REMITTANCE INFLOWS AND EXCHANGE RATE IN KENYA: AN EMPRIRICAL INVESTIGATION

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ARTICLE INFO

ABSTRACT

Purpose: This study investigated the impact of remittances on the nominal exchange rate in Kenya, using annual data from 1980 to 2020. The study was motivated by the need to find out how remittances affect the exchange rate in Kenya based on an increase in remittance inflows in low- and middle-income countries, including Kenya. This is important as Kenya continues to build a stable macroeconomic environment that supports economic growth and other milestones specified in the Sustainable Development Goals.

Methodology: The study used the autoregressive distributed lag approach to examine this linkage.

Results: The study, therefore, concludes that remittance inflows in Kenya are not associated with the appreciation of the currency, as predicted by some previous studies.

Conclusion: The study, therefore, concludes that remittance inflows in Kenya are not associated with the Dutch-disease phenomenon.

Recommendation: It is recommended that Kenya may continue to implement policies that support remittance inflows to realize an improvement in the balance of payments in the country.

1. INTRODUCTION

Remittances are associated with a positive impact on several economic variables, such as poverty reduction, economic growth, and financial development. The studies that have focused on the impact of remittances on macroeconomic indicators show overwhelming evidence of poverty mitigating economic growth support in different countries. Even the United Nations (UN) has embraced remittances as a source of development finance in most countries, especially in developing countries. Low- and middle-income countries received US$540

billion in 2020 despite the disruptions caused by COVID-19 (World Bank, 2021). Although this was a decline of US$8 billion from remittance inflows in 2019, these inflows remained high and surpassed the overseas development assistance of US$170 billion in 2019 (World Bank, 2021). A surge in remittances was also recorded in sub-Saharan Africa. With the exclusion of Nigeria, remittances increased by 2.3% in 2019 (World Bank, 2021). The surge in remittances has been a welcome development, especially in developing countries that have been relying on development assistance, external borrowing, and foreign direct investment (FDI) as sources of development finance. Remittances are projected to increase to US$565 billion in 2022 as the world recovers from COVID-19 disruptions and effects (World Bank, 2021). The question that this study sought to answer is whether remittance inflows impact the exchange rate.

The studies that investigated the impact of remittances on the nominal exchange rate or real effective exchange rate had inconclusive results. Some of the studies found that remittances caused an appreciation of the exchange rate (for example, Joof & Touray, 2021; Kim, 2019; Dutta & Sengupta, 2018). Others found that remittances caused a depreciation of the exchange (for example, Barrett, 2013), yet others found no effect (for example Adejumo & Ikhide, 2019). Most of these studies used panel data analysis. The inconclusive results are specific to the countries where they were conducted and cannot be generalised to other countries. This leaves countries in a catch-22 situation. Although remittances are a welcome source of external funding that does not come with conditionalities, they may lead to exchange rate instability that negatively affects macroeconomic stability if they are not properly managed.

This study relooks the relationship between exchange rate and remittances in Kenya using the autoregressive distributed lag (ARDL) approach. Kenya has been selected for this study because it is one of the signatories to the Sustainable Development Goals (SDGs) which require each country to achieve set targets on the 17 SDGs. Given this pressure, multiple sources of development finance (including remittances) are important to support projects necessary to achieve the SDG targets for Kenya. However, an understanding of the trade-off between remittances as a source of development finance and undesired exchange rate movement is important. Furthermore, Kenya is among the countries that have witnessed an increase in remittance inflows even in the face of economic interruptions like COVID-19. The exchange rate movement is one of the key economic variables that measure macroeconomic stability. The exchange rate movement also reflects a country's ability to maintain the stability that is pertinent to achieving the SDGs. It can also be argued that Kenya has managed to maintain a relatively stable exchange rate compared to some African countries; hence a

study investigating the impact of remittances on the exchange rate will add value to the economy in the quest to maintain and support macroeconomic stability and economic growth.

The rest of the paper is divided as follows: Section 2 discusses the literature review. This section is subdivided into two: 2.1 delves into country-based literature, and 2.2 highlights theoretical and empirical literature. Section 3 focuses on the estimation techniques, while section 4 outlines the data analysis and discussion of the results. Section 5 concludes the study.

