The Impact of Remittance Flow on Real Effective Exchange Rate: Empirical Evidence from The Gambia

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Abstract

The paper investigates the impact of remittance on real effective exchange rate in The Gambia. The Fully Modified OLS and Dynamic OLS are used on a monthly data from 2009M1 to 2019M12. FMOLS and DOLS estimations revealed that remittance has a positive significant impact on real effective exchange rate in The Gambia, implying that 1% increment in remittance leads to a real appreciation of the Gambian Dalasi (GMD) against the major currencies by 1.5%. Likewise, inflation is positively associated with REER, while the relationship amid foreign reserves and REER is inconclusive. Contrarily, money supply and monetary policy rate were found to have a depreciating impact on REER in both models.

Keywords: Remittance, Real effective exchange rate, FMOLS, DOLS, The Gambia

1.0 Introduction

Empirical evidence indicates that foreign capital flows (of which remittances form a significant portion in developing countries) foster economic growth, welfare, and poverty reduction and have positive impact on certain social indicators. For example, Fajnzylber and Lopez (2006) concluded that workers' remittances accelerate economic growth and reduce poverty in the recipient countries. There is also compelling evidence that remittances could bolster the fiscal position of governments of recipient countries by expanding the tax base (Abdih et al.2009). Governments generally do not tax remittances directly, but they do so indirectly through tax on consumption and trade. Since remittances boost consumption and imports, they contribute to revenue generation of government.

Despite the benefits, excessive capital inflows have implication for macroeconomic stability, especially for small open economies like The Gambia. Theoretically, large capital inflows result in acceleration in domestic inflation. This is because higher income due to large inflows would increase demand, which would translate to higher prices of non-tradable

goods. Firms are likely to respond to the rise in demand and prices by increasing output which requires more factors of production and a rise in wages. This would fuel a further increase in domestic prices and a real exchange rate appreciation. Using data from 1985 – 2013, Tung et al. (2015) investigated 32 developing countries in the Asian and Pacific region and found that remittance inflows caused a significant increase in REER in these countries.

In addition, it has been established empirically that large external inflows to developing countries have the tendency to appreciate the domestic currency in real terms and hurt other sectors of the economy. This is particularly so if the inflows are not spent on the productive sectors. For instance, Acosta et al. (2009) found evidence of real exchange rate appreciation in response to remittances in various countries. The rise of the exchange rate and the accompanying loss of competitiveness hurt the export sector. In the case of The Gambia, the principal sector is the tourism which is the country's single most important service export and a major driver of economic growth. On the other hand, The Gambian economy may benefit from a real appreciation of the domestic currency (dalasi) given that it is largely import-based, provided the capital that flows in is invested in productive sectors. This is because the country would import cheaper to finance production. Although remittance is an important feature in the Gambia, its impact on the economy has been rarely investigated. Therefore, we deem it necessary to examine the impact of remittance flow on real effective exchange rate by employing the Fully Modified and Dynamic OLS.

The remaining sections of this paper are organized as follows: Section 2 provides a background of remittance flows to The Gambia prior and during COVID-19, section 3 highlighted the theoretical consideration, Section 4 elucidates empirical review, Section 5 the methodology employed. Section 6 the data findings, discussions conclusion and recommendation.

2.0 Background of Remittance Flows to The Gambia Prior and During COVID-19.

Money sent by migrant workers abroad to their countries of origin has proven to be a vital and reliable source of financing for many developing countries. According to the World Bank, private remittance flows to the low-middle income countries (LMICs) reached US$554 billion, surpassing foreign direct investment and foreign aid to those countries. In some cases, private remittance accounts for up to 30 percent of a country's GDP[1].

[1] World Bank, Migration and Development Brief 33, October 2020

The Gambia has a long history of international migration with North America, the United Kingdom, Italy, and Spain as the major destination countries. According to the United Nations on international migration[2], an estimated 9.2 percent of The Gambia's 2.3 million population were living abroad in 2019 in search of better opportunities.

