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Remittances, Exchange Rate and Exports in Nigeria: Investigating the Foreign Exchange Channel for Future Optimization

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Abstract: The study investigated the nexus among diaspora remittance inflows, foreign exchange, exchange rate and exports in Nigeria. The objective of this study therefore, was to examine the pass-through effect of remittance inflows to exports via the exchange rate in Nigeria, focusing on the foreign exchange channel. The study utilised the Structural Vector Autoregressive (SVAR) model which uses the contemporaneous effects, impulse response and the forecast variance error decomposition to measure the pass-through effects among macroeconomic variables. Annual time series data on remittance inflows to Nigeria, the supply of foreign exchange, exchange rate and the monetary value of exports of goods and services in Nigeria from 1986 to 2020 were used for the investigation. Findings revealed that diaspora remittance inflows have the potential effect of increasing foreign exchange, which in turn appreciates the exchange rate. Also, the study revealed that the exchange rate appreciation potentially erodes the competitiveness of the exports-oriented sectors in Nigeria. The paper explored policy prescriptions that may offset the negative effects of large inflows of remittance in the country for future optimisation. The innovation of this study stems from the use of the SVAR to systematically examined

the pass-through effects of the diaspora remittance inflows to exports via exchange rate in Nigeria. Its uniqueness and novelty is the focus on the foreign exchange channel for future optimisation of remittances in the country.

Keywords: Diaspora Remittance, Exchange Rate, Export, Foreign Exchange, Structural Vector Autoregressive, Tradable Sector.

Introduction

Globally, diaspora remittance inflows have become an important source of developmental finance and foreign exchange supply in developing countries. Diaspora remittance inflows also, serve as a vital source of supplementary income for low-income households and, it significantly contributes to growth of the Gross Domestic Product (GDP) for these countries (Joseph, 2017).

Diaspora remittance inflows into many economies of the world exert positive impact on the foreign exchange market; as the increase in the inflows of remittance leads to increases in the supply of foreign currency thereby stabilising the exchange rate especially in developing countries. On the other hand, the exchange rate appreciation precipitated by the remittance inflows tends to increase imports and reduce exports competiveness of the recipient economy. The negative impact of remittance on the tradable oriented sector may increase if there is high level of inflation in the economy. Also, appreciation of the exchange rate occasioned by remittances may have widening effect on the current deficit of the recipient economy (Lopez et al., 2007). The implication of the foregoing is that, remittance inflows exert both desirable and undesirable impact on the internal and external balances of the recipient economy.

In Africa, the World Bank (2022) estimated that, diaspora remittances to the continent have grown by 5.2% to $53 billion with Nigeria having the highest inflows. Furthermore, the World Bank (2022) stated that, diaspora remittances to the Nigerian economy stood at $163.33 billion in the past eight years and these remittances have contributed to cushioning the adverse effects of foreign exchange scarcity thereby keeping the country's foreign exchange reserves afloat.

Again, the World Bank (2022) opined that, diaspora remittance is one of the major sources of non-oil foreign exchange for the Nigerian economy in 2022, and the sustained increase of the diaspora remittance inflows since 2021 in the country is attributed to the several new policies of the Central Bank of Nigeria.

In view of the fact that, significant diaspora remittance inflows result in real exchange rate appreciation with the potential effects of increasing imports and eroding the export competitiveness of the recipient country; what then, is the nexus among diaspora remittance inflows, exchange rate and exports in Nigeria? In Nigeria, understanding this nexus has immense policy relevance. This is because the Central Bank of Nigeria (CBN) in 2020 has evolved new policies on Diaspora remittances in the country with a view to enhancing the inflows of remittances in the country. According to Ifeoluwa (2020), the policy has the potential of stabilising the rate of dollar to naira and this would invariably increase the supply of foreign exchange in the country. The new policy will allow for proper accounting of the foreign exchange inflows in Nigeria via the diaspora remittances as the use of unsafe and unofficial channels are prohibited. The new policy empowers the International Money Transfer Operators (IMTOs) and the Deposit Money Banks (DMBs) to officially disclose to the beneficiaries the amount transferred to them. This is expected to enhance the supply of foreign exchange in Nigeria with its attendant potential effects on exchange rate and exports in the country (Ifeoluwa, 2020).

However, in literature exists knowledge gaps concerning the nexus among diaspora remittance inflows, exchange rate and exports in Nigeria. This is because, few empirical studies have attempted to investigate this nexus in Nigeria and have produced mixed findings. For instance, Adejumo and Ikhide (2019) used the dynamic ordinary least squares and found that remittances depreciate the naira; Sanusi

and Oderinde (2020) used the VAR method and found that remittances stabilise the exchange rate but do not increase imports. Furthermore, Adejumo and Ikhide (2017) employed the dynamic OLS technique and found that remittances tend to appreciate exchange and precipitates loss of exports in Nigeria leading to the Dutch Disease phenomenon in the economy.

In view of these divergent arguments regarding the relationships among remittances, exchange rate and exports in Nigeria; the impact of diaspora remittance inflows on exports through the exchange rate is not clear in Nigeria. This knowledge gap has profound policy implications for the Nigerian economy especially now that the CBN has initiated new policies on diaspora remittances in the country to strengthen the transfers of remittances to recipients for unfettered access and utilisation of such inflows. The policy also aims that the closure of all unsafe and unofficial channels which hitherto facilitated remittance inflows diversions into Nigeria that undermine the foreign exchange management framework in the country. Therefore, if enhanced diaspora remittance inflows can help overcome the pressure in the foreign exchange market in the country; then, policy makers can evolve other monetary and fiscal measures to circumvent the potential effects of the exchange rate appreciation on exports (Ifeoluwa, 2020).

Predicated upon this premise, this study therefore, systematically investigated the nexus among diaspora remittance inflows, exchange rate and exports in Nigeria focusing on the foreign exchange channel for future optimisation. In doing this, the study has employed the Structural Vector Autoregressive (SVAR). The choice of the SVAR in this study amid other competing techniques is as a result of these facts: first, the SVAR has the capacity of depicting clearly the pass-through effects of diaspora remittance inflows to exports via the supply of foreign exchange and exchange rate. Second, it produces the contemporaneous effects which are critical in ascertaining the short-run effects of diaspora remittances on exports through the supply of foreign exchange and exchange rate. Also, the SVAR produces the impulse response functions and the forecast error variance decompositions which are appropriate for analysing the short and long-run responses of exports to shocks and innovations in diaspora remittances, supply of foreign exchange and exchange rate in Nigeria.

Thus, the unique contributions of this paper to literature were two-fold; that was, the use of the foreign exchange channel and the SVAR as a superior technique to robustly handle the short and long-run dynamics among diaspora remittance inflows, the exchange rate and exports in Nigeria. From the foregoing, the paper had practical policy relevance to policy makers especially the Central Bank of Nigeria to design policy prescriptions to handle the resultant effects of exchange rate appreciation on exports, if enhanced diaspora remittance inflows appreciate the naira.

Research Aim and Research Questions

On the basis of the above, the research question that was: what is the impact of diaspora remittance inflows on exports in Nigeria through foreign exchange and exchange rate? Answering this question was the concern of this paper. Thus, the research aim and objective was to investigate the pass-through impact of diaspora remittance inflows on exports in Nigeria through foreign exchange and exchange rate.

Literature Review

Theoretical Issues

The gaps theories postulate that developing countries are faced with saving-investment gap and foreign exchange constraints which inhibit the growth in these countries. The inflows of foreign capital help to close these gaps (Chenery, 1969). According to the gaps theories, the foreign exchange gap prevents developing countries from the importation of capital goods for domestic production that propels economic growth. This constraint creates internal and external imbalances in developing countries. In view of this, the gaps theories advocate for the inflow of foreign capital to close these gaps.

Diaspora remittance inflows constitute part of these capital inflows that supplement in closing these gaps. According to the altruism theory propounded by Austine Conte in the 1880s, migrants sacrifice to transfer resources earned in foreign countries to their home countries to make up for the income shortfall of family members for either consumption or investment. These transfers enter the recipient economies in form of foreign currencies and constitute foreign exchange.

