid to enlarge the scope, the Bureau de change was created in 1989 coupled with the fixed exchange rate. Up till date the Nigerian exchange rate is still running in-between the fully managed and freely floating regimes.

### 2.2. Theoretical Framework

The theories that underpin this research work are Portfolio balance theory, the purchasing power parity and balance of payment theory. They are explained as follows:

#### 2.2.1. The Portfolio Balance Theory

This theory developed by Branson (1975), assumes that residents distribute their wealth among three forms of assets – monetary base, domestic bonds, and foreign bonds. Exchange rate is in equilibrium when the holding of these assets are in their desired proportion. In portfolio analysis, the current account balance becomes the reflection of the government budgetary imbalance when the private sector is satisfied with the holding of financial assets. The inability of government to sell bonds to foreigners without an excessive fall in their prices reflected in the overall balance of payment deficit.

#### 2.2.2. The Purchasing Power Parity (PPP) Theory

The theory was developed by Gustav Cassel in 1981 and the fundamental idea of the theory is that exchange rate among countries of the world is determined by equating the relative difference in the levels of prices in the various countries Jhingan (2011). This theory further states that the country with a higher domestic inflation have the tendency of experiencing depreciation in their nominal rate of exchange and vice versa. Purchasing power parity is also with the main thrust that the ability to compete at the international front can be measured by comparing the relative prices of goods of different countries by using the same currency.

#### 2.2.3. The Balance of Payments Theory

This theory states that considering a free exchange rate regime, the receipts from exports and payments for import of an economy determines its rate of exchange (Jhingan 2011). When an economy experiences a favorable balance of payment, her exchange rate tends towards appreciation while otherwise, the value of exchange rate depreciates. The implication is that, demand and supply of foreign exchange determines the rate of exchange. Therefore, this theory,

Vol. 5, No.07; 2021

ISSN: 2456-7760

stresses that to cause any adjustments in the balance of payments some currencies could be devalued or revalued when there is deficit or surplus in the balance of payment, respectively.

**2.3. Empirical studies**

There are several empirical studies on the impact of exchange rate on macroeconomic performances with divergent results. Some of the previous researchers concluded that positive relationship exists between exchange rate management and the macroeconomic performances in Nigeria and Turkey economy while others confirmed a negative relationship. For instance in the works of Eme and Johnson (2010), how the movement in exchange rate affect real output growth in Nigeria was investigated between 1986 and 2010. A Generalized Method of Moments (GMM) technique and simultaneous equations model employed showed that, there is no significant positive relationship exchange rate and output growth.

In the works of Birgül, Hacer and Konstantinos (2013) on the nexus between exchange rate on macroeconomic variables in Turkey from 2003 to 2010, findings revealed that the channel of exchange rate is effective for both Turkey and Argentina. The result was discovered by employing vector auto-regression (VAR) models and five macroeconomic variables which are; the real effective exchange rate short-term interest rates, the consumer price index , net exports, and industrial production index.

By considering the Nigerian economy, Adeniran, Yusuf and Adeyemi (2014) determined the effect of exchange rate on economic growth between 1986 and 2013. Using, the correlation and regression analysis of the ordinary least square (OLS) the author revealed that export promotion strategies would maintain surplus balance of trade. Özcan (2020) studied the impact of exchange rate on Turkish Economic growth between 2002 and 2019. The relationship between exchange rate and economic growth was examined by employing Johansen co integration test, Granger causality test and Innovation Accounting Techniques. It was deduced from the findings that there is a negative causal relationship between exchange rates and economic growth in Turkey.
Abdulkadir, Ajibola, Olutope and Abiola (2015) examined exchange rate misalignment and Nigerian economic growth from 2000 to 2014. Behavioral Equilibrium Exchange Rate approach of Edwards (1989) was employed to determine sustainable equilibrium path which was used to derive estimates of Real Exchange Rate Misalignment (RERMIS) by computing deviations of the actual real exchange rate. The study discovered that, real exchange rate misalignment exerts a negative effect on Nigerian economic growth.

