The Relevance of Remittances on Economic Growth in Tanzania

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Abstract

Despite the increasing importance of remittances in total international capital flows, the relationship between remittances and economic growth has not been adequately addressed, especially in Tanzania. This article, therefore, explores the aggregate impact of remittances on economic growth from 1985 to 2017. The Autoregressive Distributed Lag Model is used for time series estimation. Employing the general to specific technique, the article reveals that remittances have a positive and significant effect on economic growth in the country. It also reveals that foreign direct investment and terms of trade have a robust and significant influence on economic growth. However, exchange rates happened to have a negative impact on economic growth in Tanzania. It is therefore being recommended that policy-makers should endorse initiatives to attract huge amounts of personal remittances in the country in order to continue achieving the positive long-run relationship between remittances and economic growth. Also, they should pay more attention to policies that help to engage the diaspora for the development of the country. In this regard, the government ought to establish innovative schemes to trap the diaspora's cash.

Key words: Economic Growth, Remittances, ARDL, Tanzania

Introduction

Presently, remittance has risen significantly in developing countries. Depending on the current debate on remittance, two schools of thought have emerged: optimist and pessimist views. The optimist view contends that remittances have a positive effect on the remit receiving country through reducing poverty (Adams & Page, 2005; Acosta *et al*., 2007) and stimulating the economic growth (Stratan & Chistruga, 2012; Fayissa & Nsiah, 2010; Matuzeviciute & Butkus, 2016; Goschin, 2014; Mwangi & Mwenda, 2015). Thus, remittances have been promoted as a growth and development tool since they can raise incomes (Shera & Meyer, 2013). Also, remittances may promote economic growth (Giuliano & Ruiz-Arranz, 2009; Mundaca, 2009; Bugamelli & Paterno, 2011) by providing funds that can be used in different sectors of development including education (Orrenius *et al*, 2010; López-Córdova, 2005), health care (Davis & Carr, 2010), research and development (Gjini, 2013) or investing in national education (Stratan & Chistruga, 2012). From a macro-economic perspective, remittances can boost aggregate demand as well as accelerate economic growth. However, on the other hand, remittances may have adverse macro-economic impacts by increasing income inequality (Barham & Boucher, 1998), though Acosta *et al*. (2007) argue differently that remittances have no effect on inequality. Others like Davis and Carr (2010), Gjini (2013), Alkhathlan (2013) and (Catrinescu *et al*. (2006) remain on the pessimist view believing that remittances have a negative effect on economic growth. Notwithstanding the increasing importance of remittances in total

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international capital flows in different countries, the relationship between remittances and economic growth in Tanzania has not been adequately studied. Through this article, therefore, it is hoped that this knowledge gap has been addressed, by indicating the position of Tanzania in respect to the optimist and pessimist schools of thought.

By the year 2018, the World Bank had noted the growth of remittances to the tune of 10% culminating to US$ 689 billion, including US$ 528 billion to developing countries. The report also noted that by 2019 the overall global remittance is expected to grow to 3.7%, reaching US$ 715 billion in 2019, including US$ 549 billion to developing nations[3]. In Sub-Saharan Africa (SSA) region, in 2017, the formal remittance inflows increased by 10% from about US$ 34 billion in 2016. This is partly because of improvement in economic activities in the high-income Organisation for Economic Co-operation and Development (OECD) countries that are the major remittance-sending countries for SSA. Nigeria is projected to continue to be the largest remittance recipient in the region as indicated in Figure 1. This is because of experiencing a recovery in oil production with an increase in oil output leading to improved confidence for investment-oriented remittances[4]. The Kenyan Wall Street also noted that the SSA has always recorded the highest remittance costs in the world. However, recently there has been a moderate decline in remittance costs from 9.4% in 2017 second quarter to 9.1% in 2017 third quarter of the year, compared to global averages of 7.3% and 7.2% respectively.

It should be noted that remittances do not act as an alternative to other forms of development finance, but rather they act as a critical financial flow for many developing countries. Through emigration, remittances lead to improvements in welfare in families and communities in receiving nations (UNCTAD, 2018). Remittances can take three forms, whether cash, in-kind or social; all of these forms can potentially enable family members to improve their daily activities. Families can access better education and health care, start businesses and improve their quality of life (UNCTAD, 2018). However, this article only dwells on cash flow form of remittances. In developing and least developing countries, remittances represent a major part of international capital flows to the extent of exceeding foreign direct investment (FDI), foreign aid, even surpassing the export revenues (Giuliano & Ruiz-Arranz, 2009). This is vividly noted by the World Bank (2006) which showed the record of remittances exceeding the amount of FDI and official development assistance. Even Gupta *et al*. (2007) noted that the estimated official remittances increased twice as much as the amount of development assistance received by emerging economies. For many developing nations, remittances received make up a significant share of their economies often receiving over 10% of their GDP in remittances each year; some countries like Tajikistan receive over half of their national GDP in remittances. Also, countries like Liberia (26.7%) and Lesotho (18.2%) have a high dependence on remittance flows as a share of GDP (UNCTAD, 2018).