2. LITERATURE REVIEW

2.1. Remittance and Exchange Rate Dynamics in Kenya

Kenya is one of the signatories to the SDGs, the successor to the Millennium Development Goals that ended in 2015. This puts the government under pressure to support remittances in an endeavour to increase much-needed capital inflows to achieve the SDGs. To monitor the remittances, the Central Bank of Kenya (CBK) carries out a monthly survey with formal channels such as commercial banks and other authorised international remittances service providers in Kenya. Although it is widely known that statistics from formal remittance channels underestimate the total remittances that are remitted through informal channels, Kenya has consistently recorded an increase in remittances despite the negative impacts of COVID-19 on employment and wages (IFAD, 2021a). This shows how important remittances are to the country. The consistent increase in remittance inflows is attributed to financial innovation that has opened more convenient channels, such as facilitate using mobile phones for transactions, allowing families to receive money in the face of the lockdown (IFAD, 2021a). It can also be argued that an increase in remittance inflows could be because of the use of formal channels, compared to previous periods when emigrates were coerced with a ban on travel because of the lockdown.

To encourage remittance inflows, the UN has set the cost of these transactions at 3%. Although Kenya has reduced the cost of remittance transactions from 15 to 8% in the past 10 years, it still has a lot of work to do to see the rate decline to the recommended 3% (IFAD, 2021a). However, compared to other sub-Saharan African countries, Kenya ranks third (IFAD, 2021a). As an initiative of IFAD, the Platform for Remittances, Investment and Migrants' Entrepreneurship (PRIME Africa) has the main objective of reducing remittance transfer costs to Kenya in support of SGD 10.c, enhancing financial inclusion through remittance-linked financial services and reducing informal channels in Kenya (IFAD, 2021b).

Apart from initiatives through IFAD, the CBK is in the process of reviewing the National Payment Strategy 2021–2025 by focusing on enhancing digital payments that will hopefully smoothen remittance transactions (IFAD, 2021b). In Kenya, there are 41 commercial banks, 14 microfinance banks, the Post Office Savings Bank (Postbank), and 17 money remittance providers that are licenced to handle inbound and outbound transfers (IFAD, 2021b). This has increased the number of formal channels that can be used to transfer remittances to and from Kenya.

Remittance inflows into Kenya have defied all the odds, especially during the COVID-19 pandemic when remittances were anticipated to decline due to the negative effects of the pandemic on employment (IFAD, 2021a). Remittance inflows increased from US$139.6 million in 1990 (contributing only 1.6% of the gross domestic product – GDP) to US$2838.2 million in 2019 (3% of the GDP), almost double the amount received in 1990 (World Bank, 2022). Remittances fluctuated between 1991 and 2003; thereafter, the inflows grew steadily to an average of 2.2% of GDP or US$1164 million (World Bank, 2022). Kenya experienced a surge in remittance inflows between 1997 and 2000, while major drops were recorded in 1996 and 2001, with 0.7% and 0.3% of GDP registered (World Bank, 2022). In 2020, remittance inflows exceeded every expectation, with an increase of 0.1% contribution to GDP or US$261 million recorded (World Bank, 2022). Figure 1 shows the trends in remittances from 1980 to 2020.
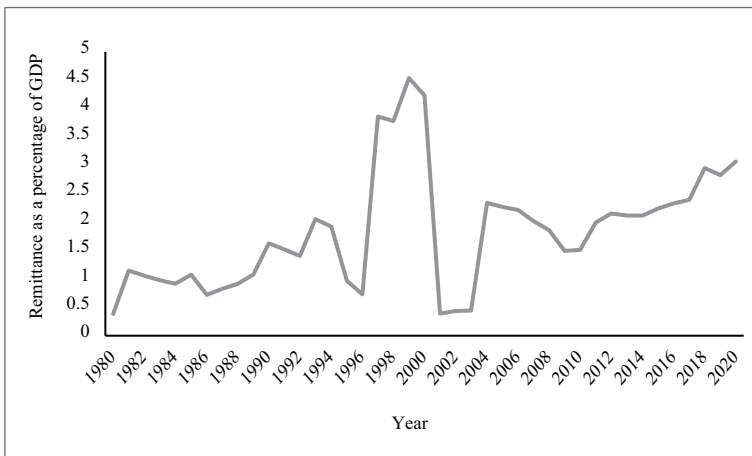

Figure 1. Remittance Inflows 1980–2020
Source: World Bank, 2022

Figure 1 shows a consistent increase in remittance inflows from 2003, although the remittances never reached the levels recorded between 1997 and 2000 (World Bank, 2022).

On the real exchange rate front, the Central Bank of Kenya (CBK) is mandated to regulate the foreign exchange space under the Central Bank of Kenya Act Part VI A and Legal Notice No. 23 of 1996 (CBK, 2016). The CBK works closely with authorised dealers to ensure that buying, selling, borrowing, and lending of foreign currency are done by observing set guidelines to ensure transparency and efficiency (CBK, 2016). All transactions that involve foreign currency, including exports and imports, are, therefore, at the helm of the CBK through licenced dealers (CBK, 2016).