It is empirically established by Lopez et al. (2007) that, remittance inflows exert both desirable and undesirable consequences on the recipient economy. First, the inflows of remittance supplement domestic capital shortages and this has the potential of increasing investment in the recipient countries. In some instances, the huge inflows of remittances can impact macroeconomic stability by exerting positively on the exchange rate. On other hand, an upsurge in the inflows of remittances is associated with the Dutch Disease phenomenon in the recipient economy. Increase in remittances tend to increase the income of households in the recipient country and creates additional demand leading to "spending effect". This effect causes the movement of resources from the tradable sector to the non-tradable sectors. This precipitates a surge in the output of the non-tradable sectors leading to increase in factor demand in the sector. The effect of price shift and resource allocation in the non-tradable sector will dampen the competitiveness of the export-oriented sectors on the account of the appreciation of the exchange rate (Bussolo & Medvedev, 2007). This situation precipitates what is commonly referred to as the Dutch Disease effect. The exchange rate appreciation occasioned by the inflows of remittances tend to increase imports and erode exports competitiveness in the recipient economy.

Again, increased domestic demand induced by remittance inflows will widen the current account deficit thereby creating external imbalance. Also, the inflows of remittance have the potential effects of pushing up the monetary aggregates with its attendant negative consequences on inflationary pressure in the recipient country (Lopez et al., 2007).

Empirical Literature

Some empirical studies have examined the nexus among diaspora remittances, the exchange rate and exports in different economies. For instance, the study by Kim (2019) investigated the nexus among remittances, the exchange rate and money supply in developing economies. The study utilised the system generalized method of moments and found that, remittance inflows appreciate exchange rate and the index of openness has a vital role to play. Also, Azizi (2021) studied the relationship between the inflows of remittances, exchange rate and net exports in 101 developing economies from 1990 to 2015. Using the panel data technique, findings revealed that, inflows of remittances appreciate exchange rate with the attendant consequences of reduction in the exports of the remittance-receiving countries.

Furthermore, Sanusi and Oderinde (2020) examined the relationship between remittances and spending in Nigeria from 1977 to 2019. Using the VAR model, findings indicated that remittance inflows have stabilising effect on the exchange rate but do not increase imports. Again, the study by Adejumo and Ikhide (2017) investigated the relationship between remittances, exchange rate and the agricultural, manufacturing and the merchandize exports performance in Nigeria from 1981 to 2013. Employing the dynamic OLS technique, findings revealed that the inflows of remittances exert effects on these sectors in line with the postulations of the Dutch Disease phenomenon. Also, findings indicated that, remittances tend to appreciate exchange rate leading to exports loss.

Another study by Adejumo and Ikhide (2019) used the dynamic OLS technique and investigated the nexus between the inflows of remittances and exchange rate in Nigeria from 1981 to 2014. The findings of the study showed that the inflow of remittances depreciates the naira. The study by Okharedia and Osagie (2021) examined the relationship between of remittances on the economic performance in Nigeria from 1986 to 2018 using the VECM. The findings revealed that remittances improve the economic performance but exchange rate depreciation occasioned by remittance inflows tend to affect economic performance.

Nevertheless, Akeerebari (2022) employed the vector error correction model and granger causality on quarterly data from 2010Q1 to 2020Q4 and analysed the influence of diaspora remittance on macroeconomic stability in Nigeria. The study found that in the short-run, remittances have insignificant effect on exchange rate but in the long-run, it had significant effect on exchange rate.

Again, Onono and Mohammed (2020) used the multiple regression model on quarterly data from 1980Q1 to 2016Q4 and analysed the effect of selected macroeconomic variables on diaspora remittance in Kenya. Findings of the study revealed that, currency depreciation, economic growth, financial sector development and trade openness increase diaspora remittances. Ediri and Okonkwo (2020) employed the OLS method and granger causality on Nigerian data from 1997 to 2017 and investigated the effect of diaspora remittances on exchange rate and inflation. The study found a long-run relationship among diaspora remittances, exchange rate and inflation in Nigeria. Also, the findings showed a unidirectional causality running from remittance inflows to the gross domestic product; from gross domestic product to exchange rate, and from exchange rate to remittance inflows, respectively. The study by Nwiado et al. (2021) utilized the Johansen cointegration test and investigated the effect of diaspora remittance on exchange rate in Nigeria from 1977 to 2020. The study found that diaspora remittance inflows had a long-run positive and significant effect on exchange rate in Nigeria. Also, Ilu (2019) used the Autoregressive Distributed Lag model and examined the impact of remittances inflow on exchange rate stability in Nigeria from 1990 to 2018. The study found that remittance inflows are positively and significantly related to exchange rate, implying that remittances depreciate the Naira.

Chetachukwu et al. (2021) investigated the nexus between the remittance and private investment in Nigeria from 1981 to 2020 using the Toda Yamamoto method. The results revealed one-way causation running from remittances to private investment in Nigeria.

The study by Loto and Alao (2016) examined the relationship between diaspora remittance and the growth of the Nigerian economy from 1980 to 2016. By using the Vector Error Correction Model (VECM), the study found that the remittance inflows have positive and statistically significant relationship with economic growth in Nigeria both in the short and long-run. Also, Chukwudi and Beede (2015) studied the relationship between diaspora remittance and the Nigerian economy from 1987 to 2013. The study employed the ARDL technique and found that remittance inflows have positive and statistically significant relationship with Nigerian economy.

Regarding the nexus between exchange rate and exports, Eje & Ugwu (2022) analysed the relationship between real effective exchange rate and exports in the Nigerian economy from 1986 to 2020 using the Error correction model. The study found that the real effective exchange rate exerts an increasing effect on exports in the country. Similarly, Kabayiza et al. (2022) analysed the nexus among exchange rate volatility, price and exports coffee in Rwanda using the data set from January 2001 to December 2016. The study employed the Glosten, Jagannathan, and Runkle-Generalized Autoregressive Conditional Heteroskedasticity (GJR-GARCH) model. The findings revealed that exchange rate volatility tend to increase Rwandan export of coffee by 1.5% in the long run and decrease by 0.2% in the short run.

Again, Jacob et al. (2021) interrogated the determinants of export in India focusing on the exchange rate and inflation from 1995 to 2020. The study used the VECM and finding showed that the exchange rate and inflation increase export performance in India. Furthermore, Salam and Maduechesi (2021) in their study on Nigeria, examined the relationship between exchange rate and total export using time series data spanning from 1981 to 2019. The study employed the OLS method and found that the exchange rate appreciation tends to increase the total export in the short-run.

In a panel of 27 countries, Muinelo-Gallo et al. (2020) examined the relationship between the exchange rate uncertainty and export flows and found that, the exchange rate exerts negative influence on the exports of the manufacturing sector, but does not affect the exports of the commodity sector in

these countries. Also, Ahmed et al. (2017) examined the nexus between exchange rate and exports in Pakistan for the period of 1970 to 2015. The study employed the Autoregressive Distributive lag (ARDL) and found statistically insignificant negative effect of exchange rate on the exports of Pakistan.

In the same vein, Olubiyi et al. (2019) investigated the relationship between the exchange rate movement and exports selected agricultural products in five African countries from 1995 to 2015. With the use of the ARDL, and found that exports of these products responded differently to changes in exchange rate in the short-run. In some countries, the exports of the products react positively, while in some instances, the exports respond negatively.

From the foregoing empirical review, there is a gap in the previous studies especially on the Nigerian economy regarding the nexus among remittances, exchange rate and exports. First, there are mixed conclusions on the effect of diaspora remittances on exchange rate in Nigeria. Some studies found negative relationship; while some found positive relationship between remittances and exchange rate. Also, there is no empirical study to the best of the researchers' knowledge that has systematically investigated the transmission mechanism of remittances to exports via the exchange rate that takes into cognisance foreign exchange as a vehicle that signals the effect of exchange rate stabilization. It is against this backdrop that this current study has employed the structural VAR method to explore the nexus taking into account the role of foreign exchange as vehicle of transmission.