[3] India to retain top position in remittances with $80 billion: World Bank India is followed by China ($67 billion), Mexico and the Philippines ($34 billion each), according to World Bank. The Economic Times (Dec 08, 2018) retrieved on 11/4/2019 at: //economictimes.indiatimes.com/articleshow/66998062.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

[4]Kenyan Wall Street. In African News (April 11, 2018), retrieved on 12/04/2019 at https://kenyanwallstreet.com/top-10-countries-with-high-remittance-inflows-in-africa/

The cash flows to Africa rose from US$ 38.4 billion in 2007 to US$ 64.9 billion in 2016, accounting for 2.8% of GDP and 14.8% of total exports. Countries like Cabo Verde, Comoros, Gambia, and Liberia have their remittances greatly exceeding the export earnings. Since 2015, remittances have accounted for the bulk of total external flows to Africa, as official development assistance declined from 37% in 2003 to 28% in 2016. Nevertheless, remittance flows are unevenly distributed between countries as reflected in Figure 2. While India is taking the lead globally with US$ 69 billion, Nigeria has US$ 18.9 billion, and comes number one in Africa; however, it globally positioned itself to top five below India, China (US$64 billion), Philippines (US$33 billion) and Mexico (US$31 billion). This was in the year 2017 (UNCTADstat database, 2018). In 2016, remittances to Africa totalled almost US$ 60 billion with Nigeria, Egypt and Morocco receiving more than half of the total (see Figure 1).

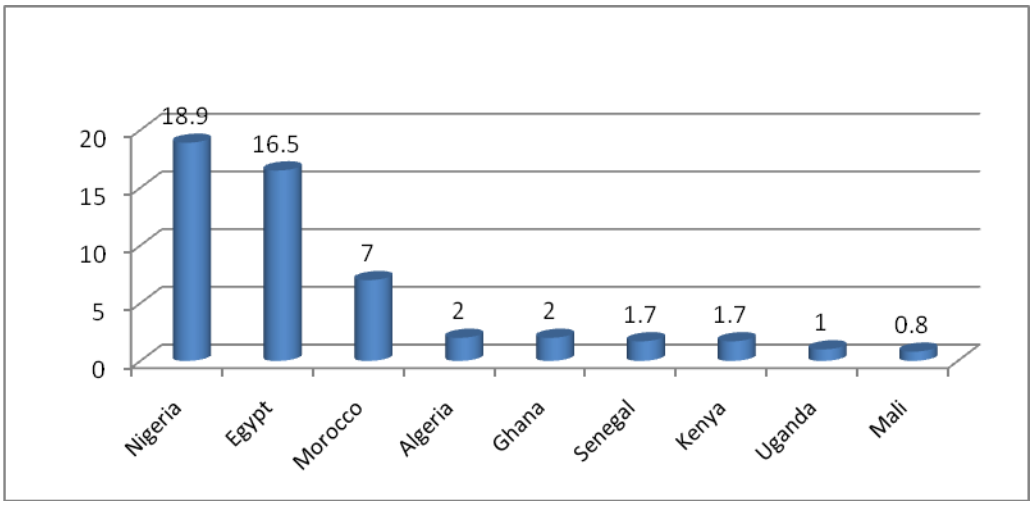

Figure 1: Top 10 Remittances Received in Africa, 2016 (in US$ billion)

Remittances in Tanzania

In Tanzania, remittances stimulate the economy by increasing both the currency flows, consumer purchasing power, and work towards poverty reduction (Hansen, 2012). However, the contribution made by Tanzania's diaspora in terms of remittances has often been jeopardised to the extent of been unaccredited by the government, international society and policy makers. This may be because the country has not been characterised by a strong tradition for international migration to the western richest countries (Shivji, 2009). Reckoning this, Hatibu (2007) noted that there was a small number of Tanzanians in the diaspora, in the world, estimated at around 200,000 people. These were the records up to the late 1980s (before the collapse of *Ujamaa*[5]); however, now it is hard to get the estimates. It should be noted that the amount of remittances received in a country is very small compared to other EAC countries (see Figure 3). With this, Hatibu (2007) noted that the small amount is caused by lack of systematic records, lack of knowledge and inadequate literature on the flow of remittances to Tanzania. Again, Hatibu noted that the practice of diaspora sending remittances via informal channels such as personnel carriers

[5]In Tanzania, the Kiswahili word "Ujamaa" means a socialist system of village cooperatives based on equality of opportunity and self-help, established in the 1960s. Ujamaa Villages generate wealth in rural areas.

or personal networks, friends/relatives, travellers is another reason why there are poor records of remittances. Therefore, this explanation stands as a justification of the study, and many people seem to agree that international emigration (diaspora) from Tanzania is increasingly affecting the country's economy in terms of remittances (Hansen, 2012). Backed up with this information, the study sought to find out how this was effective to the country's economic growth. In 2017, the value for personal remittances received in Tanzania was to the tune of US$ 887 million. The data from the World Bank for Tanzania between 2001 and 2017 indicates that the average value for Tanzania during that period was US$ 176.88 million with a minimum of US$ 1.9 million in 2003 and a maximum of US$ 385.16 million in 2011. Nevertheless, the IMF data of 2019 notes that Kenya is doing better in attracting migrant remittances in East African countries followed by Uganda and Tanzania, while Burundi is lagging behind (see Figure 2).

