

**Established 2000**

# **Midlands State University**



## **FACULTY OF COMMERCE**

### **DEPARTMENT OF ECONOMICS**

#### **THE IMPACT OF USD- RAND EXCHANGE RATE ON REMMITTANCE TO ZIMBABWE (2008-2015)**

**BY**

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*A Dissertation Submitted in Partial Fulfillment of the Requirements of Bachelor of Commerce  
Economics Honours Degree.*

**Gweru: Zimbabwe, 2017**

### **DECLARATION FORM**

I, Chinembiri Terrence R142796R do hereby declare this research study represents my own work and not copied from any source without acknowledgement of the sources.

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## **SUPERVISOR'S APPROVAL FORM**

The undersigned certifies that they have supervised the student Terrence Chinembiri dissertation entitled "The impact of USD-Rand exchange rate on remittance to Zimbabwe (2008-2015)," submitted entitled in partial fulfilment of the requirements of Bachelor of Commerce Honours Degree in Economics (Midlands State University).

Supervisor's Signature

Chapter One .....  
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## **APPROVAL FORM**

The undersigned certify that they have supervised, read and recommend to Midlands State University for acceptance a research project entitled:

The impact of US\$-Rand exchange rate on remittance to Zimbabwe (2008-2015)

Submitted by Chinembiri Terrence.in partial fulfilment of the requirements of the Bachelor of Commerce Honours Degree in Economics.

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Date: ..... / ..... /

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## **DEDICATION**

I dedicate this research project to my parents and my sisters whom I know are supportive and proud of what I have managed to achieve

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Finally, to the King of Kings, Almighty God, My Provider, My Creator, I say “thank you for being with me every day, hour, minute and every second”

## **ABSTRACT**

*Remittances are emerging as a stable source of foreign capital inflow in Zimbabwe. Much of the remittances are coming from South Africa. The study sought to explore the impact of US\$-Rand exchange rate on remittances to Zimbabwe. Estimation of regression results was done using Ordinary Least Squares (OLS), using data sample spanning from 2008 to 2015. The findings show that depreciation of the rand value has a negative impact on remittances. This suggests that a depreciation in the rand value results in low remittances flowing into Zimbabwe. The findings support the theory of enlightened self-interest. Given that the Zimbabwe diaspora community is enlightened, the study recommends for the need to put in place a conducive business environment that will attract remittances even when the rand depreciates.*

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

ADF Augmented Dickey-Fuller

CPI Consumer Price Index

DW Durbin Watson

FRED Federal Reserve Economic Data

GDP Gross Domestic Product

MOFED Ministry of Finance and Economic Development

OLS Ordinary Least Square

RBZ Reserve Bank of Zimbabwe

SARB South African Reserve Bank

US\$ United states dollar

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.0 Introduction**

Remittances are emerging as one of the strongest source of external capital for developing countries and they are playing a fundamental role in citizen's livelihoods. They provide crucial social insurance, stimulate consumption and contribute to recipient country's capital formation, (Maposa, 2007; Lucas; 2005; and Beineet *al*, 2004). Also, remittances provide key source of foreign exchange for countries of origin. In particular, they were critical in jumpstarting and sustaining the Zimbabwe's multiple currency regime. Remittances proved to be stable and non-reversing. The distinctiveness of remittances from other foreign capital flows has made them more popular and most sort non-debt creating capital flow among developing countries.

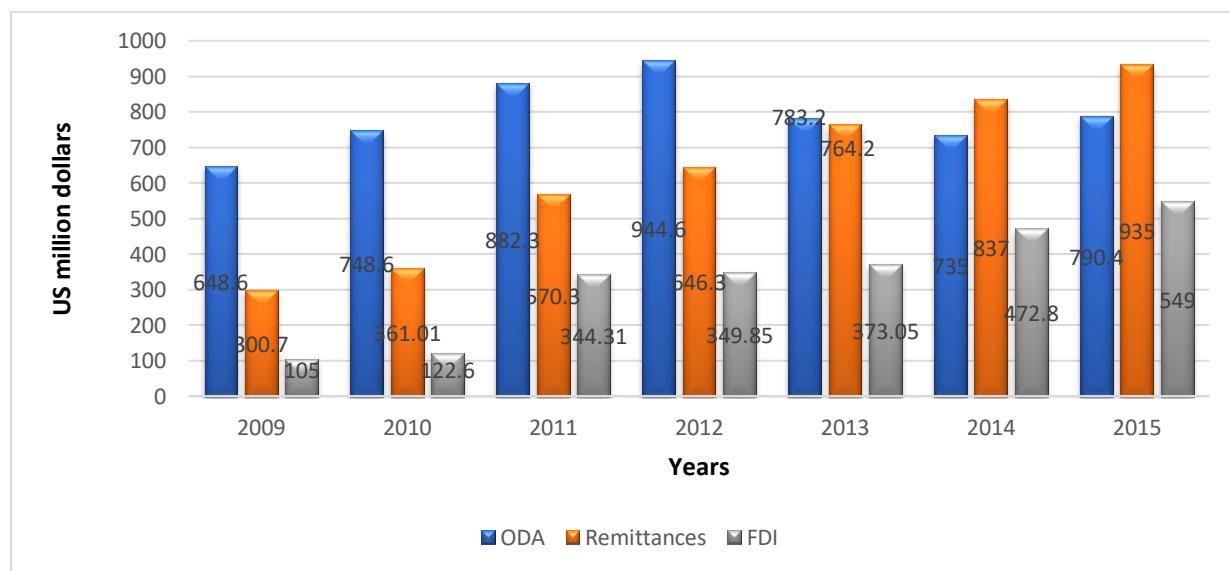
Although having such a critical character, the flow of remittances is a function of a number of factors of which some are outside the control of recipient country. According to Lucas and Stark (1985) remittances in general are a function of pure ultraism and self-interest. These decisions are, however, affected by macroeconomic environment of both the host and recipient countries. Such variables include GDP, exchange rate, migration policy, employment policy and cost of remitting. These variables, are mostly controlled by the host country and they are the most critical in determining the flow of remittances. In general, the impact of exchange rate depends on purpose of remitting and also on whether the exchange rate volatility is anticipated or not (Ebenezeret *al.*, 2015).

### **1.1 Background of the Study**

Zimbabwe after dollarizing in 2009, there was about 300 million in foreign reserves (RBZ, 2014). This was the total monetary base in the economy. Exports were very low and the official development assistance was mainly in form of humanitarian assistance. The only viable source of foreign currency was remittance inflows. The Reserve Bank of Zimbabwe (RBZ, 2014), estimates that remittances accounts for 27% of the country's liquidity since dollarization of the

economy. In comparison with other non-debt private capital flow, remittances occupy the second position ahead of overseas development assistance.

