BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

EXPLORING THE RELATIONSHIP BETWEEN REMITTANCE INFLOWS AND ECONOMIC GROWTH IN ZIMBABWE (1990-2020)

SUBMITTED BY

BRIAN MUPINDU

THIS DISSERTATION IS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE BACHELOR OF SCIENCE HONOURS DEGREE IN ECONOMICS OF BINDURA UNIVERSITY OF SCIENCE EDUCATION. FACULTY OF COMMERCE

JUNE 2023

RELEASE FORM

NAME OF AUTHOR	**:**	**BRIAN MUPINDU**
STUDENT NUMBER	**:**	**B192052B**
PROJECT TITLE	**:**	**Exploring the relationship between Remittance Inflows and Economic Growth in Zimbabwe (1990 – 2020)**
DEGREE TITLE	**:**	**BACHELOR OF SCIENCE HONOURS DEGREE IN ECONOMICS**
YEAR GRANTED	**:**	**2023**

Permission is hereby granted to the Bindura University Library to produce single copies for private, scholarly or scientific research purpose only. The author reserves other publication rights and neither the project nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

SIGNED  **DATE: 02/06/2023**

PERMANENT ADDRESS	**:**	**Mt View Flats, Kingsbridge Road, Mt Pleasant, Harare, Zimbabwe**

APPROVAL FORM

The undersigned certify that they have supervised, read and recommend to the Bindura University of Science Education for acceptance of the research project entitled: **EXPLORING THE RELATIONSHIP BETWEEN REMMITANCE INFLOWS AND ECONOMIC GROWTH IN ZIMBABWE (1990-2020)**, submitted by **BRIAN MUPINDU**, in partial fulfilment of the requirements for the **BACHELOR OF SCIENCE (HONOURS) DEGREE IN ECONOMICS.**

Signature: ..... Date: .....
Supervisor

Signature: ..... Date: .....
Chairperson

Signature: ..... Date: .....
Examiner

DEDICATION

This study is dedicated to Josephine, my mother, who instilled in me a deep passion for education and made sacrifices to ensure that I have access to it. Moreover, I dedicate this work to my close family and friends whose unwavering support played an instrumental role in my academic journey.

ABSTRACT

In Zimbabwe, remittance inflows constitute the largest source of foreign financial inflows, exceeding FDIs and other financial inflows. This study aims to explore the relationship between remittance inflows and economic growth in Zimbabwe. The research problem is to determine if these remittances actually enhance economic growth in the country, given the limited empirical evidence on the subject. The outcome of this research is fundamental in providing insight for policy formulation towards achieving the country's objective of becoming a middle-income economy by 2030. The OLS econometric model was used as the main model of analysis, estimated using E-views 7 software, and a series of diagnostic and stability tests were conducted to ensure model robustness. The sample consists of time series data from 1990 to 2020 obtained from various databases such as World Bank, IMF, RBZ and ZIMSTAT.

The study findings show that remittance inflows negatively affect economic growth in Zimbabwe at a 1% significance level possibly due to the "Dutch Disease" phenomena. Furthermore, findings point towards the negative impact of trade openness while gross capital formation, financial development, and FDI positively affect economic growth and are significant at a 5% significance level. The CUSUM test confirms 95% confidence in the model's stability for forecasting.

The study recommends that policymakers should implement policies aimed at diversifying the economy to reduce reliance on remittances as a source of foreign currency while simultaneously promoting exports. Additionally, policymakers should prioritize gross capital formation and financial development policies such as financial inclusion and addressing correspondent banking relationships. This will improve the country's access to international financial markets.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my gratitude to God Almighty for enabling me to achieve this ultimate goal. As Matthew 19:26 states, "Jesus looked at them and said, 'With man this is impossible, but with God all things are possible.'"

Secondly, I am deeply thankful to Bindura University of Science Education and the Economics Department for granting me the opportunity to pursue my studies. A special mention goes to my supervisor Dr Nkala for his patience, guidance, and extensive knowledge which played an instrumental role in bringing this research project to fruition. I cannot imagine having completed this project without him, and he is truly a great mentor.

My sincere thanks also goes to my close family being: Josephine, Valentine, Taffy, Rev Oliver, Perseverance and Georgina. Their support has been invaluable in achieving this ultimate goal. To my amazing family in Christ; Living Water Falls Church of the Nazarene, all would not have been complete without acknowledging their love and concern throughout my studies. Your presence surely strengthened me during my academic journey.

Last but not least, I feel indebted to my classmates for their contributions to this journey. I would like to give a special mention to the "Springlers" group which includes: Panashe, Enoch, Often, Pride, Yaseen, and Sharon. I recall the sleepless nights and all the fun we've had over the last four years.

Thank you all!!

De Bryne

Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACROYNIMS

ADF	Augmented Dickey-Fuller
BLUE	Best Linear Unbiased Estimators
DW	Durbin Watson
ECM	Error Correlation Model
ESAP	Economic Structural Adjustment Program
FDI	Foreign Direct Investment
FIN	Financial Development
GCF	Gross Capital Formation
GDP	Gross Domestic Product
IMF	International Monetary Fund
INF	Inflation
IOM	International Organization for Migration
L	Logarithm of
MERP	Millennium Economic Recovery Plan
NEDPP	National Economic Development Priority Program
ODA	Official Direct Assistance
OLS	Ordinary Least Square
OPN	Openness
RBZ	Reserve Bank of Zimbabwe
REM	Remittance Inflows
RGDP	Real GDP per capita
TSP	Transitional Stabilization Program
UNCTAD	United Nations Conference on Trade and Development
VAR	Vector Autoregressive
ZimAsset	Zimbabwe Agenda for Sustainable Socio-Economic Transformation
ZIMPREST	Zimbabwe Program for Economic and Social Transformation
ZIMSTAT	Zimbabwe National Statistics Agency
Δ	Change in

CHAPTER I

INTRODUCTION

1.0 Introduction

This research aims to explore the relationship between remittance inflows and economic growth in Zimbabwe using time series data from 1990 to 2020. Remittances have become a crucial source of external financing for many developing countries, including Zimbabwe. Remittances accounted for 8.5% of the nation's Gross Domestic Product (GDP) in 2020. However, there is insufficient empirical evidence to determine their impact on economic growth in Zimbabwe. The research findings will be of significant importance to policymakers in Zimbabwe by providing insight for policy formulation towards achieving the country's objective of becoming a middle-income economy by 2030. The involvement of the diaspora community in policy formulation is also explored whilst also adding value to the academic literature.

Zimbabwe is currently pursuing sustainable economic growth as one of its primary macroeconomic objectives, with a goal of attaining middle-income status by 2030. Policymakers in Zimbabwe have been designing policies to attract Foreign Direct Investments (FDIs), which has been identified as significant driver of economic growth in various countries, despite the growing volume of remittance inflows. In 2017, Zimbabwe's President, His Excellency Dr Emmerson Dambudzo Mnangagwa, launched a mantra "Zimbabwe Is Open For Business" to attract international investors to invest in the country. Therefore, this study aims to explore the relationship between remittance inflows and economic growth in Zimbabwe from 1990 to 2020.

This chapter will provide the following aspects: introduction, background of the study, statement of the problem, objectives of the study, research questions, statement of hypothesis, significance of the study, assumptions, delimitations of the study, limitations of the study, definition of essential terminology and organization of the rest of the study.

1.1 Background of the Study

Zimbabwe's efforts towards economic growth are hindered by socio-economic challenges such as: high unemployment rates, increasing inflation, multiple exchange rates, poverty, and other issues (World Bank, 2022). The migration of skilled individuals to other nations, which is known as “brain drain”, has resulted in a significant loss of talent, thus greatly affecting Zimbabwe. According to Pasura (2008), an estimate of 4 million Zimbabweans migrated because of the crisis and the major destination was South Africa. Surveys show that over 2 million Zimbabweans migrated to South Africa as of 2009. According to ZIMSTAT (2022), from all the households enumerated in the 2022 census, 13.6% constituted emigrants. It is noteworthy that remittances are being transferred through both formal and informal channels as migrants remain connected with their family members in Zimbabwe.

1.1.1 Zimbabwe`s Economic Growth Policy Outlook

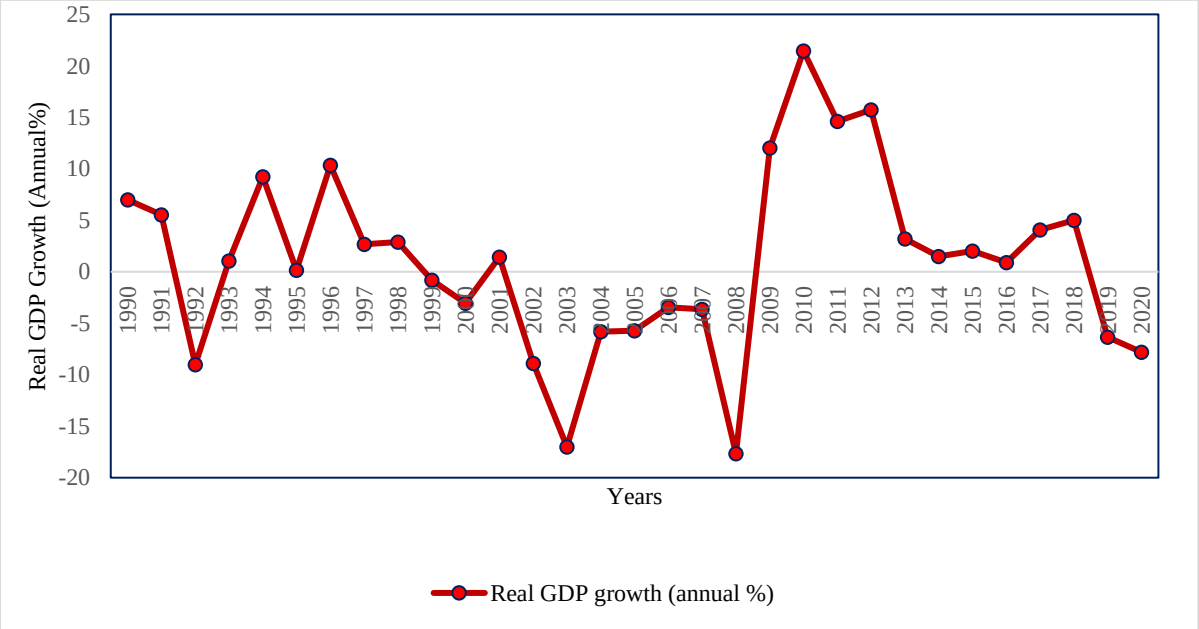
Zimbabwe faced several economic challenges, such as: hyperinflation, currency instability, and slow economic growth during the period 1990 to 2020 (Munyanyi, Mhaka & Mhaka, 2019). To address these challenges, Zimbabwe implemented various economic growth policies. These included: the Economic Structural Adjustment Program (ESAP) in 1991, the Zimbabwe Program for Economic and Social Transformation (ZIMPREST) in 1996, the National Economic Development Priority Program (NEDPP) in 1998, the Millennium Economic Recovery Plan (MERP) in the early 2000s, the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset) in 2013, and the Transitional Stabilization Program (TSP) in 2018 (Adepoju, 2019). Adepoju (2019) argued that although these policies aimed to stimulate economic growth, some failed to achieve the desired outcomes due to poor implementation, political instability, and lack of funding. However, the average real economic growth rate for the period 1990-2020 was 1.02% (World Bank, 2022).

1.1.2 Zimbabwe`s Real GDP Growth Outlook

According to data extracted from World Bank (2022), the period between 1990 and 2020 was marked by fluctuations in real GDP growth rates, ranging from 7% in 1990 to a peak of 21.5% in 2010. This was then followed by a decline in growth due to various factors such as poor

economic policies, political instability, and droughts. In 2003, the real GDP growth rate declined sharply to -17%, and Zimbabwe experienced hyperinflation until 2009. Moyo (2005) argued that the government's policies, particularly the fast-track land reform program, exacerbated the economic crisis and contributed to a further decline in real GDP growth rates. The World Bank (2022) reported the largest contraction in Zimbabwe's history in 2008, with a real GDP growth rate of -17.7%. However, Zimbabwe's economy has slowly started to recover since 2009, with a real GDP growth rate of 3% in 2019 and an estimated -7.8% in 2020 due to the impact of the COVID-19 pandemic. Zimbabwe has abundant natural resources such as gold, platinum, and diamonds, which could drive economic growth in the future. The government recently set up and implemented economic reforms to attract FDIs as an external source of financial inflow to promote economic growth.

Figure 1: Zimbabwe`s Real GDP Trend from 1990 to 2020



Source: World Bank (2022)

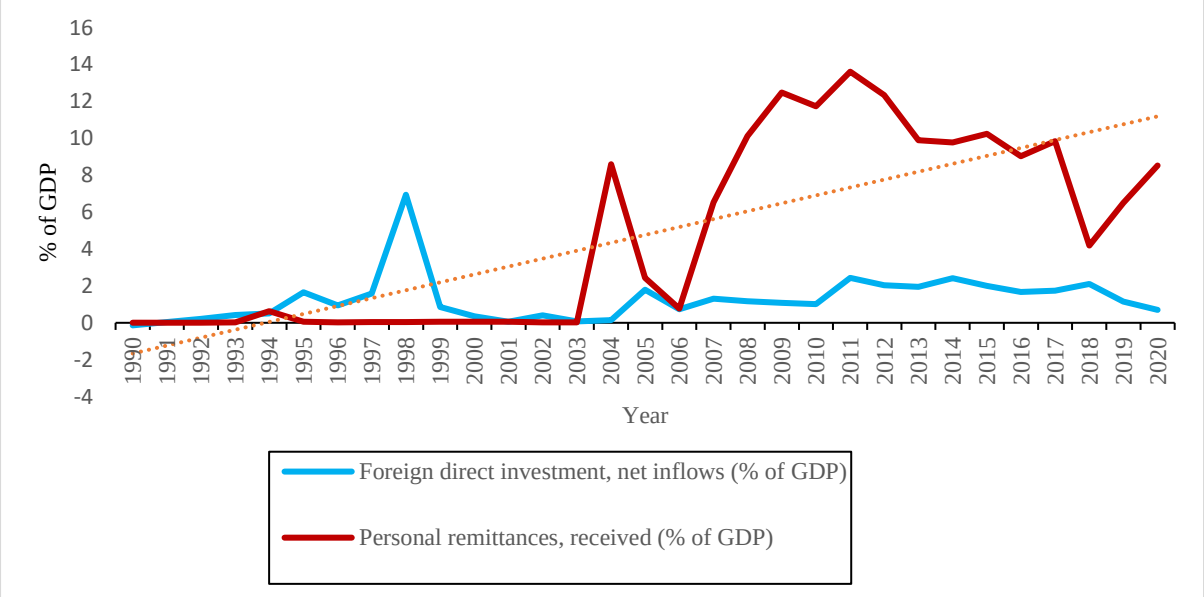
1.1.3 Zimbabwe`s Financial Inflows Outlook

Zimbabwe has received financial inflows from different external sources between 1990 and 2020. These sources include FDI, remittances, Official Development Assistance (ODA), and other capital flows (Mujere, 2021). According to data from the World Bank, total external financial inflows to Zimbabwe have increased from $313 million in 1990 to $3.5 billion in

2020, with significant fluctuations from year to year. Remittances have been the largest source of external financial inflows to Zimbabwe in recent years, accounting for approximately 55% of total external financial inflows in 2020. FDI and ODA have been much smaller sources of external financial inflows, accounting for approximately 6% and 4% of total external financial inflows, respectively. However, the trend of external financial inflows has been volatile, with external financial inflows declining sharply after 2000 due to political instability, economic turmoil, and controversial land reform policies.