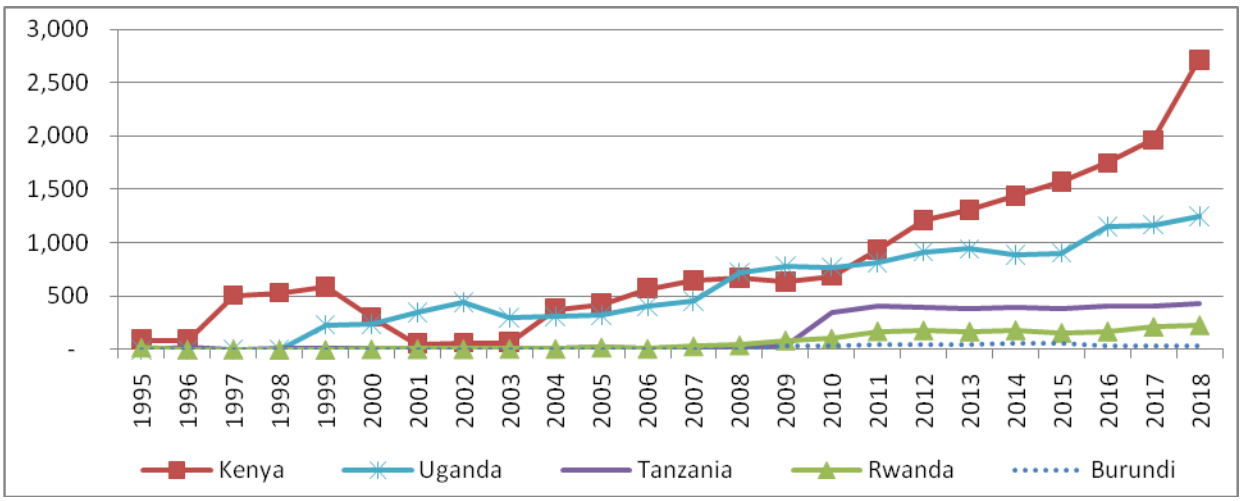

Figure 2: Migrant Remittance Inflows in EAC Countries (US$ million)
Source: IMF, World Economic Outlook, April 2019

Despite the increasing importance of remittances, the relationship between remittances and economic growth in East African Countries (EACs) especially Tanzania has not been adequately addressed. This gives an alarming call and the need to investigate the matter. Therefore, this study, as mentioned earlier, set out to explore the aggregate impact of remittances on the economic growth in Tanzania within a conventional model of economic growth, using time series data. The rest of the article is organised as follows: Section two provides a review of selected literature. In section three, a conventional economic growth model which incorporates remittances as one of the sources of economic growth is provided. The section also includes the estimation results for regression analysis. The last section summarises the results, draws conclusions, and makes policy recommendations for promoting remittances as a growth and development strategy.

Impact of Remittances on a Country's Economy

The debate of whether or not remittances have a significant impact on a economy forms a continuing dispute among many scholars. Nonetheless, the role of remittances on the economic growth for developing and least developing countries is generally accepted by policymakers as a very important economic factor for providing direct benefits to households. Some of them Meyer

and Shera (2017), Catrinescu *et al*. (2006) and Tolcha and Rao (2016) argue that remittances have positive effects on economic growth, while others maintain that remittances have negative impact. The latter, in most cases, argue that the money sent is mostly spent on consumption purposes rather than on productive assets as claimed by the former (Matuzeviciute & Butkus, 2016). They argue further that remittances have a great distortion rather than promote economic growth and structural change (Glytsos, 2002). Issues like increase of price levels of goods and services, decreasing export competitiveness, and decrease of labour supply, are negative consequences of remittances especially on the receiving countries (Stahl & Arnold, 1986). On the other hand, the supporters of the idea that remittances have positive impact on economic growth believe on the issues of financial development which include, among other things, issues of increasing investment, increasing the amount of foreign currency and increasing imports (Figure 3) (Fayissa & Nsiah, 2008).

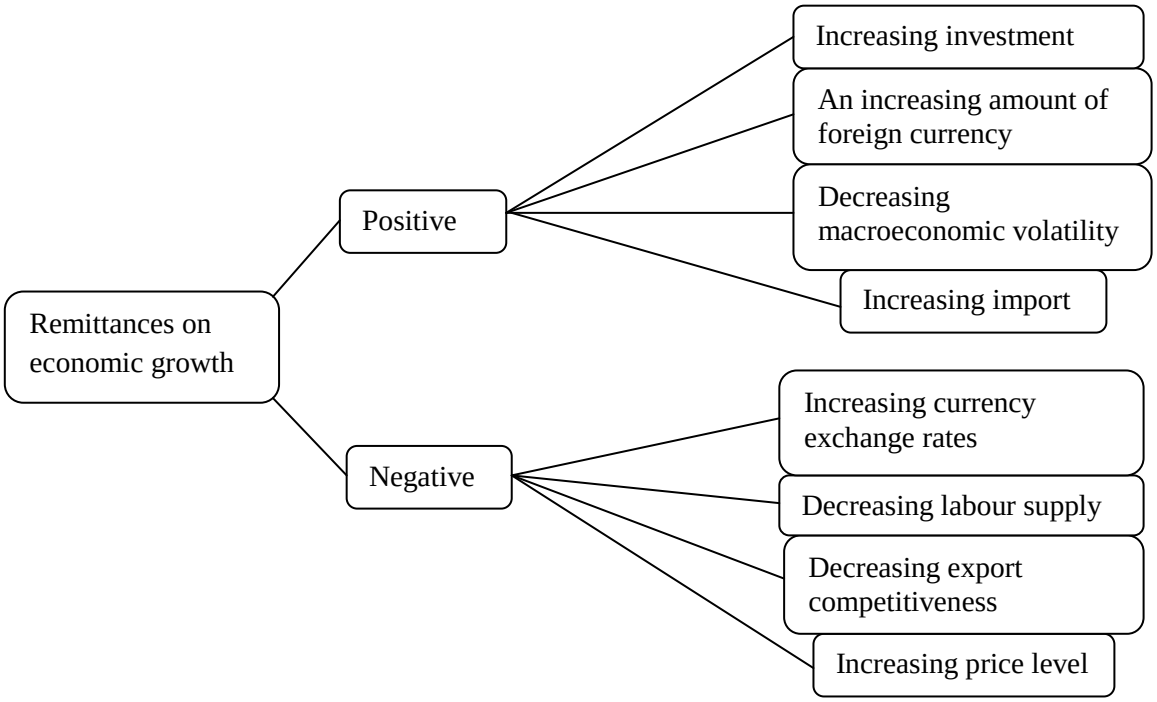

Figure 3: Impact of Remittances on Economic Growth
Source: (Matuzeviciute & Butkus, 2016)