The Diasporans have a strong desire to contribute to the economic development of Zimbabwe. Remittances by Diasporans present a great opportunity for the country to tap into the Diaspora resources to develop the country through investing in business, land, technology and skills transfer. Facilitating and structuring such activities would enhance increase employment opportunities and access to markets and technology



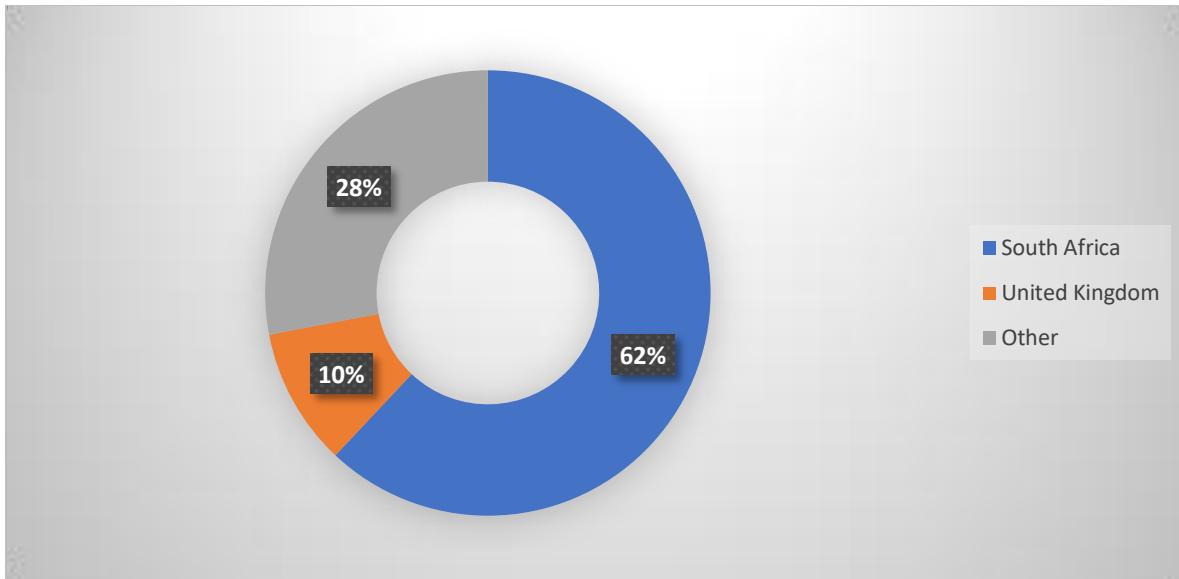
**Figure 1.1 Foreign Capital Inflows From 2009-2015 (US million)**

Source: RBZ (2015)

Remittances are transfers from international migrants to family members in their country of origin. In Zimbabwe, remittances have become one of the fastest growing non-debt private capital flow, surpassing foreign direct investment and official development assistance over the past 5 years. In addition, they become a new source of foreign currency and liquidity during the economic crisis (2008) and post dollarization periods. Evidence have also shown that remittances to Zimbabwe, are a stable source of private capital flow and has proved to be a non-reversing. What remains contentious is that despite the surge and stability, economic remain volatile. This has raised important issues of debate on whether exchange rate can spur remittances

Within the general debate of remittances, there is a belief that volatility in exchange rate do not contribute to the impact of remittances flow as they are spent on conspicuous consumption and accumulation unproductive assets (Rahman *et al*, 2006; Stahl and Arnold, 1986). However, it is also undeniable that exchange rate impact remittances, if one took the approach of considering the multiplier effects of consumption financed by remittances, the development of financial institutions that administer remittances and use of remittance as an alternative to debt (Aggarwal *et al*, 2006). Others took the debate to weak statistical methods which may not be powerful to detect the potential effects of remittances

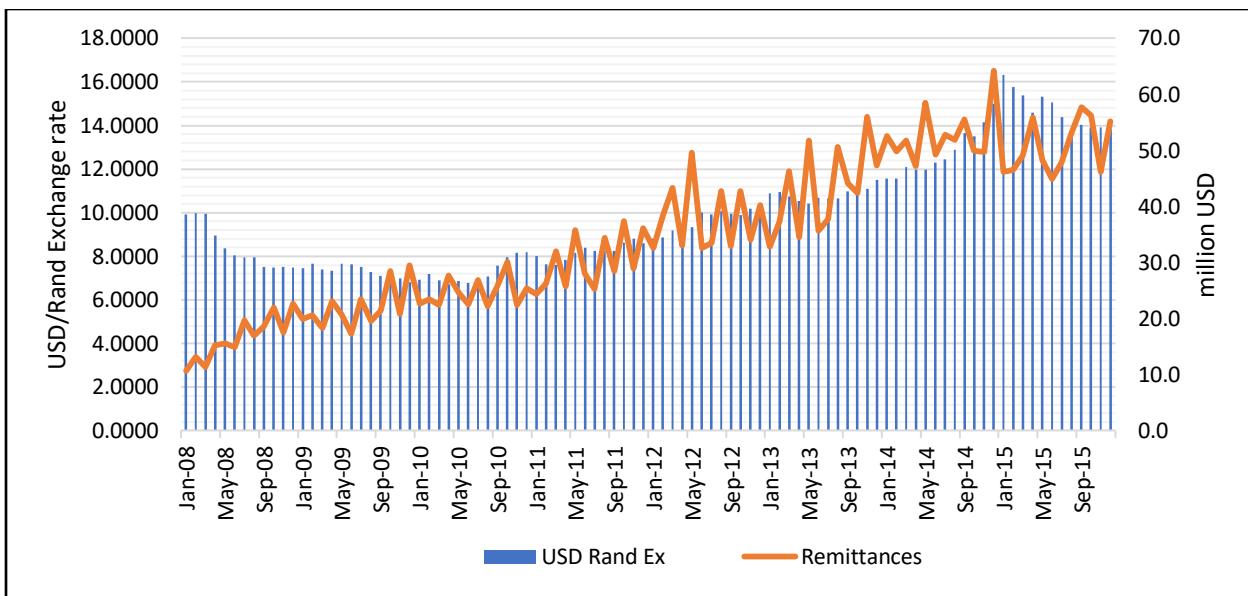
The country's major source of diaspora remittances is South Africa. It accounts for the majority of migrants from Zimbabwe. It is estimated that about 3 million Zimbabweans are residing and working in South Africa, (Pasura, 2008). Majority although are now living with their immediate families, a significant portion has left their families behind. It is estimated that South Africa every year contribute about R11.6 billion in remittances to other SADC countries (Finmark Trust, 2012). Of this total, Zimbabwe accounts for about 68% (Finmark Trust,2012). In terms of total remittances coming into Zimbabwe, South African accounts for 62% followed by the United Kingdom at 10% and other countries contribute the remainder, as indicated in the Figure 1.2. With regards to uses, about 85% of the remittances are used to support family to meet health and educational needs, 4% to build houses, 3% to invest in business and 2% to support friends (Ozozco and Lindley, 2007).



**Fig 1.2 Sources of Remittance to Zimbabwe**

Source: Finmark Trust (2012)

Significant remittance inflows to Zimbabwe were noticeable starting 2008 (SARB and Ministry of Finance, 2015). The period before, migrants were much focused on acquiring education and skills to apply back home. The sudden rise in remittances was driven by intensification of economic crisis. Between 2008 and 2009 the quantum of remittances was relatively low. This suggest also the relatively low migrant stock. There after the trajectory was sustained, with remittance inflows reaching a record peak of US\$633 million by 2014. The increase in remittances is partly attributed to their countercyclical properties. Resulting in the growing stock of migrants, lower transaction costs as a result of technological improvements as well as the growing diaspora's confidence. The use of formal channels such as the money transfer agencies and mobile money transfer to remit funds. More importantly, the macroeconomic conditions in South Africa were relatively stable, hence attracting more migrants from Zimbabwe (South African Reserve Bank, 2015). In 2015, however, remittances started to slow down in line with challenging macroeconomic conditions of main host country, South Africa. The rand which used to be stable prior 2011 was exposed to a number of shocks and its value against the US dollar become more volatile. The Figure 1.3 show trends in US\$-rand exchange rate and remittance flows between 2008 and 2015.