Kenya has a strong engine in domestic consumption that accounts for over 70% of GDP, while exports remain weak (World Bank, 2012). Agriculture remains the major driver of exports (tea, coffee, cut flowers, and vegetables) (Kenyan Government, 2019). The major trading partners of Kenya are Europe, Japan, the United States of America, and low-income countries in Africa. The growth of Kenyan exports in these markets has been both intensive margin (growth of existing products in existing markets) and extensive margin (new products in existing markets and new products in new markets) (World Bank, 2012). Kenya uses the instruments of the Common Market for Eastern and Southern Africa and the East African Community to limit imports of food by charging high tariffs to non-members (Kenyan Government, 2019). It is quite evident that Kenya has not fully explored export performance, which has affected the country's competitiveness (especially with a mismatch between exports and imports and a limited export base that is predominantly merchandise related).

Although Kenya has programmes, initiatives, and policies in the foreign exchange space to support transactions related to foreign exchange, the composition of the exports (which is largely agriculturally based) and a comparably high import demand have put pressure on the country's exchange rate. The real effective exchange rate is the real value of a currency in relation to another currency. The trends in the exchange rate are shown in Figure 2.

Figure 2 shows that the Kenyan Shilling (KSh) was strong between 1980 and 1992, with an average of KSh 17.2 (World Bank, 2022). The exchange rate deteriorated by KSh 26 in 1993 and never recovered from the trajectory (World Bank, 2022). In 2020, the currency recorded the highest exchange rate of KSh 110.9, the highest ever recorded between 1980 and 2020 (World Bank, 2022). The general upward trend in the exchange rate signified a depreciation of the Kenyan Shilling against the US Dollar.
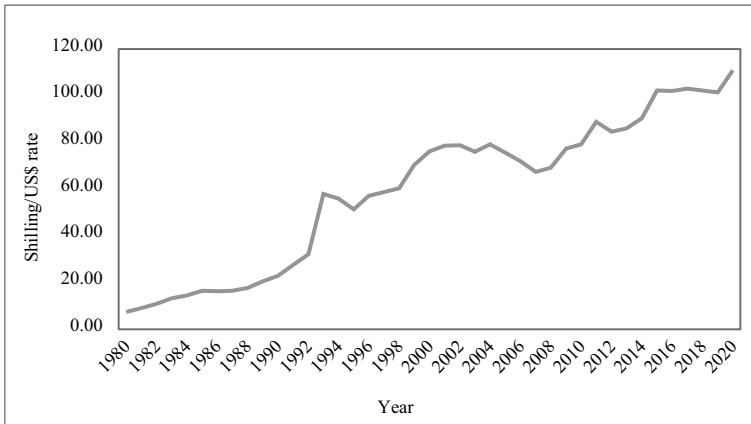
Figure 2. Trends in the Exchange Rate 1980–2020
Source: World Bank, 2022

2.1 A Review of Related Literature

Lucas & Stack (1985) propose three motives for migrants to send money home. The first motive is ultraism, which is linked to empathy for the struggling family members left back home. The desire to assist them in their financial struggle causes migrants to send remittances home. The second motive is co-insurance, where migrants invest back home as a fallback when they return home or when they lose their jobs in a foreign land. The third motive is the savings motive, where migrants endeavour to build up savings back home in case there is a fluctuation in their earnings. Remittances are likely to lead to an increase in demand for non-tradables in response to an increase in domestic demand. This is supported by Adam & Page (2005), who found that remittances result in an increase in human investment – education and cash assets, real estate investment, and starting or expanding small businesses. Remittances also provide a stable and countercyclical income during shocks such as droughts and wars (Kapur, 2004). Although the benefits of remittances are well documented in the literature, the surge in remittance inflows can result in remittance-receiving countries experiencing an appreciation of their currency. This is when the surge in remittances results in a plethora of challenges in the domestic economy, such as the balance of payments challenges as exports become less competitive due to an appreciation of the domestic currency. An upward movement in the exchange rate harms the tradable sectors of the economy if the surge in inflows is not channelled into investment but increases the demand for imports. This puts pressure on the balance of payments.

In the literature, two channels have been proposed that result in the firming of the exchange rate, which negatively affects the competitiveness of tradable goods. The first channel is the Salter-Swan-Conder-Dornbusch model, where exchangeable prices are assumed to be exogenously determined. The spending effect (due to higher capital inflows) and the exogenously determined prices cause the price of non-tradable goods to increase. This causes an expansion in the non-tradable sector – and an increase in the price of non-tradable – relative to the tradable sector, resulting in the exchange rate appreciation. The expansion of the non-tradable sector results in a resource movement effect, drawing additional resources toward the sector (Acosta, Baerg & Mandelman, 2009; Corden & Neary, 1982). A second channel is an increase in household wealth that may result in households substituting labour for leisure (Acosta, Lartey & Mandelman, 2007). This causes a decrease in the supply of labour, leading to a shrink in the labour, putting an upward pressure on wages, and resulting in an increase in production costs. The labour effect and resource reallocation cause an appreciation of the exchange rate.