By ensuring there is stable political and economic environment in the receiving country, remittances can guarantee economic growth. Therefore, the impact of remittances on the country's economic growth occurs through different factors as argued by different scholars. Fayissa and Nsiah (2008) investigated the impact of remittances on economic growth and development in Africa, utilising panel data ranging from 1980 to 2004 for 36 African countries. The study found there was a positive relationship between remittances and economic growth and that the former provides an alternative way to finance investment and help to overcome liquidity constraints. Meyer and Shera (2017), used panel data set for six high remittances receiving countries (Albania, Bulgaria, Macedonia, Moldova, Romania, and Bosnia Herzegovina) for the period 1999 to 2013. Using the random effects and fixed effects model, the results suggested that

remittances have a positive impact on growth and that the impact increases at higher levels of remittances relative to GDP. Matuzeviciute and Butkus (2016)**,** while examining the same, used an unbalanced panel data for the 116 countries over the period of 1990 to 2014 and concluded that there is a positive impact on the economic growth in the long run. However, the impact differs based on the country's economic development level and the abundance of remittances in the economy. Adams and Page (2005) while observing whether international migration and remittances reduce poverty in 71 developing countries concluded that the variables studied significantly reduced the level, depth, and severity of poverty in the developing world. Giuliano and Ruiz-Arranz (2009) using a newly-constructed dataset for remittances covering 100 developing countries, found that remittances boost economic growth in countries with less developed financial systems. Fayissa and Nsiah (2010) dealing with 18 Latin American countries within the conventional neo-classical growth framework, using the panel data of 1980 to 2005, found that remittances have a positive and significant effect on the growth of Latin American countries. Goschin (2014) found there was positive influence of remittances on both absolute and relative GDP growth in Central and Eastern European (CEE) countries. Mwangi and Mwenda (2015) used the Granger causality together with the ordinary least squares estimation, and found that the international remittances have an influence on economic growth in Kenya.

Further, Tolcha and Rao (2016) came up with mixed results while investigating the impact of remittances on economic growth in Ethiopia, using the Autoregressive Distributed Lag (ARDL) Model for time series data covering the period from 1981 to 2012. The study revealed that there is significant impact of remittances on economic growth in the short-run whereas it affects the economy negatively in the long-run. Also, Alkhathlan (2013) established that in the long-run, there was a negative but statistically insignificant relationship between outflows of workers' remittances and economic growth, while in the short-run, there was a negative and statistically significant relationship of the same in Saudi Arabia. Using a fixed-effects model with heteroscedasticity corrected standard errors, the article finds that remittances have had negative effects on growth whereby an increase in remittances by 10% decreased the output by about 0.9%. Other studies by Davis and Carr (2010) and Catrinescu *et al*. (2006) found there was a negative relationship between remittances and economic growth in their respective countries.

Table 1: Impact of Remittances on Economic Growth

Author	Research Period	Research sample	Research Methods	Research Results
(Mwangi & Mwenda, 2015)	1993 - 2013	Kenya	Granger Causality & OLS	International remittances have an influence on economic growth
(Matuzeviciute & Butkus, 2016)	1990 - 2014	116 countries	OLS & fixed effects	Remittances have a positive impact on economic growth
(Goschin, 2014)	1995 - 2011	Central and Eastern Europe countries	Panel estimation methods	Remittances have a positive influence on GDP growth
(Meyer & Shera, 2017)	1999 - 2013	Albania, Bulgaria, Macedonia, Bosnia Moldova, Romania, and Herzegovina	Random effects and fixed effects model	Remittances have a positive impact on growth
(Catrinescu *et al*., 2006)	1970-2003	162 countries	Dynamic Data Panel estimates	Remittances exert a weak positive impact on long-term macro-economic growth
(Fayissa & Nsiah, 2008)	1980 - 2004	36 African countries	Panel data analysis	Remittances impact positively on economic growth

(Tolcha & Rao, 2016)	1981 to 2012	Ethiopia	ARDL model	In the short-run, remittances have a positive influence on growth while it affects the economy negatively in the long-run.
(Giuliano & Ruiz-Arranz, 2009)	1975 - 2002	100 developing countries	Ordinary least squares	Remittances boost economic growth
(Fayissa & Nsiah, 2010)	1980 - 2005	18 Latin American countries	Unbalanced panel data analysis	Remittances have a positive and significant effect on growth
(Stratan & Chistruga, 2012)	Unspecified	Moldova	Analysis of migration and remittances patterns	A positive relationship between remittances and economic growth.
(Alkhathlan, 2013)	1970 - 2010	Saudi Arabia	ARDL and ECM techniques	Remittances impact negatively on economic growth
(Gjini, 2013)	1996 - 2010	Central and Eastern European (CEE) countries	Panel data analysis with a fixed-effects model	Remittances have had negative effects on economic growth