Havvanur and Rahmi (2016) examined the optimal macro-economic uncertainty index for turkey from a period of 2002 to 2014. This research employed generalized method of moment (GMM) and the Ordinary least square (OLS) for the study. The authors used Inflation rate as the dependent variable alongside Real output, Real Exchange Rate and Real Interest Rate as the independent variable. The findings revealed that some periods had a positive uncertainty and the remaining periods had negative uncertainty in the Turkish economy.

Kenneth, Jonathan and Kenneth (2016) analysed the influence of exchange rate regimes on growth of Nigerian economy between 1970 and 2014. Generalized Method of Moments (GMM)

Vol. 5, No.07; 2021

ISSN: 2456-7760

was employed to estimate economic growth equation. The authors suggest that exchange rate regimes indeed contributes to performance of Nigerian economy since the result showed that deregulated exchange rate regime improve economic growth in Nigeria when compared to the whole period and fixed exchange rate regime.

Ravindran and Soroush (2015) examined the influence of macroeconomic variables on exchange rate in USA, Australia and Germany by employing regression modeling technique. Exchange rate represented the dependent variable while the independent variables were employment rate, inflation rate, Tax rate, Corruption index, GDP, interest rate, surplus/deficit rate, borrowing rate and balance of payments. From the five models formulated, the result obtained showed that most of the variables exact negative influence on exchange rate. However, one of results revealed that all macroeconomic variables had significant effect on the exchange rates apart from budget deficit and employment.

Also, for Nigeria, Ngerebo and Reginald (2013) investigates the causal relationship between exchange rate (dependent variable) and other macroeconomic variables such as; inflation rate, balance of payment, gross domestic product, growth rate, external reserves and external debt in from 1987 to 2011. The result of the Granger causality test shows that a unidirectional causality exists from exchange rate to BOP, external reserves and gross domestic product growth rate. Also, from gross domestic product growth rate to external reserve there is a unidirectional causality.

Moreover, Ojo and Alege (2014) investigated the relationship between exchange rate fluctuations and Macroeconomic performance in sub-saharan African Countries between 1995 and 2007 and discovered that there exist a bilateral relationship between exchange rate, consumer index, degree of openness and interest rate. Generalized methods of moments and panel granger causality test were employed for the purpose of analysis.

In another study, Iyeli (2017) examined the contributions of exchange rate volatility on the performance of Nigerian between 1970 and 2011. The model formulated depicts Real GDP as the dependent variable while Exchange Rate (EXR), Balance of Payment (BOP) Oil Revenue (OREV) and inflation (INF) are independent variables. By employing parsimonious model, it was revealed that OREV and EXR had positive influence on GDP. This further implies that, in the long run, oil revenue and exchange rate volatility exert a positive effect on GDP.

Karahan (2017) examined exchange rate pass through in Turkey before and after the adoption of inflation targeting regime between 2006 and 2014. This research makes use of error correction model in estimating the data gathered for the research. Consumer price and exchange rate were considered in achieving the research objectives. The result of the analysis showed that in the post-IT period, exchange rate pass-through reduced compared to pre-IT period. It could also be stressed that, in Turkey, exchange rate pass through is reduced by inflation targeting regime.

Pelin (2018) examined the macroeconomic uncertainty and investment relationship for Turkey spanning from 1994 to 2018. This research employs generalized autoregressive conditional heteroskedasticity (GARCH) model to measure uncertainties. For this study, private investment

Vol. 5, No.07; 2021

ISSN: 2456-7760

to GDP was used as the regressed variable alongside current real gross domestic product, relative price of capital, and credit to private sector relative to nominal GDP as the independent variable. The research result reviews that the effect of macroeconomic uncertainties on private investment in Turkey, is significantly negative.

In another study, Achouak, Ousama and Mourad (2018) investigated the effect exchange rate volatility has on economic growth in 45 developing and emerging countries over the period of 1985 and 2015. By using generalized method of moments estimators it was discovered that nominal and real exchange rate volatility contributes negatively to growth of Nigerian Economy and that this effect is determined by the level of financial openness of the economy and the type of exchange rate regime practiced in the economy.