**Fig 1.3 US Rand Exchange Rate and Remittances**

Source: SARB and Ministry of Finance (2015)

## 1.2 Statement of the Problem

Remittances to Zimbabwe have been increasing in size since 2008 and this has been transforming people's lives. Overall remittances become the second major foreign capital inflow. Given this growing importance, the Zimbabwean government has come up with measures in order to encourage formal transmission of remittances. Such measures include the 5% diaspora incentive and reduction in transaction costs. These measures, however, are critical but not sufficient to ensure sustained flow of remittances because they do not address the sources of remittances adequately. The economy of South Africa is experiencing a slowdown that is reflected in rand losing value against the US dollar which is Zimbabwe's anchor currency. These challenges are affecting a combined population of Zimbabweans living and working in South Africa. The question, therefore, is: To what extent does the US\$-rand exchange rate affect remittances inflows to Zimbabwe?

## 1.3 Objectives

In view of the above discussion, the study's main objectives are as follows:

- To determine the impact of US\$-rand exchange rate on remittances to Zimbabwe

- To derive policy recommendations and evaluation based on the findings, that maybe valuable for future policy-makers and researchers.

#### **1.4 Hypothesis**

The study seeks to test the null hypothesis that the impact of rand exchange rate on remittances to Zimbabwe.

#### **1.5 Significance of the Study**

Remittances have become an important foreign capital flow in Zimbabwe's development matrix. Most importantly it has become a key source of liquidity in a dollarized Zimbabwe. Knowledge of the impact of rand value on remittance inflows into Zimbabwe is important for authorities to come up with sound policy measures that will support the sustained flow of remittances to Zimbabwe. The results of the study are critical in influencing policy decisions in Zimbabwe.

In the case of Zimbabwe, remittances provides social security. Most of the recipient families who are suffering from excess labour supply, are able to meet their necessity though remittances. Also, these inflows can be used as a form of collateral for raising fund. Remittance inflows can be used to provide access to capital markets and commercial credit. Infrastructural Development can be as result of remittances that serves investment of human and physical capital. In addition, several studies have concluded that a country at the primary stage of receiving remittances has indeed for higher income. This is as a result remittance reduces poverty and the increase in income attributed to remittances over time reduces the income gap and alleviate poverty.

Moreover, the study seeks to bridge the gap that exists in literature. Most studies that were available and reviewed focused entirely on the impact of recipient country exchange rate on remittances rather than the exchange rate of the host country. Specific studies (see Orozco and Lindley, 2007; Bracking and Sachikonye, 2006, Tevera and Chikanda, 2009, Magunhaet al, 2009; Maphosa 2007) done on Zimbabwe only seek to verify the remittance inflows, their uses as well as analyzing the profile of beneficiaries, without demonstrating the impact of rand value on Zimbabwe's remittances inflows.

## **1.6 Delimitation of the study**

In this study, the researcher mainly focuses on the research to Zimbabwe. Thus, results on this study may be relevant to Zimbabwe policy makers. The study concentrate on the impact of rand value on remittances flows to Zimbabwe. Due to the scarcity of time, resources and data the researcher is not going to use data comes from the use side of remittances but otherwise. With time and data, the researcher could use data on the South African side where remittances come from which is relevance to the study.

## **1.7 Organization of rest of the study**

The study organized as follows, the next chapter reviews both empirical and theoretical literature. Third Chapter of the study outline the methodology used by researcher and Forth Chapter presents the study results. Finally, Chapter Five provides summary, conclusion, policy recommendation and suggestions of future areas of research.

## CHAPTER TWO

### LITERATURE REVIEW

#### **2.0 Introduction**

This chapter breaks into two sections. The first reviews theoretical literature on the impact of exchange rate fluctuations on remittances. The second section reviews empirical studies that were done in line with the impact of exchange rate fluctuations on remittances.

#### **2.1 Theoretical Literature Review**

To understand the impact of rand value on remittances, it critical to understand the major reasons that drive migrants to send back money. There is a plethora of theoretical literature that examined various drivers of remittances. A common trend within literature is that there are three main rationales for sending remittances: self-interest theory, pure altruism and tempered altruism or enlightened self-interest theory. These theories have been advocated by Lucas and Stark (1985). The impact of exchange rate on remittance flows, therefore, indexed to these motives.

##### *2.1.1 Self-Interest theory*

As its title advocate, the self-interest theory purports that workers migrants send money to households in their recipient country in pursuit of personal gain. The main reason for the self-interest theory is the intent of a migrant to return to their recipient home country. Vargas-Silva and Huang (2006) suggested that some emigrants send remittances because they expect to return home in the future and can benefit from the household's gratitude from having sent remittances. Lucas and Stark (1985) mentioned that when emigrants intend to return to their home country, they would send more remittances to ensure that their social assets, that is, relationships with family and friends are intact. Anticipation of a bequest is another factor that explain the self-interest motive for sending remittances. Those who support this view suggested that a migrant might use remittances as a strategy for investing in future inheritance (Rapoport and Docquier, 2005 and Hoddinott, 1994, Lucas and Stark, 1985) provided one of the best explanations for the self-interest motive in sending remittances. They believed that if inheritance is conditioned by behavior, their motive for supporting their family might concern favour in the line of inheritance. The impact of exchange rate on remittances under self-interest rational tend to be neutral as the

decision to remit is mainly to further personal interest. An exchange rate depreciation or appreciation implies loss or gain real value to the migrant is outweighed by the migrant's personal gain (Ebenezer, 2015). The amount tends not to change unless it may increase depending on arising obligations at home. In this scenario, Zimbabwe migrants remit money for inherit their assets back home. Also, they remit in order for them to return to their recipient country with dignity. Given, Zimbabwe is facing deterioration in economic performance, migrants are most likely to remit more since the situation will have negative impact on inheritable assets.

#### *2..1.2 Pure Altruism theory.*

Atruism refers to a migrant's genuine care for their remaining recipient family in their home country. Lucas and Stark (1985) mentioned that migrants enjoy remitting because they care about

household consumption. Glytsos (2002) have argued that only permanent migrants remit for altruistic purposes, as temporary migrants are more likely to remit for investment and future consumption smoothing. With an altruistic model, the strength of family ties as well as the net earnings of recipients will be important. According to Rapoport and Docquier (2005), suggested that, the more migrants earn, the more remittances recipient households should anticipate. Additionally, strong family ties between migrants and remaining households would increase the probability of migrants remitting. On the other hand, remittances would decline with an increase in the recipient household's wealth and the length of time the migrant stays in the host country. If remittances are based on pure ultraism, and exchange rate depreciation is expected to reduce the amount left for the migrant while an appreciation tends to increase the amount. Hence a depreciation of an exchange rate under pure ultraism behavior tends to impact negatively the amount of remittances while an appreciation is otherwise.