Remittance inflows to Zimbabwe have grown at an inconsistent rate over the years, with slow growth in the 1990s and much faster growth in the 2000s and 2010s. According to IOM (2020), the increase in remittance inflows during these two decades can be attributed to factors such as: increasing migration and the growing use of formal channels for remittance transfers. Remittances have consistently been a much larger source of external financing for Zimbabwe than FDI. Remittances in 2019 and 2020 were more than seven and almost ten times larger than FDI inflows, respectively. This demonstrates the large population of Zimbabwean individuals residing and employed overseas, who are sending financial support to their loved ones in Zimbabwe. Fig 2 below illustrates the points discussed.

Figure 2: Remittance Inflows & FDI (% of GDP), 1990 to 2020



Source: World Bank (2022) & IMF (2022)

Although FDI can contribute significantly to Zimbabwe's economic growth and development, the country has experienced difficulties in attracting FDIs due to issues such as political

instability, corruption, and an unpredictable regulatory framework (UNCTAD, 2020). In contrast, remittances are largely determined by labour demand in destination countries and are thus less influenced by domestic economic and political factors. Consequently, remittances have become a crucial external funding source for Zimbabwe, especially during periods of economic crisis.

1.1.4 Zimbabwe`s Real GDP and Remittance Inflows Outlook

Given that the research focuses on establishing a connection between remittance inflows and economic growth, the subsequent analysis in Figures 1 and 2 demonstrate the patterns observed for real GDP and remittance inflows, respectively. This information indicates a potential link between remittance inflows and real GDP in Zimbabwe. Specifically, it appears that between 2009 and 2017, there was a correlation between increases/decreases in remittance inflows and increases/decreases in real GDP. This leads to an intriguing research hypothesis that remittance inflows may play a role in promoting economic growth. Therefore, this research seeks to determine the nature of relationship between the two variables.

1.2 Statement of the Problem

Zimbabwe aims to increase its economic growth every year to become a middle-income economy by 2030. However, Zimbabwe`s real GDP growth rate on average for the period 1990 to 2020 was 1.02%. Remittance inflows, can be a source of growth by providing an external source of finance. According to RBZ data, remittance inflows through official channels in Zimbabwe rose by 57%, from USD 635.7 million in 2019 to USD 1.0 billion in 2020. This is more than the FDIs received by the country in the same year, amounting to USD 150 million. The World Bank reported that remittances contributed to 8.5% of Zimbabwe's GDP in 2020, up from 6.5% in 2019. Given the high numbers of remittance inflows to Zimbabwe, a key question then arises: "Does remittance inflows enhance economic growth in Zimbabwe?"

There is insufficient empirical evidence to determine the impact of remittances on economic growth in Zimbabwe. Therefore, it is unclear whether economic growth in Zimbabwe is affected positively or negatively by remittance inflows. Therefore, this has prompted the researcher to investigate the nature of the relationship between remittance inflows and

economic growth in Zimbabwe using time series data from 1990 to 2020. The study employs the OLS econometric model to examine the relationship between the two variables.

1.3 Objectives of the Study

The primary aim of this study is to explore the relationship between remittance inflows and economic growth in Zimbabwe. To achieve this objective, there are specific objectives that are guiding this research, including:

1. To develop an econometric model to establish the relationship between remittance inflows and economic growth in Zimbabwe.
2. To estimate the impact of remittance inflows on economic growth in Zimbabwe.
3. To propose policy recommendations based on objectives 1 and 2.

1.4 Research Questions

The following research questions were formulated to address the aforementioned research objectives:

1. What is the nature of relationship between remittances inflow and economic growth?
2. What is the impact of remittance inflows on economic growth in Zimbabwe?
3. What are the policy recommendations based on the study?

1.5 Statement of the Hypothesis

H_0: There is a positive relationship between remittances inflow and economic growth.

H_1: There is a negative relationship between remittances inflow and economic growth.

1.6 Significance of the Study

There are several reasons why it is important to investigate the relationship between remittance inflows and economic growth in Zimbabwe:

1.6.1 To the Policymakers

The results of this study could have crucial policy implications not only for policymakers in Zimbabwe but also for those in other countries. Policymakers in Zimbabwe can use the findings of the study to formulate policies aimed at proliferating the economic growth rate and achieving the goal of becoming a middle-income economy by 2030.

1.6.2 To the Economy

The research can offer valuable knowledge about the Zimbabwean economy and the impact of remittance inflows on promoting economic growth. Such insights can undoubtedly play a positive role in assisting with making informed economic development decisions, sustainable use and effective allocation of resources.

1.6.3 To Academic Literature

This research has the potential to make a significant contribution to the existing academic literature regarding the correlation between remittance inflows and economic growth. Moreover, it can serve as a valuable case study for further investigation on the subject in the future.

1.6.4 To the Diaspora Community

The research can also contribute to advancing the understanding of the involvement of diaspora communities in economic development and encourage diaspora engagement. This, in turn, can result in greater support for initiatives that promote the engagement of diaspora communities.

1.7 Assumptions

1. The researcher assumed that changes in real GDP per capita is an appropriate indicator for measuring economic growth.
2. The data obtained is dependable, comprehensive, and pertinent and can be trusted.
3. All research instruments are valid and ethically accepted.

4. The research is expected to be completed within the University's specified time frame.

1.8 Delimitations of the study

1. The data was limited to Zimbabwe and did not encompass other countries.
2. The research analysed data that is available from 1990 to 2020.
3. The data sources were limited to trusted organizations, thereby establishing constraints on the data sources.
4. The research solely incorporated information and literature obtainable in the English language, and there was a possibility that it overlooked important research published in other languages.

1.9 Limitations of the study

1. The researcher encountered time constraints, but to mitigate this, the researcher conducted the research during semester breaks.
2. The researcher utilized secondary data, which can have limitations such as lack of clarification and potential biases. To mitigate this, the researcher used data from trusted sources.

1.10 Definition of terms

1.10.1 Remittance Inflows

According to IOM (2018), remittance inflow is the transfer of money by a person who has migrated from their home country to another country to a recipient in their home country.

1.10.2 Economic Growth

According to Mankiw (2017), economic growth can be defined as an increase in the production of goods and services in an economy over a period of time, which is usually measured by changes in real GDP per Capita.

1.10.3 Real GDP per capita

According to Mankiw (2017), Real GDP per capita is a metric that considers both inflation and the size of a country's population to measure its economic output.

1.10.4 Official Channels

The legal and regulated methods of sending and receiving remittances, such as banks, money transfer companies, or other financial institutions (World Bank, 2022).

1.10.5 Foreign Direct Investment

Carbaugh (2019) defines FDI as the long-term investment which reflect a lasting interest and control by a foreign investor (or patent enterprise), of an organisation resident in an economy located in another country.

1.10.6 Gross Capital Formation

Gross Capital Formation can be defined as the as a monetary commitment or expenditure on real capital goods, such as infrastructure, buildings, machinery, and equipment, within the boundaries of a country by its government, businesses, and individuals (World Bank, 2022).

1.10.7 Financial Development

According to Levine (2005), financial development is the extent to which financial products and services, such as loans, credit, and insurance, are accessible to individuals and businesses in a country and their ability to use them effectively. A well-developed financial system is typically considered a crucial element in fostering economic growth and mitigating poverty.

1.10.8 Trade Openness

World Bank (2021) defined trade openness as the degree to which a country is involved in international trade and the extent to which its economy is integrated with the global economy. There are different ways to calculate trade openness, but one common method is to use the ratio of exports plus imports to GDP as a percentage.

1.10.9 Inflation

McConnell & Brue (2003) defines inflation as the increase in the general price level of goods and services within an economy over time.

1.11 Chapter Summary

This chapter focused on presenting the problem statement, study background, importance of the research and the objectives of the research. The next chapter will focus on the review of both theoretical and empirical literature. The structure of the study is laid down as follows: Chapter 2 being a literature review; Chapter 3 discussing the research methodology and econometric procedures; Chapter 4 presenting the results; Chapter 5 concluding with a summary and policy recommendations.

CHAPTER II

LITARATURE REVIEW

2.0 Introduction

The literature on the relationship between remittance inflows and economic growth is extensive, with both theoretical and empirical studies examining from various perspectives. This chapter, review the existing literature, focusing on the key theoretical frameworks using different economics schools of thought and empirical findings.

2.1 Theoretical Literature

The relationship between remittance inflows and economic growth in Zimbabwe is examined from a theoretical perspective using various schools of economic thought, including Keynesian, endogenous, and neoclassical. The literature also covers theories that explore the motivations behind remittances.

2.1.1 Keynesian Growth Theory

1. The Two Gap Model

The two-gap model of economic growth, developed by Chenery and Strout in 1966, is a theoretical framework that aims to explain the challenges developing countries often face in achieving sustained economic growth. According to this model, these countries encounter two main obstacles: a foreign exchange gap and a savings-investment gap. Ranis, Stewart, and Ramirez (2000) postulate that the foreign exchange gap arises when a country's exports cannot generate enough foreign exchange to cover its import requirements due to factors such as: limited technology, infrastructure, or competitiveness. The savings-investment gap, on the

other hand, arises when a country lacks sufficient domestic savings to finance the investments needed for economic growth. Keynesian economists developed a mathematical model shown in Equation 2.1.

$$g = {}^{s}/_{k} + {}^{b}/_{k} \quad \text{.....2.1}$$

Where g is economic growth; s is savings ratio, b is foreign exchange requirement and k is capital output ratio. The level of foreign exchange in developing countries is not enough to finance its imports of expensive capital goods needed for production. This gap can be filled by remittances hence remittances are deemed to affect economic growth positively where foreign exchange is not enough to finance imports. In developing countries, it is common to have inadequate foreign exchange reserves to fund the purchase of costly capital goods essential for production. To overcome these gaps and achieve economic growth, developing countries may need to adopt policies that promote exports, remittances and attract foreign investment, as argued by Ranis et al. (2000).

2.1.2 Endogenous Growth Theory

1. Finance-Nexus Growth Theory

The finance-nexus growth theory, which was first proposed by Schumpeter in 1912, is an economic theory that suggests a relationship between financial development and economic growth. Levine (1997) supported the theory by proposing that a sound-developed financial sector can promote economic growth by increasing investment, streamlining resource allocation, and reducing information asymmetries. Financial intermediaries such as banks and other institutions, play a central role in this theory by aggregating savings and directing them towards productive investments (Levine, 1997). By providing credit to businesses and households, these intermediaries can help reduce market inefficiencies and stimulate investment, ultimately leads to economic growth. Lucas and Romer investigated this issue using a macroeconomic approach by using an endogenous growth model to elucidate the link between finance and economic growth. Equation 2.2 depicts the dynamic equilibrium equation for the steady state.

$$g = A\emptyset s - \delta \quad \text{.....2.2}$$

The above endogenous growth model is represented by the steady state growth rate 'g' in conjunction with other variables such as the level of technology 'A', the proportion of savings converted to investment 'theta', the savings rate 's', and the depreciation rate 'delta'. This group of economists argued that the impact of finance on economic growth can be explained through various channels, such as: capital accumulation and decreased transaction costs (Mohapatra, Ratha & Silwal, 2011), this aligns with Schumpeter's thinking. Additionally, remittances are recognized as an important source of loanable funds, particularly as they are often available in foreign currency (Levine, 1997).

Schumpeter's idea regarding the significant role of financial institutions in stimulating economic growth did not gain widespread acceptance, partly due to the economic crises triggered by the Great Depression (Stolbov, 2012). Arestis and Demetriades (1997) pointed out that this led to a temporary reduction in the influence of financial institutions on economic growth. Consequently, there was a shift in focus towards the development of the real economy, which was heavily influenced by Keynesian ideology (Stolbov, 2012). According to Keynesians, the financial system played an important but not the crucial part in economic growth, and their model stipulated that economic growth would lead to financial development.

2.1.3 Neoclassical Growth Theory

1. Solow-Swan Growth Model

The Solow-Swan growth model, which is also referred to as the neoclassical growth model, is an economic theory that explains the occurrence of sustained economic growth in a stable economy. It was independently developed by Robert Solow and Trevor Swan in 1956. According to Acemoglu (2009), the model suggests that capital, labour, and technology are the main factors of growth. It assumes that the economy is in a steady state where output, capital, and labour grow at a consistent rate. The pace of technological advancement, which is provided externally, determines the rate of growth of output per capita in this steady state (Acemoglu, 2009). Equation 2.3 demonstrates the relationship between the increase in output level and two main components: input and factor productivity.

$$\boldsymbol{Y = K^{\alpha}(AL)^{1-\alpha}} \quad \textbf{.....2.3}$$

Where Y is output level; K is both physical and human capital, A is labour productivity; L is labour; α is the elasticity of output with respect to capital and (1-α) is the elasticity of output

with respect to labour. Transforming the specific link between input and output growth assuming constant return to scale, we have the growth accounting equation as expressed in equation 2.4.

$$\Delta Y/Y = a(\Delta K/K) + (1-a)(\Delta A/A + \Delta L/L) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.4$$

Since α is assumed to be less than 1, the model yields diminishing returns to both capital and labour. There's need to increase factor productivity such as through improvement of human capital. Remittances are deemed to increase factor productivity such as through improved health and access to education.