There is growing literature on the impact of remittances on the real exchange rate, real effective exchange rate, and nominal exchange rate. The surge in remittances that African countries have experienced in the past few years in general, and in Kenya in particular, requires a relook at the relationship between remittances and the exchange rate. The findings of this study provide policy makers in Kenya with policy options to manage the exchange rate. Studies that have investigated the impact of remittances on the exchange rate can be divided into three categories. Some studies found that remittances cause an exchange appreciation (see, for example, Joof & Touray, 2021; Kim, 2019; Dutta & Sengupta, 2018; Acosta, Baerg & Mandelman, 2009). A second set of studies found that remittances cause a depreciation of the exchange rate (see Braihim, Nefzi & Sambo, 2018; and Barrett, 2013). The third category of studies found no impact (see, Mongardini & Rayner, 2009). This section outlines empirical studies that were done on the impact of remittances on exchange rate.

The first category of literature found that remittances cause an appreciation of the exchange rate. Olekslv & Mirzoieva (2022) examined the influence of remittances on the exchange rate on Ukraine using the autoregressive distributed lag approach. The study found that remittances cause an appreciation of the exchange rate. In the same spirit, Joof & Touray (2021) investigated the impact of remittances on the real effective exchange rate using fully modified ordinary least squares (OLS) and dynamic OLS, using quarterly data from 2009 to 2019 for Gambia, and found that remittances cause an appreciation of the real effective exchange rate. A 15% increase in remittances was found to result in a 1.5% appreciation of the real effective exchange rate. Azizi (2021) investigated the

impact of remittances on the exchange using data for 101 developing countries from 1990 to 2015. The study found that remittances lead to real exchange rate appreciation. Hien et al. (2020) examined the impact of remittances on real effective exchange rate for 32 Asian countries using data from 2006 to 2016. Employing the System Generalised Methods of Moments (S-GMM), the study found a 1% increase in remittance per capita lead to 0,103% appreciation in the real effective exchange rate. Kim (2019) investigated the impact of remittances on the exchange rate using data from 114 developing countries spanning from 1970 to 2013. Employing a general equilibrium monetary model, the study found that remittances cause an increase in money supply under a fixed exchange rate regime and an appreciation of the nominal exchange rate. However, the degree of openness was found to mitigate the appreciation of the nominal exchange rate. Dutta & Sengupta (2018) investigated the impact of workers' remittances on the real effective exchange rate in India using data from 1980 to 2015. Employing the ARDL approach to cointegration, the study found that remittances cause an appreciation of the exchange rate. One percent increase in remittances led to 0.076% appreciation of the exchange rate in the long run, with a rate of adjustment of 51%. In the same spirit, Hassan & Holmes (2013) examined the long-run relationship between the real exchange rate and remittances for emerging and developing economies. The results confirmed that an increase in remittance inflows lead to an appreciation of the real effective exchange rate. This finding was also confirmed by a panel Error Correction Model (ECM), where unidirectional causal flow was found from remittances to real exchange rate in the short run.

Acosta, Baerg & Mandelman (2009) investigated the impact of remittances on real exchange rate using panel data from 1990 to 2003 for 106 developing and transition countries. The study found results consistent with those of Joof & Touray (2021) and Kim (2019). The study found evidence that remittances put an upward pressure on the real exchange rate, although the effect was weak in deeper and more sophisticated financial markets that could maintain trade competitiveness. Lopez, Molina & Bussolo (2007) investigated the impact of remittances on the real effective exchange rate using cross-country data for 24 Latin American countries. They found a surge in remittance inflows caused an appreciation. Izquierdo & Montiel (2006) found the same results in three out of six Central American countries for the period from 1960 to 2004: the Dominican Republic, El Salvador, and Guatemala. Similarly, Amuedo-Dorantes & Pozo (2004) employed a panel data assembled from 13 Latin American and Caribbean countries over the period from 1978 to 1998, which validated the conventional view that an increase in remittances leads to an appreciation of the real exchange rate.