Private remittance inflows to the country have more than doubled in the past decade. Data published by the Central Bank of The Gambia (CBG) shows that remittance inflows through the official channel increased from US$174.1 million in 2009 to US$329.8 million in 2019 (see Chart 2). To put this in context, these figures respectively represent 12 percent and 18 percent of the country's GDP in 2009 and 2019. This placed the country among the highest recipients of remittances in sub-Saharan Africa when compared to the size of the economy. It is important to emphasize that data reported by the authorities only represent inflows that pass through the official channel which hugely understates total remittance figures. It is evident that a substantial amount of unreported diaspora money flows through the unofficial channel that is not captured and difficult to estimate.

Figure:1

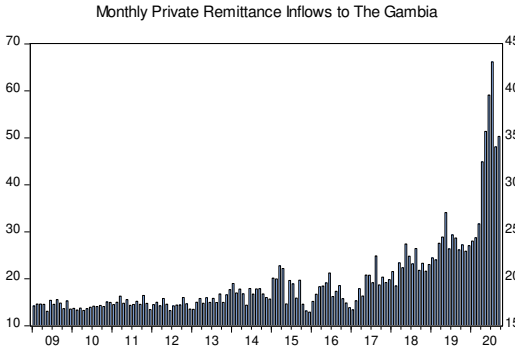
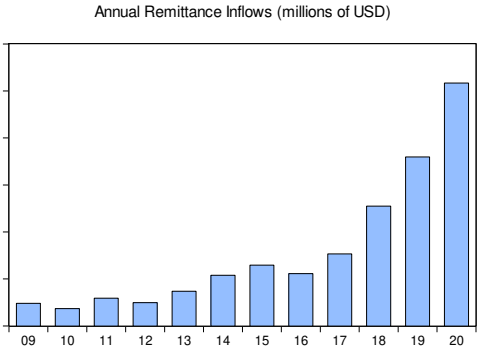


figure: 2



Evidence suggests that remittances are inherently countercyclical given that they tend to increase during periods of crisis to smoothen household consumption, thus providing some form of insurance for families against income shocks (Sayeh and Chami 2020). However, the COVID-19 pandemic was initially thought to be different given the massive economic devastation wrought by the pandemic particularly in richer countries that are the main sources of private remittances. At the early stages of the pandemic, the World Bank projected a staggering 20% decline in the amount of money sent by migrant workers back home in 2020 as a direct consequence of the crisis. The Bank predicated this mainly on the decline in wages and employment among migrants during the pandemic.

[2] United Nations, Department of Economic and Social Affairs. Population Division (2019). International Migrant Stock 2019 (United Nations database, POP/DB/MIG/Stock/Rev.2019).

However, several months into the pandemic, data shows that The Gambia, like many developing countries, has registered the most remarkable annual increase in remittance inflows. Gambians in the diaspora remitted record US$589.8 million in 2020, about 78.8% higher than US$329.8 million in the previous year. The unprecedented increase in official statistics is attributable to several factors, including the improvement in data collection by the Central Bank[3], both in terms of methodology and coverage as more money transfer agents get registered. Travel restrictions in response to the public health crisis shut down unofficial channels of transfer. Further, the use of technology does not only make it easier and less expensive to send and receive money but ensures that data is accurately captured.

Due to the low level of financial inclusion, the money transfer method commonly utilized in The Gambia has been the traditional wire transfer through money transfer operators, which is often expensive. As a result, the cost of remitting money to The Gambia is high, at 7.0 percent in first quarter of 2019, according to the World Bank despite being a major recipient country compared to the size of the economy. Financial technology, which makes it easier and cheaper to send and receive money is still developing with limited products and services. However, with the continuous modernization of the payment system infrastructure, increasing awareness and the high rate of mobile phone penetration, the use of electronic and digital payment methods is growing. Caron (2020) attributed the increased flow of private money to developing countries not only to the improvement in data as the informal channel collapsed, but also reflects the fact that migrants tend to work in essential sectors and continued to earn steady flow of income during the pandemic. In addition, part of the COVID-19 stimulus money by governments in advanced economies found itself in developing countries to support families, as an investment, or increase in savings. However, another important limitation of data from official sources in The Gambia is that it does not show disaggregation of the data into usage or purpose.