2. Dependency Growth Theory

Dependency theory is a neoclassical economic concept that argues that developing countries are reliant on developed nations, and are at a disadvantage in the global trade system (Dos Santos, 1970). According to dependency theory, the underdevelopment of developing countries is due to their economic and political reliance on developed countries. Dos Santos (1970) argued that this dependence is characterized by an unequal exchange of goods and services. Developed countries extract resources and labour from developing countries at low prices while selling their products and services to these countries at high prices. The consequence of this is a transferal of resources from developing countries to developed countries, which exacerbates poverty and economic stagnation in the developing countries. The theory identifies several factors that perpetuate this dependence, ODA, FDI, and international organizations like IMF and the World Bank. According to dependency theory, remittances can discourage the development of local industries and encourage the consumption of imported goods, leading to a dependence on the sending country (Cardoso and Faletto, 1979).

2.1.4 Theories of Remittances

1. Pure Altruism Theory

The theory of pure altruism in remittances was initially introduced by Richard H. Adams in 1965, in his article "Remittances and Economic Development." In this article, Adams proposed that remittances played a crucial role in providing financial aid to families and communities in the home country, which could help to foster economic growth and decrease poverty levels.

Adams also stressed the significance of comprehending the social and cultural aspects that motivate remittance behaviour, including the function of altruism, to create effective policies aimed at promoting economic development in developing countries. According to the theory of pure altruism in remittances, migrants send money back to their home countries due to their altruistic nature or desire to assist their families and communities. Thus, remittances are viewed as an act of selflessness rather than a form of investment or insurance. Although some critics have argued that this theory oversimplifies the multifaceted motivations driving remittance behaviour, it underscores the crucial role that altruism and a sense of obligation can play in shaping migrant behaviour, thus simultaneously promoting development in home countries.

2. Pure Self Interest Theory

The Pure self-interest theory of remittances was initially proposed by economist Thomas J. Espenshade in his book "The Remittance Revolution: Western Union and the Making of the American West" in 1971. According to this theory, migrants primarily send remittances for their own economic self-interest. They are viewed as rational economic actors who make decisions based on their self-interest and send remittances to invest in businesses, property, or other assets that will generate a return on investment. The theory suggests that migrants send remittances to maximize their economic gain rather than out of a sense of obligation or altruism. This motivation can have significant implications for the development and well-being of their home communities, as migrants are driven by a desire to improve their economic prospects and social status.

3. Portfolio Diversification Theory

The Portfolio Diversification Theory of remittances has been proposed by several scholars and economists. One of the earliest proponents of this theory was economist Richard H. Adams, who discussed this theory in his 1989 book titled "Foreign Exchange Constraints in Economic Development." According to this theory, the decision to remit is sometimes influenced by the offer of a risk return option to be weighed against local sources of income. One of the determinants of the return is the rate of interest that the remitter will receive on funds such as positive real interests. Consideration for interest rate differential on comparable deposit account offered in host and home countries, black market exchange premium, the return on real

estate in the home country, inflation rates and other returns will thus influence the decision as whether to remit or not.

2.2 Empirical Evidence

Numerous researches have explored the direct effects of the research understudy, and their findings have indicated positive, negative and mixed results.

2.2.1 Positive Results

Mukoka (2020) carried out research to scrutinize the association between remittance inflows and the growth of Zimbabwean economy. The study utilized time series data spanning from 1990 to 2019 and adopted the error correction model (ECM) to establish the correlation between remittance inflows and economic growth. The findings demonstrated that remittance inflows have a substantial stimulus on economic growth. Therefore, the study recommends that Zimbabwe create formal mechanisms to exploit all remittance inflows. In addition, the study considered other variables such as inflation, unemployment, and FDI to account for economic growth in Zimbabwe.

Chikozho and Makochekanwa (2014) also scrutinized this relationship in Zimbabwean economy using the vector autoregressive (VAR) model. Their study, which spanned from 1980 to 2012, revealed a meaningful and positive influence of remittance inflows on economic growth. Moreover, the impact was found to be greater than that of ODA and FDI.

In their research, Fayissa and Nsiah (2008) employed a linear Cobb-Douglas production function to analyse panel data for 37 African countries for the period 1980-2004. They investigated the contribution of remittances to economic growth relative to other factors that influence growth such as FDI, foreign aid, human and physical capital, openness of a country, polity and lagged income. They found that remittances influence on economic growth was positive and significant. A 10% increase in remittances led to 0.3% increase in GDP per capita. Fayissa and Nsiah (2008) argued that remittances enhance economic growth in countries where financial systems are not very strong. Remittances provide an alternative way to finance investment and help to overcome liquidity constraints.

In a study conducted by Adams and Page (2005), it was revealed that remittance inflows had a beneficial impact on economic growth in developing countries. Adams and Page (2005) used the data of 71 developing countries in their study on remittances, inequality, and poverty. It was concluded that remittances significantly reduce the level, depth and severity of poverty in the developing world. The study demonstrated that a 10% increase in remittances as a proportion of GDP led to a growth in per capita GDP ranging from 0.8% to 1.3%.

2.2.2 Negative Results

Giuliano and Ruiz-Arranz (2009) conducted a study that indicated the potential of remittance inflows to contribute to economic growth by financing investment and easing credit constraints. However, the study also identified a potential negative impact on growth, as remittances can lead to an increase in consumption of non-tradable goods and services.

Moreover, Barajas et al (2009) scrutinized the connection between remittance inflows and economic growth in Mexico from 1970 to 2006. They utilized a VAR model to analyse the dynamic relationship between remittances, real exchange rate, and GDP growth. Their findings revealed that remittance inflows had an adverse effect on economic growth in Mexico. Specifically, the study concluded that a 1% increase in remittance inflows corresponded to a 0.05% decrease in real GDP growth. According to the researchers, this negative impact was due to the Dutch Disease effect, where the appreciation of the exchange rate due to remittance inflows caused a decline in competitiveness of exports, which in turn led to a reduction in economic growth. Empirical results also indicate that remittances may indirectly affect real exchange rate leading to the "Dutch Disease" phenomenon. This is whereby remittances inflow causes a real appreciation or postpones depreciation of the exchange rate. Exchange rates appreciate in countries with large remittances which in turn hurts the economic growth.

Ratha (2003) conducted a study to scrutinize the effect of remittance inflows on growth of the Zimbabwean economy. The study used a regression analysis to estimate this relationship for the period from 1980 to 1999. The results of the study showed that there was a negative effect of remittance inflows on economic growth in Zimbabwe. The study found that other factors such as domestic investment, government policies, and macroeconomic stability had a greater influence on economic growth than remittance inflows. Ratha (2003) concludes that

remittances increase the consumption level of rural households, which might have substantial multiplier effects, because they are not likely to be spent on investment.

2.2.3 Mixed Results

Several studies have examined the link between remittances and economic growth in individual countries using time-series econometrics. For instance, Siddique, Selvanathan & Selvanathan (2012) investigated the causality between this relationship in Bangladesh, India, and Sri Lanka between 1976 and 2006. The study utilized the Granger causality test and found that the association between the two variables varied across the three countries. In Sri Lanka, economic growth led to an increase in remittance inflows, and remittance inflows also contributed to economic growth. In Bangladesh, an increase in remittance inflows supported economic growth, but economic growth did not influence remittance inflows. However, no causal relationship between remittances and economic growth was found in India.

Research on exploring this relationship has generated mixed outcomes. For instance, Singh et al (2010) conducted a study using panel data from 36 countries covering the period between 1990 and 2005 to examine the macroeconomic effects and determinants of remittances. They established two models: one for determining remittances and another for determining economic growth, using a standard growth model. The findings indicated that the size and location of the Diaspora were the primary determinants of remittances received. However, the influence of remittances on economic growth produced mixed outcomes. While remittances were found to be countercyclical and could help cushion economic shocks, there was a negative coefficient of remittances on growth in all the countries surveyed. This suggests that the adverse effects of remittances on economic growth were more significant than the positive ones.

2.3 Literature Gap Analysis

The research aims to explore the relationship between remittance inflows and economic growth in Zimbabwe (1990-2020), and it differs from other studies in various ways. Firstly, while Mukoka (2020) studied the same topic in Zimbabwe covering the period from 1990 to 2019, this research employs an OLS econometric model, while Mukoka's study employed an ECM model. Additionally, the study by Mukoka (2020) left out key control variables such as

financial development, gross capital formation, and openness of a country, which are going to be incorporated into this research.

Furthermore, the study by Chikozho and Makochekanwa (2014) in Zimbabwe covered a period from 1980 to 2012, and the study by Ratha (2003) in Zimbabwe covered a period from 1980 to 1999. In contrast, this study covers a more recent and relevant period from 1990 to 2020, which encompasses significant political changes in Zimbabwe, including the multicurrency regime and the change of government. It is worth noting that the sample size studied by Ratha (2003) was less than 30 years due to the lack of data, leading to a lower number of degrees of freedom and a lower level of accuracy in the estimated parameters.

Lastly, it is worth noting that previous studies such as Giuliano and Ruiz-Arranz (2009) and Singh et al. (2010) have tended to focus on a broad group of developing countries or a specific region such as Sub-Saharan Africa. These studies have used panel data, where one coefficient on remittances is used as a measure of the impact on growth for all countries. However, using one coefficient to measure the impact of several countries may not accurately reflect the impact on a specific country like Zimbabwe due to differences in the structure of the economy, policies, and income levels. Therefore, conducting this research is essential to fill the gap in the literature and provide a more comprehensive understanding of the relationship between remittance inflows and economic growth in Zimbabwe during, the 1990-2020 period.

2.4 Chapter Summary

This chapter examined the literature that has been produced by other scholars and researchers. It analysed the gaps in the research and provided a justification for why it is necessary to statistically explore this relationship in Zimbabwe. Additionally, the chapter reviewed various perspectives and opinions from different authors regarding this relationship. The following chapter will concentrate on explaining the methodology used to tackle the research questions.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

The aim of this chapter is to detail the methodology and model employed to explore the relationship between remittance inflows and economic growth in Zimbabwe from 1990 to 2020. This chapter will cover the research design, the population sampled, the data source and collection instrument. Moreover it contains the model specification, the justification of variables, the estimation procedures, and the econometric tests utilized in the analysis. Lastly, this chapter presents the anticipated outcomes of the research.

3.1 Research Design

This research utilized quantitative research techniques acceptable in the fields of Statistics and Economics, and secondary data was employed. According to Hair, Black, Babin, and Anderson (2014), secondary data refers to information that has been previously gathered, processed, and scrutinized by other researchers or organizations for their own specific purposes. Utilizing secondary data has several benefits, such as cost-effectiveness, availability of large sample sizes, and the ability to conduct historical analyses.

3.2 Population and Sample

The study extracted relevant data from RBZ, IMF, World Bank, and ZIMSTAT databases to obtain findings. A non-probability sampling method was employed, as it is more appropriate for exploratory research. Babbie (2016) suggested that non-probability sampling is often used in exploratory research to further explore identified patterns or trends. The study utilized time-

series data from 1990 to 2020. This period covers significant economic and political changes in Zimbabwe, such as the introduction of a multi-currency system in 2009, the adoption of the "Zimbabwe is Open for Business" mantra in 2017, and the change of government in 2017. The period also covers significant global event such as the COVID-19 pandemic in 2019.

3.3 Data Source

The data was extracted from trusted sources, namely the World Bank, IMF, RBZ, and ZIMSTAT databases. Booth, Sutton, and Papaioannou (2016) argued that collecting secondary data from trusted sources such as the World Bank has advantages, including reliability, wide coverage, and access. The researcher used triangulation as a data supporting technique by using multiple sources of secondary data to validate the findings (Patton, 2014). This approach adds strength to the study and helps to reduce potential biases or errors that could arise from using only one source of data.

The researcher encountered a significant challenge of missing data, especially for remittance inflows, financial development, and inflation. While most of the data was obtained from the World Bank, missing data for remittance inflows from 1995 to 2008 was obtained from the IMF BOP Statistics Yearbook. Financial development data from 2006 to 2008 was obtained from RBZ Monetary Policy Reports. Inflation data was extracted from ZIMSTAT due to missing values in other databases.

3.4 Data Collection Instrument

A structured data extraction checklist was used to identify the necessary variables and data points. The researcher used Microsoft Excel to collect the data by scraping it directly from the aforementioned databases, which reduced errors and minimized the need for manual data entry. Periodic reports, including annual reports, were also utilized to address gaps in the data.

3.5 Theoretical Model

This study adopts the saving-investment theoretical gap framework developed by Chenery and Strout (1966). The theory presumes that developing countries can use foreign inflow of funds

in which remittances is among, to achieve equilibrium in their saving investment gap. From the two-gap model, we have at equilibrium saving equals investment at all time as:

$$S_t = I_t \quad \text{.....3.1}$$

However, in reality, actual saving is usually less than investment (saving gap); therefore, remittance inflows can serve as external funds used to augment the low saving level with investment as:

$$S_t + remit_t = I_t \quad \text{.....3.2}$$

The capital stock equation where capital stock depends on saving can then be written as:

$$K_t = S_t + remit_t + (1 - \delta)K_{t-1} \quad \text{.....3.3}$$

In which case, the Cobb- Douglas production function that links capital stock, technology and labour to output is written as:.

$$Y_t = AL_t^{1-a}K_t^a \quad \text{...3.4}$$

Where Y_t is the gross domestic product (GDP); L_t is labour and K_t the capital stock. After writing equation 3.4 in per capita terms, equation 3.4 can further be written as:

$$y = Ak^a \quad \text{...3.5}$$

Where $y = Y/L$, $k = K/L$, y is output per labour, A is the exogenous technology taken as given and k is capital per labour ratio. Following equation 3.3 and previous studies such a Guiliano and Ruiz (2009) that remittances from migrants are spent on productive investment and capital stock in most cases, then equation 3.5 can be written as:

$$y = Aremmit^a \quad \text{...3.6}$$

Log linearizing equation 3.6 leads to:

$$y = A + \beta remmit \quad \text{...3.7}$$

Giuliano and Ruiz-Arranz (2009) employed control variables on equation 3.7 such as financial development, human capital, trade openness and institutional quality to analyse the relationship between remittances and economic growth in a panel data of 119 countries. The model, was specified as:

$$RGDP = \beta_0 + \beta_1 REM_t + \beta_2 FIN_t + \beta_3 HC_t + \beta_4 OPN_t + \beta_5 IQ_t + \mu_t \quad \text{.....3.8}$$

Where:

RGDP = Per Capita real GDP.

REM = Remittances received as a % of GDP.