The second category of literature found remittances to cause a depreciation of the exchange rate. Adejumo & Ikhide (2019) investigated the impact of remittances on the exchange rate in Nigeria using dynamic OLS and data from 1981 to 2014. The study found remittances to cause the exchange rate to depreciate Braihim, Nefzi & Sambo (2018) investigated the impact of remittances on the real effective exchange rate in nine Middle East and North Africa (MENA) countries using data from 1980 to 2015. Employing panel ARDL, remittances were found to cause a depreciation of the exchange rate. Essayyad, Palamuleni & Satyal (2018) examined the impact of remittances on Nepal's real effective exchange rate using the ARDL approach. The study found the same results as those Adejumi & Ikhide (2019) found for Nigeria, where remittances caused real effective exchange rate depreciation in the short run but were insignificant in the long run. Khurshid el al. (2017) carried out a study on the effects of workers' remittances on exchange rate volatility in Pakistan. Using annual time series data and the generalised methods of moment approach, the study found that remittances caused exchange rate depreciation but had a positive effect on export competitiveness. The study further revealed that remittance inflows only led to exchange appreciation if it was associated with savings, while remittances channelled towards consumption reduced competitiveness and caused depreciation. Barrett (2013) employed a model with official development assistance, government expenditure and trade terms in Jamaica using data from 1995 to 2010. The study found that remittances caused a depreciation of the exchange rate.

Nketiah et al. (2019) examined the impact of remittances on real exchange rate in Ghana using data from 1970 to 2016. Employing Ordinary Least Squares (OLS) the study found that remittances have no significant impact on real exchange rate. Izquierdo & Montiel (2006) in a study on six Central American countries using data from 1960 to 2004, found consistent results with Nketiah et al. (2019) for Jamaica, Nicaragua, and Honduras. Mongardini & Rayner (2009) carried out a study on the relationship between remittances and the real effective exchange rate in sub-Saharan African countries and found no relationship between remittances and the real effective exchange rate in the long run mainly because of excess capacity in non-tradable sectors of these countries.

The extant literature reveals a need for further research to establish the impact of remittances on the exchange rate. The inconclusive results of different studies reviewed make generalisation of the result inappropriate. Another study on the nature of the relationship in Kenya will provide more information on how to strike a balance between using remittances as a development finance source and stabilising the exchange rate, as well as provide a conducive environment for economic growth.

3. MATERIALS AND METHODS

Estimation techniques

The ARDL bounds approach was used in this study to investigate the impact of remittances on the exchange rate in Kenya. The ARDL approach was developed by Pesaran & Shin (1999) and later expanded by Pesaran, Smith & Shin (2001). The ARDL approach was selected for this study because of its numerous advantages, such as, the use of variables integrated of different orders and robust in small samples.

Variable definitions

The key variables in this study are remittances (REM) and exchange rate (EXR). The remittances are measured by remittance inflows as a percentage of GDP, while the exchange rate was measured by the real exchange rate between the Kenyan Shilling and the US Dollar using the average period rate. Remittances are anticipated to cause an appreciation of the nominal exchange rate.

The variable descriptions are given in Table 1.

Table 1. Variable Descriptions for the Model

Variable	Description	Expected Impact on Exchange Rate
EXR	Shillings/US$ – average period nominal exchange rate	-
REM	Remittance inflows as a percentage of GDP	Remittances are expected to cause an appreciation of the exchange rate.
FDI	FDI inflows as a percentage of GDP	FDI is expected to cause an appreciation of the exchange rate.
TOP	Exports and imports as a percentage of GDP	Trade openness is expected to cause an exchange rate appreciation if exports outweigh imports.
BM	Broad money as a percentage of GDP	Broad money is expected to cause an exchange rate depreciation.
GFE	Government consumption expenditure as a percentage of GDP	Government consumption expenditure is expected to cause exchange rate depreciation.
GDPG	GDP growth rate	Economic growth is expected to cause exchange rate appreciation.
PL	Price level	High prices are expected to cause exchange rate depreciation.

Source: Authors' compilation

Model Specification

The ARDL bounds model specification is given in Equation 1 below.

$$\Delta EXR = \varphi_0 + \sum_{i=1}^{p} \varphi_{1i} \Delta EXR_{t-i} + \sum_{i=0}^{q} \varphi_{2i} \Delta REM_{t-i} + \sum_{i=0}^{q} \varphi_{2i} \Delta FDI_{t-i} + \sum_{i=0}^{q} \varphi_{3i} \Delta TOP_{t-i}$$

$$+ \sum_{i=0}^{q} \varphi_{4i} \Delta BM_{t-i} + \sum_{i=0}^{q} \varphi_{5i} \Delta GFE_{t-i} + \sum_{i=0}^{q} \varphi_{6i} \Delta GDPG_{t-i} \sum_{i=0}^{q} \varphi_{7i} \Delta GDPC_{t-i}$$

$$+ \pi_1 EXR_{t-1} + \pi_2 FDI + \pi_3 TOP + \pi_4 BM_{t-1} + \pi_5 GFE_{t-1} + \pi_6 GDPG_{t-1}$$

$$+ \pi_7 GDPC_{t-1} + \mu_{1t} \tag{1}$$

Where:

