



Nexus Between Diaspora Remittances and Economic Growth

Sanderson Abel^{1*}, Kenneth Chiwakaya², Courage Mutonhori³, Henry Muleya⁴, Pierre Le Roux⁵

¹Nelson Mandela University, South Africa and Botswana University of Agriculture and Natural Resources, Botswana, ²Midlands State University, Gweru, Zimbabwe, ³Great Zimbabwe University, Masvingo, Zimbabwe, ⁴Lupane State University, Bulawayo, Zimbabwe, ⁵Nelson Mandela University, Gqeberha, South Africa. *Email: sabel@buan.ac.bw

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ABSTRACT

There has been a proliferation of studies seeking to understand the relationship between remittances and economic growth albeit with contradicting outcomes. The study evaluated the impact of remittance inflows on economic growth in Zimbabwe. The Autoregressive Distributed lag model with time series data from 1980 to 2020 was utilised. Apart from remittance inflows the model also included other variables that impact economic growth. Variables such as fixed capital formation, private consumption, foreign direct investment, and private consumption were included as explanatory variables. The results indicated that remittance inflows positively impact economic growth in the short and long run. Fixed capital formation hurts economic growth in the short run, while private consumption was found to have a negative impact on economic growth both in the long run and short run. As the results indicated that remittance inflows spur economic growth, policy concern should focus on increasing remittance inflows in Zimbabwe to promote economic growth.

Keywords: Remittances, Economic Growth, Autoregressive Distributed Lag, Fixed Capital Formation, Diaspora, Zimbabwe

JEL Classifications: O3, O4, O5

1. INTRODUCTION

Zimbabweans have experienced recurring economic and political crises since 2000 (Welborn et al., 2019). Most Zimbabweans have emigrated to other countries for better opportunities. Many nations host the bulk of Zimbabwean emigrants notably the United Kingdom, Australia, Canada, Australia, United States of America hosts most of Zimbabwean emigrants. SADC countries that have taken most Zimbabwean immigrants include South Africa, Zambia and Botswana (Bonga, 2020). With the economic challenges facing Zimbabwe, it is estimated that more than three million people have immigrated to other countries to seek better opportunities. Bonga (2020) argue that South Africa hosts the largest number of Zimbabwean immigrants estimated to be around 2-2.5 million by September 2022. Bonga (2020) further claimed that the United Kingdom (UK) has also attracted significant skilled and educated Zimbabwean immigrants.

Bonga (2020) argues that there is a linkage between the migrated and those left behind. Most of the migrants send money back home to families and friends for various reasons, including sustaining families left behind investment in the future, and saving. Though the nation loses skilled personnel through migration, Zimbabwe may still benefit from the income received from the immigrants through remittances. Remittance inflows are crucial to household survival and sustainability in Zimbabwe (Mukoka, 2020) As of December 2022, Zimbabwe received a total of US\$1.66 billion in remittance inflows indicating a 16% increase from the 2021 figure of US\$ 1.43 billion (RBZ, 2023). South Africa contributed the bigger share of the remittance inflows in Zimbabwe with 40% followed by the United Kingdom with 25% (RBZ, 2023).

Due to their small size, remittances were not previously seen as a significant source of foreign income in Zimbabwe. There is a growing interest in remittance flows in developing nations due to their volumes and impact on economic growth. Globally

remittance flows are estimated to be larger than foreign direct investment and at least 3 times the size of foreign aid (Mukoka, 2020). In 2017 global remittance flows were estimated at US\$633 billion and increased to US\$689 billion in 2018, indicating a 12% increase (Onwuteaka et al, 2023) due to an increase in global remittance flows to the increases in migration.

For the past two decades, remittance inflows to Africa have been increasing. This also happened against rising economic growth (Olayungbo and Quadri, 2019). Mukoka (2020) noted that remittance flows to most developing nations are around 10% of their gross national product (GDP). This indicates that remittance inflows have the potential to spur economic growth in developing countries. Remittance inflows to Sub-Saharan Africa were estimated to be US\$34 billion in 2016 and rose to US\$38 billion in 2017 indicating a 10.5% increase. Remittance inflows to Sub-Saharan Africa are anticipated to continue a growth path (Munanga, 2020).