FIN = Financial development measured by domestic credit to private sector as % of GDP.

HC = Human capital measured by the average years of schooling.

OPN = Trade openness measured by the sum of exports and imports as a % of GDP.

IQ = Institutional quality measured by the average score of six governance indicators.

,$\boldsymbol{\beta_0}$ **to** $\boldsymbol{\beta_5}$, are constant and $\mathbf{u_1}$ is an error term.

3.6 Model Specification

To scrutinize this relationship in Zimbabwe, the study utilized an OLS econometric model. Gujarati and Porter (2009) explain that the primary objective of model specification is to identify the independent variables that should be incorporated or excluded from an econometric model. The model used in this research included remittance inflows and control variables such as financial development, gross capital formation, trade openness, FDI, and inflation as independent variables. However, variables such as human capital and institutional quality were excluded from the model due to data unavailability. The dependent variable in this model is economic growth. Re-specifying equation 3.8, we have:

$$RGDP = \beta_0 + \beta_1 REM_t + \beta_2 FIN_t + \beta_3 GCF_t + \beta_4 FDI_t + \beta_5 OPN_t + \beta_6 INF_t + \mu_t \quad \text{.....3.9}$$

Where:

RGDP = Per Capita real GDP.

REM = Remittances received as a % of GDP.

FIN = Financial development measured by domestic credit to private sector as % of GDP.

GCF = Gross Capital Formation as a % of GDP.

OPN = Trade openness measured by the sum of exports and imports as a % of GDP.

FDI = Foreign Direct Investment received as a % of GDP.

INF = Inflation rate.

,$\boldsymbol{\beta_0}$ **to** $\boldsymbol{\beta_6}$, are constant and $\mathbf{u_1}$ is an error term.

3.7 Data Transformation

The researcher transformed the model in equation 3.9 by taking the logarithm of all independent variables to reduce variability and smooth out the dataset, resulting in elasticities for their respective coefficients (Gujarati and Porter, 2009). For estimation, the researcher utilized the following econometric model, specified in lin-log form:

$$\boldsymbol{RGDP = \beta_0 + \beta_1 LREM_t + \beta_2 LFIN_t + \beta_3 LGCF_t + \beta_4 LFDI_t + \beta_5 LOPN_t + \beta_6 LINF_t + \mu_t} \quad \textbf{.....3.10}$$

Where: **L** denotes Logarithm of.

3.8 Justification of Variables

The variables in the above model were chosen based on their theoretical relevance and empirical evidence of their relationship with economic growth.

3.8.1 Dependent Variable

1. Per Capita Real GDP: RGDP captures macroeconomic factors such as inflation and population growth, which significantly impact Zimbabwe's economic performance. Researchers like Giuliano and Ruiz-Arranz (2009), Fayissa and Nsiah (2008), and Adams and Page (2005) have used per capita real GDP as a dependent variable in their models to analyse this relationship.

3.8.2 Independent Variables

1. Remittance Inflows: Our variable of interest is REM, which refers to the money sent back to Zimbabwe from abroad and represents a significant source of foreign currency. REM is supported by all the theories and empirical studies discussed in Chapter 2. However, previous studies have shown mixed results, with some indicating a negative relationship and others a positive one. It is for this reason that this study is being carried out, as the researcher expects to find either a negative or positive sign for the relationship between REM and the dependent variable in Zimbabwe.

2. Financial Development: The inclusion of FIN as a control variable is supported by the finance-nexus growth theory. This theory posits that a well-functioning financial sector can stimulate economic growth by facilitating the efficient allocation of resources, promoting entrepreneurship, and providing credit to firms and households. Financial institutions can help to bridge the gap between savings and investment, which is crucial for economic growth, by providing loanable funds. Fayissa and Nsiah (2008) and Giuliano and Ruiz-Arranz (2009) both included financial development in their models and found a positive effect on economic growth. Therefore, in this study, the researcher expects to find a positive sign for the relationship between FIN and the dependent variable.

3. Gross Capital Formation: This is another control variable in the model and is supported by the Solow-Swan growth model. According to this theory, investment is a crucial element that determines the long-run growth rate of an economy. Investment leads to the accumulation of physical and human capital, which in turn increases productivity, output, and income levels. Chikozho and Makochekanwa (2014) and Ratha (2003) found a positive effect of GCF on economic growth. Hence, in this study, the researcher also expects to find a positive sign for the relationship between GCF and the dependent variable.

4. Foreign Direct Investment: One theory that supports the inclusion of FDI as a control variable is the Solow-Swan model, which argues that FDI can stimulate economic growth by increasing the availability of capital and technology in recipient countries. FDI is also supported by the dependency theory due to knowledge spill overs and technology transfer, which can enhance the productivity and efficiency of developing countries. Mukoka (2020) found a negative effect of FDI on economic growth, while Chikozho and Makochekanwa (2014) and Fayissa and Nsiah (2008) found a positive correlation. Therefore, in this study, the

researcher expects to find either a positive or negative sign for the relationship between FDI and the dependent variable.

5. Trade openness: The inclusion of OPN as a control variable is supported by the two-gap model, which emphasizes the importance of import and export balance in achieving economic growth. This theory suggests that a country can decrease its foreign exchange deficit by concentrating on producing goods that it has a comparative advantage in and exchanging them with other nations. Fayissa and Nsiah (2008) and Giuliano and Ruiz-Arranz (2009) found a positive relationship between openness and economic growth. Therefore, in this study, the researcher also expects to find a positive relationship between OPN and the dependent variable.

6. Inflation: Including INF as a control variable helps measure the macroeconomic stability of the economy, as discussed in previous studies by Fischer (1993) and Modigliani and Miller (1958), and it should be included in the model. Mukoka (2020) found a negative effect of inflation on economic growth. Therefore, in this study, the researcher expects to find a negative relationship between INF and the dependent variable.

Table 1: Summary of Variables and Expected Signs

Independent Variable	**Expected Sign**
Remittance Inflows	Positive (+) or Negative (-)
Financial Development	Positive (+)
Gross Capital Formation	Positive (+)
Foreign Direct Investment	Positive (+) or Negative (-)
Trade Openness	Positive (+)
Inflation	Negative (-)

3.9 Estimation Method

The research will employ the Ordinary Least Squares (OLS) technique to determine the effect of REM and other independent variables on RGDP. OLS is a highly dependable approach for evaluating the correlation between economic variables because it provides the most accurate linear unbiased estimates (BLUE). Consequently, diagnostic tests must be conducted to make sure that estimates are BLUE.

3.10 Econometric Model Diagnostic Testing

The researcher is going to employ some diagnostics test in order to check the assumptions of OLS and make sure that they are BLUE.

3.10.1 Stationery Test

The stationarity of a time series is determined by the consistency of its mean, variance, and auto-covariance across various lags (Gujarati 2004). Non-stationary series can have unlimited persistence of shocks, which can influence their behaviour and properties. The Augmented Dickey Fuller (ADF) test is commonly used to test for stationarity. ADF tests whether a series has a unit root or not. The hypothesis are stated as:

H0: The series has no unit root

H1: The series has a unit root

3.10.2 Multicollinearity Test

Cook and Weisberg (1982) defined multicollinearity as a situation where some explanatory variables in a model have a perfect linear relationship, or when they are highly inter-correlated. This can make it difficult to isolate the separate effects of each explanatory variable on the dependent variable. If some or all explanatory variables are highly correlated, with a correlation coefficient above 0.8, it can lead to low t-ratios and high p-values. To test for multicollinearity, this study will use the correlation matrix. The hypothesis are stated as:

H0: There is no multicollinearity among explanatory variables

H1: There is multicollinearity among explanatory variables

3.10.3 Heteroskedasticity Test

According to Gujarati (2004), heteroskedasticity occurs when the errors in a model do not have a constant variance across observations. This can be due to outliers or the absence of important

variables in the model. Consequences of ignoring heteroscedasticity results in biased and inefficient estimates. This study will use the Breusch-Pagan-Godfrey test to determine if heteroskedasticity exists. The hypothesis are stated as:

H0: There is homoskedasticity

H1: There is heteroskedasticity

3.10.4 Autocorrelation Test

Autocorrelation occurs when there is a non-zero covariance among different error terms, indicating a relationship between two or more successive error terms (Gujarrati, 2004). Autocorrelation may occur when the assumption of independence between consecutive values of the error term is violated. This can happen if influential variables are excluded from the model. The study will employ the Durbin Watson and the Breusch Godfrey test to test for autocorrelation in the model. The hypothesis are stated as

H0: There is no autocorrelation

H1: There is autocorrelation

3.10.5 Normality Test

OLS assumes that the error terms in the model are normally distributed, and failure to meet this assumption can lead to biased and inefficient parameter estimates. Therefore, before conducting OLS regression, it is essential to test for the normality of the error terms. The normality test helps to ensure that the OLS model is valid and reliable for making accurate predictions and statistical inferences. The researcher plans to use Jarque-Bera test, which tests the skewness and kurtosis of the error terms against the normal distribution. The hypothesis are stated as:

H0: The error term is normally distributed.

H1: The error term is not normally distributed.

3.11 Econometric Model Stability Testing

The researcher is going to test the stability of the model because it is essential and useful for policy analysis and forecasting. If a model is unstable, its predictions may be unreliable, and its usefulness may be limited. The researcher will employ a CUSUM of squares test to test the stability of the model. The CUSUM of squares test is a statistical method used to detect changes in the variance of a time series or process. It involves calculating the cumulative sum of squared deviations from the mean of the process over time and comparing this cumulative sum against a threshold value to determine if a change in variance has occurred. The hypothesis are stated as:

H0: The model is stable for forecasting.

H1: The model is not stable for forecasting.

3.12 Chapter Summary

This chapter provided an overview of the research methodology, including the research design, sample population, data source and collection instrument, econometric model specification, justification of the variables used, diagnostic and stability tests to be conducted on the model. The purpose of the chapter was to outline the approach that will be used to carry out the study. The econometric model developed is expected to provide a comprehensive analysis of the relationship understudy in Zimbabwe.

CHAPTER IV

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

Without conducting data analysis, it would not be practical to claim that: remittance inflows, financial development, trade openness, foreign direct investment and inflation, affect economy growth in Zimbabwe. This chapter presents the findings and outcomes of the research. The statistical software E-views 7 was employed to explore the relationship between remittance inflows and economic growth. This chapter also includes a description of the data, diagnostic evaluations, regression findings, and the importance of the econometric model. Ultimately, a succinct summary of the research findings is provided, along with a discussion of the connections observed between the independent variables and the dependent variable.

4.1 Descriptive Statistics

Gujarati & Porter (2009) define descriptive statistics as a set of techniques used to summarize and describe important features of a dataset, such as its central tendency, dispersion, and shape. These techniques enable researchers to gain insights into the data's distribution and properties, without drawing conclusions about the overall population. Some common measures of descriptive statistics include: mean, median, mode, standard deviation, range, skewness, kurtosis, and correlation coefficients. In this study, data spanning a 30-year period from 1990 to 2020 was analysed, and summary statistics were calculated for each variable based on the 30 observations. Table 2 below presents the summary statistics for each variable.

Table 2: Descriptive Statistics

	RGDP	LREM	LFIN	LGCF	LFDI	LOPN	LINF
Mean	14505.42	-0.221721	1.171305	1.037090	-0.125665	1.829339	0.551574
Median	14623.43	0.386317	1.239277	1.118796	0.035952	1.847893	0.336812
Maximum	18385.89	1.133904	1.924550	1.375280	0.841363	2.039500	2.781717
Minimum	8486.446	-2.392716	0.183320	0.183320	-1.490908	1.659529	-0.434838
Std. Dev.	2732.466	1.289993	0.330379	0.298053	0.542527	0.090421	0.807903
Skewness	-0.436512	-0.309327	-0.692420	-1.475272	-0.921123	0.070472	1.402419
Kurtosis	2.281133	1.358735	4.571569	4.950120	3.247719	2.378960	4.165217
Jarque-Bera	1.651967	3.973788	5.667331	16.15705	4.463011	0.523844	11.91542
Probability	0.437804	0.137121	0.058797	0.000310	0.107367	0.769571	0.002586
Sum	449668.1	-6.873344	36.31046	32.14980	-3.895628	56.70950	17.09879
Sum Sq. Dev.	2.24E+08	49.92249	3.274509	2.665063	8.830057	0.245276	19.58119
Observations	30	30	30	30	30	30	30

Source: Eviews 7

Table 2 displays the descriptive statistics for the 7 variables used in the research model, which was based on 30 observations. Standard deviation (Std. Dev.) measures the extent to which data points deviate from the mean (Crawshaw, Lewis & Clegg, 2011). When the standard deviation is higher, it implies that there is more variation among the data points. Conversely, a lower standard deviation indicates that the data points are closer to the mean. In this particular case, RGDP exhibits the highest standard deviation, implying that its values are more dispersed than those of the other variables.

According to Crawshaw et al (2011), skewness measures the degree of asymmetry in a distribution. Positive skewness indicates a right-skewed distribution while negative skewness suggests a left-skewed distribution. In this instance, most of the variables display negative skewness, except for LINF and LOPN, which exhibit positive skewness.

The Jarque-Bera test checks for normality, evaluating whether data follows a normal distribution. Here, we observe that LFIN, LGCF, and LINF have low Jarque-Bera values below the p-value of 0.1, which indicates that they are not normally distributed. It is worth mentioning that in OLS, it is crucial for the residuals of the variables to follow a normal distribution, not necessarily the variables themselves. Therefore, we don't have to worry about the variables that are not normally distributed.

4.2 Econometric Model Diagnostic Test

As the model utilizes time series data, it is probable that it may encounter issues such as autocorrelation, multicollinearity, non-stationarity, and specification errors. Consequently, diagnostic tests were conducted to assess the strength and credibility of the model, as specified in the methodology chapter.

4.2.1 Stationery Test

Time series data is often non-stationary, which can result in inaccurate regression results and an inflated R2 value. To ensure that the variables are integrated at the same level, unit root tests was conducted using the Augmented Dickey-Fuller (ADF) test to establish the time series properties of the variables. Variables tests were performed in their levels and the results are shown in table below.