#### *2.1.3 Tempered Altruism or Enlightened Self-interest theory*

The enlightened self-interest theory view of remittances is suggested as an alternative to the pure altruistic and self-interest theories. Lucas and Stark, (1985) proposed that this motive views remittances as a mutually beneficial arrangement between a migrant and household. Van Datelet *et al* (2005) theory on the sending of remittances as a repayment of the principal invested by family

members in the education of a migrant and also concurred, as they viewed remittances as repayment of loans that were used to finance the migrant's investments in human capital or expenditures. Migration can be viewed as a household strategy for risk diversification, a subtle form of insurance. Under this theory, main objective is for investment purposes or honoring previous obligations. Hence an exchange rate impact is depending on whether it is anticipated or not. If a depreciation is anticipated, depreciated will generate additional cost of investment, hence negatively affecting remittances. If it is unanticipated remittances will be affected positively (Goldberg, 2008).

## **2.2 Empirical Literature Review**

The empirical literature on the impact of exchange rate on remittances is limited. Much effort has been expended looking at the impact of remittances on the exchange rate of the recipient country (Amuedo-Dorantes and Pazo, 2004; Singer; 2008; Spatafora, 2005; Moore, 2008). Studies that looked at the impact of currency volatility on remittances have contrasting findings and conclusions. This could be due to different methodologies, sample sizes, differing institutional arrangements and economic structure of countries that were investigated

Using a simple model of remittances that involve active parallel market premiums in the home country and the difference between the official rate preferential exchange rate for remittances in the home country, Swamy (1981) estimated that remittances were not significantly affected by any of the above. Similar results in the case of Turkey and Germany were obtained by Straubhaar (1986). Sayan (2004), focus on the flow of remittance in Turkey over the period of 1987-2001 and the evidence suggest that there is no statistically significant relationship between the business cycle in Germany and remittance flows to Turkey despite Germany accounting for the largest share of Turkey migrants. The results of Swamy (1981) were, however, contested by Elbadawi and Rocha (1982) sighting the fact that the non-significance of exchange rate was because of presence of multicollinearity, and small data size. These studies mainly focus on the workers income earnings but did not take into consideration other factors that affects remittances flow such as the host country exchange rate volatility.

Wahba (1989) looked at the determinants of remittances in Egypt. The study applied a model which was developed within the framework of portfolio management and remittances. Remittances were assumed to follow perfect arbitrage condition which involve a binary outcome that is the migrant either remit nothing or all his savings. The results show that remittances that come through the formal means if the black-market premium is smaller than the cost of using the black market are higher than otherwise. The study concluded that official exchange rate was sensitive to black market premium. The results were supported by Rocha (1989). El Sakka and McNabb (1999) using the ordinary least square estimation approach to investigate macroeconomic effects on remittances in Egypt, found that official exchange remittances are highly responsive to exchange rate under managed floating regime. The evidence found that source country condition was important with around 0.03 elasticity. Lianos (1997), finds that host country exchange rate and income levels are significant in determining remittance flow in Greece. Host country exchange rate and income variables found to be significant. The researcher finds out the opposite since framework regresses remittances on host country income levels by ignoring business cycle perspective and consumer basket of the workers migrants.

According to Silver and Huang (2005), the determinants of workers remittances in Brazil, Colombia, Dominican Republic, El Salvador, Mexico and United States using quarterly data from 1981 to 2003 quarterly. The results of variance decomposition, impulse response functions and granger causality support that remittances respond more to changes in exchange rate than to changes in macroeconomic conditions of the home country. Results found causality between remittances and exchange rate. The researcher on this study focuses on the supply side variables that affect remittances other than the use side.

Furthermore, Hasan (2008) studied the macroeconomic determinants of remittances in Bangladesh and found that exchange rate impacted positively on remittances. Explicitly, a 10% increase in exchange rate is associated with a 2.5% increase in remittances. Using the Generalized Method of Moments methodology to examine determinants of remittances in 35 Sub-Saharan African (SSA) countries between 1980 and 2008, Kemegue et al (2011) found that

financial services delivery, investment opportunities in the home country and exchange rate consideration were significant in determining remittances in SSA.

In addition, Ebenezer *et al.* (2015) employed ordinary least square approach. And a simple-choice theoretical model in analyzing whether exchange rate affect remittances in Nigeria. The study uses generalized method of moments. The study found that real exchange rate impacted negatively on remittances, implying a fall in remittance inflow was caused by depreciation of the exchange rate. Hence concluded that although altruism mostly dictates remittances to Nigeria, self-interest motive to remit is also important. The study uses log-linearization model and variable on both host and home countries. The results obtained found that exchange rate impact negatively on remittances. This study suggests the same outcome but only consider the variables that can affect remittance on the supply side only.

The above studies were critical in exploring the impact of exchange rate on remittances across various countries with different economic set ups and institutional arrangements. Given the diversity in the studies contrasting results and conclusions were made. What remains common across the reviewed studies except for Silver and Huang (2005) is that their focus was entirely on the impact of recipient country exchange rate on remittances rather than that of the source country. Despite giving a general guide on the impact of exchange rate on remittances, they fail to pin down on the impact of exchange rate of the host country which is the focus of this study.

Moreover, all of the studies reviewed focused on other countries which are by far are not related to Zimbabwe, economically and in terms of other institutional arrangements. Specific studies done on Zimbabwe to explore the impact of rand value on remittances are scarce. The available studies (see Orozco and Lindley, 2007; Bracking and Sachikonye, 2006; Tevera and Chikanda, 2009; Magunha *et al.* 2009; Maphosa, 2007) focussed on verifying the remittance inflows, their uses as well as analysing the profile of beneficiaries, with few demonstrations on the impact of rand value on remittance inflows.

## **Conclusion**

The decision to remit money remain the major factor in determining the flow of remittances. The impact of exchange rate on the flow of remittances therefore depends on the motives of sending money. Given the varied reasons associated with sending money, the impact of exchange rate is therefore not unidirectional. Thus, the impact of exchange rate on remittances is inconclusive. Therefore, literature on the flow of remittances is however contradictory when it comes to the question of determining which of these theories explains increased inflows of remittances. The chapter focus on what different scholars and authors have written about the impact of exchange rate on remittances. Some authors found that there is negative relationship between exchange rate and remittances (El Sakka and McNabb ,1999;Lianos ,1997) while others found a positive impact (Hasan, 2008; Kemegueet *al.*,2011). Looking at these submissions it is very difficult to conclude on the impact of exchange rate on remittances and make it a reference to the impact of rand value to remittances in Zimbabwe. The situation has been worsened by scarcity of specific empirical literature on Zimbabwe. The available focused much on the uses of remittances rather than the supply. This study, therefore seeks to fill this empirical gap by investigating the impact of rand value on remittances in Zimbabwe.

# **CHAPTER THREE**

## **RESEARCH METHODOLOGY**

### 3.0 Introduction

The chapter outlines the econometric procedures adopted by the study in investigating the impact of US\$-rand exchange rate on remittances to Zimbabwe. It specifies the study methodological procedures form model specification, tests and expected results to be carried out. This chapter also provide justification of variables as well as data sources.