Research Methodology

General Background

The Structural SVAR model was used in order to ascertain the transmission mechanism of diaspora remittance inflows to exports via the supply of foreign exchange, exchange rate in Nigeria. Time series data spanning from 1986 to 2020 which were sourced from CBN and World Bank Statistical publications were used. The specific data used in this study included: the remittance inflows to Nigeria measured in dollars, the supply of foreign exchange to Nigeria measured in dollars, the exchange rate of naira to dollar and the monetary value of exports of goods and services. The choice of the Structural VAR among other deviants of VAR was based upon the fact that, the SVAR is the VAR type that adequately captures the pass-through effects among macroeconomic variables. In view of the fact that, this study measures the pass-through effects of diaspora remittance inflows to exports through the supply of foreign exchange and exchange rate, the SVAR is considered the most suitable approach amidst other competing econometric techniques.

The generic specification of Structural Vector Autoregressive model is presented as:

$$A_O Z_t = A_1 Z_{t-1} + \varepsilon_1 \quad (1)$$

Where A_0 = n x n contemporaneous effects matrix of the endogenous variables

Z_t = n x 1 vector of the endogenous variables to be estimated,

A_1 = n x n vector of lagged endogenous variables to be estimated,

Z_{t-1} = n x 1 vector of the lagged estimable endogenous variables, and

ε_{it} = n x 1 vector of the error terms of the SVAR.

Model Specification

Based on the postulations of the two-gaps and the altruism theories, increase in the diaspora remittances inflows into the country will lead to an increase in the supply of foreign exchange, this is supposed to appreciate the exchange rate. The exchange rate appreciation as a consequence is expected

to increase imports and erode the export-oriented sectors. This transmission mechanism can be expressed as follows:

$$\uparrow FRMI \rightarrow \uparrow SFX \rightarrow \uparrow EXCH \rightarrow \downarrow NX$$

Where FRMI is diaspora remittance inflows, SFX is the supply of foreign exchange, EXCH is Exchange Rate, and NX is Exports.

By transposing the transmission yields the following expressions:

$$NX_t = f(NX_{t-1}, EXCH_{t-1}, SFX_{t-1}, FRMI_{t-1}, EXCH_t, SFX_t, FRMI_t) \quad (2)$$

$$EXR_t = f(NX_{t-1}, EXCH_{t-1}, SFX_{t-1}, FRMI_{t-1}, EXCH_t, SFX_t, FRMI_t) \quad (3)$$

$$SFX_t = f(NX_{t-1}, EXCH_{t-1}, SFX_{t-1}, FRMI_{t-1}, EXCH_t, SFX_t, FRMI_t) \quad (4)$$

$$FRMI_t = f(NX_{t-1}, EXCH_{t-1}, SFX_{t-1}, FRMI_{t-1}, EXCH_t, SFX_t, FRMI_t) \quad (5)$$

By normalizing equations 2 to 5 and expressing as SVAR (1) system of equations has produced the following expressions:

$$NX_t = \beta_{11}^1 NX_{t-1} + \beta_{12}^1 EXCH_{t-1} + \beta_{13}^1 SFX_{t-1} + \beta_{14}^1 FRMI_{t-1} + \beta_{11}^0 EXCH_t + \beta_{12}^0 SFX_t + \beta_{13}^0 FRMI_t + \epsilon_1 \quad (6)$$

$$EXR_t = \beta_{21}^1 NX_{t-1} + \beta_{22}^1 EXCH_{t-1} + \beta_{23}^1 SFX_{t-1} + \beta_{24}^1 FRMI_{t-1} + \beta_{21}^0 EXCH_t + \beta_{22}^0 SFX_t + \beta_{23}^0 FRMI_t + \epsilon_{2t} \quad (7)$$

$$SFX_t = \beta_{31}^1 NX_{t-1} + \beta_{32}^1 EXCH_{t-1} + \beta_{33}^1 SFX_{t-1} + \beta_{34}^1 FRMI_{t-1} + \beta_{31}^0 EXCH_t + \beta_{32}^0 SFX_t + \beta_{33}^0 FRMI_t + \epsilon_{3t} \quad (8)$$

$$FRMI_t = \beta_{41}^1 NX_{t-1} + \beta_{42}^1 EXCH_{t-1} + \beta_{43}^1 SFX_{t-1} + \beta_{44}^1 FRMI_{t-1} + \beta_{41}^0 EXCH_t + \beta_{42}^0 SFX_t + \beta_{43}^0 FRMI_t + \epsilon_{4t} \quad (9)$$

By moving the contemporaneous effects to the Left-hand Side (LHS) gives the following expressions,

$$NX_t - \beta_{12}^0 EXCH_t - \beta_{13}^0 SFX_t - \beta_{13}^0 FRMI_t = \beta_{11}^1 NX_{t-1} + \beta_{12}^1 EXCH_{t-1} + \beta_{13}^1 SFX_{t-1} + \beta_{14}^1 FRMI_{t-1} + \epsilon_{1t} \quad (10)$$

$$-\beta_{21}^0 NX_t + EXCH_t - \beta_{22}^0 SFX_t - \beta_{23}^0 FRMI_t = \beta_{21}^1 NX_{t-1} + \beta_{22}^1 EXCH_{t-1} + \beta_{23}^1 SFX_{t-1} + \beta_{24}^1 FRMI_{t-1} + \epsilon_{2t} \quad (11)$$

$$-\beta_{31}^0 NX_t - \beta_{32}^0 EXCH_t + SFX_t - \beta_{33}^0 FRMI_t = \beta_{31}^1 NX_{t-1} + \beta_{32}^1 EXCH_{t-1} + \beta_{33}^1 SFX_{t-1} + \beta_{34}^1 FRMI_{t-1} + \epsilon_{3t} \quad (12)$$

$$-\beta_{41}^0 NX_t - \beta_{42}^0 EXCH_t - \beta_{43}^0 SFX_t + FRMI_t = \beta_{41}^1 NX_{t-1} + \beta_{42}^1 EXCH_{t-1} + \beta_{43}^1 SFX_{t-1} + \beta_{44}^1 FRMI_{t-1} + \epsilon_{4t} \quad (13)$$

Expressing equations 10 to 13 in matrix form yields:

$$\begin{bmatrix} 1-\beta_{12}^{0}-\beta_{13}^{0}-\beta_{14}^{0} \\ -\beta_{21}^{0}1-\beta_{23}^{0}-\beta_{24}^{0} \\ -\beta_{31}^{0}-\beta_{32}^{0}1-\beta_{34}^{0} \\ -\beta_{41}^{0}-\beta_{42}^{0}-\beta_{43}^{0}1 \end{bmatrix}\begin{bmatrix} NX_t \\ EXCH_t \\ SFX_t \\ FRMI_t \end{bmatrix}=\begin{bmatrix} \beta_{11}^{1}\beta_{12}^{1}\beta_{13}^{1}\beta_{14}^{1} \\ \beta_{21}^{1}\beta_{22}^{1}\beta_{23}^{1}\beta_{24}^{1} \\ \beta_{31}^{1}\beta_{32}^{1}\beta_{33}^{1}\beta_{34}^{1} \\ \beta_{41}^{1}\beta_{42}^{1}\beta_{43}^{1}\beta_{44}^{1} \end{bmatrix}\begin{bmatrix} NX_{t-1} \\ EXCH_{t-1} \\ SFX_{t-1} \\ FRMI_{t-1} \end{bmatrix}+\begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{bmatrix} \quad (14)$$

Hence,

$$A_O Z_t = A_1 Z_{t-1} + \varepsilon_1 \quad (15)$$

Where A_0 = 4 x 4 contemporaneous effects matrix of the endogenous parameters

Z_t = 4 x 1 vector of the endogenous variables to be estimated,

A_1 = 4 x 4 lagged of the endogenous variables matrix,

Z_{t-1} = 4 x 1 vector of lagged endogenous variables to be estimated, and

ε_{it} = 4 x 1 vector of the error terms of the SVAR.