EXR – exchange rate
REM – remittances
FDI – foreign direct investment
TOP – trade openness
BM – broad money
GFE – government consumption expenditure
GDPG – GDP growth rate
PL – price level
φ_0 – is a constant; $\varphi_1 - \varphi_7$ and $\pi_1 - \pi_7$ are coefficients; and μ_t is the error term.

ECM-based Model Specification

The ARDL bounds testing approach to cointegration is used to examine whether there is a long-run relationship between the variables in the model. The ARDL bounds test uses a set of critical values: the upper and the lower bound. The calculated statistics are compared to the upper and lower bounds. If the calculated statistics are above the upper bound, cointegration is confirmed at either 1%, 5% or 10%. If the calculated F-statistic is less than the lower bound, no long-run relationship is confirmed. However, if the F-statistic is between the lower and the upper bounds, the results are inconclusive. If cointegration is confirmed in the model, the estimation is done in two steps. The first step is the estimation of the long-run relationship and saving the residuals. The residuals are included in the estimation of the short-run equation. In the case of no cointegration, only an estimation of the short-run equation is done.

$$\Delta EXR = \varphi_0 + \sum_{i=1}^{p} \varphi_{1i} \Delta EXR_{t-i} + \sum_{i=1}^{q} \varphi_{2i} \Delta REM_{t-i} + \sum_{i=1}^{q} \varphi_{3i} \Delta FDI_{t-i} + \sum_{i=1}^{q} \varphi_{4i} \Delta TOP_{t-i}$$

$$+ \sum_{i=0}^{q} \varphi_{5i} \Delta BM_{t-i} + \sum_{i=1}^{q} \varphi_{6i} \Delta GFE_{t-i} + \sum_{i=1}^{q} \varphi_{7i} \Delta GDPG_{t-i} \sum_{i=1}^{q} \varphi_{8i} \Delta GDPC_{t-i}$$

$$+ \theta_1 ECM_{t-1} + \mu_{1t} \tag{2}$$

Where all the variables are as described in Equation 1, $\varphi_1 - \varphi_7$ and θ_1 are coefficients.

Data Sources

The data for the study – namely, remittances (REM), exchange rate (EXR), foreign direct investment (FDI), trade openness (TOP), broad money (BM), government consumption expenditure (GFE), economic growth (GDPG) and price level (GDPC) – were extracted from the World Bank Development Indicators (World Bank, 2022). Exchange rates were retrieved from the CBK (2021).

4. RESULTS

Table 2. Unit Root Test

Panel 1: Dickey-Fuller Generalised Least Squares (DF-GLS)				
Variable	Stationarity of all Variables in Levels		Stationarity of all Variables in First Difference	
	Without Trend	With Trend	Without Trend	With Trend
EXR	-0.4398	-1.9567	-5.8439***	-5.8899***
REM	-2.5237	-1.5475	-5.7422***	-5.2374***
FDI	-4.1916***	-5.0704***	-	-
GDPG	-3.3326***	-3.7597**	-	-
GFE	-0.7520	-2.5972	-4.6788***	-5.2664***
TOP	-1.2875	-2.2561	-6.1704***	-6.2208***
BM	-1.4462	-2.3807	-7.0370***	-7.2662***
PL				
Panel 2: Phillips-Perron (PP)				
Variable	Stationarity of all Variables in Levels		Stationarity of all Variables in First Difference	
	Without Trend	With Trend	Without Trend	With Trend
EXR	-0.8370	-1.8774	-5.7885***	-5.7275***
REM	-1.1750	-2.1522	-5.6110***	-5.7712***
FDI	-4.2316***	-5.3110***	-	-
GDPG	-3.5975**	-3.7362**	-	-
GFC	-1.7256	-2.8067	-5.5182***	-5.4182***
TOP	-1.7392	-2.2942	-6.1080***	-6.0735***
BM	-1.7977	-2.4600	-7.0791***	-7.0831***
PL				

Note: *, ** and *** denote stationarity at 10%, 5% and 1% significance levels respectively.

Source: Authors' calculation

The results in Table 2 confirm that all the variables are stationary in their levels or in the first difference. Stationarity is when the mean, covariance, and variance of variables in a model remain constant over time (Gujarati & Porter, 2010). To proceed with the data analysis, long run relationship among variables in the model was tested. The results are resented in Table 3.