### 3.1 Model Specification

The study adopted the model used by Ebenezer *et al.* (2015) to investigate the impact of rand value on remittances to Zimbabwe. The model is specified as follows:

Where,  $R_t$  is remittances;  $EX$  is the US rand exchange rate,  $CPI_t^f$  is South Africa Consumer Price Index,  $Y_t^f$  South Africa GDP,  $\beta_0$  is the intercept and  $\beta_1$  to  $\beta_3$  are coefficient parameters and  $\mu$  is the error term.

### **3.2 Justification of Variables**

For the use of econometric analysis, due to the assumption that the remittances elasticity with respect to family's income and migrant's income may not sum to one, the researcher relies on a log-linearization. Log-linearization allows the study to work with data from different measurement and sources. In this context, all the variables transformed to their respective indices. Adopting and applying the equation to the real aggregate remittances to Zimbabwe from 2008 to 2016. In the set of general explanatory variables, included the foreign portfolio which include South African CPI, South Africa GDP and US rand exchange rate.

### 3.2.1 US rand Exchange Rate ( $EX_t$ )

Exchange rate is the conversion of one currency to another. For this study, the exchange rate is a direct quote US dollar against South African rand. This is because the rand is converted into US

dollars for use in Zimbabwe. According to Finmark Trust (2012), since 62% of remittances inflows comes from South Africa, exchange rate is represented by US rand general price level. The exchange rate is critical in determining the value of remittances to Zimbabwe and it also determines the amount of deposable income of migrants (RBZ 2015). The sign is expected to be either positive or negative because of varied reason that are associated with sending money home.

### **3.2.3 South Africa CPI ( $CPI_t^f$ )**

Consumer price index (CPI) measures the prices of consumer basket of goods and services. The study considers the South African CPI because it measures the cost of living of migrants. CPI is included to examine how remittances respond to changes in foreign CPI since it measures cost of living of remitters (Ebenezer *et al*, 2015). If the cost of living goes up holding other things constant, the disposable income of migrants goes down and hence remittances (Faini,1994). The expected study expects a negative sign on South African CPI.

### **3.2.3 GDP south Africa ( $Y_t^f$ )**

Gross domestic product (GDP) measure the monetary value of all complete goods and services produced within a nation's boarder in a specific period of time. Given lack of monthly GDP data, the study used South Africa's volume of manufacturing index (VM1) as a proxy of GDP (Mufunda, 2015). GDP is critical as it gives the general picture of employment and other business opportunities that are available to migrant workers (Ebenezer *et al.*,2015). The study expects a positive sign on GDP.

## **3.3 Data sources and Characteristics**

The study adopts the Log-log specification model. The model provides an improvement of the responsiveness of the endogenous variable to a certain percentage change in any of the exogenous variable. The series used natural logarithm with the sample period from 2008-15 on monthly basis. The data used was obtained from Zimbabwe Statistic Agency (ZIMSTAT), Ministry of Finance (MOFED), the Reserve Bank of Zimbabwe (RBZ), Finmark Trust, Reserve Bank of South Africa and Federal Reserve Economic Data. Monthly data used tends to be easier,

fast to identify trends. Hence, better strategy in the long run. However, unavailability of data, structural breaks and unclear estimates.

### **3.2.3 Error Term( $\mu$ )**

Represents the residual, remainder term or disturbance term, created when the model provided does not show fully the actual relationship between explanatory variables and endogenous variable (Gujarati, 2004).

## **3.4 Diagnostic Tests**

Diagnostic tests are to be carried out because the research applied secondary data. The following tests were conducted; unit root test, autocorrelation, multicollinearity and cointegration.

### **3.4.1 Unit Root Test**

Time series data has been observed to be non-stationary and use of such data give rise to spurious regression results (Granger and Newbold, 1974). Unit root testing is a formal way for testing for stationarity. The Augmented Dickey–Fuller (ADF) test was used to test for presence of unit roots. The null hypothesis to be tested was no unit root while the alternative hypothesis implies presence of unit root (non-stationary). If calculated ADF absolute values is greater than critical 5% level of significant, one concludes that there is no unit root problem which means the time series is stationary. The study adopts this procedure on all the variables.

### **3.4.3 Autocorrelation Test**

According to Gujarati, (2004) autocorrelation explains the series of ordered observations in time amongst the members of correlation. Usually it arises when there is violation of the five CLRM assumptions that is the disturbance term is correlated with independent variable. To test for autocorrelation, the study adopts the Breusch Godfrey test. The null hypothesis is that there is no autocorrelation while the alternative hypothesis suggests evidence of autocorrelation. Decision rule will be, do not reject null hypothesis if F-statistic and P-values of the  $R^2$  are greater than 0.05 and conclude that there is no autocorrelation.

### **3.4.4 Multicollinearity Test**

Multicollinearity defined as the presence of a perfect, linear or particular relationship among some independent variables of a regression model (Gujarati, 2004). When the degree of multicollinearity is high, the estimates of the coefficients from the regression model become unstable and their standard errors can be overestimated (Baltagi, 2012). High correlation among variables exceeds 0.8. The existence of multicollinearity is corrected by dropping off other variables. The study run a correlation matrix to determine which variables are correlated to one another. If there is existence of severe multicollinearity, the solution is to apply the do-nothing approach or to drop a variable which has higher  $R^2$ . The null hypothesis will be that there is higher correlation while alternative hypothesis will be that there is no correlation among variables.

### **3.4.5 Model Specification test**

According to Gujarati (2004), model specification test is used to see whether the model is correctly specified or not. For such model used there is no inclusion of irrelevant variable or missing variable. Using Ramsey RESET to test the hypothesis. Null hypothesis stated that the model is correctly specified and alternative hypothesis stated that the model is not correctly specified. The decision rule, reject null hypothesis if the P-values is less than 0.05. If P-values from Ramsey RESET test found to be greater than 0.05, then do not reject the null hypothesis and conclude that the model is correctly specified.

### **3.4.6 Heteroscedasticity**

Heteroscedasticity occurs when error is time variant (Gujarati, 2004). Using the Harvey Test regression of the logs of squared residuals to detect the presence of heteroskedasticity (Baltagi, 2012). If there is present of heteroskedasticity, the OLS estimator remain constant and unbiased but they will be inefficient. Heteroskedasticity needs to be corrected. Using Harvey Test for heteroskedasticity if P-value is greater than 0.05, do not reject null hypothesis and conclude that the model is heteroskedasticity free. However, if P-value is less than 0.05, reject null hypothesis and conclude that there is heteroskedasticity present.

### **3.4.7 Normality**

Time series data is well known of violating the normality assumption therefore the author took the Jarque-Bera (JB) statistic to test the normality of variables. This test computes the skewness and kurtosis of the Ordinary Least Squares (OLS) residuals under the null hypothesis which postulates that the null hypothesis is normally distributed. If the computed probability value of the Jacque Bera statistic in an application is sufficiently low, which happen if the value of the statistic is very different from zero, one can reject the hypothesis and conclude that the residuals are normally distributed. But if the probability value is reasonably high, that is, close to zero we do not reject the normality assumption

### **3.5 Conclusion**

The core concerns of this chapter, show the model adopted, estimation procedure, variables incorporated and sources of data. The next chapter, Chapter four shows presentation of data and interpretation of the results found.