According to the Reserve Bank of Zimbabwe (2023), remittance inflows were USD 1,658.36 million in 2022, indicating a 14% contribution to total foreign currency receipts. Apart from export receipts, diaspora remittance inflows in 2022 were substantially higher in comparison to other foreign inflows.

Figure 1 shows the trends in real Gross GDP growth (proxy for economic growth) and remittance inflows in Zimbabwe from 1980 to 2020. It suffices to say that, Figure 1 shows that there may be a relationship between real GDP growth and remittance inflows. This is highlighted by similar trend patterns of the two graphs for the period under review. There is still a debate on the impact of remittance flows on economic growth. Most of the researchers concluded that remittances influence economic growth (Muzapu and Havadi, 2021; Bucevska, 2021; Taiwo, 2020). Other studies have established that remittances negatively affect economic growth in Africa (Bird & Choi 2020). The inconclusive nature of the debate warrants further studies. The current study is an attempt to understand the relationship between remittances and economic growth.

2. LITERATURE REVIEW

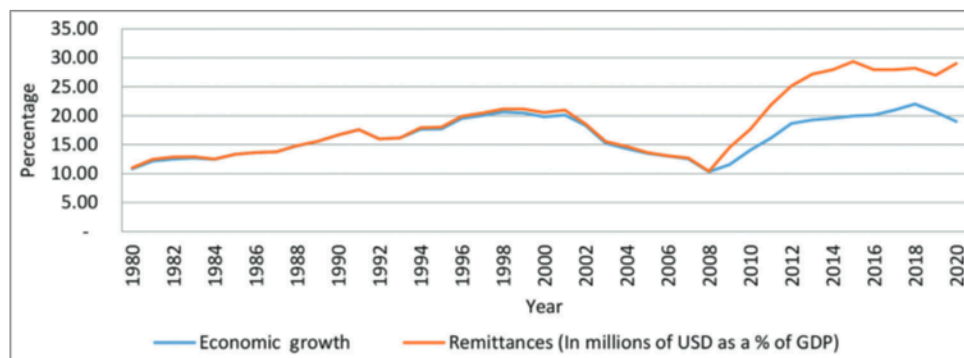
There has been a proliferation of studies seeking to understand the relationship between remittances and economic growth (Muzapu

and Havadi, 2021; Bucevska, 2021; Taiwo, 2020; Dhungel, 2019). The studies seem to find contrasting results with some having established that remittances are growth-enhancing (Muzapu and Havadi, 2021; Taiwo, 2020; Dhungel, 2019). Other studies have established a negative effect of remittance on economic growth (Koyode, 2020; Bird and Choi, 2020). Methodologically, the various studies have employed various methods to ascertain the relationship between remittances and economic growth. Some of the methods include Auto Regressive Distributed Lag (Ekanayake and Moslares 2020; Dhungel, 2019), the fixed effects model (Bucfcedevska, 2022; Sutradhar, 2020); General methods of moments (Lacheheb and Ismail 2020; Miniaoui and Ounin, 2020); Johansen Cointegration test (Munanga, 2020; Mukoka, 2023) among other methods.

Ekanayake and Moslares (2020) assessed the effect of remittances on economic growth and established a positive relationship. The result meant that an increase in remittances enhances economic growth. The result was also found by Dhungel (2019) in Nepal who found out that a 1% rise in remittance inflow leads to a 0.36% rise in income (GDP) in the long run. Using panel data estimation techniques Bucfcedevska (2022) also discovered that there was a positive relationship between remittances and economic growth and found that a 1% increase in remittance resulted in a 0.0478% rise in gross domestic product (GDP). Lacheheb and Ismail (2020) found that a 1% increase in remittance results in a 0.008% decline in Gross Domestic Product. Their finding thus indicates that nations with high levels of remittance inflows are associated with low rates of economic growth. Onyeji et al (2024) examined the effect of diaspora remittances on the economy of Nigeria for the period 1999 – 2023. The findings revealed negative short-run association between remittances and economic development variable, a significant positive effect of official development assistance, insignificant effect of foreign direct investment, and international loans and grants on Gross Domestic Product per Capita.