Table 3. Cointegration Results

Dependent Variable	Function	F-Statistic	Cointegration Status
EXR	F(EXD|REM, FDI, TOP, BM, GFC, GDPG, PL)	8.1380***	Cointegrated

Note: *, ** and *** denote stationarity at 10%, 5% and 1% significance levels respectively.

Source: Authors' calculation

Coefficient Estimation

The confirmation of cointegration in the model implies an estimation of the long-run equation and saving the residuals as the first step. The second step is the estimation of the short-run equation, including the residuals. The selection of appropriate lags for the variables in the model was done using the Schwarz Bayesian Information Criteria (SIC). The criterion was selected because it gave the most parsimonious equation. The optimal lag length selection for the model is 1, 2, 0, 1, 0, 1, 2, 0 (REM, FDI, TOP, GFC, GDPG, BM and PL respectively). The long-run and the short-run results are reported in Table 4.

Table 4. Long-Run and Short-Run Results

Regressors	Coefficient	T-ratio
Panel A - Long run Results		
C	-59.7807	0.7690
REM	0.9761***	2.9392
FDI	0.8784***	2.9099
TOP	-0.6655	-1.1674
GFC	0.5942	0.2227
GDPG	-0.7364*	-1.9469
BM	0.6752***	3.6037
PL	0.1045	0.7690
Panel B – Short-Run Coefficients		
Δrem	0.2656**	2.2283
Δrem1	0.1604**	3.1062
ΔFDI	0.7790**	2.4393
ΔTOP	0.2905**	2.3739
ΔGFC	0.17982	0.2144
ΔGDPG	-0.1761	-0.5249
ΔBM	0.1263	0.4017
ΔBM1	0.7165**	2.1843
ΔPL	0.0316	0.6408
ECM (-1)	-0.3026***	-3.3405

R-squared – 0.778
S.E of Regression – 3.2943
Akaike Info Criterion – -107.367
R-Bar Squared – 0.6487
F-Stat (10, 28) – 8.4183[0.000]
Schwarz Bayesian Criterion – 119.8433

Note: *, ** and *** denote stationarity at 10%, 5% and 1% significance levels respectively.

Source: Authors' calculation

5. DISCUSSIONS

The results in Table 4, Panel A and Panel B, show the positive impact of remittances on the nominal exchange rate. This is reflected by a coefficient that is positive and significant at 1% level of significance in the long run and 5% level of significance in the short run. The findings point to the fact that remittances cause a depreciation of the exchange rate in Kenya. The findings of this study are not unique for Kenya alone. Adejumo & Ikhide (2019) in a study on Nigeria; Braihim, Nefzi & Sambo (2018) in a study on nine MENA countries; and Essayyad, Palamuleni & Satyal (2018) in a study on Nepal found the same results. The same pattern is exhibited by the trend in remittances and exchange in Figure 1 and Figure 2, respectively. The possible explanation for this relationship is that remittances have an influence on the exchange rate indirectly through the channels that households decide to use to remit the funds. If remittances are used for consumption purposes, they result in exchange rate depreciation because they cause exports to be less competitive and possibly cause a surge in import demand. This could be the case for Kenya. Although the financial system is advancing, it is possible that the recipients of remittances have limited knowledge or access to the financial instruments for investment and savings. This implies that policy makers in Kenya need to complement remittances promoting policies with education on different export competitive promoting channels and vehicles that can be exploited by remittance recipients besides consumption.

Other results reported in Table 4 show that FDI has a positive impact on the exchange rate in the short run and the long run. Thus, FDI causes an increase in the nominal exchange rate – a depreciation. One possible explanation was identified by Khurshid et al. (2017) that if FDI was related to acquisition associated with privatisation, it would not cause an appreciation of the exchange rate. Trade openness was found to have no impact on the exchange rate in the long run, but only a positive impact in the short run. This outcome corroborates the depreciation effect of remittances on the exchange rate. The surge in consumption due to remittance inflows could account for the positive impact in the short run. However, in the long run, there could be a tendency of exports and imports levelling up, resulting in no impact on the exchange rate. Government consumption expenditure as a percentage of GDP has no impact on the exchange rate in Kenya. Economic growth was found to have a negative impact in the long run, but not in the short run. The study also found that broad money has a positive impact on the exchange rate in the long run and in the short run. According to the results in Table 4, an increase in the money supply results in an exchange rate depreciation. This is in line with economic theory, where an increase in money supply (especially not matched by production) is inflationary and less favourable

for both external and internal investors (Mohr & Associates, 2015). The price level was found to be insignificant in both short and long run.

