A STUDY OF THE MACRO ECONOMIC FACTORS AFFECTING THE VALUE OF THE ZAMBIAN KWACHA

BY

DERICK C. MWANSA

A dissertation submitted The University of Zambia in Partial Fulfilment of the Requirements for the Award of the Degree of Master Of Science in Accounting & Finance

THE UNIVERSITY OF ZAMBIA

LUSAKA

2020

COPYRIGHT DECLARATION

AUTHOR'S DECLARATION

I, Derick C. Mwansa, do hereby declare that this research project is my original work and has not been presented in any other University or College for award of degree, diploma or certificate.

Signed……Date……...

CERTIFICATE OF APPROVAL

This dissertation of Derick C. Mwansa has been approved for the partial fulfilment of the requirement for the award of the Degree of Master of Science in Accounting & Finance.

Examiner 1:…….Signature…….Date……..

Examiner 2:…….Signature…….Date……..

Examiner 3:…….Signature…….Date……..

Chair Person/Board of
Examiner:……...Signature…….Date……

Supervisor: Name:……...Signature…….Date…….

DEDICATION

This piece of work is dedicated to my wife Mutinta, my son Derrick Jr, my daughter Kunda for their understanding during my absence from home to ensure that I completed studies for the award of Msc degree. My late brother Willie whom I shared a lot of things with and my Uncle Anderson who started teaching me things I could not even understand at a tender age, which inspired me to push further in my education so that I can have an opportunity to learn them and know more about them.

To you all, I say God bless.

ACKNOWLEDGEMENTS

I wish to sincerely acknowledge the contribution of my supervisor, Dr. Lubinda Habaazoka for his invaluable insights and timely guidance that have culminated in the successful completion of this study. I also wish to acknowledge the contributions made by my employers-Government of the Republic of Zambia (Central Statistical Office – Zambia Statistics Agency) in terms of their unending moral and financial support during those times when I was unable to be at the office.

Special thanks are extended to my friends from the November, 2016 Cohort who gave me the encouragement to soldier on with the research in spite of the many challenges encountered.

A further vote of thanks goes to the staff of the University of Zambia–Graduate School of Business for their support and guidance during my Master of Science in Accounting and Finance programme.

ABSTRACT

This study was aimed at determining the influence of macroeconomic factors on foreign currency exchange rate fluctuations and the value of the Zambian Kwacha. Macroeconomic factors include inflation rates, interest rates, Gross Domestic Product growth rate (GDP) and Balance of Payments which constituted independent variables whilst the dependent variable in the study was the value of the Kwacha against the United States Dollar ($). Secondary data representing annual average covering the period 1993 to 2018 was extracted from various Bank of Zambia and Central Statistical Office reports for the study. The study used regression model, E.Views software version 22 to analyse the data set. The study established that, based on the error correction model, R-squared was 0.6 meaning that 36% of variations in the performance of the kwacha against the US dollar is caused by the four independent variables in the developed model. The results also showed that interest rates and Gross Domestic Product growth rate were negatively related to the performance of the kwacha, while inflation and Balance of Payment rates were positively related to the value of the kwacha at 0.05% level of significance. However, the response of the kwacha with respect to all independent variables was not very responsive as all the variables were inelastic. In addition, the F.Test based on the ANOVA showed that there was no significance between the dependent variable and independent variables. The study, therefore, recommends that both contractionary monetary policy and expansionary fiscal policy can greatly improve the performance of the kwacha against the US dollar in times of economic recession.

Key Word: *Foreign Currency, Exchange Rate, Inflation Rate, Interest Rate, Gross Domestic Product, Foreign Exchange Market, Balance of Payment.*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

ACRONYMS

DF	Augmented Dickey Fuller
ANOVA	Analysis of the Variance
BOP	Balance Of Payments
CEPR	Center for Economic Policy Research
CIC	Currency in Circulation
ER	Exchange Rates
EU	European Union
E. Views	Econometrics Views
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
INF	Inflation Rate
IR	Interest Rates
NBER	National Bureau Of Economic Research
OMO	Open Market Operations
PPP	Purchasing Power Parity
SOE	State Owned Enterprises
IRPT	Interest Rate Pass -Through
USA	United States of America
US$	United States of America Dollar
ZMW	Zambian Kwacha