## 3.0 Research Methods

This study investigates the causality between Exchange rate and other selected macroeconomic variables by taken into account the Nigerian and Turkish economy. These countries were selected on the justification that they faced the same crash in their exchange rate system and operate the same exchange rate system after several structural adjustment programmes. Moreover, they are consistent business partners in the international platform. Similarly, both countries can be categorized as emerging markets.

The data sourced for this study are secondary in nature and extracted from the database of World development indicator. The study covers a period of 37 years (1980-2017).

The variables and symbols used in the study are shown below in table 3.1:

| Variables | Symbols |
|---|---|
| Real Exchange rate | REER |
| Gross Domestic Product | GDP |
| Inflation Rate | INF |
| Export | Export |
| Import | IMP |
| Foreign Direct Investment | FDI |

## 3.1 Estimation technique

To achieve the objective of this study, the causality test proposed by Toda-Yamamoto (1995) was applied. This method is preferred to the normal granger causality test because itcan be administered without considering the co-integration information in the system and the series need not be stationary in the same order. Also Standard vector autoregressive model (VAR) is created by using the levels regardless of the order of the series. This is achieved by artificially changing the actual order of VAR model to $k + dmax$. This is done by adding the maximum integration order of $dmax$. $k$ is the maximum number of delay and $d$ is the degree of integration of the variables.

Vol. 5, No.07; 2021

ISSN: 2456-7760

For this study, the T-Y model in VAR framework can be expressed as:

$$\begin{aligned}\mathrm{REER}_t = \alpha_0 &+ \sum_{i=1}^{k} \alpha_{1i}\mathrm{REER}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{2j}\mathrm{REER}_{t-j} + \sum_{i=1}^{k} \alpha_{3i}\ln\mathrm{GDP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{4j}\ln\mathrm{GDP}_{t-j} \\ &+ \sum_{i=1}^{k} \alpha_{5i}\ln\mathrm{INF}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{6j}\ln\mathrm{INF}_{t-j} + \sum_{i=1}^{k} \alpha_{7i}\ln\mathrm{EXP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{8j}\ln\mathrm{EXP}_{t-j} \\ &+ \sum_{i=1}^{k} \alpha_{9i}\ln\mathrm{IMP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{10j}\ln\mathrm{IMP}_{t-j} + \sum_{i=1}^{k} \alpha_{11i}\ln\mathrm{FDI}_{t-i} \\ &+ \sum_{j=k+1}^{k+d_{max}} \alpha_{12j}\ln\mathrm{FDI}_{t-j} + \varepsilon_{1t} \qquad \ldots.(3.3.1)\end{aligned}$$

$$\begin{aligned}\mathrm{GDP}_t = \alpha_0 &+ \sum_{i=1}^{k} \alpha_{1i}\ln\mathrm{GDP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{2j}\ln\mathrm{GDP}_{t-j} + \sum_{i=1}^{k} \alpha_{3i}\mathrm{REER}_{t-i} \\ &+ \sum_{j=k+1}^{k+d_{max}} \alpha_{4j}\mathrm{REER}_{t-j} \sum_{i=1}^{k} \alpha_{5i}\ln\mathrm{INF}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{6j}\ln\mathrm{INF}_{t-j} + \sum_{i=1}^{k} \alpha_{7i}\ln\mathrm{EXP}_{t-i} \\ &+ \sum_{j=k+1}^{k+d_{max}} \alpha_{8j}\ln\mathrm{EXP}_{t-j} + \sum_{i=1}^{k} \alpha_{9i}\ln\mathrm{IMP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{10j}\ln\mathrm{IMP}_{t-j} + \sum_{i=1}^{k} \alpha_{11i}\ln\mathrm{FDI}_{t-i} \\ &+ \sum_{j=k+1}^{k+d_{max}} \alpha_{12j}\ln\mathrm{FDI}_{t-j} + \varepsilon_{1t} \qquad \ldots.(3.3.2)\end{aligned}$$