# CHAPTER FOUR

## RESULTS PRESENTATION AND INTERPRETATION

### 4.0 Introduction

With specified model provided in the previous chapter and interpretation of results is presented in this chapter. The running of regression equation and diagnostic tests done using E-views 7.

### 4.1 Diagnostic Results

#### 4.1.1 Unit Root Test Results

The results of the ADF tests carried all variables. This suggest that all variables are integrated of order 1

**Table 4.1 Unit Root Test Results Summary**

Variable	ADF test	Critical value		Intercept	trend	P values	Order of integration
$\text{Log } R_t$	-4.833194***	1%	-4.057528	YES	YES	0.0008	I (0)
		5%	-3.457808				
		10%	-3.154859				
$\text{Log } EX$	-7.095781***	1%	-3.501445	YES	N0	0.0000	I (1)
		5%	-2.892536				
		10%	-2.583371				
$\text{Log } CPI_t^f$	-6.722703***	1%	-3.501445	YES	N0	0.0000	I (1)
		5%	-2.892536				
		10%	-2.583371				
$\text{Log } Y_t^f$	-11.81488***	1%	-3.501445	YES	N0	0.0001	I (1)
		5%	-2.892536				
		10%	-2.583371				

**NB (\*\*\*) shows stationarity at 1%, 5% and 10% level of significance.**

### 4.1.3 Multicollinearity Test Results

Results from the correlation matrix show that correlation across all variables is not greater than 0.8 which means independent variables on this model are not suffering from severe multicollinearity (Cameron and Trivedi, 2005).

**Table 4.2 Correlation Matrix**

	$EX$	$CPI_t^f$	$Y_t^f$
$\text{Log}(EX)$	1.000000	0.272785	0.749187
$\text{Log}(CPI_t^f)$	0.272785	1.000000	0.234881
$\text{Log}(Y_t^f)$	0.749187	0.234881	1.000000

### 4.1.4 Autocorrelation Test Results

**Table 4.3 Breush-Godfrey Serial Correlation LM Test**

F-statistic	1.736446	Prob Chi-Square (1)	0.1800
Obs*R-squared	1.797555	Prob. F(1,91)	0.1909

Since the results found to be significant that there is no serial autocorrelation. F-statistic and P-values of the R<sup>2</sup> are greater than 0.05.and conclude that there is no autocorrelation.

### 4.1.5 Model Specification test results

**Table 4.4 Ramsey RESET test**

F(1, 91)	0.624841
P-Values	0.4313

Since the P-value is greater than 0.05 and conclude that the model is correctly specified therefore do not reject null hypothesis.

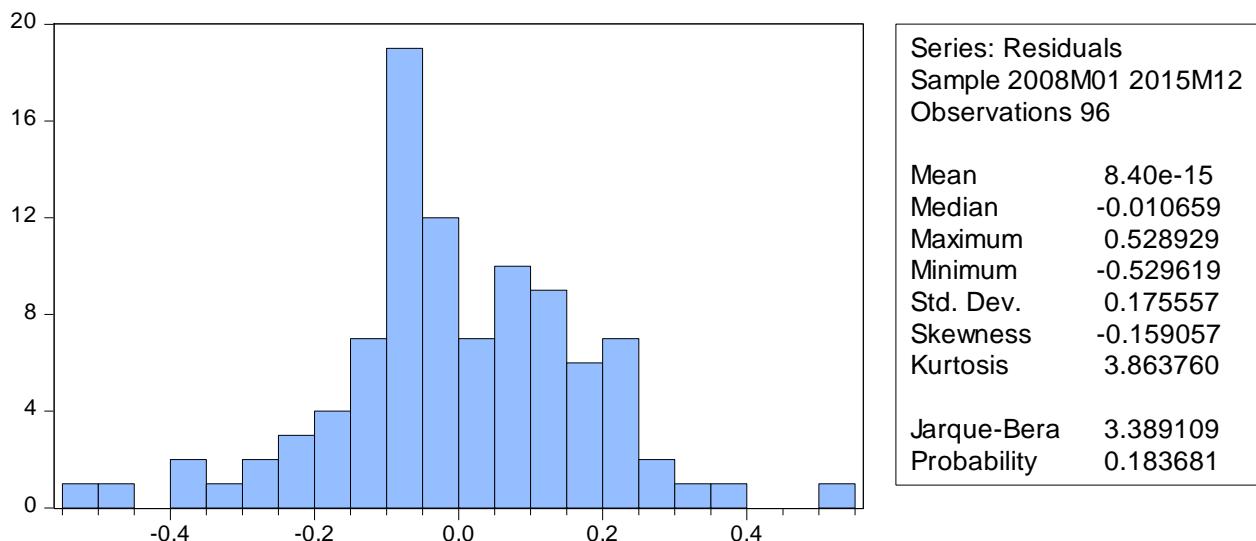
#### 4.1.7 Heteroskedasticity Test Results

Harvey test is used to test Log-log model for Heteroskedasticity. From chapter 3, heteroskedasticity test results from the table 4.5 below obtained the P-Value is greater than 0.05 and conclude that the model is free from heteroskedasticity

**Table 4.5 Harvey Test**

Prob. F (3,92)	0.1238
Prob. Chi-Square (1)	0.1219

#### 4.1.8 Normality



**Figure 4.1: Jacque-Bera Tests Results**

Since the probability is 0.183681 which is greater than 0.05 this means that the data is normally distributed and hence accept the  $H_0$  hypothesis and conclude that the data is normally distributed. Skewness is -0.159057 which is below 0 hence it is negatively skewed and this means that the author's data set is negative.

#### 4.2.1 Presentation of Regression Results

The results of the linear regression show exchange rate Inflation and GDP are all significant in determining remittances to Zimbabwe as indicated in Table 4.5. The variable explained about 92% of variations in remittances.

**Table 4.6: Presentation of regression results**

Variable	Coefficient	Std. Error	t-statistic	Prob
C	1.031612	1.930853	0.534278	0.5944
Log( EX )	-1.052171	0.139932	-7.519141	0.0000
Log( $CPI_t^f$ )	6.261271	0.223635	27.99772	0.0000
Log( $Y_t^f$ )	-2.378946	0.394523	-6.029936	0.0000

R-squared=0.925838

Adjusted R-squared=0.923420

Durbin Watson stat=1.696440

F Statistic=382.8444

P value (F statistic) = 0.000000

The model specified as follows after regression

$$\log R_t = 1.031612 - 2.378946 \log Y_t^f - 1.055217 \log EX_t + 6.261271 \log CPI_t^f$$

### 4.3 Interpretation of Regression Results.

#### 4.3.1 Exchange Rate (logEX)

The US dollar rand exchange rate was found to be statistically significant in explaining the variations in remittances to Zimbabwe. the t-statistics value of 7.519141 is greater than two. Results obtained a coefficient of -1.052171 and p value of 0.0000, suggesting an inverse relationship between rand volatility and remittance inflows. This means a 1% depreciation in exchange rate is associated with an average 1.05% elasticity decrease in remittances. The result support the theory of enlightened self-interest by Goldberg (2008), that if exchange rate depreciation is anticipated and negatively affects remittances.