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Researchers have experimentally been exploring the trade rates exposures of firms for the last few decades. The vast majority of this exploration shows the introduction as the versatility amid adjustments in firm value and the currency conversion scale measures. In Kenya, there has been expanded changeability in the conversion standard as the Kenyan money has deteriorated radically against major worldwide currencies and this has adversely affected the domestic economy of the nation (Adler and Dumas, 2010). There has dependably been some dispute about the most appropriate rate of exchange in the third world nations. It predominantly spins around the level of changes amid times of unverifiable action as a consequence of inside and outside forces (Abor, 2005). There has been across the board financial ramifications on the local economy as a consequence of the nearby cash deterioration that has happened in the course of the most recent couple of years.

Fluctuations in exchange rates among major currencies raises concern about how exactly the fluctuations affect organization's operations and performance (Farah, 2014). Trade and investment in a country are likely to be impacted by foreign exchange market. Stable currency environment is most likely to improve both the welfare of the business and the country's economy in general. In the smaller scale, the exchange rates are important in that they are a great determinant on how organizations perform, specifically the multinational companies (Hommel, 2003). These organizations ought to carefully evaluate their risks due to undertaking their business in the volatile international markets.

Fluctuations in the exchange rates may have impact on the external operations of a country, mainly through their impact on foreign trade transactions. Exchange rates also affect the cost of servicing on the country's foreign debt (Omagwa, 2005). Like most commodities, the exchange rates are based majorly on the demand and supply for a particular currency form. A country's fiscal and monetary policies are mostly responsible for the domestic currency supply (Berger and Bouwman, 2010).

Foreign exchange is one of the most important means through which a country's relative level of economic health is determined. A country's foreign exchange rate provides a window to its economic stability, which the reason it is constantly watched and analysed, Alexander T. (2020).

Depreciation (or devaluation) of the domestic currency may stimulate economic activity through the initial increase in the price of foreign goods relative to home goods. By increasing the international competitiveness of domestic industries, exchange rate depreciation diverts spending from foreign goods to domestic goods. According to Guitian (1976) and Dormbush (1988), the success of currency depreciation in promoting trade balance largely depends on switching demand in proper direction and amount, as well as on the capacity of the home economy to meet the additional demand by supplying more goods.

Before World War 1, most countries' currencies were linked with gold but after world war 11, US dollar was a fixed as reference for most countries. Pound sterling was the reference currency for Zambia till 1967 when the kwacha was introduced and linked to the United States dollar. (Bank of Zambia, 2016).

When Zambia introduced a floating exchange rate regime in 1994, it was one of the first countries in Sub – Sahara Africa to do so. While this has been welcomed as a critical step towards economic modernisation and sound macroeconomic management, it has created new challenges, Lionel R., Gregory S and Oliver M. (2017). Zambia being a small, open and rather undiversified economy (Copper alone accounts for more than 70% of exports), the country is highly exposed to global shocks, potentially inducing large and unexpected fluctuations in the value of its currency (Zambia Kwacha). Recently, this potential issue surfaced with great force and between January and august 2015, the Zambia Kwacha gradually lost value of 21% of its value against the United States Dollar (US$). By mid-November of the same year, its value plummeted by another 60%. The overall depreciation of the kwacha was more than 40% in 2015. The impact on the economy was huge and severe, especially for consumers. The weakness of the currency abruptly fed through to consumer prices and monthly inflation jumped from an average of 0.7% to 6.2% in October and another 5% in November, 2015. Overall, consumer prices had risen by 21% in 2015 World Bank Group(Ed.). (2016).

1.1 Background

The value of a currency like the Zambian kwacha is simply the foreign currency exchange rates of the Zambian kwacha against other convertible currencies. The value of Zambian kwacha (ZMW) is measured against major international convertible currencies such as the United States of America dollar (US$), the Euro of European Union (EU) member countries and the Pound of Great Britain. At regional level, the ZMW is also traded with currencies such as the South African Rand and Botswana Pula (Mbao .F.Z (2015).

The Zambian Kwacha is a decimal type of currency with K1 being made up 100 ngwee. Before Zambia's independence in 1964, the country then known as Northern Rhodesia used the British pound as legal tender before migrating to the Kwacha in 1965. The Currency Act of 1967 completely replaced the British pound with the Zambian Kwacha banknotes and the ngwee coins. Bank of Zambia (2016).