Model Specification, Data and Methodology

Data and Variables

The purpose of the study was to empirically analyse the relationship between economic growth and the inflow of the remittances in Tanzania for the period from 1985 to 2017. In order to determine the awareness of income growth rate (per capita GDP has been taken as proxy for economic growth in US$ at constant prices) to remittances and the conventional sources of economic growth such as terms of trade of the economy as measured by imports in current US$ in millions, proxied by terms of trade, inward foreign direct investment measured by percentage of gross fixed capital formation, and the variation in exchange rate, we first specify a simple double log-linear Cobb-Douglass production function as:

$$\ln GDP_t = \alpha + \beta_1 \ln REM_t + \beta_2 \ln FDI_t + \beta_3 \ln EXR_t + \beta_4 \ln TOT_t + \varepsilon_t \text{.....(1)}$$

Where $\ln GDP_t$ is the natural log of real gross domestic product per capita, $\ln REM_t$ denotes the natural log of personal remittances received in US$, while $\ln FDI_t$ is the natural log of foreign direct investment used to capture the effects of external sources of capital on growth. $\ln EXR_t$ denotes the natural log of exchange rates, and $\ln TOT_t$ is the natural log of the terms of trade capturing the impact of trade or openness of the economy on economic growth. α is the intercept, β_1 to β_4 are the coefficients of the respective variables, while ε_t is the random error term.

Descriptive Data Analysis

The descriptive statistics in Table 2 exhibits the presence of low standard deviation for all variables in this article. This signifies that most of the numbers in these variables are very close to the mean. It also appears that three variables of lnGDP, lnREM, and lnTOT are right-skewed, while lnFDI and lnEXR are negatively skewed. Observing the Kurtosis of the data, the analysis exhibits that all variables are platykurtic (short-tailed) except for lnFDI and lnEXR which are leptokurtic (long-tailed). A Jarque-Bera test of normality shows that the residuals of lnGDP, lnREM, and lnTOT are normally distributed, while the remaining two variables of lnFDI and lnEXR are not normally distributed. Also, the correlation coefficients show that all of the selected variables are positively correlated to each other. However, some are highly correlated

(lnGDP with lnTOT) and others are weakly correlated (lnFDI with lnTOT). The details are provided in Table 2.

Table 2: Statistical Analysis for Selected Variables

	lnGDP	lnREM	lnFDI	lnEXR	lnTOT
Mean	6.317652	16.10639	0.937609	6.378431	7.925734
Median	6.234348	16.30042	2.120888	6.775836	7.423294
Maximum	6.787456	19.83060	3.063827	7.714795	9.400256
Minimum	6.023275	11.76235	-8.039380	2.860619	6.713136
Std. Dev.	0.240856	2.644987	2.834577	1.215785	0.931916
Skewness	0.499903	0.067216	-2.049039	-1.342960	0.436459
Kurtosis	1.864910	1.798871	6.569854	4.107309	1.621801
Jarque-Bera	2.146056	2.008577	40.61490	11.60542	2.659452
Probability	0.207416	0.366305	0.000000	0.003019	0.160458
Correlation					
lnGDP	1.000000				
lnREM	0.940678	1.000000			
lnFDI	0.538583	0.633044	1.000000		
lnEXR	0.798337	0.867505	0.660125	1.000000	
lnTOT	0.972450	0.921738	0.495001	0.780417	1.000000

Source: Author's own computation

Estimation and Testing Procedures

Unit root test

This article employs the Augmented Dickey-Fuller (ADF) unit root testing procedure (Dickey & Fuller, 1979) to test the stationarity of the series for each variable. This is the first step in examining the time series properties of the data by looking at the patterns and trend. For the ADF test, the interest lies in determining the size of the coefficient *β.* To achieve this, equation 2 is applied.

$$\Delta Y_t = \alpha + \beta K_{t-1} + \sum_{j=1}^{n} \delta_i \Delta K_{t-1} + \mu_t + \varepsilon_t \text{..(2)}$$

Therefore, the standard Dickey-Fuller model has been augmented by ΔK_{t-i}, where Y_t represents a linear time trend, Δ is the first difference operator, while *β*, *δ*, and *μ* are parameters to be estimated. Nonetheless, the lag length 1 was chosen to avoid autocorrelation in the residual.

Results for the unit root

The ADF test results in Table 3 indicate that the lnEXR variable whose null hypothesis of the presence of unit root at level was rejected indicate that lnEXR is stationary at 1% level of significance. The remaining variables become stationary at first difference. Backed up with these results, no other method of co-integration was upheld rather than engulfing the ARDL approach which fulfils the basic two requirements. First, the approach does not require all the variables to be integrated in the same order (Pesaran & Pesaran, 1997). Second, the approach requires that no variables should be integrated into order two I(2) (Ouattara, 2004). Therefore, the ARDL model suffices for this article. Considering such explanation, Pesaran *et al*. (2001) noted that the applicability of ARDL is possible only if some variables are purely I(0) and purely I(1) or mutually integrated. Therefore, the ARDL model of co-integration is reasonably employed.