Remittances is a critical component of the current account of the balance of payments as well as a source of tax revenue for governments in developing countries (Abdih et al. 2011). The low export base and the high import bill implies that The Gambia persistently runs a deficit in

[3] In The Gambia, the Central Bank is the authority that licenses, regulates and supervises banks, foreign exchange bureaus and money transfers agents.

the goods account of the balance of payments. Thus, tourism receipts, as well as official and private transfers, are important components of the current account that mitigate the impact of the large trade deficit. They are the major sources of foreign exchange liquidity that keeps the domestic currency stable against international currencies. The dalasi is among the most stable currencies in the sub-Saharan Africa region despite the absence of extractive industries.

This study intends to establish the empirical relationship between private transfers and the real exchange rate in The Gambia. It is expected that it will add to existing knowledge on the critical role of remittances in the Gambian economy and help inform and guide policy.

3.0 Theoretical considerations

Remittances can potentially affect the real exchange rate through three main channels (see the technical annex for a formal discussion). First, remittances may affect the external equilibrium of the economy by raising the net foreign asset position of the country. For example, the theoretical models of Mussa (1984), Alberola and Lopez (2001) and Aberola et al. (2002) imply that the external equilibrium of the economy will be reached when any current account imbalance is compensated by a sustainable flow of international capital. In turn, the rate of sustainable capital flows will be a function of the stock of foreign assets and liabilities of the economy, so that changes to the net foreign asset position of the country will lead to changes in the real equilibrium exchange rate.

Given that international remittances are transfers of foreign currency that unlike other types of international flows have no obligation associated, remittances will have a direct impact on the net financial position of the country vis a vis the rest of the world. Note in this regard that the impact of remittances on the stock of net foreign assets differs from the impact of other flows such as loans or foreign direct investment flows. In the case of a loan, there is an associated liability (the repayment) and therefore the contribution to the net foreign asset position of the country is given by the difference between the proceeds and the net present value of the repayment obligations. In this regard, loans will positively affect net foreign assets to the extent that they have a positive grant component. On the other hand, foreign direct investment flows coming into the home country will increase the foreign liabilities and therefore, will lead to a decline of the net foreign asset position.

Second, remittances can also affect the internal equilibrium of the economy understood as the situation where domestic capital and labor are efficiently utilized. If as discussed above, remittances lead to an acceleration in the demand for services, inflation will tend to be higher in these sectors which typically are not tradable (and hence somewhat protected from competition) leading to a real exchange rate appreciation (the traditional Balassa-Samuelson effect).

Similarly, market rigidities may result in productivity differentials between sectors. For example, if remittances raise the reservation wage, then excessive wage pressures in the tradable sector may lead to employment adjustments to maintain competitiveness, whereas in the non-tradable sector employers may admit these pressures because they can pass them onto prices. As a result, remittances can also lead to higher productivity growth and lower inflation in the tradable sector through their potential impact on the reservation wage. One implication of this discussion is that whether remittances are primarily used for household consumption or investment purposes will have a direct impact on the way they affect the real exchange rate, with remittances that are predominantly consumption oriented having more of an appreciating impact on the real exchange rate (Mussa, 1984).

A third possibility for remittances to affect the real exchange rate is through their impact on growth (Acosta, et al., 2007), although in this case the impact on the exchange rate is likely to be uncertain. On the one hand, an acceleration in the growth rate would lower the stock of net foreign assets as a percentage of GDP and hence this would lower the real exchange rate (i.e. growth would have the same impact as an increase in the liabilities of the country). If on the other hand, the net foreign asset position of the country is negative vis a vis the rest of the world, the increase in the rate of growth would lower the liabilities to GDP ratio and hence lead to an appreciation.

4.0 Empirical Review

The relationship between remittance and exchange rate have been widely studied. An earlier study of the impact of remittance on REER was conducted by Bourdet and Falck (2003) in Cape Verde for the period of 1980 to 2000. They highlighted that an upsurge in remittance receipts is associated with an appreciation of the equilibrium REER. Subsequently, Amuedo-Dorantes and Pozo (2004) utilized a panel data of 13 Latin American and Caribbean nations from 1978–1998. They propounded that an increase in remittance inflow results to an