The New kwacha was then denominated into six denominations; namely; K10, K2, 50N, 20N, 10N and 5N denominations. Since 1967 the Kwacha has undergone several structural changes aimed at ensuring that it supports economic activities while maintaining public confidence in the national currency. Some of the notable changes include the following:

1.1.1 The Currency Structure of 1968 -1974

The Zambian Kwacha came into being after a government policy decision to decimalise the national currency. The Currency Act of 1967 saw the birth of the Zambian Kwacha and ngwee replacing the Zambian pound, shilling and pence in 1968. The new currency designated the main unit as the Kwacha comprising of 100 ngwee and had the following banknotes and coins in its family: K1, K2, K10 and K20 banknotes and 50 ngwee, 20 ngwee, 10 ngwee, 5 ngwee 2 ngwee and 1 ngwee in coins. The official rate of the Kwacha was one half of the old unit (pound) and or US$1.40. The new K1 was equivalent to the old 10s, while the £5 (Five pound) banknote was equivalent to the K10, the £1 was equivalent to the K2 and the old 5s was replaced by the newly introduced 50 ngwee paper note. In coinage the old 2s piece was replaced by a 20 ngwee while the 1s and 6d were replaced by the 10 ngwee and 5 ngwee, respectively. Bank of Zambia (2016).

The Zambian Kwacha continued to be linked to both the British pound and the United States dollar and as such the devaluation of the US dollar on 15th August 1971 saw the Kwacha appreciate through its link with the British Pound (on 23rd August 1971). The rate of the Kwacha was then fixed at K1.7094 being equivalent to £1.00. In December 1971 Zambia broke her currency ties with the British pound. The Kwacha was then linked to the US dollar re-establishing the official exchange rate at K1 equivalent to US$1.40. The devaluation of US dollar in February 1973 saw the Kwacha's gold reserves reduced by 7.89 percent. To cushion such shocks, the Bank of Zambia introduced a 4.5 percent fluctuation range for the Kwacha. During this period the Zambian pound circulated alongside the Zambian Kwacha until 31st January 1974 when the withdrawal process was completed and the sole legal tender became the Kwacha and ngwee. Bank of Zambia (2017).

1.1.2 The Currency Structure of 1973-1974

Zambia political landscape changed and gave birth to the "One Party Participatory Democracy in 1973". To commemorate this historic event in Zambia's political history the Bank of Zambia issued a commemorative 50 Ngwee coin to join the rest of the nation in celebrating the birth of the Second Republic on 13th December 1973. Other currency changes included changing the colour of the 50 Ngwee banknote in order to eliminate the confusion that appeared to exist between the 50 Ngwee banknotes and the new K5 banknotes; hence the multi-colored 50 Ngwee banknote made its first appearance in April 1974 but was later phased out of circulation.

During this period the Zambian Kwacha depreciated marginally against the US dollar with the official exchange rate at K1 equivalent to approximately US$1.28. By the late 1970s the Kwacha had depreciated further and was below USD$1. Bank of Zambia (2016).

1.1.3 The Currency Structure of 1980

The currency structure in 1980 remained the same with the highest denomination still being the K20. However, there was a change in the design of all the banknotes in 1980. By 1980 the 50 Ngwee paper note had been completely withdrawn from circulation. Bank of Zambia (2016).

1.1.4 The Currency Structure of 1986 -1991

Low copper prices and continued increased fuel prices on the world market were some of the major contributing factors to the declining economy. Inflation from the mid-1980s to the early 1990s continued to gallop at 3 digits. In order to meet the public demand for cash in the economy it was necessary to introduce a higher banknote and in 1986 the Bank of Zambia issued into circulation the K50 denomination. In 1991, the K100 and K500 banknotes were added to the family of banknotes. During this period the K1 was replaced with a coin of the same denomination while the K2 paper note ceased to exist and was eventually withdrawn from circulation. Bank of Zambia (2016).