Table 3: Results for Unit Root Tests

Variables	Augmented Dickey-Fuller (ADF) test			
	At levels		At first difference	
	Intercept (t)	Trend and intercept (t)	Intercept (t)	Trend and intercept (t)
lnGDP	4.293189	-1.336290	-1.259029	-4.801083***
lnREM	-0.964257	-4.848523**	-10.46977***	-10.33753***
lnFDI	-1.501068	-1.445918	-2.859457	-4.832846***
lnEXR	-11.86868***	-9.763421***	-3.002926*	-2.883414
lnTOT	-0.298161	-1.442067	-4.322444***	-4.255326***

Source: Author's own computation
Note: MacKinnon's (1996) critical values are used in the rejection of the null hypothesis of the unit root, where ***, ** and * represent 1%, 5% and 10% respectively

Diagnostic Stability Test

The diagnostic checks performed in this analysis passed four major tests: serial correlation, heteroskedasticity, normality, recursive residuals and the CUSUMSQ (cumulative sum of recursive residuals of square). This allows checking of the validity of the regression model and assists in deciding whether the subsequent inference results can be trusted (Pesaran & Pesaran, 1997).

Table 4: Results of the Diagnostic Test

	Test statistic	Prob	Remarks
Breusch-Godfrey serial correlation LM test	5.913682	0.0520	Do not reject H_0
Heteroskedasticity test (Breusch-Pagan-Godfrey)	3.118765	0.6817	Do not reject H_0
Normality (Jarque-Bera test)	1.932022	0.3805	Do not reject H_0

Source: Author's own computation

The diagnostic test results presented in Table 4 indicate that an estimated regression line fulfils all the requirements of the good regression model. There is no indication of heteroskedasticity and misspecification in the model as confirmed by Breusch-Pagan-Godfrey test. The residuals are normally distributed, as the Jarque-Bera statistics and the corresponding probability is more than 0.05. Also, there is no serial correlation, as confirmed by Breusch-Godfrey serial correlation LM test. Additionally, the presence of the cumulative sum inside two critical lines at 5% significant level, as shown in Figure 4, signifies the stability of the model. Therefore, the model can be trusted.

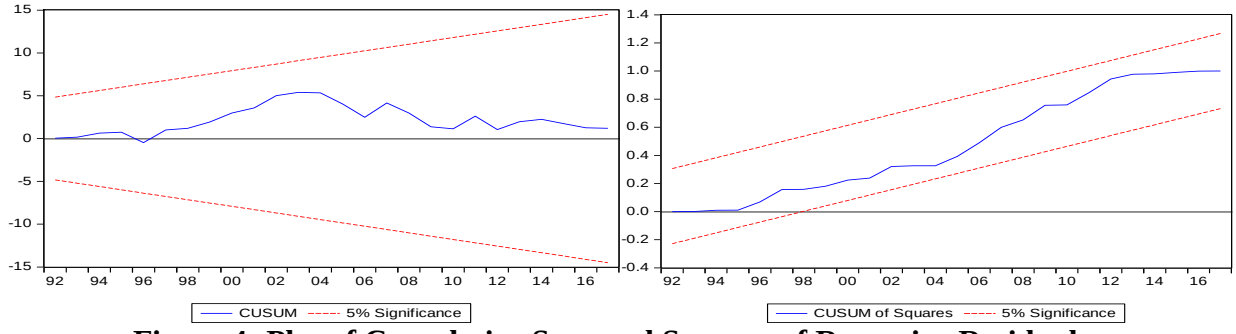

Figure 4: Plot of Cumulative Sum and Squares of Recursive Residuals

Co-integration Testing Using the ARDL Approach

The article uses the ARDL model (bound test) for co-integration to test the relationship between variables. Employing the dynamic model (eqn 3), the OLS method on estimation is used and the results are presented in Table 5.

$$\Delta \ln GDP_t = \mu + \lambda \ln GDP_{t-1} + \delta_1 \ln REM_{t-1} + \delta_2 \ln FDI_{t-1} + \delta_3 \ln EXR_{t-1} + \delta_4 \ln TOT_{t-1}$$
$$+\sum_{i=1}^{p} \alpha_i \Delta \ln GDP_{t-i} + \sum_{i=0}^{p} \beta_{1i} \Delta \ln REM_{t-i} + \sum_{i=0}^{p} \beta_{2i} \Delta \ln FDI_{t-i} + \sum_{i=0}^{P} \beta_{3i} \Delta \ln EXR_{t-i}$$
$$+\sum_{i=0}^{p} \beta_{4i} \Delta \ln TOT_{t-i} + \varepsilon_i \quad \text{.....(3)}$$

Whereby, δ_1 to δ_4 correspond to the long-run relationship, β_1 to β_4 correspond to short-run dynamics of the model, whilst subscripts $_t$ and $_{t-i}$ represent time periods. The re-parameterised results are presented in Table 5.

Table 5: Re-Parameterised Results - ΔlnGDP$_t$

Method: LS, Sample (adjusted): 1985 - 2017				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-120.4277	52.81515	-2.280174	0.0292
lnGDP$_{t-1}$	0.179194	0.116979	1.531846	0.1412
lnREM$_{t-1}$	1.986518	0.464819	4.273745	0.0002
lnFDI$_{t-1}$	0.785692	0.430844	1.823610	0.0832
lnEXR$_{t-1}$	-1.482946	0.437535	-3.389317	0.0020
lnTOT$_{t-1}$	-2.279571	1.138187	-2.002809	0.0546
ΔlnGDP$_{t-1}$	2.289345	0.910949	2.513143	0.0194
ΔlnREM$_{t-1}$	0.080306	0.039852	2.015136	0.0557
ΔlnFDI$_{t-1}$	-0.003321	0.003525	-0.942128	0.3559
ΔlnEXR$_{t-1}$	-0.009469	0.024527	-0.386045	0.7035
ΔlnTOT$_{t-1}$	0.620733	0.207312	2.994199	0.0065
R-squared	0.766907	Mean dependent var		15.28151
Adjusted R-squared	0.650361	S.D. dependent var		10.72629
S.E. of regression	6.342484	Akaike info criterion		6.803840
Sum squared resid	804.5420	Schwarz criterion		7.312675
Log likelihood	-94.45953	Hannan-Quinn criter.		6.969708
F-statistic	6.580283	Durbin-Watson stat		2.375342
Prob(F-statistic)	0.000184			