appreciation of the RER. Similarly, Combes et al. (2012) used "panel co-integration technique" to examine the link between remittances and REER, using 42 developing nations. they discovered that both public and private inflows lead to the appreciation of the REER. Hassan, and Holmes (2013) used the panel co-integrating technique to investigate the long-run relationship between the remittances and REER for emerging and developing economies. The results divulged that an increase in the remittance inflow leads to an appreciation of the REER. Keefe (2014) employed a monthly and quarterly data for 15 developing countries. The analysis disclosed that remittances stimulate the growth of foreign currency and confirms stability for several small developing economies. Nguyen et al. (2020) also explore whether Asian developing countries affected by the Dutch disease, using the "System Generalized Methods of Moment (S-GMM) for the linear dynamic panel data (DPD) model "from 32 countries between 2006 to 2016. They found when remittances per capita rise by 1%, the real effective exchange rate (REER) of these countries appreciates by 0.103% which undermines these countries' competitiveness, supporting the existence of Dutch disease. They further, highlight that the Dutch disease only appears in nations with low ratio of remittances of GDP (less than or equal to 1%).

However, in contrast to the above study, Ozcan (2011) found that remittance leads to depreciation in REER. Likewise, Lopez et al. (2007) highlighted that remittances have a significant influence on REER. They concluded that with the acceleration of the growth rate, the ratio of net foreign assets to GDP reduces and subsequently diminishes the REER. On the other hand, increase in growth rate will lower the liabilities of the country and hence appreciation in RER. On the internal ground, higher internal demand leads to faster growth of the economy, which in turn, leads to appreciation in RER. To sum up, they concluded that effect of remittances on RER is uncertain. Similarly, Acosta et al. (2008) deduced similar results from their study. Mongardini and Rayner (2009) investigated association between remittance and REER in Sub-Saharan African nations, they suggested that there is no long run, association between remittance and REER.

5.0 Methodology

5.1 Data

In scrutinizing the influence of remittance (GPR) on real effective exchange rate (REER) in The Gambia, we used a monthly time series data. The data for REER is obtained from IMF International Financial Statistics while the remaining data from "Central Bank of The Gambia

(CBG) Data Warehouse "covering the period 2009M1-2019M12. The choice of the data is based on its availability. REER is used as the dependent variable, GPR is the explanatory variables, while foreign reserves, money supply, inflation and monetary policy are the control variables.

LREER=f (LGPR, LFR, LM2, LCPI and MPR) (1)

Where, LREER is the log of real effective exchange rate, LGPR is the log of remittance, LFR is the log of foreign reserves, LM2 is log money supply, LCPI is the log of Consumer Price Index and MPR is the monetary policy rate.

Table-1. *Variables Representation*

Indicators	Procedure	**Unit**	**Source**
Real Effective Exchange Rate (LREER)	(a measure of the value of the Gambian dalasi weighted average of a basket of foreign currencies) divided by a price deflator or index of costs.	Index	IMF (2019)
Gross Personal Remittance (LGPR)	Personal remittances comprising personal transfers (thus include all current transfers between resident and non-resident individuals. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by non-resident entities).	USD	CBG (2019)
Foreign Reserve (LFR)	Total Foreign Reserve held abroad.	GMD	CBG (2019)
Money Supply (LM2	M1(Coins and currency in circulation +demand deposits) + saving deposits+ + time deposits.	GMD	CBG (2019)
Inflation (LCPI)	Consumer Price Index	Index	CBG (2019)
Monetary Policy Rate (MPR)	3 months T-bills rate	%	CBG (2019)

Source: *Created by authors from the data*

5.2 The Long Run Estimates (FMOLS, DOLS, CCR)

The "Fully Modified Ordinary Least Square" proposed by Phillips and Bruce (1990) is used in this paper. This estimation can resolve endogeneity issues, autocorrelation, omitted variable bias and measurement errors present in a model. To test the robustness of the FMOLS analysis, the "Dynamic Ordinary Least Square" (DOLS) by Stock and Mark (1993) is used. This technique is also able to evade potential endogeneity problems that can showcase between the regressors. The dynamic models (FMOLS and DOLS) have the proficiency to automatically generate the optimal lags and leads for a model, thereby solving the endogeneity and heteroskedasticity as contrast to the ARDL. Our choice of estimation method was also dictated by the relatively small sample size. The FMOLS performs better when it comes to small sample size compared to the ARDL, thus, due to the lag section process involved in the ARDL various observations are normally lost (Fereidouni et al., 2014). Likewise, Amarawickrama and Hunt (2007) highlighted that FMOLS makes appropriate rectifications to the inference issues that occurs in the EG cointegration method, this makes the T-statistic long run coefficient valid.