1.1.5 The Currency Structure of 1992

In the early 1990s, Zambia's political landscape changed yet again with the country holding its first multiparty elections in October, 1991. The advent of multiparty politics ushered in the Third Republic and an era of economic liberalisation. Under the new liberalised economy, the government made policy decision that led to the changing of the features of the Zambian currency from bearing the portrait of the Head of State to the current features which bear the famous Fish eagle and other important national monuments, wildlife and bird life that characterize the rich culture and heritage of the Zambian people. Apart from changing the appearance of the banknotes, there were no additions to the family of banknotes. However, other changes included the replacement of the K5 and K10 paper notes with coins in the same denomination. Smaller denominations of coins were slowly disappearing from circulation and thus the lowest coin in circulation was the newly introduced 25 Ngwee. As inflation levels continued to remain high, the members of the public did not readily accept coins given their diminishing purchasing power and this resulted in increased public demand for banknotes. Bank of Zambia (2016).

1.1.6 The Currency Structure of 1996

As inflation remained relatively high and the demand for cash in the economy began to increase, the Bank of Zambia further introduced three banknotes in May 1996 namely; the K1, 000, K5, 000 and K10, 000. Continued poor economic performance with annual GDP growth averaging 2 - 4 percent in the late 1990s contributed to the public's loss of confidence

in other forms of formal payment instruments such as cheques further increasing the public's heavy reliance on cash for many of its transactions. This led to an exponential increase in currency in circulation (CIC) during the same period from K65.4 billion in 1994 to K671 billion in 2003 (i.e. representing a 926 percent increase).

During the mid-1990s the Kwacha's depreciation against the US dollar had worsened with approximately K1, 000 equivalent to US$1. Bank of Zambia (2016).

1.1.7 The Currency Structure of 2003

In 2003 as a reaction to the increased demand for banknotes for daily transactions, the Bank of Zambia introduced two more denominations to the family of the Zambian currency i.e. the K20, 000 and K50, 000. The family of Zambian currency now had nine (9) banknotes; namely; the K20, K50, K100, K500, K1, 000, K5, 000, K10, 000, K20, 000 and K50, 000. The K20, 000 and K50, 000 were introduced as high value notes in September 2003. In coinage, though not in circulation, there were five (5) denominations as follows: 25ngwee, 50ngwee, K1, K5 and K10. In addition to the two new denominations, The Bank introduced two polymer banknotes in the K1000 and K500 denominations. The change in substrate was intended to extend the circulation lifespan of these two high velocity banknotes. This family of banknotes was in circulation until 2013. Bank of Zambia (2016).

1.1.8 The Currency Rebasing Project of 2013

The Government of the Republic of Zambia approved the recommendation of the Bank of Zambia Board to re-denominate the national currency on 23rd January 2012.

The old family of the Zambian currency was characterised by high denominations as a consequence of high inflation rates experienced over a long period of time. Zambia experienced high levels of inflation during the 1990s and early 2000 which peaked at 188.0% in 1993. The objective of re-denominating the Zambian Kwacha was, therefore, mainly to address costs associated with an accumulated loss in value of the currency that undermined its basic function as a store of value, medium of exchange and measure of value.

The Currency Rebasing exercise entailed dividing all denominational values by a denominator (1,000) and this resulted in the replacement of all Zambian banknotes and coins in circulation

with the rebased currency. The Bank introduced two (2) K100 and K2 banknotes to the family of the Zambian currency. The current family comprises six (6) banknotes (K100, K50, K20, K10, and K5 & K2) and four (4) coins (K1, 50N, 10N &5N). The Bank generally maintained the features of the old currency on the rebased currency. Bank of Zambia (2016).

1.1.9 Reasons for Rebasing the Zambian Currency

The Zambian Government approved the recommendation to rebase its currency because of the need to address costs associated with the accumulated loss in value of currency arising from high inflation rates over a prolonged period of time. The high levels of inflation resulted in:

- Inconveniences and risks inherent in carrying large sums of money for transactions;
- Increased difficulties in maintaining book-keeping and statistical records and ensuring compatibility with data processing software;

Higher costs on the payments system, particularly the delivery of banking services through a greater use of technology. Bank of Zambia (2016).