Table 3: ADF at Level – (I (0))

Variable	ADF Test Statistic	1%	5%	10%	Probability	Status
RGDP	-1.823811	-3.679322	-2.967767	-2.622989	0.3620	Non Stationary
LREM	-1.686142	-3.670170	-2.963972	-2.621007	0.4278	Non Stationary
LFIN	-1.867658	-3.670170	-2.963972	-2.621007	0.3423	Non Stationary
LGCF	-1.955152	-3.670170	-2.963972	-2.621007	0.3040	Non Stationary
LFDI	-2.833927	-3.670170	-2.963972	-2.621007	0.0656	Non Stationery
LOPN	-2.706280	-3.670170	-2.963972	-2.621007	0.0847	Non Stationery
LINF	-2.038206	-3.670170	-2.963972	-2.621007	0.2698	Non Stationery

Source: Eviews 7

Table 3 above displays that all variables are non-stationary at the level using the 5% critical value as the maximum critical value. Although LFDI and LOPN are significant at 10%, the researcher concluded that they are non-stationary. It is important to note that accepting a unit root test at a higher significance level may increase the risk of a Type I error and lead to incorrect conclusions. As all variables were non-stationary, the data analysis process did not continue, and the researcher employed the ADF test at first difference for all variables.

Table 4: ADF at First Difference – (I (1))

Variable	ADF Test Statistic	1%	5%	10%	Probability	Status
RGDP	-3.364281	-3.679322	-2.967767	-2.622989	0.0209	Stationery @ 5%
LREM	-6.041333	-3.689194	-2.971853	-2.625121	0.0000	Stationery @ 1%
LFIN	-4.485429	-3.679322	-2.967767	-2.622989	0.0013	Stationery @ 1%
LGCF	-5.341044	-3.679322	-2.967767	-2.622989	0.0001	Stationery @ 1%
LFDI	-7.336587	-3.679322	-2.967767	-2.622989	0.0000	Stationery @ 1%
LOPN	-7.339555	-3.679322	-2.967767	-2.622989	0.0000	Stationery @ 1%
LINF	-6.393138	-3.679322	-2.967767	-2.622989	0.0000	Stationery @ 1%

Source: Eviews 7

Table 4 presents the results of the unit root tests for all variables at their first difference, and it indicates that all variables exhibit stationarity, meaning that they are integrated of order one (I(1)). After running the ADF at the first difference, the model was re-estimated, as shown below, and the data analysis process continued.

$$\boldsymbol{\Delta RGDP = \beta_0 + \beta_1 \Delta LREM_t + \beta_2 \Delta LFIN_t + \beta_3 \Delta LGCF_t + \beta_4 \Delta LFDI_t + \beta_5 \Delta LOPN_t + \beta_6 \Delta LINF_t + \mu_t} \quad \textbf{4.1}$$

Where: **Δ** denotes a change in.

4.2.2 Multicollinearity Test

Time series data is typically multicollinear, so researchers are concerned with the extent of multicollinearity rather than its mere existence. According to Gujjarati (2004), to accept the null hypothesis that the estimated model has no multicollinearity, the coefficient of determination among explanatory variables should be lower than 0.80. To determine if the correlation among the independent variables: ΔLREM, ΔLFIN, ΔLGCF, ΔLFDI, ΔLOPN and ΔLINF are within acceptable limits, a test for multicollinearity was conducted. Table 5 presents the correlation matrix used for the multicollinearity test.

Table 5: Correlation Matrix

Variable	ΔLREM	ΔLFIN	ΔLGCF	ΔLFDI	ΔLOPN	ΔLINF
ΔLREM	1.000000	-0.505327	-0.308241	0.560619	0.025942	0.320237
ΔLFIN	-0.505327	1.000000	0.171633	-0.215192	-0.076146	-0.340242
ΔLGCF	-0.308241	0.171633	1.000000	-0.028518	-0.221971	0.014885
ΔLFDI	0.560619	-0.215192	-0.028518	1.000000	0.218533	0.117431
ΔLOPN	0.025942	-0.076146	-0.221971	0.218533	1.000000	-0.274975
ΔLINF	0.320237	-0.340242	0.014885	0.117431	-0.274975	1.000000

Source: Eviews 7

As shown in Table 5, all variables have a correlation of less than 80%, indicating that the model does not suffer from multicollinearity.

4.2.3 Model Robustness Test

The researcher encountered issues of autocorrelation and heteroscedasticity in the model, despite not having multicollinearity as indicated above. The researcher addressed these issues by dropping the insignificant variable, ΔLINF, which was contributing to overfitting and reducing the model's robustness by negatively impacting the Durbin-Watson statistic and the F-statistic. The researcher created Model 2 without ΔLINF to test the robustness of the results under alternative specification. Using model 2, the researcher tested the model for heteroscedasticity and autocorrelation as indicated by the results below. Model 2 which is going to be used for this research is now estimated as:

$$\boldsymbol{\Delta RGDP = \beta_0 + \beta_1 \Delta LREM_t + \beta_2 \Delta LFIN_t + \beta_3 \Delta LGCF_t + \beta_4 \Delta LFDI_t + \beta_5 \Delta LOPN_t + \mu_t} \quad \textbf{4.2}$$

Where: Δ denotes a change in.

4.2.4 Heteroskedasticity Test

Heteroscedasticity arises when homoskedasticity is lacking, which means that the error term's variance is unequal. In case heteroskedasticity is present during data estimation, it may cause the confidence interval to be too broad, thereby reducing the likelihood of rejecting the null

hypothesis. To check for homoscedasticity, the researcher performed the Breusch-Pagan Godfrey Test.

Table 6: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.871887	**Prob. F(14,99)**	0.1353
Obs*R-squared	8.444332	**Prob. Chi-Square(14)**	0.1334

Source: Eviews 7

From Table 6, it can be observed that the F-statistic probability value is 0.1353, which is greater than the significance level of 0.1. Therefore, there is no evidence to reject the null hypothesis that the error variance is homoscedastic. The p-value of Obs*R-squared is also greater than 0.1, further supporting the presence of homoscedasticity, indicating that the error term's variance is constant across all observations. If the test had indicated the presence of heteroscedasticity, the researcher would have corrected the problem using the heteroskedasticity consistent standard errors covariance. However, since the model is not suffering from heteroscedasticity, such a correction is not necessary.

4.2.5 Autocorrelation Test

Autocorrelation refers to the correlation between the independent variables and the error term in a model. To determine whether there is any autocorrelation, the Durbin Watson statistic is a widely used method. A DW statistic value of approximately 2 signifies the lack of autocorrelation. The current model has a DW statistic of 1.579533, indicating the absence of autocorrelation. However, due to the DW test's ambiguity, the researcher carried out the Breusch-Godfrey Serial Correlation LM Test to investigate further the presence of autocorrelation.

Table 7: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.021533	**Prob. F(14,99)**	0.3758
Obs*R-squared	2.529046	**Prob. Chi-Square(14)**	0.2824

Source: Eviews 7

Table 7 displays that the probability value of the F-statistic is 0.3758, which surpasses the significance level of 0.1. Hence, there is no proof to reject the null hypothesis that the model

lacks autocorrelation. Furthermore, the p-value of Obs*R-squared is also higher than 0.1, which adds more confirmation to the absence of autocorrelation in the model.

4.2.6 Normality Test

The OLS model's normality test is a statistical evaluation to check if the model's residuals follow a normal distribution. Residuals refer to the differences between the predicted and actual values of the dependent variable. If the residuals are normally distributed, it indicates that the model is suitable for the data, and the predicted values are close to the actual values. To conduct the normality test, the researcher used a Histogram-Normality Test.

Table 8: Histogram-Normality Test

Skewness	-0.551097	**Jarque-Bera**	1.639336
Kurtosis	3.233093	**Probability**	0.440578

Source: Eviews 7

Table 8 demonstrates that the Jarque-Bera statistic equals 1.639336 with a corresponding probability value of 0.440578. Since the p-value is greater than 0.05, there is insufficient evidence to reject the null hypothesis that the residuals conform to a normal distribution. Therefore, we can conclude that the OLS model is accurately specified and an appropriate fit for the data.

4.3 Econometric Model Results

As previously discussed, the formulation of an econometric OLS model relies on various underlying assumptions. After conducting diagnostic tests, the researcher proceeded to perform a regression analysis of the model using Eviews 7, and the resulting outcomes are presented below.

Table 9: OLS Model Results

Dependent Variable: ΔRGDP Method: Least Squares Included observations: 30 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	21570.94	6529.494	3.303616	0.0029
ΔLREM	-1273.418	312.6409	-4.073100	0.0004
ΔLFIN	2371.946	959.3709	2.472397	0.0206
ΔLGCF	2658.791	1013.443	2.623522	0.0146
ΔLFDI	1491.537	647.5144	2.303481	0.0298
ΔLOPN	-6940.271	3240.948	-2.141433	0.0422
R-squared **Adjusted R-squared**	0.754468 0.705362			
F-statistic **Prob(F-statistic)**	15.36397 0.000001	**Durbin-Watson stat**	1.579533	

Source: Eviews 7

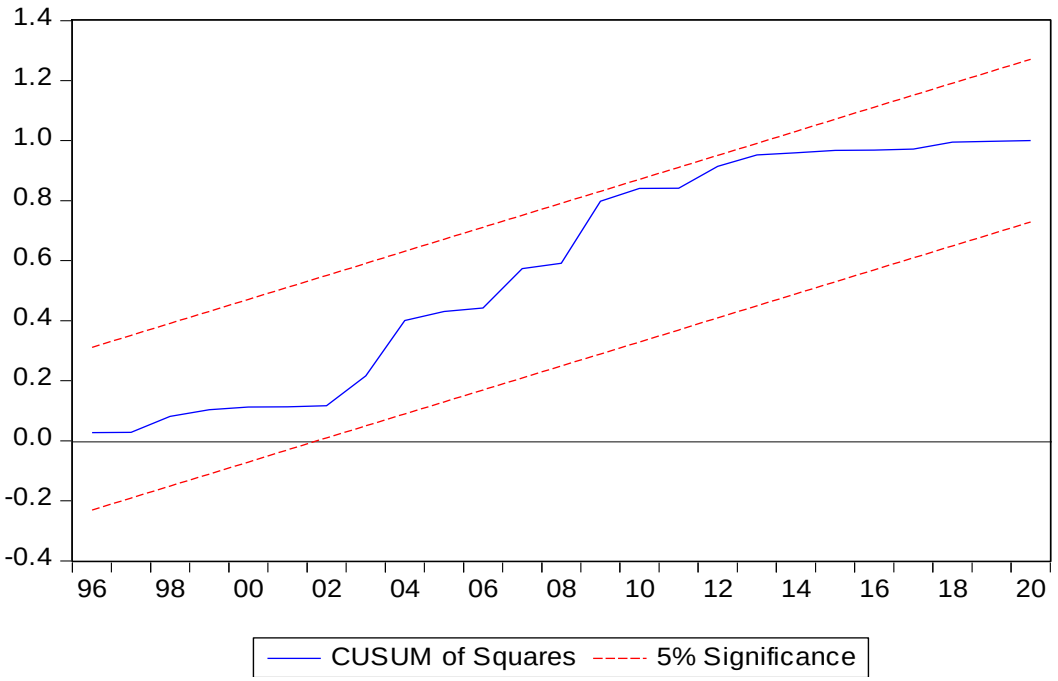
4.3.1 Model Significance

The results demonstrate that the R-squared value is 0.754468, indicating that approximately 75% of the variation in ΔRGDP can be explained by the independent variables, while the remaining 25% is attributed to other factors captured by the error term of the model. The Adjusted R-squared value of 0.705362 suggests that the model is accurately specified. Furthermore, the F-statistic has a value of 15.36397 with a probability of 0.000001, measuring the overall significance of the model and how well the included variables explain ΔRGDP. Based on the results, the model is statistically significant at the 1% level of significance because the p-value of the F-statistic is less than 0.01.

4.3.2 Model Stability Test

Model stability refers to the ability of an economic model to maintain its validity and reliability over time or under different conditions. An economic model is stable when it produces consistent and reliable results when applied to different datasets or used to make predictions under different scenarios. The researcher performed a CUSUM of squares test, and the results are presented in Figure 3 below.

Figure 3: CUSUM of Square Test



Source: Eviews 7

Figure 3 above presents the CUSUM of squares results without structural breaks under a 5% significance level. Therefore, there is no evidence to reject the null hypothesis that the model is stable for forecasting. It can be concluded that the estimated model can be used for policy formulation and forecasting with a 95% c confidence level.

4.4 Model Results Interpretation and Discussion

The model result was used to derive the equation below for interpreting the results of the model by plugging in the obtained coefficients.

Table 10: Substituted Coefficients: Lin-Log Model

ΔRGDP = 21570.94- 1273.418*Δ**LREM** + 2371.946*Δ**LFIN** + 2658.791*Δ**LGCF** + 1491.537*Δ**LFDI** - 6940.271*Δ**LOPN**

Source: Eviews 7

4.4.1 Remittance Inflows

The estimated coefficient of ΔLREM is negative and statistically significant at the 1% level of significance. The results indicate that, while holding all other factors constant, a 1% increase in ΔLREM leads to a $12.73 **(1273.418/100*)*** decrease in ΔRGDP. With 99% confidence, it can be concluded that a 1% increase in the change of remittance inflows results in a $12.73 decline in the change of per capita income. The observed effect runs contrary to the prediction of the theories discussed in Chapter 2, which suggests that remittance inflows boost GDP growth. However, the results align with those of Barajas et all (2009), Ratha (2003) and Giuliano and Ruiz-Arranz (2009), who identified a negative relationship. Based on these findings, the researcher confidently concluded that, despite their large volumes, remittance inflows are having a negative impact on Zimbabwe's economy.

Possible economic reasons that may explain the negative impact of remittance inflows on economic growth in Zimbabwe, as investigated by the researcher, include:

1. Dutch disease effect: Barajas et all (2009) applied the Dutch Disease theory to clarify the consequences of remittances on the economy and introduced a micro-macro framework to begin channels of transmission of remittances through the economy. Their findings focus on the fact that remittances can cause real exchange rate appreciation leading to sectoral production reallocation. The study argues that several shocks in remittances may take the economy towards a negative growth route resulting from the weakening of the traded sector. In Zimbabwe, most remittances are received through formal channels and are being used to fuel the black market exchange rate, leading to exchange rate volatility, a phenomenon known as the 'Dutch disease'.

2. Dependence on remittances: The heavy dependence on remittance inflows can also have implications for overall economic growth in Zimbabwe. The volatility and uncertainty associated with remittance inflows can hinder the stability economic growth factors. A sudden reduction in remittance inflows can lead to decreased domestic consumption, reduced investment opportunities, and an overall slowdown in economic growth.