The model above is an over-parameterised model, which cannot be estimated using SVAR. However, following the recursive approach, some restrictions were placed on some parameters of matrix AO in order to overcome the identification problem in the SVAR. These restrictions were placed on the elements of the off main diagonal matrix as follows:

$$-\beta_{12}^{0} = -\beta_{13}^{0} = -\beta_{14}^{0} = -\beta_{23}^{0} = -\beta_{24}^{0} = -\beta_{34}^{0} = 0$$

Based on these restrictions imposed, equation 14 is now expressed in the parsimonious form as:

$$A_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\beta_{21}^{0} & 1 & 0 & 0 \\ -\beta_{31}^{0} & -\beta_{32}^{0} & 1 & 0 \\ -\beta_{41}^{0} & -\beta_{42}^{0} & -\beta_{43}^{0} & 1 \end{bmatrix}\begin{bmatrix} NX_t \\ EXCH_t \\ SFX_t \\ FRMI_t \end{bmatrix} = \begin{bmatrix} \epsilon_{1t} \\ \epsilon_{2t} \\ \epsilon_{3t} \\ \epsilon_{4t} \end{bmatrix} \quad (16)$$

Where $\varepsilon_t = \beta\eta_t$, and

$$\beta = \begin{bmatrix} \delta_1^2 & 0 & 0 & 0 \\ 0 & \delta_2^2 & 0 & 0 \\ 0 & 0 & \delta_3^2 & 0 \\ 0 & 0 & 0 & \delta_4^2 \end{bmatrix} = \text{Unit Variance i.e, } Var(\eta_t) = 1 \quad (17)$$

$$A_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\beta_{21}^{0} & 1 & 0 & 0 \\ -\beta_{31}^{0} & -\beta_{32}^{0} & 1 & 0 \\ -\beta_{41}^{0} & -\beta_{42}^{0} & -\beta_{43}^{0} & 1 \end{bmatrix}\begin{bmatrix} NX_t \\ EXCH_t \\ SFX_t \\ FRMI_t \end{bmatrix} = \begin{bmatrix} \delta_1^2 NX & 0 & 0 & 0 \\ 0 & \delta_2^2 EXCH & 0 & 0 \\ 0 & 0 & \delta_3^2 SFX & 0 \\ 0 & 0 & 0 & \delta_4^2 FRMI \end{bmatrix}\begin{bmatrix} \mu_t^{NX} \\ \mu_t^{EXCH} \\ \mu_t^{SFX} \\ \mu_t^{FRMI} \end{bmatrix} \quad (18)$$

This means that the normalised SVAR of the form $A_O Z_t = A_1 Z_{t-1} + \varepsilon_t$ has reduced to $A_O e_t = \beta\eta_t$. $\beta\eta_t = \beta\mu_t$, thus, the reduced form of the baseline of the SVAR model can be specified as:

$$A_O e_t = \beta\mu_t \tag{19}$$

Where A_0 = contemporaneous long-run effects matrix

e_t = vector of error terms for the respective variables

β = structural shocks matrix of the model, and

μ_t = vector of structural shocks of the model.

Hence, the 'S' matrix is specified as follows:

$$e_t = A_O \beta \mu_t = \begin{bmatrix} e_t NX \\ e_t EXCH \\ e_t SFX \\ e_t FRMI \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 & 0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 & 0 \\ -\beta_{41}^0 & -\beta_{42}^0 & -\beta_{43}^0 & 1 \end{bmatrix} \begin{bmatrix} \mu_t^{NX} \\ \mu_t^{EXCH} \\ \mu_t^{SFX} \\ \mu_t^{FRMI} \end{bmatrix} \tag{20}$$

Equation 20 shows the initial impact of shocks in the SVAR model. The impulse response and variance forecast error decomposition were used to determine the final impact of shocks in the SVAR model to analyse the short and long-run responses among diaspora remittance inflows, supply of foreign exchange, exchange rate and exports in Nigeria.

Research Results

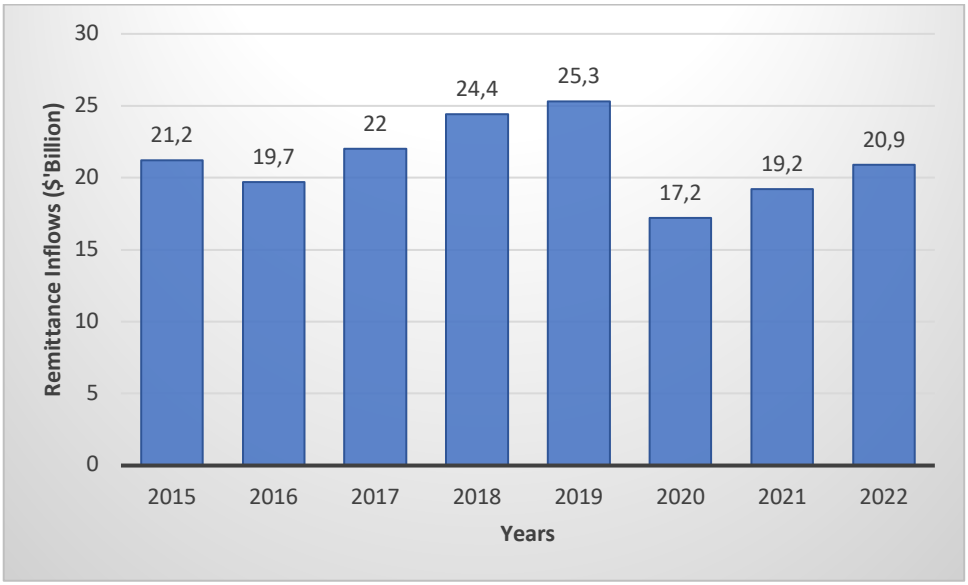
Prior to the estimation of the model, the series used in the models were subjected to descriptive statistical analysis and unit root tests.

Descriptive Properties of the Data

World Bank (2022) reveals that, from 1986 to 1998, the inflows of remittance into Nigeria increased from $4million to $448 million. Diaspora remittance inflows in Nigeria recorded a consistent growth from 1999 to 2021. It grew significantly with the return of democracy from $1.3 billion in 1999 to $24.4billion in 2018. In 2019, the inflows surged to $25.3billion. However, with the outbreak of the COVID-19 pandemic, the inflows dipped to $17.2billion in 2020. In 2021, the inflows rose to $19.2 billion which may be ascribed to the several CBN new policies on diaspora remittance inflows in December, 2020 aimed at improving the visibility of remittance inflows in the country. Following the implementation of these policies, remittance inflows into the country further surged to $20.9billion as depicted in Figure 1.

Figure 1

Trends of inflow of diaspora remittance in Nigeria

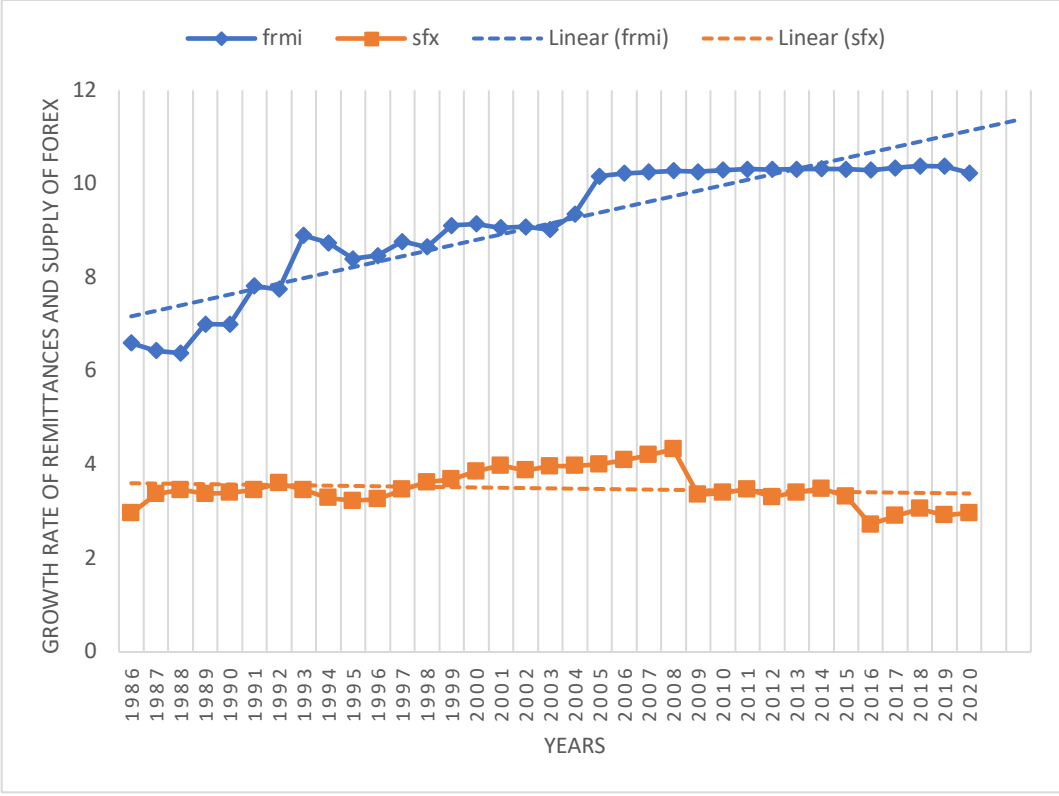


Source: World Bank (2022)

Furthermore, the growth rate of diaspora remittance inflows and the growth rate of the supply of foreign exchange in Nigeria are presented in Figure 2.