After having the re-parameterised results as presented in Table 5, the article employs the general to specific technique only to drop or maintain some variables. This technique was also adopted by Magai (2018), Katrakilidis and Trachanas (2012) and Fousekis *et al*. (2016) while arguing their case. The decision to maintain or drop some variables is made by t-statistics and their respective probability, whereby the bigger the value of the t-statistic the better the model and vice versa. Thus, for the variables to be maintained, the corresponding t-statistics have to be greater than 1.96, otherwise, the variables have to be dropped (see the notation below).

$\hat{\beta}_{1,0}$: If the value of $\hat{\beta}_{1,0}$ is / < 1.96 /, drop the variable, otherwise;

$\hat{\beta}_{1,0}$: If the value of $\hat{\beta}_{1,0}$ is / > 1.96 /, maintain that variable.

Applying the stipulated method, two differenced variables of lnFDI and lnEXR have to be dropped because the corresponding t-statistic was found to be less than 1.96. A reduced model in equation (4) was also run and came up with the reduced results which are presented in Table 6. The results obtained will be used to test the long-run relationship between variables.

$$\Delta \ln GDP_t = \mu + \lambda \ln GDP_{t-1} + \delta_1 \ln REM_{t-1} + \delta_2 \ln FDI_{t-1} + \delta_3 \ln EXR_{t-1} + \delta_4 \ln TOT_{t-1}$$
$$+\sum_{i=1}^{p} \alpha_i \Delta \ln GDP_{t-i} + \sum_{i=0}^{p} \beta_{1i} \Delta \ln REM_{t-i} + \sum_{i=0}^{p} \beta_{4i} \Delta \ln TOT_{t-i} + \varepsilon_i \text{.....(4)}$$

Table 6: Reduced Results - $\Delta \ln GDP_t$

Method: LS, Sample (adjusted): 1985 - 2017				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-95.06160	41.68027	-2.280734	0.0288
$\ln GDP_{t-1}$	2.258136	1.014683	2.225459	0.0343
$\ln REM_{t-1}$	-1.921727	0.783951	-2.451335	0.0205
$\ln FDI_{t-1}$	-0.079553	0.026604	-2.99037	0.0045
$\ln EXR_{t-1}$	0.002109	0.015756	0.133875	0.8947
$\ln TOT_{t-1}$	-0.002137	0.002595	-0.823683	0.4190
$\Delta \ln GDP_{t-1}$	-0.095580	0.261010	-0.366193	0.7177
$\Delta \ln REM_{t-1}$	8.331192	2.036371	4.091195	0.0003
$\Delta \ln TOT_{t-1}$	-0.655410	0.290704	-2.254558	0.0355
R-squared	0.704971	Mean dependent var		15.28151
Adjusted R-squared	0.597688	S.D. dependent var		10.72629
S.E. of regression	6.803479	Akaike info criterion		6.910446
Sum squared resid	1018.321	Schwarz criterion		7.326765
Log likelihood	-98.11191	Hannan-Quinn criter.		7.046155
F-statistic	6.571123	Durbin-Watson stat		1.964033
Prob(F-statistic)	0.000209			

From the reduced results presented in Table 6, the long-run relationship can be computed using the Wald Test (the F-test). Therefore, the lower and upper bound values are employed basing on 1% significance level for the unrestricted intercept and no trend in the model as proposed by Pesaran *et al*. (2001). To accept the long-run relationship between variables, the computed value of F-statistics has to be greater than that of the upper bound value; this will enable the rejection of the null hypothesis and acceptance of the alternative hypothesis. If the computed F-statistic falls below the lower value, then it means that there is no co-integration between variables. But if the computed value of F-statistic falls between two bounds, the results are inconclusive and a different technique of co-integration has to be applied (Ghildiyal *et al*., 2015). Below are the hypotheses used to assist in arriving at a decision.

H_0: $\lambda = \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ (the long-run relationship does not exist)
H_1: $\lambda \neq \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$ (the long-run relationship does exist)

Table 7: ARDL Long-run Relationships (bounds F-test)

	F- Statistic (computed)		*Probability*		*Remarks*	
Bounds test	*7.7849*		*0.0001*		Reject H_o	
Critical value bounds	1%		5%		10%	
	I(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)
Pesaran *et al*. (2001, p. 300), Table CI (iii) Case III	3.41	4.68	2.62	3.79	2.26	3.35

Source: Author's own computation

The analysis of the ARDL bounds testing approach to co-integration results presented in Table 7 shows that the calculated F-statistic 7.7849 is greater than that of Pesaran *et al*. (2001), at 1% level of significance. This indicates that all variables from 1985 to 2017 are co-integrated. In other words, all variables move together in the long-run.

$$\delta_{\ln REM}; -\frac{\delta_1}{\lambda} = 0, \delta_{\ln FDI}; -\frac{\delta_2}{\lambda} = 0, \delta_{\ln EXP}; -\frac{\delta_3}{\lambda} = 0, \delta_{\ln TOT}; -\frac{\delta_4}{\lambda} = 0$$

Using the reduced results, long-run coefficients are calculated and this is ultimately useful in the determination of long-run effects. The notation above is used to compute F-statistic and its corresponding p-values, as shown in Table 8.