The topic of remittances has become topical evidenced in recent years. Mukoka (2023) studied the impact of diaspora remittances on economic growth in Zimbabwe. The error correction model (ECM) was used to analyse the relationship between diaspora remittances and economic growth. It was found that remittances have a positive impact on economic growth. Ikpesu (2023) investigated the link between migrant remittances, financial

Figure 1: Zimbabwe GDP and remittance inflows (1980-2020)



Source: World development indicators database (2023)

market, and economic growth (measured as per capita real growth) in Sub-Saharan African countries. The study utilised the pool mean group approach to analyse the data. The regression results indicated that remittance inflows positively impact economic growth. Dada and Akinlo (2023) analysed the impact of remittance and financial development on economic growth in Nigeria. The results showed that in the short run remittances and financial development act as substitutes to impact economic growth and in the long run, they complement each other to impact economic growth.

Maune and Matanda (2022) employed the autoregressive distributed lag model to examine the nature of the relationship between remittance inflows and economic growth. They found that there exist bi-directional causality linkages between foreign remittances and economic growth. Chowdhury and Dey (2022) analysed the short-run and long-run causality between remittances, imports, exports, and gross domestic product (GDP) in Bangladesh. The Granger Causality test found that remittance inflows do not show any causality impact on economic growth in the long run and the short run. Bantimaroudi et al. (2022) investigated the relationship between remittance inflows, foreign direct investment, political stability, and economic growth in Greece. The study employed both the Vector Error Correctional model and the Autoregressive Distributive Lag models. The results established that remittance inflows impact economic growth negatively both in the short run and the long run.

Saha (2021) employed the Johansen-Juselius test and the Granger causality test to investigate the impact of remittance and domestic investment on economic growth. They found that there exists a unidirectional relationship between remittances and economic growth in Bangladesh. Gebereyesus (2020) evaluated the contribution of remittances to economic growth in Ethiopia. The study found that remittances, capital formation, population growth, inflation, government consumption, and exchange rate determine economic growth. The author finds out that remittance inflows have a strong significant positive relationship with real gross domestic product, both in the long run and the short run. Munanga (2020) studied the impact of diaspora remittances on economic growth in Zimbabwe using secondary data. It was found that remittances failed to have any significant impact on economic growth in the short run but had a causal impact on economic growth in the long run.

The literature review has shown that the remittances-growth nexus has been studied using case studies from different countries, and regions, using different methods, and periods retaining different outcomes. Despite the differences, there is inconclusive evidence on how remittance influences growth. Most empirical literature was in agreement that remittances do spur economic growth, however, some contracting studies argue that remittances retard economic growth. Hence the current study uses Zimbabwe as the case study to evaluate the impact of remittances on economic growth.

3. METHODOLOGY

Most studies on the impact of remittance on economic growth in Zimbabwe used methodologies such as the Ordinary least

squares method (Maune et al., 2023), the error correction method (Mukoka, 2020) and the vector error correction model (Munanga, 2020). The study seeks to employ the ARDL as it is preferable in a small sample size (Gujarati and Porter, 2009). The ARDL model can also handle endogeneity problems in estimation, which makes the model better than the ECM and the VECM which are based on the exogeneity assumption.

The study utilises the ARDL methodology to analyse the data under review. The model was developed by Persaran and Smith (1998), Persaran, Shin and Smith (2001). The research model of the study is generated from the Neoclassical Solow Growth (1950; 1960) model where factors such as labor, capital, and technology are argued to be the main factors to spur economic growth. The study assumes a Cobb-Douglas production function as illustrated in equation 1.

$$Y = AK^{\alpha} L^{\beta} \quad (1)$$

Where α and β represents the respective elasticities of substitution.