$$\begin{aligned}\ln\mathrm{INF}_t = \beta_0 &+ \sum_{i=1}^{k} \beta_{1i}\ln\mathrm{INF}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \beta_{2j}\ln\mathrm{INF}_{t-j} + \sum_{i=1}^{k} \beta_{3i}\mathrm{REER}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \beta_{4j}\mathrm{REER}_{t-j} \\ &+ \sum_{i=1}^{k} \alpha_{5i}\ln\mathrm{GDP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{6j}\ln\mathrm{GDP}_{t-j} + \sum_{i=1}^{k} \beta_{7i}\ln\mathrm{EXP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \beta_{8j}\ln\mathrm{EXP}_{t-j} \\ &+ \sum_{i=1}^{k} \beta_{9i}\ln\mathrm{IMP}_{t-i} + \sum_{j=k+1}^{k+d_{max}} \beta_{10j}\ln\mathrm{IMP}_{t-j} + \sum_{i=1}^{k} \beta_{11i}\ln\mathrm{FDI}_{t-i} \\ &+ \sum_{j=k+1}^{k+d_{max}} \beta_{12j}\ln\mathrm{FDI}_{t-j} + \varepsilon_{2t} \qquad \ldots.(3.3.3)\end{aligned}$$

Vol. 5, No.07; 2021

ISSN: 2456-7760

$$\ln EXP_t = \delta_0 + \sum_{i=1}^{k} \delta_{1i} \ln EXP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \delta_{2j} \ln EXP_{t-j} + \sum_{i=1}^{k} \delta_{3i} REER_{t-i} + \sum_{j=k+1}^{k+d_{max}} \delta_{4j} REER_{t-j} + \sum_{i=1}^{k} \alpha_{5i} \ln GDP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{6j} \ln GDP_{t-j} + \sum_{i=1}^{k} \delta_{7i} \ln INF_{t-i} + \sum_{j=k+1}^{k+d_{max}} \delta_{8j} \ln INF_{t-j} + \sum_{i=1}^{k} \delta_{9i} \ln IMP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \delta_{10j} \ln IMP_{t-j} + \sum_{i=1}^{k} \delta_{11i} \ln FDI_{t-i} + \sum_{j=k+1}^{k+d_{max}} \delta_{12j} \ln FDI_{t-j} + \varepsilon_{3t} \quad \ldots (3.3.4)$$

$$\ln IMP_t = \Phi_0 + \sum_{i=1}^{k} \Phi_{1i} \ln IMP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \Phi_{2j} \ln IMP_{t-j} + \sum_{i=1}^{k} \Phi_{3i} REER_{t-i} + \sum_{j=k+1}^{k+d_{max}} \Phi_{4j} REER_{t-j} + \sum_{i=1}^{k} \alpha_{5i} \ln GDP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{6j} \ln GDP_{t-j} + \sum_{i=1}^{k} \Phi_{7i} \ln INF_{t-i} + \sum_{j=k+1}^{k+d_{max}} \Phi_{8j} \ln INF_{t-j} + \sum_{i=1}^{k} \Phi_{9i} \ln EXP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \Phi_{10j} \ln EXP_{t-j} + \sum_{i=1}^{k} \Phi_{11i} \ln FDI_{t-i} + \sum_{j=k+1}^{k+d_{max}} \Phi_{12j} \ln FDI_{t-j} + \varepsilon_{4t} \quad \ldots (3.3.5)$$

$$\ln FDI_t = \rho_0 + \sum_{i=1}^{k} \rho_{1i} \ln FDI_{t-i} + \sum_{j=k+1}^{k+d_{max}} \rho_{2j} \ln FDI_{t-j} + \sum_{i=1}^{k} \rho_{3i} REER_{t-i} + \sum_{j=k+1}^{k+d_{max}} \rho_{4j} REER_{t-j} + \sum_{i=1}^{k} \alpha_{5i} \ln GDP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \alpha_{6j} \ln GDP_{t-j} + \sum_{i=1}^{k} \rho_{7i} \ln INF_{t-i} + \sum_{j=k+1}^{k+d_{max}} \rho_{8j} \ln INF_{t-j} + \sum_{i=1}^{k} \rho_{9i} \ln EXP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \rho_{10j} \ln EXP_{t-j} + \sum_{i=1}^{k} \rho_{11i} \ln IMP_{t-i} + \sum_{j=k+1}^{k+d_{max}} \rho_{12j} \ln IMP_{t-j} + \varepsilon_{5t} \quad \ldots (3.3.6)$$

### 3.2 Unit root Test

This test is used to determine whether the variables are stationary or not. As earlier mentioned, Toda-Yamamoto can be used either the variables contain unit root test or not. The unit root test is employed to arrive at the maximum stationary degree (*dmax)*. Therefore the Augmented Dickey Fuller was used to determine the stationary state of the variables.