Figure 2

Trends of the growth rate of remittance inflows and the supply of foreign exchange



The figure shows the trends of growth rate of remittance inflows and the supply of foreign exchange in Nigeria from 1986 to 2020. A cursory look at the figure reveals that, the inflows of remittances in Nigeria have assumed an increasing but fluctuating trend over the years. When a linear

trend was fit into the trend, it reveals that, the growth rate of remittances into the country has averaged from 7.82% to 10.30% over the period of time under review. This suggests that Nigeria as a country receives relatively higher inflows of diaspora remittances over these years.

Also, it is evident from the graph that the growth rate of the supply of foreign exchange has exhibited a relatively stable growth rate from 1986 up to 2008 after which it started declining. This declining growth rate continued throughout the period under consideration. When a linear trend was fit into the graph, it reveals an average growth rate of 3.37% to 3.50%. This suggests that the growth rate of foreign exchange in the country is not high.

Again, the trends of the growth rate of exchange rate and exports in the country from 1986 to 2020 was plotted and presented in Figure 3.

Figure 3

Trends of the growth rate of exports and exchange rate in Nigeria

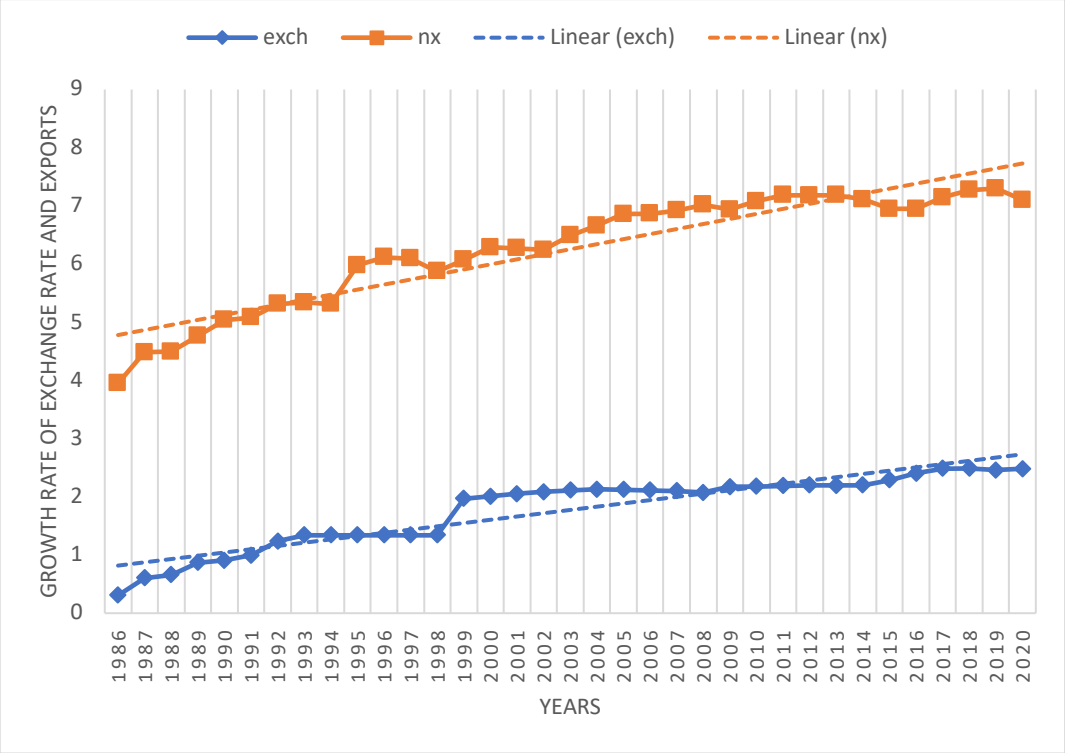


Figure 3 shows the trends of the growth rate of exports and exchange rate in Nigeria from 1986 to 2020. It can be seen from the graph that, exports have exhibited an increasing trend though fluctuating up to 2013, after which it started declining. The declining trend continued up to 2020. Also, when a linear trend line was fitted, it shows that exports grow at an average rate of 5.04% to 7.18% over this period of time under consideration. Also, the plot of the growth rate of exchange rate shows an increasing and fluctuating trend over the period under review. By fitting the linear trend line, the growth rate of exchange rate reveals an average trend of 0.87% to 2.50%. This implies the exchange rate in Nigeria has on the average increased from 0.87% to 2.50% over the period under consideration.

Furthermore, the descriptive properties of the series were computed and presented in Table 1.

Table 1

Descriptive statistics

Statistics	FRMI	SFX	EXR	NX
Mean	9.155121	4687.438	113.0171	6144811.

Median	9.143585	2892.700	120.9702	3087886.
Maximum	10.38580	21493.70	306.9400	19910534
Minimum	6.384627	534.2045	2.020575	8920.600
Std.Dev.	1.296665	4739.405	95.04698	6294299.
Skewness	-0.824938	1.881821	0.605701	0.639662
Kurtosis	2.505126	6.295264	2.493612	2.060845
Jarque-Bera	4.326861	36.49298	2.514059	3.673076
Probability	0.114930	0.000000	0.284498	0.159368
Observations	35	35	35	35

Source: Authors' Computations using Eviews' 10

Table 1 presents the descriptive properties of the series used in the analysis. It is evident from the table that, diaspora remittances growth rate has a mean value of 9.15%, with a maximum value of 10.38% and it has a minimum value of 6.38%. The Jarque-Bera statistic value of 4.32 and it is not statistically significant at 5% level of significance. This implies that the series is normally distributed. For the supply of foreign exchange (SFX), it has a mean value of $4,687.43 billion with a maximum value of $21,493.70 billion and a minimum value of $ 534.20 billion. The Jarque-Bera statistic value of 36.49 which is statistically significant at 5% level of significance. This suggests that the series is not normally distributed. Given that the series is not normally distributed, it was transformed using the logarithm transformation technique.

Again, the table shows that exchange rate (EXR) has a mean value of 113.01% with a maximum value of 306.9% and a minimum value of 2.02%. The Jarque-Bera statistic value of 2.51 is not statistically significant at 5% level of significance. This suggests that the series is normally distributed. Finally, the table reveals that Export (NX) has a mean value of N6,144,811 billion with a maximum value of N19,910,534 billion and a minimum value was N8,920,600 billion. The Jarque-Bera statistic value of 3.67 is not statistically significant at 5% level of significance. This suggests the acceptance of the null hypothesis that the series is normally distributed.

In order to avoid spurious regression estimates, the series were subjected to unit root tests. In doing this, the Augmented Dickey-Fuller (ADF) test was used and the results are presented in Table 2.