3. Brain drain: Large volumes of remittance inflows are resulting from a significant portion of the population (4 million approximation) leaving the country for better job opportunities abroad. This can lead to a decline in human capital and skills in the domestic labour market, negatively impacting per capita income and economic growth.

4.4.2 Financial Development

The impact of ΔLFIN, as a proxy of domestic credit to private sector as % of GDP, on ΔRGDP is positive and significant at the 5% level of significance. Holding all other factors constant, a 1% increase in ΔLFIN leads to a $23.72 **(2371.946/100)** increase in ΔRGDP. With 95% confidence, it can be concluded that a 1% increase in the change of financial development results in an increase in the change of per capita income by $23.72. This conforms to the finance-nexus growth theory which emphasize that the development of the financial sector helps provide loanable funds for investment purposes, leading to enhanced GDP growth. The findings also support the results of Fayissa and Nsiah (2008) and Giuliano and Ruiz-Arranz (2009).

4.4.3 Gross Capital Formation

The estimated coefficient of ΔLGCF is positive and significant at 5% level of significance. A 1% increase in ΔLGCF, leads to $26.59 **(2658.791/100)** increase in ΔRGDP. With 95% confidence, it can be concluded that a 1% increase in the change of gross capital formation results in a positive increase in the change of per capita income by $26.59. This conforms to the Solow-Swan growth model which emphasize the great role that capital formation play in increasing the potential level of an economy. The findings are also in tandem with Chikozho and Makochekanwa (2014) as well as Ratha (2003).

4.4.4 Foreign Direct Investment

The estimated coefficient of ΔLFDI is positive and significant at 5% level of significance. A 1% increase in ΔLFDI, leads to $14.92 **(1491.537/100)** increase in ΔRGDP. With 95% confidence, it can be concluded that a 1% increase in the change of foreign direct investment results in a positive increase in the change of per capita income by $14.92. This conforms to the Solow-Swan growth model which posits that FDI can stimulate economic growth by increasing the availability of capital and technology in recipient countries. Chikozho and Makochekanwa (2014) and Fayissa and Nsiah (2008) also found out the same result.

4.4.5 Trade Openness

Openness of the economy is often seen as a way to boost growth (Ayanwale, 2007). However, the research did not yield the expected sign as the coefficient of ΔLOPN is negative and significant at the 5% level of significance. This means that a 1% increase in ΔLOPN results in a $69.40 **(6940.271/100)** decrease in ΔRGDP. With 95% confidence it can be concluded that a 1% increase in the change of trade openness leads to a decline in the change of per capita income by $69.40. This finding contradicts a study by Fayissa and Nsiah (2008) and Giuliano and Ruiz-Arranz (2009) that found a positive and significant impact of openness on GDP growth. The negative coefficient may be attributed to poor terms of trade, as Zimbabwe imports expensive products and its exports are usually low value-added.

4.4.6 Inflation

The variable was dropped from the model as part of the model robustness test performed during the econometric model diagnostic tests.

4.5 Chapter Summary

This chapter presents the findings of the study for the specified period. Diagnostic tests were conducted for the OLS estimator, which provided sufficient evidence that the estimated model is BLUE thus reliable and unbiased. Moreover the model is also stable in explaining economic growth in Zimbabwe. The chapter has successfully answered 2 research questions and achieved its 2 objectives of examining the relationship and impact of remittance inflows on economic growth. The next chapter will focus on presenting the conclusions of the study, as well as recommendations based on the empirical evidence presented in this chapter.

CHAPTER V

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 Introduction

This chapter provides an extensive overview of the research conducted in the previous chapter, including a summary of the empirical results. The chapter also presents conclusions drawn from the research findings and suggests policy recommendations that align with these conclusions. The aim of this chapter is to answer the third research question of the research, which is to provide policy recommendations based on the empirical results. Lastly, the chapter suggests potential avenues for future research.

5.1 Summary

The main aim of this research was to investigate the relationship between remittance inflows and economic growth in Zimbabwe from 1990 to 2020. Time series data for this period was obtained from various databases, including World Bank, IMF, RBZ, and ZIMSTAT, and used to estimate an OLS econometric model. The model was regressed using E-views 7 statistical package and diagnostics test were carried out to make sure that the model was BLUE. The study was prompted by the large volumes of remittances received by Zimbabwe, and the research problem was to determine if these remittances actually enhance economic growth in the country, given the limited empirical evidence on the subject. The researcher conducted the study with the aim of providing insight for policy formulation to help the country achieve its objective of becoming a middle-income economy by 2030. The researcher encountered challenges due to gaps in the data from the databases mentioned earlier, and had to use reports to fill in missing data.

The model developed by the researcher was based on a theoretical framework and empirical evidence from other researchers. To ensure that the model captured the main aspects of economic growth in Zimbabwe, the researcher included remittance inflows and control variables such as: financial development, gross capital formation, FDI, inflation and openness of the country. However, due to the modelling techniques used to create the best possible model, the researcher later dropped inflation from the model. The CUSUM test confirmed 95% confidence in the model's stability for forecasting.

Based on the findings and observations, the following conclusions were drawn.

5.2 Conclusion

Based on the research question, which is 'what is the nature of the relationship between remittance inflows and economic growth in Zimbabwe?' and 'What is the impact of remittance inflows on economic growth in Zimbabwe?'. The following conclusions were made,

- There is a negative econometric relationship between remittance inflows and economic growth in Zimbabwe.
- Remittance inflows have a negative impact on the Zimbabwean economy mainly due to the Dutch disease, a situation where the real exchange rate appreciates as a result of remittance inflows, fuelling the black market rate. Furthermore, remittance inflows are a result of brain drain which cause decline in human capital and skills in the domestic labour market.

Based on the results from the model, it can also be concluded that:

- Gross capital formation, financial development, and FDI have the positive impact on economic growth in Zimbabwe.
- Emphasis should be placed on gross capital formation and financial development to achieve a sustainable growth in Zimbabwe.
- Openness negatively impacts economic growth due to imports outweighing exports in Zimbabwe.

5.3 Policy Recommendation

Based on the above conclusions and the third research question, 'What are the policy recommendations based on the study?'. The following recommendations are proposed by the researcher;

1. Diversification of the economy: Reducing dependence on remittance inflows and diversifying the sources of income is crucial for Zimbabwe's economic resilience. For instance, it can encourage the growth of other industries, such as agriculture, manufacturing, and tourism. One way to do this is by offering tax incentives and financial support to businesses in these sectors. Policies aimed at promoting exports can also help to diversify the economy while reducing its reliance on imports and remittance inflows.

2. Promotion of financial inclusion: To promote financial inclusion and reduce reliance on informal financial channels, the government can expand access to financial services in rural areas and among the unbanked population. There should be diversification of the banking services and increased financial inclusion such as the use of mobile banking, internet banking, automated teller machines (ATM) and rural banking that will integrate more remittance-recipient households from the informal financial sectors into the formal financial system for inclusive growth. By doing so, more people would have access to formal financial channels for remittances and other financial transactions, potentially reducing the cost of such transactions and enhancing financial stability. This would also enable more people to save, borrow, invest, and insure, thereby fostering economic development and reducing poverty.

3. Solve correspondent banking problems: The government should collaborate with the central bank and other stakeholders to enhance the country's anti-money laundering and counter-terrorism financing (AML/CFT) regime. This will enable Zimbabwean banks to carry out cross-border transactions and access foreign markets. Actions directed towards this initiative might involve strengthening the legal and regulatory framework, stepping up supervision and enforcement, and offering training and capacity building to relevant parties. By doing so, the government can help improve the overall AML/CFT environment in Zimbabwe.

4. Reduction of banking transaction cost: To promote the use of formal channels for remittances, the government can explore policies aimed at reducing the transaction costs associated with such inflows. This may involve incentivizing financial institutions to lower

their remittance transfer fees and other related charges. By doing so, more people are likely to opt for formal channels for their remittances, which could ultimately lead to increased financial inclusion and economic development.

5. Improving access to finance: To enhance access to finance for small and medium-sized enterprises (SMEs), the government could establish credit guarantee schemes and venture capital funds. Such measures would reduce the cost of finance and expand the pool of funding available to businesses. By doing so, the government could encourage entrepreneurship, job creation, and economic growth, particularly in sectors dominated by SMEs for example Gazaland Complex Centre.

5.4 Suggestion of Areas For Future Study

Additional research is necessary to investigate the impact of remittances on various sectors of the Zimbabwean economy, beyond their relationship with economic growth. Currently, there is limited knowledge regarding how remittances impact other industries such as agriculture and manufacturing. Therefore, further research is needed to shed light on this topic and better understand the broader economic effects of remittance inflows in Zimbabwe.

Moreover, there is need for further research in the investigation of the impact of informal sector remittance channels in Zimbabwe. While existing studies have primarily focused on formal remittance channels, additional research is also necessary in order to understand the implications of informal channels. This is particularly in rural areas with limited access to formal financial institutions. Further research would be ideal in the exploration of the role of the informal remittance channels and their potential impact on the Zimbabwean economy.

Finally, the researcher identified correspondent banking as a potential approach to attract more remittances through formal channels and promote financial development. However, additional research is necessary to examine this issue more closely and identify any potential linkages between correspondent banking and remittance inflows. Therefore, further research is needed to examine the potential benefits and challenges of correspondent banking in the context of the Zimbabwean economy.

REFERENCES

Acemoglu, D. 2009. Introduction to Modern Economic Growth: Princeton University Press.

Adams, R. H. 1965. Remittances and Economic Development: Oxford Economic Papers Volume 17(2): 288-319.

Adams, R. H. 1989. Foreign Exchange Constraints in Economic Development: World Development Volume 17(3): 351-361.

Adams, R. H. and Page, J. 2005. Do International Migration and Remittances Reduce Poverty in Developing Countries?**:** World Development Volume33 (3):45-69.

Adepoju, O. 2019. Economic Structural Adjustment Programme (ESAP) And the Socio-Economic Development of Zimbabwe: An evaluation. Journal of Social Sciences: Volume 58(3): 147-154.

Arestis, P. and Demetriades, P. O. 1997. Financial Development and Economic Growth: Assessing the Evidence: Economic Journal Volume 107(442): 783-799.

Ayanwale, B. 2007. FDI and Economic Growth: Evidence from Nigeria: AERC Research Paper, No. 165, AERC, Nairobi.

Babbie, E. 2016. Sampling in the Practice of Social Research (15th ed.): Cengage Learning.

Barajas, A., Chami, R., Fullenkamp, C., Gapen, M. and Montiel, P. 2009. Do Workers' Remittances Promote Economic Growth?: IMF Working Papers, 09/153.

Booth, A., Sutton, A. and Papaioannou, D. 2016. Systematic Approaches to a Successful Literature Review (2nd ed.): Sage.

Carbaugh, R. J. 2019. International Economics (17th ed): Cengage Learning.

Cardoso, F. H. and Faletto, E. 1979. Dependency and development in Latin America: University of California Press.

Chenery, H. B. and Strout, A. M. 1966. Foreign Assistance and Economic Development: The American Economic Review Volume 56(4): 679-733.

Chikozho, C. and Makochekanwa, A. 2014. The Impact of Remittances on Economic Growth in Zimbabwe: An ARDL Bounds Testing Approach: Journal of Economics and Behavioral Studies Volume 6(11): 858-873.

Cook, R. D. and Weisberg, S. 1982. Residuals and Influence in Regression, New York: Chapman and Hall.

Crawshaw, J., Lewis R. and Clegg, R. 2011. Business Statistics: McGraw-Hill Education.

Dos Santos, T. 1970. The Structure of Dependence: American Economic Review Volume 60(2): 231-236.

Espenshade, T. J. 1971. The Remittance Revolution: Western Union and the Making of the American West, New Jersey: Princeton University Press.

Fayissa, B. and Nsiah, C. 2008. The Impact of Remittances on Economic Growth and Development in Africa: WB Policy Research Working Paper 2008-02.

Fischer, S. 1993. The Role of Macroeconomic Factors in Economic Growth: Journal of Monetary Economics Volume 32(2): 485-512.

Giuliano, P. and Ruiz-Arranz, M. 2009. Remittances, Financial Development and Growth: Journal of Development Economics Volume 90(1): 144–152.

Gujarati, N. D. 2004. Basic Econometrics (4th ed), New Delhi: McGraw Hill.

Gujarati, D. N. and Porter, D. C. 2009. Basic Econometrics (International ed), New York: McGraw Hill.

Hair, J. F., Black, W. C., Babin, B. J. and Anderson, R. E. 2014. Multivariate Data Analysis (7th ed): Pearson.

IMF. 2022. Economic Outlook, Washington DC.

International Organization for Migration. 2018. "Glossary on Migration." Available at https://publications.iom.int/system/files/pdf/iml_34_glossary.pdf [Retrieved on 06 March 2023].

International Organization for Migration. 2020. Zimbabwe Migration Profile Report.

Levine, R. 1997. Financial Development and Economic Growth: Views and Agenda: Journal of economic literature Volume 35(2): 688-726.

Levine, R. 2005. Finance and Growth: Theory and Evidence: Handbook of Economic Growth Volume 1: 865-934.

Mankiw, N. G. 2017. Principles of Economics (8th ed): Cengage Learning.

Mavhinga, D. 2019. Zimbabwe's Political and Economic Crisis: The Way Forward: African Affairs Volume 118(472): 614-624.

McConnell, C. R., and Brue, S. L. 2003. Economics: Principles, Problems, and Policies (15th ed): McGraw Hill.

Modigliani, F. and Miller, M. H. 1958. The Cost of Capital, Corporation Finance and the Theory of Investment: American Economic Review Volume 48(3): 261-297.

Mohapatra, S., Ratha, D. and Silwal, A. 2011. Remittance Flows and Financial Development in Developing Countries: World Bank Policy Research Working Paper, (5709).

Moyo, S. 2005. The Land Factor in Zimbabwe's Economic Crisis: Review of African Political Economy Volume 32(103): 193-206.

Mujere, J. 2021. External Financial Flows and Economic Growth in Zimbabwe: An Empirical Analysis: African Development Review Volume 33(1): 87-100.

Mukoka, S. 2020. The Impact of Diaspora Remittances on Economic Growth in Zimbabwe: An Error Correction Modelling Approach: Journal of Economics and Behavioral Studies Volume 12(6):36-43.

Munyanyi, M., Mhaka, S. T. and Mhaka, L. M. 2019. Zimbabwe's Economic Crisis: Causes, Consequences, and Prospects: Journal of Economics and Behavioral Studies Volume 11(5): 95-105.