### 4.0 Results and Discussion of Finding

Table 4.2 and 4.3 below report the Augmented Dickey Fuller Results of the variables as follows:

Vol. 5, No.07; 2021

ISSN: 2456-7760

**Table 4.2: Unit root test Result for Nigeria**

| Variables | Critical values | ADF statistics | P-value | Decision | |
|---|---|---|---|---|---|
| **REER** | **-3.626784** | **-4.17779** | **0.0024** | **I(1)** | **Stationary** |
| **GDP** | **-3.626784** | **-4.8587** | **0.004** | **I(1)** | **Stationary** |
| **INF** | **-2.943427** | **-2.9489** | **0.0495** | **I(0)** | **Stationary** |
| **EXPORT** | **-3.626784** | **-5.3210** | **0.0001** | **I(1)** | **Stationary** |
| **IMP** | **-2.94021** | **-3.396861** | **0.0183** | **I(0)** | **Stationary** |
| **FDI** | **-3.621023** | **-3.667886** | **0.0089** | **I(0)** | **Stationary** |

**Table 4.3: Unit root test Result for Turkey**

| Variables | Critical values | Adf statistics | P-value | Decision | |
|---|---|---|---|---|---|
| **REER** | **-3.626784** | **-7.6623** | **0.0000** | **I(1)** | **Stationary** |
| **GDP** | **-3.626784** | **-5.5802** | **0.0000** | **I(1)** | **Stationary** |
| **INF** | **-3.626784** | **-7.1241** | **0.0000** | **I(1)** | **Stationary** |
| **EXPORT** | **-3.621023** | **-2.8851** | **0.0567** | **I(0)** | **Non Stationary** |
| **IMP** | **-3.632900** | **-5.6530** | **0.0000** | **I(1)** | **Stationary** |
| **FDI** | **-3.632900** | **-4.9873** | **0.0002** | **I(1)** | **Stationary** |

From the result in table 4.2 and 4.3, its seen that the maximum degree of integration (*dmax)* for both countries is 1 since the maximum degree of integration is I(1).

### 4.2 Toda-Yamamoto (TY) Granger Causality Analysis

Table 4.4 below reports the T-Y Granger causality test results. The Akaike information criterion is used to determine the optimal lag length of the VAR model.

**Table 4.4 Toda-Yamamoto Var Granger causality test results**

| Null Hypothesis | Nigeria | Turkey |
|---|---|---|
| | | |
| REER does not Granger cause GDP | 0.233(0.629) | 0.168(0.682) |
| GDP does not Granger cause REER | 0.003(0.987) | 0.000(1.000) |
| REER does not Granger cause INF | 0.803(0.370) | 5.286(0.022)** |
| INF does not Granger cause REER | 0.170(0.680) | 18.112(0.000)* |
| REER does not Granger cause EXP | 0.003(0.959) | 12.931(0.000)* |
| EXP does not Granger cause REER | 9.122(0.003)* | 23.921(0.000)* |
| REER does not Granger cause IMP | 0.016(0.900) | 3.055(0.080)*** |
| IMP does not Granger cause REER | 9.326(0.002)* | 5.201(0.023)** |
| REER does not Granger cause FDI | 0.645(0.422) | 0.900(0.343) |
| FDI does not Granger cause REER | 0.082(0.775) | 7.359(0.007)* |
| *, ** and *** denote rejection of null hypothesis at 1%, 5% and 10% significance level respectively and p-values are reported in brackets.<br>Source: Author's computation (2019) | | |

Vol. 5, No.07; 2021

ISSN: 2456-7760

For Nigeria, the results show that only IMP and EXP Granger cause REER, with no feedback causal effect, implying that there is a unidirectional causality running from imports and exports to exchange RATE. Also, REER and the remaining variables (GDP, INF, and FDI) do not Granger cause each other, indicating absence of causality between the variables. In the case of Turkey, REER and GDP do not Granger cause each other and this suggests that there is no causality between exchange rate and economic growth. INF, EXP, and IMP Granger cause REER while REER also Granger cause INF, EXP, and IMP. This means that the causality between exchange rate and inflation, exports, and imports is bidirectional. Lastly, REER does not Granger cause FDI, but FDI Granger cause REER and this implies that there is a unidirectional causality running from foreign direct investment to exchange rate.