Table 2

Unit root test results

	Augmented Dickey Fuller Statistics of the variables							**Order of Integration**
				Critical Values				
Variable	**At level**	**Prob. Value**	**First Difference**	**1%**	**5%**	**10%**	**Prob. Values**	
NX	-2.142022	0.5051	-5.759459	-3.646342	-2.954021	-2.615817	0.0000	I (1)
EXCH	-2.560562	0.2994	-4.218380	-4.262735	-3.552973	-3.209642	0.0111	I (1)
SFX	-2.310984	0.4171	-6.600215	-4.262735	-3.552973	-3.209642	0.0000	I (1)
FRMI	-1.940432	0.3107	-6.530910	-3.646342	-2.954021	-2.615817	0.0000	I (1)

Source: Authors' Computations using Eviews 10

The unit root test results have revealed that, all the series were not stationary at levels but all the series became stationary after the first difference. This suggests that all the series are integrated of order one, that is, I(1). The implication of this is that, all the series have mean reverting ability. This means therefore that, any shock to the series will fade away with the passage of time.

Following the outcome of the unit root test results which showed that all the series are of I(1), the Johansen cointegration test was used to examine the long-run relationship among the series. The results are presented in Table 3.

Table 3

Trace and Max-Eigen statistics

Hypothesized No. of CE(s)	Trace Statistic	5% Critical values	Prob.**	Max-Eigen Statistic	5% Critical Value	Prob.**
r = 0	86.52152	47.85613	0.0000**	51.36133	27.58434	0.0000**
r ≤ 1	35.16019	29.79707	0.0109**	15.94697	21.13162	0.2280
r ≤ 2	19.21322	15.49471	0.0131**	10.31385	14.26460	0.1921
r ≤ 3	8.899366	3.841466	0.0029**	8.899366	3.841466	0.0029**

Source: Authors' Computations using Eviews 10

The results of the Trace Statistic have revealed 4 cointegrating equations and the results of the Max-Eigen statistic have indicated 2 cointegrating equations. This implies the existence of long-run relationship among diaspora remittances, supply foreign exchange, exchange rate and exports in Nigeria. This means that, if there are short-run disequilibria among these variables, there is high propensity that the variables will converge in the long-run.

Given the established long-run relationships among the variables, the contemporaneous estimates of the SVAR were estimated to ascertain the pass-through effects of diaspora remittance inflows to exports through foreign exchange and exchange rate in Nigeria. The contemporaneous structural parameters are presented in Table 4.

Table 4

Estimated contemporaneous structural parameters

Variable	NX	EXCH	SFX	FRMI
NX	1.000000			
EXCH	-0.149262	1.000000		
SFX	-0.530805	0.345571	1.000000	
FRMI	-0.141001	-0.668156	0.094625	1.000000

Source: Authors' Computations using Eviews 10

The results of the estimated contemporaneous structural parameters have revealed that, there was a positive but statistically insignificant relationship between diaspora remittance inflows and the supply of foreign exchange in the short run.

Again, it is evident that, there is a positive but statistically insignificant relationship between the supply of foreign exchange and exchange rate in the short run. This suggests that the supply of foreign exchange in Nigeria has the tendency of exerting an incremental contemporaneous effect on exchange rate in Nigeria.

Furthermore, the results reveal that, there is a negative but statistically insignificant relationship between exchange rate and exports in the short-run. This is suggestive of the fact that, exchange rate appreciation in the country tends to make exported goods and services costly in the international market thereby eroding the export competitiveness of the Nigerian goods. The implication of this is that, imports of goods and services in Nigeria will be cheaper.

Before, the estimation of the impulse responses and forecast error variance decompositions, various SVAR diagnostic tests were performed and the results are shown in Table 5.

Table 5

SVAR diagnostic tests

Type of Test	Test statistic	Prob**
SVAR Correlation LM Test	LRE* F-Stat (16, 52.6)	0.2953
SVAR Heteroskedasticity Test	Joint Chi-Sq (171.092)	0.2600
SVAR Residual Normality Tests	Jarque-Bera (13.3295)	0.4230

Source: Authors' Computations using Eviews 10

The table presents the SVAR residual tests for serial correlation, heteroskedasticity and normality, respectively. Given the LRE F-Statistic value of 16,52.4 with the probability value of 0.2953, the null hypothesis of no serial correlation among the residuals of the series was accepted. Also, the Joint Chi-square value of 171.092 with the probability value of 0.2600 led to the acceptance of the null hypothesis that the residuals are homoscedastic. Furthermore, the Jarque-Bera value of 13.33 with the probability value of 0.4230 led to the acceptance of the null hypothesis that the residuals are multivariate normal. Therefore, the SVAR model is free from the econometric problems of serial correlation and heteroskedasticity and it is free from non-normality problem.

Following the outcome of the SVAR diagnostic tests, the impulse responses and the forecast error variance decompositions were estimated to analyse the structural shocks of the SVAR. The impulse responses of SFX to innovations in FRMI and EXCH to innovations in SFX as well as the impulse responses of NX to innovations in EXCH are presented in Figure 4. [Figure 4].

Figure 4

Impulse response of supply of foreign exchange to innovations in remittances

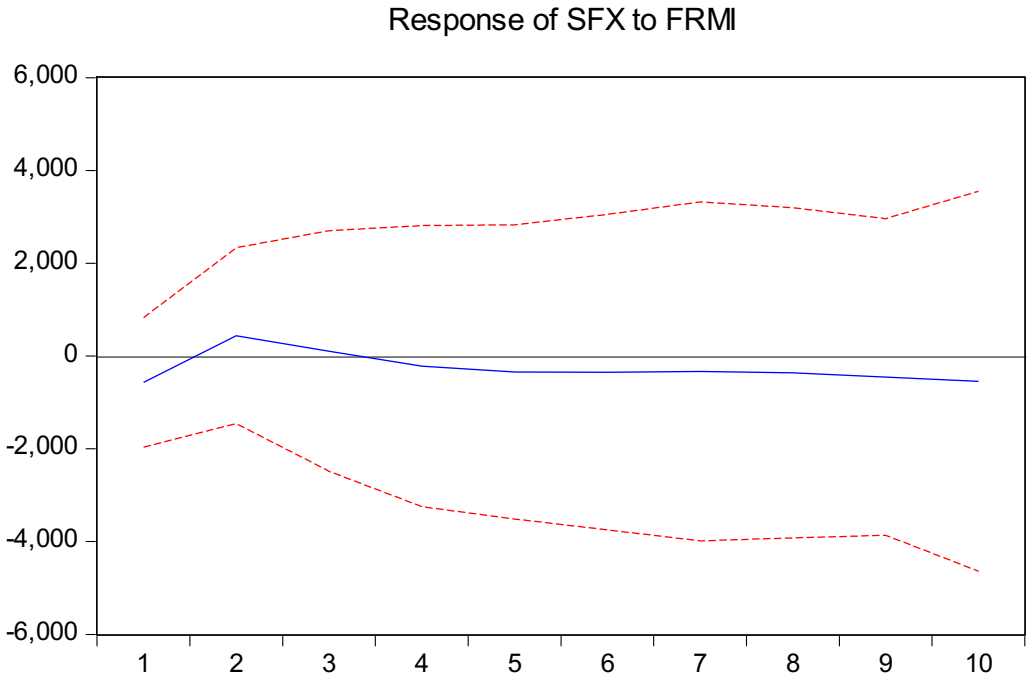
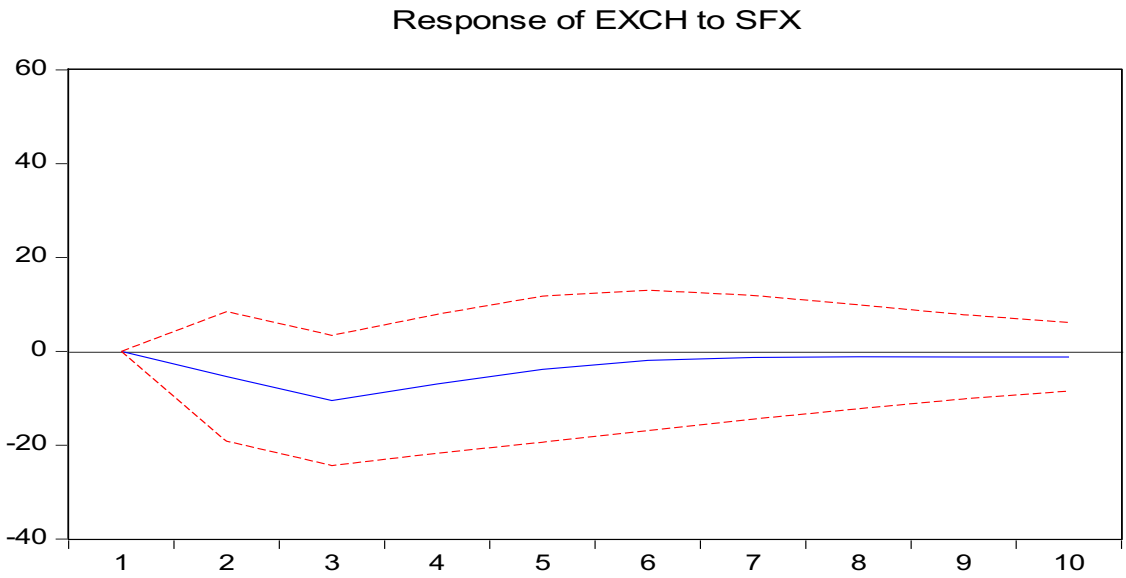