$$LREER_t=\beta_0+\beta_1 LGPR+\beta_2 LFR+\beta_3 LM2+\beta_4 LCPI+\beta_5 MPR+\varepsilon_{it}; \quad (2)$$

Where, LREER is the log of real effective exchange rate, LGPR is the log of remittance, LFR is the log of foreign reserves, LM2 is log money supply, LCPI is the log of Consumer Price Index and MPR is monetary policy rate.

6.0 Data Presentation

6.1 Descriptive statistic

Table 1 shows the monthly average growth rate of REER at 4.46%, with maximum and a minimum of 4.49% and 4.19% respectively. Remittance recorded monthly growth rate of 16.67%, with a maximum and minimum of 17.32 and 16.37% respectively. Moreover, the growth rate of foreign reserves, money supply, consumer price index and monetary policy 4.89%, 9.89%, 5.09% and 14.04% respectively. Accordingly, fairly symmetrical data sets across all observations with skewness of zero were realized.

Table 1: Descriptive Statistics

	LREER	LREM	LFR	LM2	LCPI	TBILLS
Mean	4.461951	16.67291	4.890105	9.894716	5.093108	14.04280
Median	4.496841	16.60812	5.060549	9.867183	5.080222	12.96500
Maximum	4.641416	17.31734	5.348861	10.60707	5.414161	22.05000
Minimum	4.195814	16.37348	3.951340	9.340313	4.823663	6.130000
Std. Dev.	0.103677	0.217584	0.384650	0.331004	0.176526	4.538302
Skewness	-0.574990	0.798217	-1.119779	0.455391	0.202903	0.344806
Kurtosis	2.351157	2.707582	2.761100	2.279451	1.756662	1.881283
Jarque-Bera	8.571965	12.95105	24.94076	6.631179	8.410294	8.491540
Probability	0.013760	0.001541	0.000004	0.036313	0.014919	0.014325
Sum	526.5102	1967.403	577.0323	1167.576	600.9867	1657.050
Sum Sq. Dev.	1.257623	5.539090	17.31082	12.81894	3.645890	2409.754
Observations	118	118	118	118	118	118

6.2 Unit Root Test

The long-run estimation makes it a prerequisite for the variables to be stationary at first difference and cointegrated. The Augmented Dickey Fuller (ADF) unit root analysis in Table 2 divulged that the variables contained unit root at I (0) and non-stationary. However, they are stationary at first difference, thus the null hypothesis of non-stationarity is rejected considering the ADF t-statistics and P-values which indicated that the variables are 1% significance level.

Table 2: Augmented Dickey Fuller (ADF)

Variables	t-statistics	P-Values
LREER	-1.526091	0.8151
LREM	-3.190414	0.0915
LFR	-1.539376	0.5102
LM2	-0.256374	0.9919
LCPI	-1.654229	0.7652
MPR	-0.921215	0.9493
ΔLREER	-13.68794	0.0000***
ΔLREM	-6.808641	0.0000***
ΔLFR	-8.524441	0.0000***
ΔLM2	-10.52440	0.0000***
ΔLCPI	-9.589140	0.0000***
ΔMPR	-6.047650	0.0000***

Note: "LREER is log real effective exchange rate, LFR is foreign reserve, LM2 is money supply, LCPI is log of consumer price index, and MPR is monetary policy rate, while ***'**'* represent 1%, 5% and 10% significance level respectively".

6.3 Johansen Cointegration Test

Table 3 showed the Trace statistics and Max-Eigen values and corresponding critical values (5% level) with probability values of Johansen test (1988). The Trace statistic rejects the H0: CV=0 at 1% level, while and the Max-Eigen values does not reject it. However, none of the tests rejects the second null hypothesis of H0: CV < 1. It implies any deviations in existing equilibrium relationship between the variables are temporary and move together in long-run. This shows the implication for the presence of long-rung association among the variables.