Table 8: Estimated Results for Long-run Coefficients

Regressor	Long-run coefficients	F-statistic	P-value
$\ln REM_{t-1}$	0.851024	7.2844	0.0000***
$\ln FDI_{t-1}$	0.14808	2.0329	0.0081***
$\ln EXR_{t-1}$	-0.00028	1.3289	0.0060**
$\ln TOT_{t-1}$	1.013276	3.0032	0.0010***

Source: Author's own computation

Note: *, **, *** denote significant level at 10%, 5% and 1%, respectively

Discussion of Empirical Findings

This article has managed to analyse the relationships between personal remittances received and economic growth in Tanzania. It has also included the FDI, official exchange rates and terms of trade as explanatory variables to eliminate misspecification problems in the model. The economic growth proxied by GDP per capita was used as a dependent variable. The analysis started with descriptive statistics together with correlation analysis for determining the basic features of the data. Then, employing the ADF test, the stationarity of the data was tested. The results of the ADF test were mixed; some variables were stationary while others were not. Because of this, the ARDL approach to co-integration was employed. As argued by Pesaran *et al*. (2001), the ARDL approach does not necessitate that all variables be integrated in the same order. The relationship between variables was tested to find the long-run relationship between the underlying variables. Using the dynamic model, the OLS method has been employed on estimations to come up with re-parameterised results in the country. Furthermore, the general to specific method was adopted to drop the insignificant variables. The variables that had corresponding t-statistics less than 1.96 were dropped, while those with more value were maintained. This resulted in the reduced model used to compute the long-run relationship. The

presence of a long-run relationship between variables was tested using F-test and the conclusion was that all variables in the region are co-integrated to each other meaning that in the long-run they can move together. Finally, the Wald test statistic from the reduced model was used to come up with a long-run coefficient which assisted in determining long-run effects.

Based on the empirical findings of the study and the results presented in Table 8, a positive contribution of almost all variables to economic growth is observed at 1% significant level; albeit, exchange rates happen to be negatively correlated with economic growth. Nonetheless, the long-run results for remittances, FDI and trade indicate that an increase of one million US dollars will proportionately increase per capita GDP of the country by 85.1%, 14.8%, and 101.3% respectively. These findings are consistent with theoretical and empirical literature which suggests that for most developing countries, Tanzania included, the level of economic growth is positively influenced by an increase in remittances. These findings also correspond to those of Mwangi and Mwenda (2015), Matuzeviciute and Butkus (2016)**,** Meyer and Shera (2017) and Goschin (2014) who hold that remittances have a positive impact on economic growth. Furthermore, looking at the empirical results of other variables, the article found a negative association between exchange rates and economic growth. This suggests that an increase of one million US dollars of exchange rate will negatively increase 0.02% of economic growth. These results coincide with those of Brahim *et al*. (2017) and Vargas-Silva (2009) both of whom concluded that the exchange rate is likely to negatively impact economic growth.

Conclusion and Policy Recommendations

As already mentioned, the article empirically analysed the subject of remittances and economic growth for the period of 1985 to 2017 to find out the type of relationships that exist between those two variables. Despite the fact that this subject is not new in the world of economics as many authors have tacked it, in Tanzania, this aspect is still in a juvenile stage that needs more attention. Backed up with this background, the study was set to investigate the issue of personal remittances and economic growth and come up with appropriate recommendations to policy makers. The ARDL model was used for time series estimation by employing the general-to-specific method only to come up with long-run effects. Much of the evidence from the econometric analysis finds that there exists a long-run equilibrium between remittances and economic growth in Tanzania. Further assessment of the individual variables of FDI and terms of trade is as well directly related to economic growth, though exchange rate exerts a negative impact on economic growth.

With that, it is opined that the Government of Tanzania, especially the polic-ymakers, should be required to endorse some initiatives to attract huge amounts of personal remittances in the country in order to continue achieving the positive long-run relationship between remittances and economic growth. It should be noted that, as of now, there hasn't been any proper policy mechanism of tracing and trapping the money sent back home like other developing countries are doing. Reckoned to results of this article, the Government of Tanzania has to put greater emphasis on attracting huge amounts of remittances. This policy recommendation is based on the fact that if the small amount of remittances in the country has had such a positive significant impact to economic growth, how much greater would the impact be if the country had more of remittances? The past has always been a reasonable predictor of the future. Therefore, it is plausible to say that remittances will enhance economic growth in Tanzania if a huge amount of it will be allowed to enter the economies and the necessary business environment provided. In as

much as the contribution of remittances is imperative to economic growth as revealed from this article, this gives a good signal to policy makers to check the subject and set proper policies that will encourage cash flow from abroad. Therefore, policy makers should pay more attention to policies that help to engage the diaspora for the development of the country, and establish innovative schemes to trap the diaspora's cash. By doing so, the cash transferred in form of remittances can relieve the immediate budget constraints of families by assisting the crucial spending needs like health care, food, education, and the like. This argument is supported by Gupta *et al*. (2007), who argued that remittances can assist an engineer's development activities for solving the problems of low-income countries. With that, African countries, Tanzania in particular, can improve their economic growth performance, not only by investing on the traditional sources of growth such FDI and terms of trade, but also by strategically strapping up the contribution of remittances by ensuring their efficient and reliable transfer.

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