Figure 4 reveals the impulse response of the supply of foreign exchange to shocks in remittances. It is evident from the graph that, a shock in remittances in the first year has caused an increasing respond

from the supply of foreign exchange and this positive response continued till the second year and it started declining. The negative response is sustained throughout the forecast horizon.

Figure 5

Impulse response of exchange rate to innovations in supply of foreign exchange



Source: Authors' computation

Also, Figure 5 shows the impulse response of the exchange rate to innovations in the supply of foreign exchange. It is indicative from the graph that exchange rate responds negatively to shocks in foreign exchange up to the third year and it started responding positively though within the negative region. This effect appears to be temporary. Furthermore, the impulse response of exports to innovations in exchange rate is presented in Figure 6.

Figure 6

Impulse response of exports to innovations in exchange rate

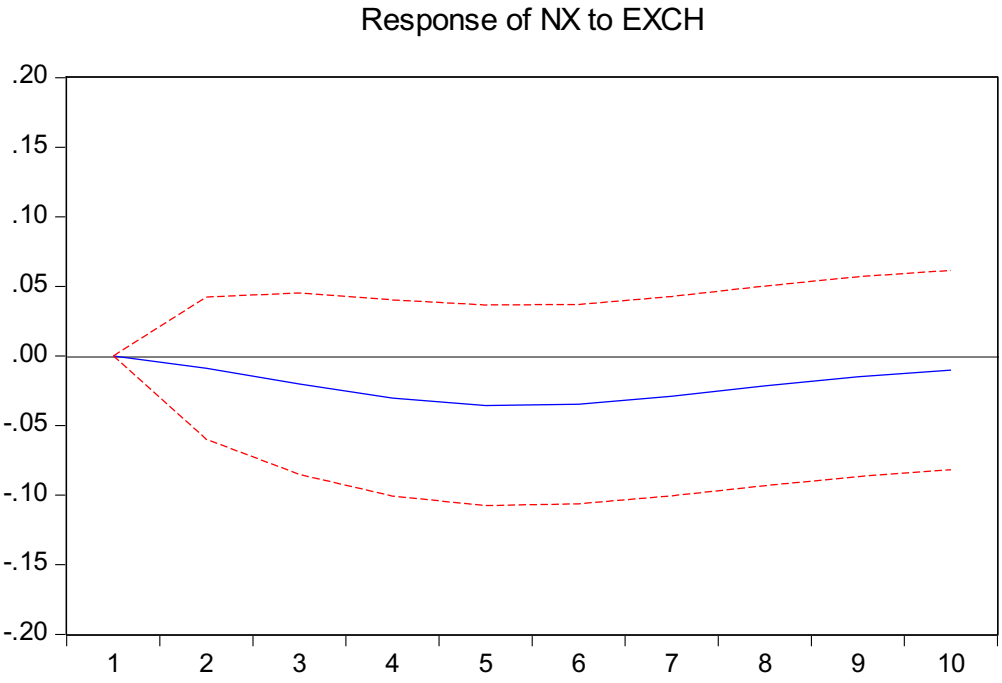


Figure 6 depicts the impulse response of exports to shocks in the exchange rate. It is evident from the graph that, exports respond negatively to innovations in exchange rate throughout the forecast horizon and the effect appears to be temporary.

Furthermore, to analyse the intertemporal dynamics among diaspora remittances, supply of foreign exchange, exchange rate and exports in Nigeria, the forecast error variance decompositions were estimated and the results are presented in the following tables. The forecast error variance decomposition of the supply of foreign exchange is presented in Table 6.

Table 6

Variance decomposition of supply of foreign exchange

Period	S.E.	NX	EXCH	SFX	FRMI
1	0.245515	7.629689	2.052638	90.31767	0.000000
2	0.321869	12.57133	1.372681	85.93072	0.125271
3	0.370508	13.30244	1.108945	82.86175	2.726867
4	0.403044	12.83029	0.937605	81.80891	4.423191
5	0.424020	12.10852	0.925063	81.36188	5.604535
6	0.438574	11.47571	0.993627	80.82022	6.710448
7	0.448450	11.02892	1.065441	80.15149	7.754146
8	0.454640	10.74213	1.122976	79.48691	8.647981
9	0.458196	10.57614	1.170290	78.94573	9.307837
10	0.460104	10.50013	1.208814	78.55526	9.735797

Source: Authors' computation from E-views 10

The variance decomposition result revealed that own shocks of the Supply of foreign exchange were dominant in the first period to the tenth period; after which, it declined from 90.32% in the first period to 78.55% in the tenth period. This implied that, the export, the exchange rate and the foreign remittance are the predictors of supply of foreign exchange in Nigeria. A unit change in export account for 7.62% of the forecast error variance of supply foreign exchange in the first period, the impact appeared to increase slightly to 10.50% in the tenth period. For the exchange rate, a unit changed in exchange rate accounts for 2.05% of the forecast error variance of supply of foreign exchange in the first period and the impact appeared to slightly decrease to 1.2% in the tenth period. Similarly, for the foreign remittance, a unit change in foreign remittance accounted for 0.12% of the forecast error variance of supply of foreign exchange in the second period and the impact appeared to significantly increase to 9.73% in the tenth period. This implied that export and foreign remittances were the strongest predictors of the supply of foreign exchange in this model.

Again, the forecast error variance decomposition of exchange rate is presented in Table 7.

Table 7

Variance decomposition of exchange rate

Period	S.E.	NX	EXCH	SFX	FRMI
1	0.103956	4.128369	95.87163	0.000000	0.000000
2	0.146347	5.678103	88.51550	2.116808	3.689594
3	0.168011	4.314164	86.06932	4.810206	4.806310
4	0.180780	4.538881	83.04816	4.379002	8.033953
5	0.189128	4.942327	80.97310	4.184103	9.900466
6	0.195000	4.878032	80.57735	4.724489	9.820126
7	0.200025	4.671167	80.55665	5.425954	9.346226
8	0.204121	4.519771	80.50480	5.990491	8.984934
9	0.207305	4.481573	80.32906	6.460282	8.729083
10	0.209881	4.543633	80.04067	6.874235	8.541462

Source: Authors' computation from E-views 10

The variance decomposition result reveals that own shocks of exchange rate are dominant in the first period to the tenth period. It however, declines from 95.87% in the first period to 80.04% in the tenth period. This implies that, export, supply of foreign exchange and foreign remittances are predictors of exchange rate in Nigeria. A unit change in export account for 4.12% of the forecast error variance of exchange rate in the first period, the impact appears to increase gradually to 4.54% in tenth period. For supply of the foreign remittance, a unit change in supply of the foreign exchange accounts for 2.11% of the forecast error variance of exchange rate in the second period and the impact appears to gradually increase to 6.87% in the tenth period. Similarly, the remittance, a unit change in the remittance accounts for 3.68% of the forecast error variance of exchange rate in the second period and the impact appears to increase gradually to 8.54% in the tenth period. This implies that remittances and the supply of foreign exchange are the strongest predictors of the exchange rate.

Furthermore, the forecast error variance decomposition of exports is presented in Table 8.