The Cobb-Douglas production presented in equation 1 highlights that output is determined by changes in the capital (K), labour (L), and technological advancement. Mabula and Uprasen (2019) argued that remittances can be incorporated into the Solow growth model as either capital or technology. When remittance recipients save the money for future investment, then they would have to increase capital accumulation (K). Remittances could also be used for inovative activities such supporting research and development activities and thus contributing to technology (A).

The Solow growth theory is augmented to include other economic development factors such as consumption, foreign direct investment, and remittances. Following the model specifications of (Dhungle, 2019) and (Munanga, 2020) the study's baseline model is stated in equation 2. The study proxied economic growth (dependent variable) with real gross domestic product per capita. Variables such as remittance, financial development, trade openness, fixed capital formation, government expenditure and private consumption were put forward as explanatory variables.

$$\begin{aligned} \Delta GDP_t = & \alpha_0 + \sum_{i=0}^n \alpha_{1i} \Delta GDP_{t-1} + \sum_{i=0}^n \alpha_{2i} \Delta REM_{t-1} + \sum_{i=0}^n \alpha_{3i} \Delta POP_{t-1} \\ & + \sum_{i=0}^n \alpha_{4i} \Delta FDI_{t-1} + \sum_{i=0}^n \alpha_{5i} \Delta FCT_{t-1} + \sum_{i=0}^n \alpha_{6i} \Delta CONS_{t-1} \\ & + \beta_1 GDP_{t-1} + \beta_2 REM_{t-1} + \beta_3 POP_{t-1} + \beta_4 FDI_{t-1} \\ & + \beta_5 FCT_{t-1} + \beta_6 CONS_{t-1} \end{aligned} \quad (2)$$

Here:

α_0 is the intercept coefficient while $\alpha_1 - \alpha_6$ and $\beta_1 - \beta_6$ are the respective short-run and long-run elasticities of gross domestic product with respect to the identified explanatory variables; GDP_t represent real gross domestic product per capita as a proxy for economic growth in the model. Real gross domestic product per capita is the dependent variable of the model and is obtained by adjusting nominal gross domestic product per capita to inflation;

4. RESULTS PRESENTATION AND ANALYSIS

REM - remittance inflows;
 PEP - population growth rate;
 FDI - foreign direct investment inflows;
 FCT - fixed capital formation;
 CONS -private consumption.

Since the study aims to analyse both the short-run and long-run impact of remittances on economic growth, the study modifies the model in line with the contributions by (Pesaran et al., 2001). Based on Equation 2, the short-run and long-run ARDL models are illustrated in Equation 3 and Equation 4 respectively.

$$\Delta GDP_t = \alpha_0 + \sum_{i=0}^n \alpha_{1i} \Delta GDP_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta REM_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta POP_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta FDI_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta FCT_{t-i} + \sum_{i=0}^n \alpha_{6i} \Delta CONS_{t-i} + \phi_1 ECM_t + \varepsilon_t \tag{3}$$

$$\Delta GDP_t = \alpha_0 + \beta_1 GDP_{t-1} + \beta_2 REM_{t-1} + \beta_3 POP_{t-1} + \beta_5 FDI_{t-1} + \beta_6 FCT_{t-1} + \beta_7 CONS_{t-1} \tag{4}$$

Where ECM is the error correctional term and ϕ_1 1 is the coefficient of the lagged error correctional term represents the speed of adjustment to long-run equilibrium (Pesaran et al., 2001). The other variables have been discussed in Equation 2.

The study utilised time series data for the period 1980-2020. The data was obtained from various sources. Table 1 indicates the data sources of the study variables.

Various diagnostic tests such as the Unit Root test, Cointegration test, Autocorrelation test, Heteroscedasticity test, Stability test, Multicollinearity, Normality, and Model specification test were carried. Various diagnostic tests were carried out as a way of endorsing the accuracy of the study results.