From the empirical results, in case of Nigeria, the findings implied that exchange rate cannot predict the movement of GDP, Foreign Direct Investment, inflation, export and import in Nigeria. However, policy makers can employ the rate of import and export in the economy to stabilize exchange rate in Nigeria. In Turkey, the bidirectional causality between exchange rate, inflation, export and import in Turkish economy except GDP and Foreign Direct Investment, implies that exchange rate can predict or cause significant changes in macroeconomic performances of the economy.

## 5.0 Conclusions and Recommendations

This research investigates a comparative analysis of exchange rate management and macro-economic performance in Nigeria and Turkey from a period of 1980 to 2017. Toda-Yamamoto (T-Y) Granger causality test results shows that gross domestic product, inflation and foreign direct investment did not granger cause each other in Nigeria while import and export granger cause exchange rate but unidirectionally. In Turkey, real exchange rate does not granger cause economic growth and Foreign Direct investment but there exist a bilateral causality between exchange rate, inflation, import and export. Conclusively, this research advocates that exchange rate management as significant effect on macro-economic variables performance in emerging markets. Therefore, it's recommended that exchange rate should be used to ensure sound performances of the macroeconomic variables in the Turkish economy. Also, for Nigeria, its recommended that importation of goods and services should be discouraged while export of goods and services should be encouraged to control exchange rate fluctuations.

## REFERENCES

Abdulkadir, Ajibola, Olutope and Abiola (2015) Impact of Naira real exchange rate misalignment on Nigeria's economic growth. CBN Journal of Applied Statistics. 6 (2), 103-131.

Achouak B., Ousama B and Mourad Z (2018). Impact of exchange rate volatility on economic growth. *Journal of Economic Integration*. 33(2), 1303-1336.

Adeniran J.O, Yusuf S.A and Adeyemi O.A(2014). The impact of exchange rate on economic growth. International Journal of Academic Research in Business and Social Sciences. 4 (8), 224-233.

Vol. 5, No.07; 2021

ISSN: 2456-7760

Ade T.O and Philip O.A (2014) focused on the relationship between exchange rate fluctuations and macroeconomic performance. *Asian Economic and Financial Review, 4*(11), 1573-1591.

Kasman A.and Kasman S. (2005). Impact of real exchange rate volatility on Turkey's export to its most important trading partners, *METU Studies in Development, 32* (1), 41-58.

Andrew F, Guonan M. and Dubravko M (2000). Exchange rate and monetary policy frameworks in EME's. BIS Papers, 37-63.

Arat K. 2003, Türkiye'de optimum döviz kuru rejimi seçimi ve döviz kurlarından fiyatlara geçiş etkisinin incelenmesi..''; The Central Bank of Turkey, Expert Thesis.

Bakare A.S ( 2011). The consequences of Foreign Exchange rate Reforms on the performances of Private Domestic Investment in Nigeria, *International Journal of Economics and Management Sciences, 1*(1), 25-31.

Birgül C., Hacer S. K. and Konstantinos V. (2013). The Effects of Exchange rates on Macroeconomic Variables: A Study on selected Emerging Economies International Conference in Eurasian Economies, 189-198.

Branson, W.H (1975). "Asset markets and Relative Prices in Exchange Rate Determination: U.S.A. Sozialiwissenschaftlich

Brighitta J. (2015). Impact of exchange rate regimes on economic growth in turkey. *Undergraduate Economic Review, 12*(1), 1-23.

Eme O.A and Johnson A.A (2010). Effect of exchange rate movements on real output growth in Nigeria. *CBN Journal of Applied Statistics, 2*(2), 1-15.