1.1.10 Benefits of Rebasing the Zambian Currency

Rebasing the currency resulted in a number of benefits including;

- Facilitating easier business transactions because it leads to the use of smaller units of money. It simplifies accounting and the ease of expressing monetary values, thereby minimizing errors associated with the inputting of financial data and time spent to review such data. It achieves a more efficient use of calculation and accounting record systems. Thus, rebasing simplify book-keeping and reduces the drudgery in transactions, record keeping and banking transactions.
- Creating greater confidence in the currency. When there are many zeros or digits, people may lose confidence in the local currency.
- Reduction in the cost often incurred when customizing standard packages that are purchased by entities. This is because most of the current accounting packages are developed in jurisdictions where values, at a maximum, tend to be in millions. The present situation in Zambia, where organizations record values in billions and trillions

of Kwacha, requires further customization of such packages in order to widen data fields. Thus, currency rebasing will limit the extent of customization of standard application packages.

- Efficient payments systems and encouraging the use of mechanisms such as pay phones, vending machines, car parking meters and other related technologies.
- Re-introduction of a culture of using coins which are more durable.

The foreign exchange rates are determined on foreign exchange market. The foreign currency exchange rate is defined by Kreinin (1983) as the number of units of one currency which can be exchanged for another currency. Exchange rates or the value of a currency change every day, and when the change happens, it affects different stakeholders in different ways depending on the direction of the change. The terms 'appreciating or strengthening' and 'depreciating or weakening' are usually used when exchange rates change, Kiplagat J. (2007).

Zambia is a small, open commodity dependent economy and regularly faces challenges from supply shocks. These include shifts in the global copper prices, rain fed agriculture output, hydro electricity generation output and global price of fuel (al) Lionel R., Gregory S., and Oliver M. (2017). Zambia has been a copper producer since prior to independence on 24th October, 1964, but from the early 1970s production fell considerably. Nationalisation in 1973 and low commodity prices hampered investments in the mining sector until the early 2000s. Fresh investments followed privatisation of State Owned Enterprise (SOE), Zambia Consolidated Copper Mines (ZCCM) and higher copper prices in mid 2000s supported by a doubling of copper production between 2004 and 2014, World Bank Group (2017). The economy was boosted from the copper industry and was also complemented by better macroeconomic fundamentals in 2000. Zambia maintained a fairly low levels of inflation rates, interest rates and foreign exchange rates judged by its historical standards and substantial debt relief improved investor's perception of the country after it qualified for the Highly Indebted Poor Countries (HIPC) initiative in 2005, Boya E. (2009). These factors supported the expansion of the economy and the Gross Domestic Product growth rate, which averaged 7.4% between 2004 and 2017. Added to this, in the late 2000s, there were inflows from large Chinese infrastructure lending and from 2012 in the form of large commercial Eurobonds placements in 2012, 2014 and 2015, Zgambo P. (2015).

Zambia's political landscape changed and gave birth to the "One Party Participatory Democracy in 1973". During this period, the tenets of the free market economy which encourages private sector driven economy were done away with and Government started running the economy. The currency depreciated marginally against the US$ with the official exchange rate at K1 equivalent to approximately US$1.28 and by the late 1970s, the Kwacha had depreciated further. Bank of Zambia (2016)

From independence in 1964 to 1974, Zambia was a major copper mining and exporter, it experienced economic boom because the prices of copper were high and mining industries profits were high hence Government revenues were high.

From 1975 – 1980, there was a massive contraction of the economy brought about by the 1973 oil crisis and the world economic recession, which resulted in a drop in copper prices on the London Metal Exchange. The fall in export prices and rise in import prices resulted in Government borrowing heavily on the international money markets as the country was heavily dependent on imports for capital and consumer goods. The result was huge debt Mwanza A. (1992).

Low copper prices and continued increased fuel prices on the world market were the major contributing factors to the declining economy and the Kwacha was pegged to the United States dollar in 1983. In 1985, the Bank of Zambia introduced a weekly auctioning system and a Foreign Exchange Management Committee was put in place whose sole mandate was to allocate the scarce foreign exchange to companies and individuals. Inflation from the mid-1980s to early 1990s continued to gallop at 3 digits. In order to meet the public demand for cash in the economy, it was necessary to introduce a higher bank note and in 1986, the Bank of Zambia issued into circulation the K50 denomination. In 1991, the K100 and K500 bank notes were added to the family of bank notes and during this period, the K1 was replaced with a coin of the same denomination while the K2 paper note ceased to exist and was eventually withdrawn from circulation. Bank of Zambia (2017).