Table 8

Variance decomposition export

Period	S.E.	NX	EXCH	SFX	FRMI
1	0.141512	100.0000	0.000000	0.000000	0.000000
2	0.166979	93.55029	1.577731	4.871292	0.000691
3	0.181892	82.22771	8.605549	4.388927	4.777815
4	0.197389	71.27794	16.42934	4.173999	8.118718
5	0.209026	66.20625	20.80958	5.249147	7.735024
6	0.219146	63.98943	22.76893	6.183594	7.058044
7	0.227515	62.50421	24.24122	6.588084	6.666482
8	0.234227	60.90358	25.96906	6.776374	6.350994
9	0.239943	59.21762	27.78664	6.913296	6.082439
10	0.244896	57.71895	29.38861	7.011999	5.880436

Source: Authors' computation from E-views 10

The variance decomposition result reveals that the own shocks of Exports are dominant in the first period to the tenth period. It however, declines from 100% in the first period to 57.71% in the tenth period. This implies that, the exchange rate, supply of foreign exchange and remittances are predictors of the export. A unit change in the exchange rate account for 1.57% of the forecast error variance of export in the second period, the impact appears to significantly improve to 29.38% in the tenth period. For supply foreign remittance, a unit change in supply foreign remittances accounts for 4.87% in the forecast error variance of export in the second quarter and the impact appears to increase gradually to 7.011% in the tenth period. Similarly, for remittance, a unit change in remittance accounts for 0.00069% of the forecast error variance of export in the second period and the impact appears to improve steadily to 5.88% in tenth period. This implies that the Exchange rate is the strongest predictor of export in this model.

Discussion

The paper investigated the nexus among diaspora remittance inflows, the foreign exchange, the exchange rate and exports in Nigeria. The study first, found the existence of long-run relationship among diaspora remittances, supply foreign exchange, exchange rate and exports in Nigeria. This suggest that, if there are short-run disequilibria, the variables will converge in the long-run. Also, the study found that there was a positive but statistically insignificant relationship between diaspora remittance inflows and the supply of foreign exchange in the short run. This suggests that, there is the propensity of diaspora remittances to exert an incremental contemporaneous effect on the supply of foreign exchange in the country in the short-run. This may be ascribed to the fact that, remittance inflows come in form of foreign currency thereby exhibiting the tendency to increase the supply of foreign exchange in the Nigerian economy. The policy implication of this positive and statistically insignificant relationship is

that, diaspora remittances have the potential of boosting the volume of the supply of foreign exchange in Nigeria in the short-run if appropriate policy actions are directed at galvanising the inflows and utilisation of remittances in the country.

Furthermore, the study found that, there was a positive but statistically insignificant relationship between the supply of foreign exchange and the exchange rate in the short run. This suggests that the increase in the inflows of remittances in the country has increased the supply of foreign exchange in the country; this in turn, has the tendency of exerting an incremental contemporaneous effect on exchange rate in Nigeria. This is due to the fact an increase in the supply of foreign exchange will increase the availability of foreign currency in the Nigerian economy and hence, appreciate the exchange rate. This exchange rate stabilisation effects may be achieved through the interaction of the forces of demand for foreign exchange and the supply of foreign exchange in line with the postulations of the Marshall-Lerner condition. That is, increase in the supply of foreign exchange, given the demand for foreign exchange, the exchange rate will appreciate. This finding corroborates the findings of Kim (2019) and Azizi (2021) who found in their studies that remittance inflows appreciate exchange rate of the recipient countries. Also, the finding is in line the findings of Sanusi and Oderinde (2020) who found that remittance appreciate the exchange rate in Nigeria but do not increase imports.

Nevertheless, the findings of the study revealed that, there was a negative but statistically insignificant relationship between the exchange rate and exports in the short-run. This is suggestive of the fact that, the exchange rate appreciation in the country tends to make exported goods costly in the international market thereby eroding the export competitiveness of the Nigerian goods. The implication of this is that, imports of goods and services in Nigeria will be cheaper. This finding is in tandem with the findings of Azizi (2021) who found that the inflows of remittance appreciate the exchange rate with the attendant consequences of reduction of exports in the remittance receiving countries. Also, the finding is in line with the findings of Ahmed et al. (2017) who negative and statistically insignificant relationship between the exchange rate and exports in Pakistan. Conversely, the finding of this study regarding the relationship between exchange rate and exports is at variance with the findings of Eje and Ugwu (2022) and Salam and Maduechesi (2021) who found positive relationship between real exchange rate total exports in Nigeria. The variation stems from the choice of exchange used in their studies. These studies used real exchange rate, and for real exchange rate, a decrease means appreciation; while increase means depreciation. Thus, the positive relationship means that, depreciation of the real exchange rate increases exports. This suggests that, their findings have explained results of this paper in other words.

Finally, the results from the impulse response functions and forecast variance decompositions have also reinforced the earlier findings that diaspora remittance inflows increase the supply of foreign exchange that tends to appreciate the exchange rate leading to reduction in the exports of goods and services in Nigeria.

Conclusions and Implications

On the basis of the findings of this study, it is concluded that surges in the diaspora remittance inflows in Nigeria appear to have potential positive effects of contributing to the supply of foreign exchange in the country; which in turn, has the propensity of appreciating the exchange rate with its attendant consequences of potential loss of export competitiveness. This has explained the Dutch Disease hypothesis in the country given the surges in the inflows of remittances in the country. These findings have profound policy implications for the Nigerian economy. First, while galvanising the diaspora remittance inflows into the country for enhanced supply of foreign exchange to cushioning the effects of foreign exchange scarcity in the foreign exchange market for macroeconomic stabilisation may be desirable on the one hand; the potential consequences of large inflows of remittances on the export competitiveness may be undesirable on the other hand. Thus, faced with this trade-off, policy makers

are expected to evolve policy prescriptions to insulate the negative consequences of eroding export competitiveness that accompanies large inflows of remittances in an economy; and at the same time, implement policy options that improve the inflows and utilisation of diaspora remittances in the country.

In order to sustain the surge in diaspora remittances inflows and utilisation for future optimisation and also, enhance the competitiveness of the export-oriented sectors of the economy for the maintenance of the internal and external balances, the following recommendations are made.

First, the Central Bank of Nigeria (CBN) must vigorously pursue its new policy on diaspora remittances which is aimed at increasing the visibility of diaspora remittances for enhanced inflows of foreign currency in the country. Stakeholders of the policy such as: The Deposit Money Banks (DMBs) and the International Money Transfer Operators (IMTOs) must co-operate to allow for proper accounting of remittances. The IMTOs should immediately disclose to beneficiaries that they exercise the discretion to receive transfers into foreign currency cash or directly into their domiciliary accounts for unfettered access and utilization. To guide against the negative consequences associated with large inflows of remittances in the country for optimal utilisation, the CBN should from time to time sterilize the remittances inflows. The sterilization here requires the exchange of government paper for foreign exchange so that the monetary base is protected from the effect of huge remittance inflows. The CBN can either achieve this by increasing the reserve requirements on all or selected parts of bank deposits. In doing this, the CBN is advised to use sterilization over the short-run since sterilizing operations have proven to be more effectual in the short-run.

Second, the government through the Nigerian Export Promotion Council must evolve fiscal inventions to stimulate of goods and services especially in the areas of agro-processing, manufacturing where the country has comparative advantage. Nigeria can leverage African Continental Free Trade Area Agreement (AfCFTA) to expand her export base through intra and inter-trade. The export advantages provided by the AfCFTA can off-set the potential negative consequences of the exchange rate appreciation.

Suggestion for Future Research

It is imperative to state that, this study is constrained by availability of data on exports of individual commodities to examine how each export commodity responds to exchange depreciation/appreciation given changes in diaspora remittance inflows and the supply of foreign exchange in Nigeria. However, in order to maintain the internal and external validity of this study, the aggregate export values were used. Thus, it is suggested that, future studies should attempt to decompose exports into sectoral exports so as to measure the responds of these sectoral commodities to exchange rate depreciation/appreciation due to changes in diaspora remittance inflows in Nigeria.

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Conflict of Interest

None.

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