Table 1: Data sources

Variable	Source
Gross domestic product per capita	World development Indicators database
Remittances	World development Indicators database
Population growth	International monetary fund (IMF) website
Foreign direct investment	International monetary fund (IMF) website
Fixed capital formation	International monetary fund (IMF) website
Private consumption	ZIMSTATS

Table 2: Descriptive statistics

Statistic	GDP	REM	FDI	CONS	FCF	POP
Mean	1087.350	3.062465	0.128597	92.58212	1.33E09	2.137073
Median	1003.834	0.366728	0.040000	88.34516	1.40E09	2.040000
Maximum	2523.249	13.61145	0.717865	121.4600	3.77E09	6.480000
Minimum	553.3760	0.004048	0.000841	77.90874	1.15E08	0.530000
Std Dev	373.6133	4.634965	0.172299	11.59055	7.34E08	1.348312

Source: Author's compilation

This section presents the study findings. Descriptive statistics are presented first.

Table 2 highlights the descriptive statistics of the study. According to the descriptive statistics shown in Table 2, all variables are positively skewed. Most data series have low standard deviation values, indicating low variability of the data series. The gap between the mean and median values of all data series is very low, indicating that our data series follows a normal distribution.

Diagnostic Tests are essential as they validate the reliability of regression results. This section presents the results of diagnostic tests (such as unit root test, model stability test, and cointegration).

The highlighted area showing (*) on the numerical figures in Table 3 are the determining factors on the optimal lag to be employed. The correct lag length is the one with minimum values for each criterion. All the selection criteria (AIC: SC: HQ) in the figure agree that 4 is the optimal lag for the study.

Table 4 shows stationarity test results for the variables under study. Since the modulus values of the ADF test statistics of all the data series are greater than their respective critical values at 5% significance levels, we may reject the null hypothesis and conclude that all data series are stationary. From the test results highlighted in Figure 2, we can deduce that gross domestic product per capita, private consumption, fixed capital formation, and remittance inflows became stationary at first difference while foreign direct investment and population growth were found to be stationary at level. The ARDL model is thus applicable since it relies on the assumption that, all the data series are only stationary at the level or first difference or a mixture of both (Pesaran et al., 2001).

To test for multicollinearity, the study utilised the pairwise correlation matrix and the results are displayed in Table 4.

Table 5 indicates that the study does not suffer the problem of multicollinearity as none of the correlation figures exceed 0.8 (Rule of thumb). The correlation figures range from 0.04 to 0.318, indicating that our data series are moderately correlated.

To test for cointegration the study utilised the F-Bounds test. The F-Bound test was employable as all data series were only stationary at level and at first difference. Table 6 summarises the F-Bounds test results.

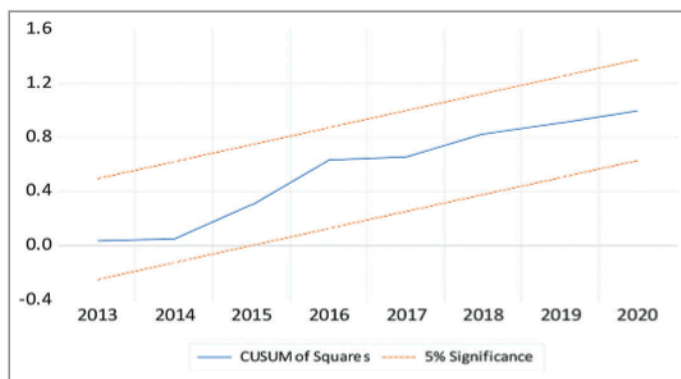
From the bounds test results presented in Table 6, the value of the F-statistic (10.07454) is higher than the values of the upper bound (3.38) and the lower bound (2.39) at the critical 5% significance level. Thus, we may reject the null hypothesis and conclude that a long-run relationship exists between the variables. K represents the number of explanatory variables of the study.

As the bounds test indicates the cointegration of variables, the next step thus is to estimate the long-run and short-run models. Estimations of the long-run and short-run ADRL models are presented in Tables 7 and 8 respectively.