Pasura, D. M. 2008. A Fractured Diaspora: Strategies and Identities among Zimbabweans in Britain. Unpublished PhD thesis: University of Warwick.

Patton, M. Q. 2014. Qualitative Research & Evaluation Methods: Integrating Theory and Practice: Sage publications.

Ranis, G., Stewart, F.and Ramirez, A. 2000. Economic Growth and Human Development." World Development Volume 28(2): 197-219.

Ratha, D. 2003. Workers' Remittances: An Important and Stable Source of Development Finance: Global Development Finance pp. 157-175.

Reserve Bank of Zimbabwe. 2020. Annual Report.

Schumpeter, J. A. 1912. The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle: Harvard Economic Studies Volume 46(1): 1-270.

Siddique, A., Selvanathan, E. A. and Selvanathan, S. 2012. Remittances and Economic Growth: Empirical Evidence from Bangladesh, India and Sri Lanka: The Journal of Development Studies Volume 48(8): 1045-1062.

Singh, R. J., Haacker, M., Lee. K. and Goff, M. L. 2010. Determinant and Macroeconomic Impact of Remittances in Sub-Saharan Africa: Journal of African Economies Volume 20(2): 312-340.

Solow, R. M. 1956. A Contribution to the Theory of Economic Growth: The quarterly journal of economics Volume 70(1): 65-94.

Stolbov, M. 2012, The Finance-Growth Nexus Revisited: From Origins to Modern Theoretical Landscape, Economics Discussion Paper.

Swan, T. W. 1956. Economic Growth and Capital Accumulation. Economic Record: Volume 32(2): 334-361.

The World Bank. 2022. World Development Indicators, Washington DC.

The World Bank. 2022. "Remittance." Available at https://www.worldbank.org/en/topic/migrationremittances/brief/migration-remittances-data [Retrieved on 06 March 2023].

United Nations Conference on Trade and Development. 2020. "World Investment Report 2020: International Production Beyond the Pandemic." Available at https://unctad.org/system/files/official-document/wir2020_en.pdf [Retrieved on 11 March 2023].

World Bank. 2021. "Trade Openness." Available at https://data.worldbank.org/topic/trade-openness [Retrieved on 06 March 2023].

Zimbabwe National Statistics Agency. 2022. Population and Housing Census Preliminary Report on Migration.

APPENDICES

Appendix 1: Raw Data

Year	RGDP	REM	FIN	GCF	FDI	OPN	INF
1990	16,962	0.00966	12.37787	17.37694	0.13896	45.65925	-0.92043
1991	17,446	0.00405	15.28036	19.10340	0.03229	51.05155	-6.77730
1992	15,479	0.00871	18.70319	20.23726	0.22143	63.71249	-14.12966
1993	15,420	0.01715	21.80481	22.77489	0.42590	63.16706	-3.79112
1994	16,745	0.63398	21.22171	23.72906	0.50284	71.11950	-3.89567
1995	16,565	0.06470	24.79001	19.66019	1.65512	79.15679	3.03854
1996	17,980	0.01590	21.54409	18.54194	0.94585	72.06962	8.98438
1997	18,163	0.03127	26.58100	18.13390	1.58390	82.20506	-2.87905
1998	18,386	0.04619	24.81542	20.75046	6.94005	88.51404	-27.04865
1999	17,974	0.06071	16.16158	14.39628	0.86031	70.92266	8.00681
2000	17,250	0.05993	21.56250	13.56942	0.34679	74.06741	0.62790
2001	17,386	0.05923	27.72416	10.26647	0.05607	67.89787	-0.13089
2002	15,743	0.01465	84.81197	5.00000	0.40838	66.80735	2.71295
2003	12,968	0.01449	53.16816	8.00000	0.06635	70.45199	8.80128
2004	12,130	8.59862	17.04778	4.50911	0.14986	76.03961	7.61152
2005	11,377	2.43398	14.94880	1.52518	1.78621	76.04371	5.13660
2006	10,889	0.76738	8.00000	1.57116	0.73477	82.82065	-2.01768
2007	10,390	6.52666	4.50911	7.10975	1.30198	84.17290	0.89489
2008	8,486	10.12918	1.52518	5.12791	1.16856	109.52164	1.34922
2009	9,409	12.47344	7.15911	12.74680	1.08631	61.77844	95.40866
2010	11,286	11.73633	13.54363	18.76330	1.01802	83.12419	2.57554
2011	12,751	13.61145	18.98324	17.39777	2.44151	89.46653	2.17176
2012	14,492	12.34939	20.14062	9.85698	2.04413	74.16253	4.85595
2013	14,635	9.90136	18.73191	9.20948	1.95406	58.65649	8.09114
2014	14,530	9.76620	19.21037	9.63922	2.42517	54.67162	0.62497
2015	14,511	10.25180	18.31569	10.03564	1.99969	56.74881	0.36742
2016	14,340	9.03238	17.09856	9.86137	1.66927	51.21902	2.01409
2017	14,623	9.83733	16.87511	9.70015	1.74688	50.02971	3.05691

2018	15,049	4.17994	5.83026	14.14831	2.10172	54.55027	200.76958
2019	13,818	6.49046	5.23771	13.79935	1.14281	52.68757	225.39465
2020	12,482	8.51727	5.41507	13.14608	0.69903	54.65056	604.94586

Appendix 2: Transformed Data

Year	RGDP	LREM	LFIN	LGCF	LFDI	LOPN	LINF
1990	16,962	-2.014962	1.066074	1.239973	-0.857115	1.659529	0.000000
1991	17,446	-2.392716	1.155870	1.281111	-1.490908	1.708009	0.000000
1992	15,479	-2.060223	1.239277	1.306152	-0.654760	1.804225	0.000000
1993	15,420	-1.765692	1.328718	1.357456	-0.370695	1.800491	0.000000
1994	16,745	-0.197925	1.320101	1.375280	-0.298573	1.851989	0.000000
1995	16,565	-1.189076	1.388086	1.293588	0.218829	1.898488	0.482665
1996	17,980	-1.798663	1.326572	1.268155	-0.024177	1.857752	0.953488
1997	18,163	-1.504803	1.418824	1.258491	0.199728	1.914899	0.000000
1998	18,386	-1.335456	1.385293	1.317028	0.841363	1.947012	0.000000
1999	17,974	-1.216727	1.197139	1.158250	-0.065346	1.850785	0.903460
2000	17,250	-1.222368	1.319668	1.132561	-0.459935	1.869627	-0.202110
2001	17,386	-1.227451	1.433277	1.011421	-1.251279	1.831856	0.000000
2002	15,743	-1.834205	1.924550	0.698970	-0.388934	1.824824	0.433442
2003	12,968	-1.838814	1.724176	0.903090	-1.178188	1.847893	0.944546
2004	12,130	0.934429	1.228577	0.654091	-0.824328	1.881040	0.881472
2005	11,377	0.386317	1.088943	0.183320	0.251932	1.881063	0.710676
2006	10,889	-0.114989	0.903090	0.196221	-0.133850	1.918139	0.000000
2007	10,390	0.814691	0.654091	0.851855	0.114603	1.925172	-0.048232
2008	8,486	1.005574	0.183320	0.709940	0.067650	2.039500	0.130084
2009	9,409	1.095986	0.842077	1.105401	0.035952	1.790837	1.979588
2010	11,286	1.069532	1.128116	1.273309	0.007757	1.919727	0.410868
2011	12,751	1.133904	1.276105	1.240493	0.387659	1.951661	0.336812
2012	14,492	1.091646	1.302813	0.993744	0.310509	1.870185	0.686274
2013	14,635	0.995695	1.272156	0.964235	0.290938	1.768316	0.908010
2014	14,530	0.989725	1.283016	0.984042	0.384743	1.737762	-0.204138
2015	14,511	1.010800	1.256341	1.001545	0.300962	1.753957	-0.434838

2016	14,340	0.955802	1.230925	0.993937	0.222528	1.709431	0.304080
2017	14,623	0.992877	1.224226	0.986778	0.242264	1.699228	0.485282
2018	15,049	0.621170	0.763399	1.150704	0.322575	1.736797	2.302698
2019	13,818	0.812275	0.716164	1.139859	0.057972	1.721708	2.352944
2020	12,482	0.930300	0.729480	1.118796	-0.155502	1.737595	2.781717

Appendix 3: Descriptive Statistics

	RGDP	LREM	LFIN	LGCF	LFDI	LOPN	LINF
Mean	14505.42	-0.221721	1.171305	1.037090	-0.125665	1.829339	0.551574
Median	14623.43	0.386317	1.239277	1.118796	0.035952	1.847893	0.336812
Maximum	18385.89	1.133904	1.924550	1.375280	0.841363	2.039500	2.781717
Minimum	8486.446	-2.392716	0.183320	0.183320	-1.490908	1.659529	-0.434838
Std. Dev.	2732.466	1.289993	0.330379	0.298053	0.542527	0.090421	0.807903
Skewness	-0.436512	-0.309327	-0.692420	-1.475272	-0.921123	0.070472	1.402419
Kurtosis	2.281133	1.358735	4.571569	4.950120	3.247719	2.378960	4.165217
Jarque-Bera	1.651967	3.973788	5.667331	16.15705	4.463011	0.523844	11.91542
Probability	0.437804	0.137121	0.058797	0.000310	0.107367	0.769571	0.002586
Sum	449668.1	-6.873344	36.31046	32.14980	-3.895628	56.70950	17.09879
Sum Sq. Dev.	2.24E+08	49.92249	3.274509	2.665063	8.830057	0.245276	19.58119
Observations	31	31	31	31	31	31	31

Appendix 4: Stationarity Test: ADF Test at Level

Appendix 4.1: RGDP Not Stationery

Null Hypothesis: RGDP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.823811	0.3620
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP)
Method: Least Squares
Date: 04/24/23 Time: 13:35
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	-0.130235	0.071408	-1.823811	0.0797
D(RGDP(-1))	0.450267	0.175229	2.569595	0.0163
C	1764.828	1055.618	1.671843	0.1065

R-squared	0.247735	Mean dependent var	-171.1580
Adjusted R-squared	0.189868	S.D. dependent var	1142.645
S.E. of regression	1028.464	Akaike info criterion	16.80722
Sum squared resid	27501177	Schwarz criterion	16.94866
Log likelihood	-240.7046	Hannan-Quinn criter.	16.85152
F-statistic	4.281142	Durbin-Watson stat	1.841627
Prob(F-statistic)	0.024707		

Appendix 4.2: LREM Not Stationery

Null Hypothesis: LREM has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.686142	0.4278
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LREM)
Method: Least Squares
Date: 04/24/23 Time: 13:38
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREM(-1)	-0.161401	0.095722	-1.686142	0.1029
C	0.056191	0.124293	0.452089	0.6547

R-squared	0.092179	Mean dependent var	0.098175
Adjusted R-squared	0.059757	S.D. dependent var	0.687848
S.E. of regression	0.666980	Akaike info criterion	2.092227
Sum squared resid	12.45615	Schwarz criterion	2.185640
Log likelihood	-29.38341	Hannan-Quinn criter.	2.122111
F-statistic	2.843075	Durbin-Watson stat	2.201977
Prob(F-statistic)	0.102882		

Appendix 4.3: LFIN Not Stationery

Null Hypothesis: LFIN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-1.867658	0.3423
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFIN)
Method: Least Squares
Date: 04/24/23 Time: 13:39
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFIN(-1)	-0.249091	0.133371	-1.867658	0.0723
C	0.284211	0.163840	1.734683	0.0938

R-squared	0.110777	Mean dependent var	-0.011220
Adjusted R-squared	0.079019	S.D. dependent var	0.243614
S.E. of regression	0.233791	Akaike info criterion	-0.004439
Sum squared resid	1.530429	Schwarz criterion	0.088974
Log likelihood	2.066580	Hannan-Quinn criter.	0.025445
F-statistic	3.488147	Durbin-Watson stat	1.500724
Prob(F-statistic)	0.072310		

Appendix 4.4: LGCF Not Stationery

Null Hypothesis: LGCF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.955152	0.3040
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGCF)
Method: Least Squares
Date: 04/24/23 Time: 13:40
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGCF(-1)	-0.233344	0.119348	-1.955152	0.0606
C	0.237324	0.128460	1.847455	0.0753

R-squared	0.120123	Mean dependent var	-0.004039
Adjusted R-squared	0.088699	S.D. dependent var	0.203834

S.E. of regression	0.194584	Akaike info criterion	-0.371563
Sum squared resid	1.060164	Schwarz criterion	-0.278150
Log likelihood	7.573448	Hannan-Quinn criter.	-0.341680
F-statistic	3.822621	Durbin-Watson stat	1.849198
Prob(F-statistic)	0.060614		

Appendix 4.5: LFDI Not Stationery

Null Hypothesis: LFDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.833927	0.0656
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFDI)
Method: Least Squares
Date: 04/24/23 Time: 13:41
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI(-1)	-0.411966	0.145369	-2.833927	0.0084
C	-0.027973	0.080918	-0.345695	0.7322

R-squared	0.222894	Mean dependent var	0.023387
Adjusted R-squared	0.195141	S.D. dependent var	0.481473
S.E. of regression	0.431949	Akaike info criterion	1.223321
Sum squared resid	5.224234	Schwarz criterion	1.316734
Log likelihood	-16.34982	Hannan-Quinn criter.	1.253205
F-statistic	8.031142	Durbin-Watson stat	2.099816
Prob(F-statistic)	0.008435		

Appendix 4.6: LOPN Not Stationery

Null Hypothesis: LOPN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.706280	0.0847
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOPN)
Method: Least Squares
Date: 04/24/23 Time: 13:41
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOPN(-1)	-0.363853	0.134448	-2.706280	0.0115
C	0.669326	0.246651	2.713658	0.0113

R-squared	0.207337	Mean dependent var	0.002602
Adjusted R-squared	0.179027	S.D. dependent var	0.072173
S.E. of regression	0.065395	Akaike info criterion	-2.552415
Sum squared resid	0.119741	Schwarz criterion	-2.459002
Log likelihood	40.28623	Hannan-Quinn criter.	-2.522532
F-statistic	7.323951	Durbin-Watson stat	2.275334
Prob(F-statistic)	0.011456		

Appendix 4.7: LINF Not Stationery

Null Hypothesis: LINF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.038206	0.2698
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LINF)
Method: Least Squares
Date: 04/24/23 Time: 13:42
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LINF(-1)	-0.373855	0.183423	-2.038206	0.0511
C	0.271141	0.154463	1.755379	0.0901