It was expected that with auctioning system, there would be minimal depreciation of the Kwacha but instead it resulted in a massive devaluation of the Kwacha, at least by 100%. As the Kwacha continued to depreciate, inflation and interest rates also accelerated and created economic uncertainty as business operations and planning became increasingly difficult and

unpredictable. Agriculture and manufacturing sectors though benefitting from increased foreign exchange allocations faced stiff competition from imports, Kasunga E. (1985). This posed a restriction on companies as only State owned Enterprises (SOE) and those preferred by the Government were considered for foreign exchange allocations. In 1987, the auctioning system was abandoned and a two–tier foreign exchange system was introduced. However, the value of the Kwacha continued to decline and inflation had reached 150% by 1989, Chipili, J. M. (2015a).

In early 1990s, Zambia's political landscape changed yet again with the country holding its first multi-party elections in October, 1991. The advent of multi-party politics ushered in the Third Republic and an era of economic liberalization. As inflation remained high and the demand for cash in the economy began to increase, the Bank of Zambia further introduced three bank notes in May, 1996 namely; K1, 000, K5, 000 and K10, 000. Continued poor economic performance with annual GDP growth averaging 2–4 % in the late 1990s contributed to the public's loss of confidence in other forms of formal payment instruments such as cheques further increasing the public's heavy reliance on cash for many of its transactions. This led to an exponential increase in currency in circulation (CIC) during the same period from K65.4 billion in 1994 to K671 billion in 2003 (i.e. representing a 926 % increase), Bank of Zambia (2017).

In 1992, the MMD Government in the wake of the debt crisis, widening budget deficit, runaway inflation, capital flight and souring interest rates shifted towards liberalisation of foreign exchange controls. These were taken as part of macro – economic stabilization or structural adjustment programme, supported by the International Monetary Fund (IMF) and the World Bank, Bank of Zambia (2016).

Since the Mid-2000, short – term movements in the kwacha have received considerable attention as a result of variations that most analysis attribute to fluctuations in the price of copper, the country's most important export (Weeks, et al. 2007, IMF 2000d and Moono 2010b).

The primary objective of the Bank of Zambia (Central Bank) has been to maintain price stability. In the exchange market, its only role has been to intervene in order to reduce volatility and manage exchange rate stability, Chileshe, P.M (2015). The key characteristics

of Zambia's foreign exchange market are that, they are "thin" in the sense that the markets are dominated by very few players (Large mining firms, Commercial Banks and Bank of Zambia) and the market do not cover the entire country i.e. it is very difficult to access foreign in Mansa or Mongu. Sometimes, there are notable times of low trading volumes, when large players are not trading and the exchange rate is fairly stable. Participants that are large relative to the level of transactions can exert influence over the rate of exchange sometimes by timing of their transactions, even if they do not intend to transact, Boya, E. (2009).

In 2014 and 2015, Zambia's economy experienced several shocks including a further decline in copper prices and after a decade of running a trade surplus, the external account fell into deficit in December, 2014. The initial consequence was a steady depreciation in the value of the kwacha during the first half of 2015. In august, 2015, the confidence of the economy was eroded further as a power crisis began to impact all sectors of the economy and the trade deficit increased. The currency also depreciated by 60% as the currency exchange market experienced an instance of market panic. Some gains were recovered in 2016 following tighter monetary policy, but at the end of 2016, the kwacha substantially remained weaker. The depreciation of the kwacha abruptly fed through to consumer prices between September and November, lifting annual inflation from 8% in preceding years to over 20% in 2015 (World policy Research Paper 8128).

The role of domestic inflation as a main driver of exchange rate appears to have steadily declined from 19% in 1996 – 1999 to 6% in 2012 to 2014. It is apparent that the factors contributing to exchange rate fluctuations have varied quite substantially over time, but also that the amplitude of the shocks – and therefore that of exchange rate fluctuations – has declined since about 2009. For instance, the early 2000s saw a number of stark movements in exchange rate, with money appearing to be the main driver. The strong appreciation in 2005 of about K3.50 to 1US$ corresponding to the debt relief under HIPC Initiative, enters mainly as a genuine exchange rate shock, while the proportional contribution of high copper prices appears rather moderate over time of the sample period. The abrupt depreciation of the kwacha in 2009 illustrates its potential importance as it accounts for about two thirds of the variation. (World Bank Group, 2017).