#### 4.3.2 GDP of South Africa

A t-statistic of 6.029936 and p value of 0.0000, suggest that GDP of South Africa is statistically significantly in explaining remittances to Zimbabwe from South Africa. A coefficient of -

2.378946 implies that a 1% decrease in GDP of South Africa will lead to 2.38% average decrease in remittances. Thus, suggest that -remittances are countercyclical. As the economy situation of South Africa deteriorate, remittances sent to Zimbabwe also increases. This supports the findings of Gytos (2002), that if the economy of the host county started to deteriorate, only permanent migrants remit for altruistic purpose.

#### **4.3.3 South African CPI**

From the results obtained South Africa CPI was found to be significant with a t-statistic value of 27.99772 and p value of 0.0000. The results also show a negative relationship between South Africa CPI and remittances. This suggest that an increase in the South Africa CPI will result in decrease in migrant's remittances. The results were not in line with the expectations, however, this may suggest that as inflation increase migrants from Zimbabwe tend to send more money back home. If the cost of living goes up holding other things constant, the disposable income of migrants goes down and as well remittances.

#### **4.4 Conclusion**

All explanatory variable suggest that they are integrated of order 1 and there is no multicollinearity as well as autocorrelation. The results of the ordinary least square model suggest that US dollar rand exchange rate, South Africa GDP and South Africa CPI are significant in explaining remittances to Zimbabwe.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS**

#### **5.0 Introduction**

This chapter presents the summary to the research findings, conclusions and policy recommendations.

#### **5.1 Summary of the Study**

Zimbabwe received insignificant remittance from the diaspora before the economic crisis period. As from 2008 remittances started to rise although at a lower rate hence were kept below the annual average of US\$60 million. Resurgence in remittances coincided with the peak of economic crisis. The trajectory was sustained through to 2014. The increase in remittances can partly be attributed to the countercyclical nature of remittance, lowering transactions costs as a result of technological improvements as well as the growing diaspora's confidence in the use of formal channels such as the money transfer agencies and mobile money transfer to remit funds. In 2015, however, remittances started to slow down.

From the study findings, it can be concluded that Exchange rate indicators are the significant factor influencing remittances inflows to Zimbabwe. The research reviews that remittances in general are those that reduce operational costs, improve capital base, employ revenue diversify and increase domestic investment. In addition, remittances in Zimbabwe improve the livelihoods of families left behind. Those remittances used for enlightened self-interest motive for investment on government securities provides huge external financial to the recipient nations. Also, contributes most to the foreign exchange earnings in the case of Zimbabwe who are in need of remittances.

#### **5.2 Conclusion**

The study was to find the impact of US\$-rand exchange on remittances to Zimbabwe from 2008 up to 2015. The study model was adopted from Ebenezer *et al.* (2015) and then modified to suit the area studied. The study found that US\$-rand exchange rate has negative impact on remittances. The negative impact can be attributed to the counter cyclical argument of

remittances. This suggest that a depreciation in the rand value results in low remittances flowing to Zimbabwe.. This suggest that a depreciation in the rand value results in low remittances flowing to Zimbabwe. The finding was in line with theory of enlightened self-interest and the findings of Goldberg (2008), that if exchange rate depreciation is anticipated it negatively affects remittances.

### **5.3 Policy Implications and Recommendations**

In line with the study findings, the remittances to Zimbabwe are mainly driven by the enlightened who are seeking for opportunities in Zimbabwe. Hence the policy trust of Zimbabwe should be to increase investment opportunities in the country. Zimbabwe should capitalize during the period when South African rand is depreciating in increasing its investment through attracting more remittances due to business environment uncertainty.

Since Zimbabwe anchor currency is United States dollar, impacts of US\$-rand value are mostly like to occurs when remittances are continued transferred though informal channels. Rand depreciation imply less remittances since it will be costly to send money Thus, by transmitted in formal channels, making incentives that increased remitting money using cheaper as compared to informal channels.

Zimbabwe should make a way of influencing remittances recipient household to save their incomes, so as to help in critical sectors of the economy. For improvement in small medium enterprise, the government should advocate policies to increase remittances in funding entrepreneurial activities in the economy. Therefore, need to be efficient and effective in distribution systems that is vibrant to financial systems so as to mobilize remittance funds and distributed to unfunded entrepreneurs as investment. Remittances have a positive effect on the economic growth hence there is need for policies to protect domestic industries if they use remittance to acquire locally products

The key policies of this findings are to facilitate secure and fast money transfers from workers migrants in South Africa. This is done in order to improve remittances inflows to meet levels and standards comparable to South Asia and Latin America. The main objective is to move towards a

formal remittance channel market that is fast, accessible, competitive in price offers and reliable. In order to achieve this, two keys option is to addressed increased effective and efficient of formal remittances services.

Other policy recommendation beyond existing policies, rules and regulations, there is other options to increase financial access of migrants. By establishing amalgamations between remittances providers and existing postal that can act as agents for remittances. Postal offices have a wide range to reach geographically. This can be done to reduce cost that arise from monopolization. As a result, to avoid that the partnership would like to have adverse effects on costs Also, by adopting new technology that slowing many formal service providers in other countries so as to lower transfer costs. Hence, it improves the efficient, reliable and security. This include use of mobile banking as an example which operates in partnership with cellphone companies, banks and retailers

#### **5.4 Suggestions for Future studies**

The study sought to investigate the impact of rand value on remittances in Zimbabwe. However, the variable included in the study were not exhaustive. Further research should incorporate other variables such as interest rates, Zimbabwe GDP and Zimbabwe CPI. Also, the study was only limited to formal remittances without looking at informal remittances and this offers an area which can be explored.

In addition, partnership between financial institutions and mobile phones should provide with incentives so as to attract remitters. This will also attract workers migrants to consider foreign employment as means of saving money for domestic investment

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## LIST OF APPENDICES

### Appendix One: Data Set

Year/month	Remit ( $R_t$ )	CPI_SA ( $CPI_t^f$ )	GDP_SA ( $Y_t^f$ )	EX (ZAR/US\$)
2008m1	5744299.25	85.5	111.2	6.9962
2008m2	9468095.14	85.9	112.6	7.6578
2008m3	7073107.43	87.0	113.8	7.9921
2008m4	7594769.54	87.6	117	7.7585
2008m5	6765346.18	88.3	113.8	7.6076
2008m6	4882541.7	89.6	115.4	7.9367
2008m7	7240783.066	90.9	112.6	7.6114
2008m8	4799567.564	91.4	113	7.6651
2008m9	5967883.63	92.0	110	8.0753
2008m10	7101751.4	92.3	107.9	9.7800
2008m11	5117606.3	92.3	103.1	10.1112
2008m12	6784241.27	92.2	98.3	9.9227
2009m1	10619415.41	92.7	97	9.9076
2009m2	13227489.15	93.6	95.9	9.9773
2009m3	11413077.39	95.0	94.1	9.9536
2009m4	15238910.01	95.4	93.8	8.9644
2009m5	15527674.87	95.7	93.6	8.3741
2009m6	14864238.2	96.0	93.3	8.0332
2009m7	19683129.87	97.0	94.7	7.9446
2009m8	16894697.84	97.3	94.5	7.9406
2009m9	18534221.35	97.6	95.5	7.5025
2009m10	22008859.88	97.6	97.5	7.4871
2009m11	17478589.1	97.6	97.3	7.5096
2009m12	22706047.06	97.8	100.4	7.4848
2010m1	19960651.01	98.1	99.1	7.4631
2010m2	20641157.5	98.7	97.3	7.6680
2010m3	18317827.53	99.5	100.4	7.4057