The error term (ECM) for the model had the right sign, with a coefficient of 0.302. It took slightly more than three years for the Kenyan economy to return to equilibrium when there is disequilibrium. The function is the right fit for the model with an explanatory power of 77%. The model passed all diagnostic tests, and the results are reported in Table 5.

Table 5. Diagnostic Results

LM Test Statistic	Results
Serial Correlation	2.515 [0.113]
Functional Form	1.846 [0.174]
Normality	0.657 [0.720]
Heteroscedasticity	0.514 [0.219]

Source: Authors' calculation

The model is stable at 5% level of significance as reported in Figure 1: cumulative sum of recursive residuals (CUSUM) and the cumulative sum of square recursive residuals (CUSUMSQ).
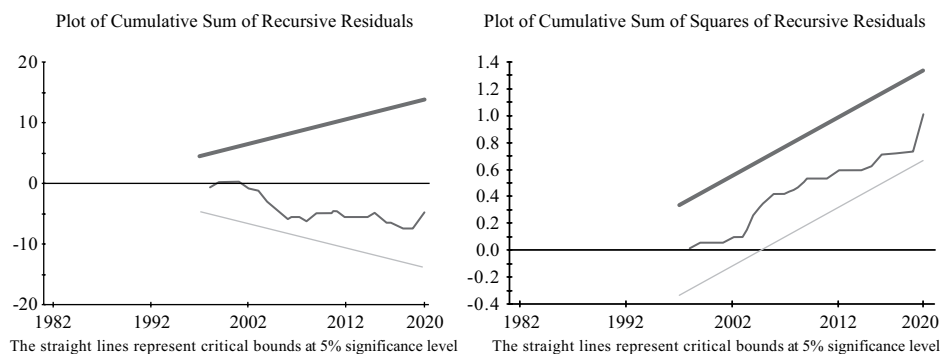

Plot of Cumulative Sum of Recursive Residuals — The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals — The straight lines represent critical bounds at 5% significance level

Figure 3. CUSUM and CUSUMSQ Plots
Source: Authors' calculation

6. CONCLUSIONS

This study investigated the impact of remittances on the nominal exchange rate in Kenya using annual time series data from 1980 to 2020. The variables of interest were nominal exchange rate and remittance inflows; however, control variables (FDI, trade openness, government consumption expenditure, economic growth, broad money, and price level) were also included to ensure that the

model is fully specified. Using the ARDL approach, the findings of this study revealed that remittances had a positive impact on the exchange rate irrespective of the timeframe considered. Thus, remittances lead to nominal exchange rate depreciation according to the findings of this study. The study fails to support the argument that remittance inflows lead to an appreciation of the local currency as opined by some previous studies. The depreciation of the nominal exchange rate causes tradable goods and services in Kenya to be attractive, according to the finding of this study. Thus, remittances help to promote exports in Kenya. Based on the findings of the study, policy makers in Kenya need to avail more channels that remittance-receiving families can use to promote savings rather than consumption. This will ensure that the consistent increase in remittances received by the country is channelled into productive activities that promote economic stability and growth in line with the SDGs. Promotion of remittances will also promote exports contributing positively to the balance of payments.

Conflict of interests

The authors declare there is no conflict of interest.

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ПРИЛИВИ ДОЗНАКА И ДЕВИЗНИ КУРС У КЕНИЈИ: ЕМПИРИЈСКО ИСТРАЖИВАЊЕ

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САЖЕТАК

Сврха: Ова студија је истраживала утицај дознака на номинални курс у Кенији, користећи годишње податке од 1980. до 2020. Студија је била мотивисана потребом да се открије како дознаке утичу на девизни курс у Кенији, имајући у виду повећање прилива дознака у земљама са ниским и средњим приходима, укључујући Кенију. Ово је важно јер Кенија наставља да гради стабилно макроекономско окружење које подржава економски раст и друге прекретнице наведене у Циљевима одрживог развоја.

Методологија: Студија је користила ауторегресивни дистрибуирани приступ коинтеграцији.

Резултати: Студија је утврдила позитивну везу између дознака и номиналног девизног курса и на кратак и на дуги рок. Наведено имплицира да повећање прилива дознака у Кенији доводи до депресијације валуте.

Закључак: Студија стога закључује да приливи дознака у Кенији нису повезани са феноменом холандске болести.

Препорука: Препоручује се да Кенија настави да спроводи политике које подржавају приливе дознака како би се остварило побољшање платног биланса у Кенији.

Кључне ријечи: *Кенија, дознаке, девизни курс, ауторегресивно дистрибуирано кашњење, апресијација, депресијација.*