The long-run regression results presented on Table 7 show that all variables except for remittance inflows (REM) and private consumption (CONS) were found to be statistically insignificant in the long run.

Holding other things constant, remittance inflows were found to have a positive impact on real gross domestic product per capita in the long run. The long-run regression results show that an increase in remittance inflows by 1% results in a 0.055% in real gross domestic per capita. The results support the findings by Maune et al. (2023) and Mukoka (2023).

Figure 2: CUSUM and CUSUM-squared test results



Source: Author's compilation

Table 3: Lag-length determination

Lag	LogL	AIC	SC	HQ
0	-84.23478	5.639674	5.914499	5.730771
1	-18.94059	3.808787	5.732566	4.446465
2	9.505468	4.280908	7.853640	5.465168
3	48.28066	4.107459	9.329143	5.838299
4	1255.490	-69.09311*	-62.22248*	-66.81569*

AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion
Source: Author's compilation

Table 4: Unit root test results

Variable	ADF-value	Critical value 5%	P-value	Drift	Trend	Intercept	Order of integration
LNGDP	-6.158512	-1.949609	0.0000	No	No	No	I (1)
LNCONS	-8.543439	-1.949609	0.0000	No	No	No	I (1)
FDI	-2.021428	-1.949319	0.0427	No	No	No	I (0)
LNFCF	-7.388328	-1.949609	0.0000	No	No	No	I (1)
POP	-2.663464	-1.949319	0.0090	No	No	No	I (0)
REM	-6.907220	-1.949609	0.0000	No	No	No	I (1)

Source: Author's compilation

In the long run private consumption (CONS) has a negative impact on real gross domestic product per capita (GDP), ceteris paribus. In the long run, a 1% increase in private consumption results in a 0.52% decline in per capita gross domestic product, ceteris paribus. The result is consistent with the findings of (Mabula and Uprasen, 2019) and (Olayungbo and Quadri, 2019).

The short-run regression results presented in Table 8 show that, remittance inflows (REM) had a positive impact on economic growth. In the short run, a 1% increase in remittance inflows was estimated to result in a 0.025% increase in per capita gross domestic product, ceteris paribus. The results are also in line with the findings of (Mukoka, 2020) and (Maune and Matanda, 2022). Fixed capital formation and private consumption were found to have negative impacts on economic growth in the short run. A 1% increase in either fixed capital formation or private consumption in the short run, would result in a 0.05% or a 0.52% decline in real gross domestic product per capita respectively.

The study also found that private consumption from the previous period (DLCONS [-1]) had a positive impact on real gross domestic product per capita in the short run. An increase in private consumption in the previous year by 1% was estimated to result in a 1.67% increase in real gross domestic product in the current year. Also, 2-year lagged private consumption was found to have a positive impact on gross domestic per capita in the short run in Zimbabwe. An increase in private consumption in 2023 by 1% is expected to result in a 1.19% increase in real gross domestic product per capita in 2025.

The short-run regression results also indicate an R squared value of 0.857495, meaning that 85.7% of the variation in real gross domestic per capita is explained by remittance inflows, fixed capital formation and other explanatory variables presented in Table 8. Gujarati (2004) argued that the R-squared figure could be inflated by the addition of irrelevant variables to the model. Thus, the adjusted R squared would provide a more accurate measurement of the goodness of fit of our model. From the short-run results presented in Table 8, our adjusted R squared value (0.828994) is close to our R squared, indicating that the model fits the data well.