R-squared	0.129198	Mean dependent var	0.092724
Adjusted R-squared	0.098098	S.D. dependent var	0.733985
S.E. of regression	0.697054	Akaike info criterion	2.180433
Sum squared resid	13.60477	Schwarz criterion	2.273847
Log likelihood	-30.70650	Hannan-Quinn criter.	2.210317
F-statistic	4.154284	Durbin-Watson stat	1.895595
Prob(F-statistic)	0.051075		

Appendix 5: Stationarity Test: ADF Test at First Difference

Appendix 5.1: RGDP Stationery

Null Hypothesis: D(RGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.364281	0.0209
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP,2)
Method: Least Squares
Date: 04/24/23 Time: 13:42
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	-0.605100	0.179860	-3.364281	0.0023
C	-128.3424	199.9913	-0.641740	0.5265

R-squared	0.295377	Mean dependent var	-62.73691
Adjusted R-squared	0.269280	S.D. dependent var	1253.892
S.E. of regression	1071.854	Akaike info criterion	16.85864
Sum squared resid	31019516	Schwarz criterion	16.95294
Log likelihood	-242.4503	Hannan-Quinn criter.	16.88817
F-statistic	11.31839	Durbin-Watson stat	1.758351
Prob(F-statistic)	0.002311		

Appendix 5.2: LREM Stationery

Null Hypothesis: D(LREM) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.041333	0.0000
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LREM,2)
Method: Least Squares
Date: 04/24/23 Time: 13:45
Sample (adjusted): 1993 2020

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LREM(-1))	-1.678726	0.277873	-6.041333	0.0000
D(LREM(-1),2)	0.419286	0.179610	2.334429	0.0279
C	0.175976	0.126856	1.387210	0.1776

R-squared	0.664307	Mean dependent var	-0.007660
Adjusted R-squared	0.637452	S.D. dependent var	1.085102
S.E. of regression	0.653361	Akaike info criterion	2.087583
Sum squared resid	10.67202	Schwarz criterion	2.230319
Log likelihood	-26.22616	Hannan-Quinn criter.	2.131219
F-statistic	24.73645	Durbin-Watson stat	2.068861
Prob(F-statistic)	0.000001		

Appendix 5.3: LFIN Stationery

Null Hypothesis: D(LFIN) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.485429	0.0013
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFIN,2)
Method: Least Squares
Date: 04/24/23 Time: 13:45
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LFIN(-1))	-0.851071	0.189741	-4.485429	0.0001
C	-0.012906	0.046272	-0.278920	0.7824

R-squared	0.426984	Mean dependent var	-0.002637
Adjusted R-squared	0.405761	S.D. dependent var	0.322852
S.E. of regression	0.248877	Akaike info criterion	0.122754
Sum squared resid	1.672369	Schwarz criterion	0.217050
Log likelihood	0.220071	Hannan-Quinn criter.	0.152286
F-statistic	20.11908	Durbin-Watson stat	1.966514
Prob(F-statistic)	0.000121		

Appendix 5.4: LGCF Stationery

Null Hypothesis: D(LGCF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.341044	0.0001
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGCF,2)
Method: Least Squares
Date: 04/24/23 Time: 13:46
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGCF(-1))	-1.026743	0.192236	-5.341044	0.0000
C	-0.005689	0.039185	-0.145192	0.8856

R-squared	0.513748	Mean dependent var	-0.002145
Adjusted R-squared	0.495739	S.D. dependent var	0.297118
S.E. of regression	0.210988	Akaike info criterion	-0.207561
Sum squared resid	1.201927	Schwarz criterion	-0.113265
Log likelihood	5.009640	Hannan-Quinn criter.	-0.178029
F-statistic	28.52675	Durbin-Watson stat	2.008636
Prob(F-statistic)	0.000012		

Appendix 5.5: LFDI Stationery

Null Hypothesis: D(LFDI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.336587	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFDI,2)
Method: Least Squares
Date: 04/24/23 Time: 13:47
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LFDI(-1))	-1.302062	0.177475	-7.336587	0.0000
C	0.055580	0.085264	0.651857	0.5200

R-squared	0.665947	Mean dependent var	0.014494
Adjusted R-squared	0.653575	S.D. dependent var	0.778433
S.E. of regression	0.458169	Akaike info criterion	1.343316
Sum squared resid	5.667814	Schwarz criterion	1.437612
Log likelihood	-17.47808	Hannan-Quinn criter.	1.372848
F-statistic	53.82552	Durbin-Watson stat	1.840602
Prob(F-statistic)	0.000000		

Appendix 5.6: LOPN Stationery

Null Hypothesis: D(LOPN) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.339555	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOPN,2)
Method: Least Squares
Date: 04/24/23 Time: 13:47
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOPN(-1))	-1.325610	0.180612	-7.339555	0.0000
C	0.001718	0.013033	0.131843	0.8961

R-squared	0.666127	Mean dependent var	-0.001124
Adjusted R-squared	0.653761	S.D. dependent var	0.119226
S.E. of regression	0.070155	Akaike info criterion	-2.409742
Sum squared resid	0.132887	Schwarz criterion	-2.315446
Log likelihood	36.94127	Hannan-Quinn criter.	-2.380210
F-statistic	53.86907	Durbin-Watson stat	2.067787
Prob(F-statistic)	0.000000		

Appendix 5.7: LINF Stationery

Null Hypothesis: D(LINF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.393138	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LINF,2)
Method: Least Squares
Date: 04/24/23 Time: 13:48
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LINF(-1))	-1.207857	0.188930	-6.393138	0.0000
C	0.112786	0.139000	0.811408	0.4242

R-squared	0.602194	Mean dependent var	0.014785
Adjusted R-squared	0.587460	S.D. dependent var	1.158310
S.E. of regression	0.743974	Akaike info criterion	2.312851
Sum squared resid	14.94443	Schwarz criterion	2.407147
Log likelihood	-31.53634	Hannan-Quinn criter.	2.342383
F-statistic	40.87221	Durbin-Watson stat	2.072531
Prob(F-statistic)	0.000001		

Appendix 6: Multicollinearity Test: Correlation Matrix

	D(LREM)	D(LFIN)	D(LGCF)	D(LFDI)	D(LOPN)	D(LINF)
D(LREM)	1.000000	-0.505327	-0.308241	0.560619	0.025942	0.320237
D(LFIN)	-0.505327	1.000000	0.171633	-0.215192	-0.076146	-0.340242
D(LGCF)	-0.308241	0.171633	1.000000	-0.028518	-0.221971	0.014885
D(LFDI)	0.560619	-0.215192	-0.028518	1.000000	0.218533	0.117431
D(LOPN)	0.025942	-0.076146	-0.221971	0.218533	1.000000	-0.274975
D(LINF)	0.320237	-0.340242	0.014885	0.117431	-0.274975	1.000000

Appendix 7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.871887	Prob. F(5,25)	0.1353
Obs*R-squared	8.444332	Prob. Chi-Square(5)	0.1334
Scaled explained SS	6.131952	Prob. Chi-Square(5)	0.2936

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/24/23 Time: 13:52
Sample: 1990 2020
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14192682	11085832	-1.280254	0.2122
LREM	654774.8	530804.5	1.233552	0.2288
LFIN	1813636.	1628828.	1.113461	0.2761
LGCF	1895505.	1720633.	1.101632	0.2811
LFDI	-2957314.	1099356.	-2.690043	0.0125

LOPN	6368526.	5502510.	1.157386	0.2581

R-squared	0.272398	Mean dependent var	1774095.
Adjusted R-squared	0.126877	S.D. dependent var	2694948.
S.E. of regression	2518187.	Akaike info criterion	32.48796
Sum squared resid	1.59E+14	Schwarz criterion	32.76551
Log likelihood	-497.5634	Hannan-Quinn criter.	32.57844
F-statistic	1.871887	Durbin-Watson stat	2.130167
Prob(F-statistic)	0.135336		

Appendix 8: Autocorrelation Test: Breusch-Godfrey Serial Correlation Lm Test

Breusch-Godfrey Serial Correlation LM Test:

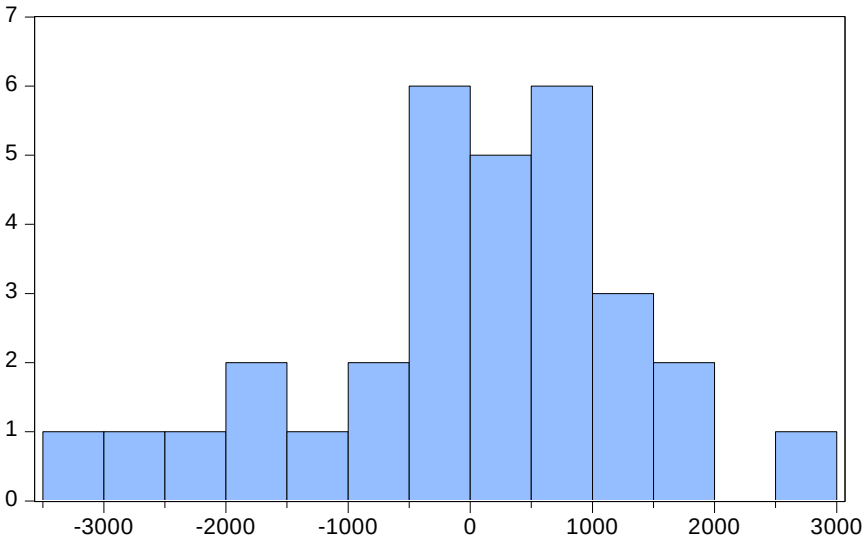
F-statistic	1.021533	Prob. F(2,23)	0.3758
Obs*R-squared	2.529046	Prob. Chi-Square(2)	0.2824

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/24/23 Time: 13:53
Sample: 1990 2020
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4662.195	7707.688	-0.604876	0.5512
LREM	265.2852	388.9932	0.681979	0.5021
LFIN	84.91262	962.5421	0.088217	0.9305
LGCF	692.4108	1161.089	0.596346	0.5568
LFDI	-577.9029	763.7454	-0.756669	0.4569
LOPN	2091.894	3740.233	0.559295	0.5814
RESID(-1)	0.370049	0.264413	1.399513	0.1750
RESID(-2)	-0.084156	0.229279	-0.367047	0.7169

R-squared	0.081582	Mean dependent var	-7.28E-12
Adjusted R-squared	-0.197936	S.D. dependent var	1353.969
S.E. of regression	1481.922	Akaike info criterion	17.65770
Sum squared resid	50510166	Schwarz criterion	18.02777
Log likelihood	-265.6944	Hannan-Quinn criter.	17.77833
F-statistic	0.291867	Durbin-Watson stat	1.866812
Prob(F-statistic)	0.950312		

Appendix 9: Normality Test: Histogram-Normality Test



Series: Residuals
Sample 1990 2020
Observations 31

Mean	-7.28e-12
Median	46.91769
Maximum	2743.336
Minimum	-3326.996
Std. Dev.	1353.969
Skewness	-0.551097
Kurtosis	3.233093
Jarque-Bera	1.639336
Probability	0.440578

Appendix 10: Model 1

Dependent Variable: D(RGDP)
Method: Least Squares
Date: 04/24/23 Time: 14:01
Sample: 1990 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23303.37	6971.390	3.342715	0.0027
D(LREM)	-1235.432	319.2978	-3.869216	0.0007
D(LFIN)	2180.869	999.9646	2.180947	0.0392
D(LGCF)	2706.793	1024.147	2.642972	0.0142
D(LFDI)	1495.569	653.1222	2.289876	0.0311
D(LOPN)	-7698.784	3418.742	-2.251935	0.0337
D(LINF)	-293.5134	387.3540	-0.757739	0.4560

R-squared	0.760205	Mean dependent var	14505.42
Adjusted R-squared	0.700256	S.D. dependent var	2732.466
S.E. of regression	1495.994	Akaike info criterion	17.65465
Sum squared resid	53711944	Schwarz criterion	17.97845
Log likelihood	-266.6471	Hannan-Quinn criter.	17.76020
F-statistic	12.68092	Durbin-Watson stat	1.506199
Prob(F-statistic)	0.000002		

Appendix 11: Model 2

Dependent Variable: D(RGDP)
Method: Least Squares
Date: 04/24/23 Time: 14:03
Sample: 1990 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21570.94	6529.494	3.303616	0.0029
D(LREM)	-1273.418	312.6409	-4.073100	0.0004
D(LFIN)	2371.946	959.3709	2.472397	0.0206
D(LGCF)	2658.791	1013.443	2.623522	0.0146
D(LFDI)	1491.537	647.5144	2.303481	0.0298
D(LOPN)	-6940.271	3240.948	-2.141433	0.0422

R-squared	0.754468	Mean dependent var	14505.42
Adjusted R-squared	0.705362	S.D. dependent var	2732.466
S.E. of regression	1483.198	Akaike info criterion	17.61377
Sum squared resid	54996933	Schwarz criterion	17.89132
Log likelihood	-267.0135	Hannan-Quinn criter.	17.70425
F-statistic	15.36397	Durbin-Watson stat	1.579533
Prob(F-statistic)	0.000001		

NB: The researcher choose to use Model 2 for this research with DLINF dropped. All test carried out above are from Model 2 hence Model 2 is BLUE.

Document Viewer

Turnitin Originality Report

Processed on: 02-Jun-2023 11:49 EAT
ID: 2025231225
Word Count: 13316
Submitted: 29

Remittance Inflows and Economic Growth in Zim... By Brian Mupindu

Similarity Index	Similarity by Source	
10%	Internet Sources:	11%
	Publications:	8%
	Student Papers:	5%

exclude quoted | include bibliography | excluding matches < 1% | mode: quickview (classic) report | print | download

4% match (Internet from 17-Jan-2023)
http://erepository.uonbi.ac.ke

2% match (Internet from 30-Nov-2020)
https://jfin-swufe.springeropen.com/articles/10.1186/s40854-019-0122-8

1% match (Internet from 21-Jan-2022)
http://liboasis.buse.ac.zw:8080

1% match (Internet from 08-Sep-2021)
http://liboasis.buse.ac.zw:8080

1% match (Internet from 26-Oct-2021)
http://elibrary.buse.ac.zw:8080

1% match (Internet from 26-Oct-2021)
http://elibrary.buse.ac.zw:8080

1% match (Internet from 04-Oct-2022)
https://www.grin.com/document/1268390

1% match (Internet from 14-Sep-2022)
https://www.researchgate.net/publication/305383808_The_impact_of_Remittances_on_Economic_growth_An_econometric_mo