Gormez Y. and Yılmaz G,(2007) The Evolution of Exchange Rate Regime Choices in Turkey, Central Bank of the Republic of Turkey, *Second Conference of the South-Eastern European Monetary History Network (SEEMHN)* April, 269-302.

Hakan B., and Mehmet P. (2003). The effect of the real exchange rate on output and inflation: Evidence from Turkey. *The Developing Economics,* XL14, 401-435.

Hakan B. and Nergiz N.D (2004). The effects of real exchange rate risk on the economic performance. *Applied Economics, 36*(1), 2429–2441.

*Havvanur F. E. and Rahmi Y. (2016)***Measuring the Optimal MacroeconomicUncertainty Index for Turkey,** *Economic Annals, 61* (210), 7-22.

Iqbal M., Ehsanullah, M., & Habib, A. (2011). Exchange rate volatility & macroeconomic variables in Pakistan. *Business Management Dynamics, 1(*2), 11-22.

Iyeli I. I (2017), Effect of exchange rate volatility on Economic Growth in Nigeria. *International Journal of Economics, Commerce and Management, 5*(7), 584-595.

Vol. 5, No.07; 2021

ISSN: 2456-7760

Jhingan, M.L. (2011). International Economics, 6th Ed. India, Vrinda Publications Ltd.

Karahan O.(2017). Exchange Rate Pass-Through in Turkey before and after the Adoption of Inflation Targeting Regime. DOI: 10.5817/FAI2017-2-2, 8 (2), 37-48.

Kenneth O.O, Jonathan O.O and Kenneth U.N (2016). Impact of exchange rate regimes on Economic growth in Nigeria, *Journal of Economics and Sustainable Development, 7*(12), 115-127.

Magda K., Hakan B., and Nergiz N.D (2006). Effects of exchange rate fluctuations on real output. JEL classification : F41; F31; E32; E31, 407-488.

Ngerebo A. T., and Ibe, R. C. (2013). Exchange rate and macroeconomic performance in Nigeria: A causal post Structural Adjustment Programme investigation. *Global Journal of Management and Business Research Finance, 13(*7), 42-48.

Obadan, M.I (1994). Nigeria's Exchange Rate Policy and Management. National Centre for Economic Management and Administration (NCEMA) Monographs Series. No.5, NCEMA Publication, Ibadan

Obianuju N. (2017). Effect of exchange rate fluctuations on the Nigerian economy. *International Journal of Economics and Financial Management, 2*(3), 27-50.

Ojo A.T and Alege P.O (2014). Exchange Rate Fluctuations and Macroeconomic Performance in Sub-Saharan Africa: A Dynamic Panel Cointegration Analysis, *Asian Economic and Financial Review, 4(*11), 1573-1591.

Osaka, G.C, Masha, I and Adamgbe, E (2003). Issues in Exchange Rate Policy: Economic and Political Considerations In: Nnana, O.J., Alade, S.O. and Odoko, F.O. ed. Contemporary Economic Policy Issues, Abuja, Central Bank of Nigeria.

Özcan K. (2020). Influence of Exchange Rate on the Economic Growth in the Turkish Economy, DOI: 10.5817/FAI2020, 21-34.

Pelin O.G (2019) Macroeconomic Uncertainty and Private Investment: The Case of Poland Uiiid-Ijeas, 2019 (22):93-106 ISSN7-9832.

Rasaq, A. D. (2013). The impact of exchange rate volatility on the macroeconomic variables in Nigeria. *European Scientific Journal, 9(*7), 152-165.

Ravindran R. and Soroush K. A (2015) Influence of Macroeconomic Variables on Exchange Rates, *Journal of Economics, Business and Management, 3*( 2), 194-276.

Robert S.M., Bulent N.G., Suleyman O., Tayyeb S. and Alper C.E (2004). Prediction of currency crises: case of Turkey. Rev. Middle East Econ. Fin. 2(3), 87-107.

Vol. 5, No.07; 2021

ISSN: 2456-7760

Toda, H.Y., and Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics, 66,* 225–250.

Tiryaki A., Erdogan L. and Ceylan R. (2017), The Causal Relationship Between Selected Macroeconomic Variables And Stock Returns In Turkey, *UİİD-IJEAS*, 1(19):299-326.