ECM(-) represents the error correctional term. The error correctional term has a probability value of 0.0000, indicating that it is statistically significant. The error correctional term has a coefficient value of -0.900775, indicating that the model adjusts

Table 5: Pairwise correlation matrix

	DREM	DINCONS	DLNFCF	FDI	POP
DREM	1				
DINCONS	-0.062774	1			
DLNFCF	0.310805	-0.317489	1		
FDI	-0.242591	-0.321086	0.083758	1	
POP	-0.107811	-0.137011	0.045557	-0.094344	1

Source: Author's compilation

Table 6: F-bounds test results

Hypothesis	Test statistic	Value	K
H_0 : No cointegration	F-statistic	10.07454	5

Critical value bounds			
Decision rule	Significance	Lower bound I (0)	Upper bound I (1)
Reject H_0 if the F-statistic > I (1) and I (0)	5%	2.39	3.38

Source: Author's compilation

Table 7: Long-run model

Variable	Coefficient	Standard error	t-statistic	Probability
REM	0.055196	0.018734	2.946203	0.0070
FDI	0.210227	0.153827	1.366643	0.1844
LNFCF	-0.128749	0.076412	-1.684919	0.1050
LNCONS	-3.060854	1.276016	-2.398758	0.0246
POP	-0.018023	0.027865	-0.646781	0.5239

Source: Author's compilation

Table 8: Short-run model

Variable	Coefficient	Standard error	t-statistic	Probability
DREM	0.025303	0.005862	4.316596	0.0002
DLNFCF	-0.048133	0.023305	-2.065359	0.0499
DLCONS	-0.516961	0.230754	-2.240315	0.0346
DLCONS (-1)	1.670212	0.302743	5.516934	0.0000
DLCONS (-2)	1.188354	0.241715	4.916339	0.0001
ECM(-1)	-0.900775	0.095940	-9.388943	0.0000
R squared	0.857495			
Adjusted R squared	0.828994			

Source: Author's compilation

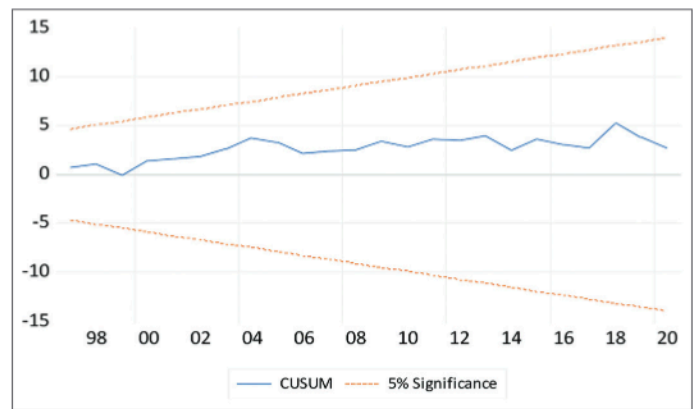
towards long-run equilibrium by a factor of 90.07 annually should there be a shock in the short run.

The regression results presented in Tables 7 and 8 show that remittance inflow (the main variable of the study) has a positive impact on economic growth both in the long run and the short run in Zimbabwe. The results presented in Tables 7 and 8 are efficient as the model has passed various diagnostic tests such as multicollinearity, heteroscedasticity test, normality and stability.

To test for the stability of the model, the study employed the CUSUM test and CUSUM and CUSUM-Squared test. Figure 3 highlights the CUSUM test and the CUSUM and CUSUM-squared test results.

Since both the CUSUM plot and CUSUM and CUSUM-Squared stay inside the critical 5% significance bounds, we may accept the null hypothesis and conclude that the model is stable.

Figure 3: CUSUM test results



Source: Author's compilation

5. CONCLUSION

The study thus contributes immensely to the growing literature of remittance inflows particularly in Zimbabwe and in other developing nations in Sub-Saharan Africa. The empirical results indicated that remittance inflows positively impact economic growth both in the long run and the short run. The results mean Zimbabwe can count on remittance inflows as a major source of economic growth. The study thus, can assist policy makers to make informed decisions that are based on empirical evidence. It would be recommended for the Government to offer incentives to people abroad to increase remittances to promote economic growth. The Reserve Bank of Zimbabwe, through financial intermediaries, could reduce transaction costs on remittances and offer incentives such as tax exemptions. The Government should also promote transparency so that Zimbabwean people working abroad can trust the formal channels of remitting money into the country. These approaches could encourage remittance inflows into the country through formal channels and promote economic growth.

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