Table 3: Johansen Cointegration Test

Hypothesis H_0	H_A	Trace Statistics	Critical Values 5% Level	P Values
CV=0	CV≥1	112.5176*	95.75366	0.0021
CV≤1	CV≥2	76.04127*	69.81889	0.0146
CV≤2	CV≥3	46.53896	47.85613	0.0661
CV≤3	CV≥4	25.02250	29.79707	0.1606
CV≤4	CV≥5	8.189926	15.49471	0.4453
CV≤5	CV≥6	0.919337	3.841466	0.3376
		Max-Eigen Values		
CV=0	CV≥1	36.47634	40.07757	0.1205
CV≤1	CV≥2	29.60231	33.87687	0.1524
CV≤2	CV≥3	21.51646	27.58434	0.2462
CV≤3	CV≥4	16.83258	21.13162	0.1800
CV≤4	CV≥5	7.270589	14.26460	0.4576
CV≤5	CV≥6	0.919337	3.841466	0.3376

Table 4: Method: Fully Modified Least Squares (FMOLS) Dependent Variable: REER

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LM2	-1.552070	0.417592	-3.716714	0.0003
LFR	0.009370	0.078721	0.119029	0.0515
LCPI	2.236594	0.806857	2.771982	0.0065
LREM	0.519243	0.060657	8.560367	0.0000
TBILLS	-0.019509	0.004411	-4.422630	0.0000
R-squared	0.278237			
Adjusted R-squared	0.252460			
S.E. of regression	0.089250			
Long-run variance	0.022671			

Table 5: Method: Dynamic Least Squares (DOLS) Dependent Variable: LREER

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LM2	-1.395188	0.515190	-2.708101	0.0080
LFR	-0.038730	0.106932	-0.362193	0.7180
LCPI	1.841894	1.032377	1.784129	0.0776
LREM	0.559635	0.080482	6.953577	0.0000
TBILLS	-0.021127	0.005796	-3.645132	0.0004
R-squared	0.534291			
Adjusted R-squared	0.441149			
S.E. of regression	0.076533			
Long-run variance	0.020520			

6.4 Findings and Discussion

FMOLS and DOLS estimations revealed that remittance has a positive significant impact on real effective exchange rate in The Gambia, this implies that 1% increment in LREM leads to a real appreciation of the Gambian Dalasi (GMD) against the major currencies by 1.5%. This relationship can be attributed to the hypothesis of Mussa (1984), Alberola and Lopez (2001) and Aberola et al. (2002), who state that remittances could affect the external equilibrium of the economy by boosting the "net foreign asset" position of the country. Implying that the external equilibrium of the economy will be achieved when any current account imbalance is reimbursed by a sustainable flow of international capital. In turn, the rate of sustainable capital flows will be a function of the stock of foreign assets and liabilities of the economy, so that fluctuations to the net foreign asset position of the country will lead to changes in the real equilibrium exchange rate. Likewise, inflation is positively associated with REER, this confirms the study of Joof and Jallow (2020) who established a positive association between inflation and exchange rate in The Gambia.

6.5 Conclusion

The paper investigates the impact of remittance on real effective exchange rate in The Gambia. The Fully Modified OLS and Dynamic OLS are used on a monthly data from 2009M1 to 2019M12. The estimation from the FMOLS revealed that an increase in remittance leads to an increase in real effective exchange rate, signifying that as remittance increased by 1% the Gambia Dalasi (GMD) will increase (appreciate) by 0.27% in real terms. Likewise, CPI has a positive relationship with REER, this confirms the study of Joof and Jallow (2020) who established a positive association between inflation and exchange rate in The Gambia. Contrarily, money supply and monetary policy rate have a negative impact on

REER, which indicates that an increase in M2 and MPR will decrease the real exchange rate of the GMD.

6.6 Recommendation

Base on the analysis which suggested that remittance flow leads to an appreciation of the Gambian Dalasi (GMD) against foreign currency, the following recommendations is made: Hence, The Gambia is an import dependent economy, its strength largely dependent on the appreciation of the GMD against major currencies- as such policy makers should endeavour to developing a national agenda to boost remittance flow and introduce several policies and interventions.

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