2010m4	23171480.94	99.5	99.3	7.3444
2010m5	20685356.82	99.8	101.6	7.6515
2010m6	17244212.68	99.8	101.5	7.6356
2010m7	23510679.04	100.4	102.8	7.5212
2010m8	19602528.52	100.5	98.6	7.2877
2010m9	21383344.79	100.7	97.9	7.1100
2010m10	28509300.55	100.8	100.4	6.9087
2010m11	20811350.85	101.0	100.1	6.9749
2010m12	29516775.14	101.1	100.1	6.8237
2011m1	22675176.36	101.7	102.6	6.9239
2011m2	23480738.31	102.2	103.2	7.1844
2011m3	22448885.14	103.5	104.6	6.8976
2011m4	27628024.78	103.8	102	6.7209
2011m5	24552759.4	104.4	101.4	6.8556
2011m6	22576238.67	104.9	103.3	6.7859
2011m7	26887231.45	105.8	97.7	6.7871
2011m8	22207070.78	105.8	103.5	7.0871
2011m9	25712772.29	106.4	105.2	7.5769
2011m10	30039958.16	107.1	103.9	7.9540
2011m11	22476791.94	107.2	103	8.1493
2011m12	25454890.71	107.5	103.8	8.1933
2012m1	24327992.32	108.1	103.6	8.0025
2012m2	26171030.2	108.6	105.4	7.6388
2012m3	32020109.39	109.8	103.2	7.6071
2012m4	25689368.98	110.3	104.3	7.8329
2012m5	35822488.89	110.3	105.7	8.1506
2012m6	28076178.39	110.8	104.9	8.3818
2012m7	25245131.86	110.9	104.3	8.2535
2012m8	34376719.3	111.3	105.1	8.2596
2012m9	28493736.3	112.2	104.7	8.2574

2012m10	37441659.55	113.0	105	8.6424
2012m11	28978916.4	113.3	107.2	8.7994
2012m12	36137486.88	113.7	106.1	8.6116
2013m1	32586563.13	114.0	105.9	8.7978
2013m2	38368680.74	115.0	104.6	8.8766
2013m3	43380375.26	116.4	105.1	9.1927
2013m4	33031255.03	116.7	107.6	9.1007
2013m5	49641315	116.4	107.4	9.3494
2013m6	32577768.56	116.9	106.4	10.0001
2013m7	33549368.97	118.0	109.1	9.9133
2013m8	42727450.05	118.4	106.9	10.0708
2013m9	32895016.04	119.0	101.8	9.9616
2013m10	42735067.69	119.3	106.6	9.8979
2013m11	34036986.83	119.4	108	10.2009
2013m12	40226362.69	119.7	107.4	10.3683
2014m1	32865648.87	120.6	108.3	10.8872
2014m2	37313077.97	121.8	106.9	10.9506
2014m3	46267116.63	123.4	105	10.7445
2014m4	34503566.99	124.0	108.6	10.5364
2014m5	51780206.29	124.4	106	10.4092
2014m6	35678249.09	124.8	107.1	10.6766
2014m7	37766428.1	125.8	101.1	10.6577
2014m8	50661031.66	126.1	105.3	10.6632
2014m9	44147165.56	126.1	107.1	10.9908
2014m10	42409888.17	126.4	108.3	11.0594
2014m11	55960419.54	126.4	107.3	11.0901
2014m12	47350361.37	126.1	107.6	11.4975
2015m1	52517429.65	125.9	106.6	11.5527
2015m2	49817548.54	126.8	106.8	11.5773
2015m3	51774852.5	128.4	109	12.0884

2015m4	47190877.04	129.6	105.2	11.9755
2015m5	58535621.04	129.8	104.9	11.9720
2015m6	49306487.43	130.5	105.1	12.2913
2015m7	52826322.07	131.6	105.9	12.4602
2015m8	51829981.45	131.8	106.4	12.9012
2015m9	55589560.9	131.8	107.8	13.6388
2015m10	49927308.14	132.1	107.3	13.4928
2015m11	49682888.32	132.3	105.5	14.1449
2015m12	64158897.12	132.6	107.2	15.0024

## Appendix Two: Regression Results

Dependent Variable: LOG(REMIT)

Method: Least Squares

Date: 08/25/17 Time: 18:09

Sample: 2008M01 2015M12

Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP_SA)	-2.378946	0.394523	-6.029936	0.0000
LOG(EX)	-1.052171	0.139932	-7.519141	0.0000
LOG(CPI_SA)	6.261271	0.223635	27.99772	0.0000
C	1.031612	1.930853	0.534278	0.5944
R-squared	0.925838	Mean dependent var	17.02206	
Adjusted R-squared	0.923420	S.D. dependent var	0.644655	
S.E. of regression	0.178396	Akaike info criterion	-0.568848	
Sum squared resid	2.927914	Schwarz criterion	-0.462000	
Log likelihood	31.30468	Hannan-Quinn criter.	-0.525658	
F-statistic	382.8444	Durbin-Watson stat	1.696440	
Prob(F-statistic)	0.000000			

### **Appendix Three: Unit Root for Remittances**

Null Hypothesis: D(REMIT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.833194	0.0001
Test critical values:		
1% level	-3.501445	
5% level	-2.892536	
10% level	-2.583371	

#### **Appendix Four: Unit Root for Us\$-Rand Exchange Rate**

Null Hypothesis: D(EX) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.095781	0.0000
Test critical values:		
1% level	-3.501445	
5% level	-2.892536	
10% level	-2.583371	

## **Appendix Five: Unit Root for CPI\_SA**

Null Hypothesis: D(CPI\_SA) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.722703	0.0000
Test critical values:		
1% level	-3.501445	
5% level	-2.892536	
10% level	-2.583371	

## **Appendix Six: Unit Root for GDP\_SA**

Null Hypothesis: D(GDP\_SA) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.81488	0.0001
Test critical values:		
1% level	-3.501445	
5% level	-2.892536	
10% level	-2.583371	

## Appendix Seven: Correlaation Matrix

Correlation			
	LOG(EX)	LOG(GDP_SA)	LOG(CPI_SA)
LOG(EX)	1.000000	0.272785	0.749187
LOG(GDP_SA)	0.272785	1.000000	0.234881
LOG(CPI_SA)	0.749187	0.234881	1.000000

## **Appendix Eight: Test for Autocorrelation**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.736446	Prob. F(1,91)	0.1909
Obs*R-squared	1.797555	Prob. Chi-Square (1)	0.1800

## **Appendix Nine Testing for Cointegration**

Null Hypothesis: RESID01 has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.118098	0.0000
Test critical values:		
1% level	-3.502238	
5% level	-2.892879	
10% level	-2.583553	

\*MacKinnon (1996) one-sided p-values.

## Appendix Ten: Model Specification

Ramsey RESET Test

Equation: UNTITLED

Specification: LOG(REMIT) LOG(GDP\_SA) LOG(EX)  
LOG(CPI\_SA) C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.790469	91	0.4313
F-statistic	0.624841	(1, 91)	0.4313
Likelihood ratio	0.656920	1	0.4176

## Appendix Eleven: Normality Test