1.2 Statement of the Problem

The variability of the nominal kwacha against the major trading currencies declined over the last several years. The variability or "instability" is quite low by comparison to other countries, both in Africa and elsewhere. Foreign exchange rate instability seems closely associated with capital account fluctuations, and moderated by the level of foreign exchange holdings of the Bank of Zambia. Reserve accumulation has an opportunity cost, though currently the level of holdings is substantially below the Bank of Zambia target level. Weeks J. and Mungule O.F. (2013),' According to Devarajan (2003), the rate of exchange among different monetary forms changes each day as speculators rethink new data. The nation's Central Bank can attempt to impact its currency conversion scale with different currencies, at last, it is the free market that decides the actual swapping scale through the tenets of demand and supply.

The downward run of the Zambian Kwacha against the significant monetary forms between 2009 and 2018 (World Bank Country Report, 2019) has influenced the economy of Zambia negatively as it has brought through an increase in price of goods and services. Zambia as it is for a greater part of developing economies of the world, vigorously depends on import of products to take care of internal demand for merchandise and enterprises. A feeble Kwacha hence harms importers and expands the cost of products. Like anything, the estimation of the currency rises and falls as a result of the forces of free market action. The free market movement of a country's trade is reflected out in its outside transformation scale, Ademola T. (1986).

When a nation's economy flounders, buyer spending lowers and exchanging feeling for its currency goes bad, prompting a decrease in that nation's money against different monetary standards with more grounded economies. In the developed nations, researchers have additionally investigated the effect of currency conversion standard instability and related vulnerability on exchange, speculation, and monetary development. A significant number of these studies have found that conversion standard instability can straightforwardly impact exchange, Cheong (2004).

Regarding the literature on the macroeconomic factors such as inflation, interest rate, Balance of Payment and Gross Domestic Product growth effecting the value of the Zambian Kwacha, a lot of studies have been on forecasting rather than identification of underlying mechanic

and main drivers Chipili(2015b); Mbao (2015). Exceptions include Mutoti et al. (2011), who established the importance of oil price and money supply as determinants of inflation, and Chileshe (2015), who shows that the fiscal shocks can have a great impact on consumer prices.

1.3 Aim of the Study

The aim of this study was to empirically determine the influence of macroeconomic factors i.e. Gross Domestic Product growth, interest rate, inflation and Balance of Payment on foreign currency exchange rate fluctuations and the value of the Zambian Kwacha.

1.4 Research Objectives

i. To determine the extent to which Gross Domestic Product growth rate affects the value of the Zambian Kwacha.
ii. To describe the relationship between interest rates and the value of the Zambian Kwacha.
iii. To establish the impact of inflation rate on the value of the Zambian Kwacha and suggest measures to mitigate the impact.
iv. To explain the effect of Balance of Payments on the value of the Zambian Kwacha

1.5 Research questions

i. What is the extent to which Gross Domestic Product growth rate affects the value of the Zambian Kwacha?
ii. What is the relationship between interest rates and the value of the Zambian Kwacha?
iii. How can the impact of inflation rate on the value of the Zambian Kwacha be mitigated?
iv. Why is the effects of Balance of Payment important on the value of the Zambian Kwacha

1.6 Significance of the Study

The study of macroeconomic factors makes it easier to understand demand, supply and price trends. It teaches the way to maintain the balance between unlimited demands and limited

resources. Basic know how helps business enterprises and individuals the economic state of the country and helps to make better decisions Ayesha I. (2017).

The study shall contribute to the existing body of knowledge and also provide a basis for Government and other policy makers to devise policies based on the findings to improve the value of the Kwacha in Zambia. The study will also benefit foreign and local investors, cross border traders and academicians understand the various factors that affect foreign exchange rate fluctuations on the foreign exchange market and the value of the Zambian kwacha.

1.7 Scope of the Study

The scope of a study explains the extent to which the research area will be explored in the work and specifies the parameters within the study will be operating. This explains what the study will cover and what it is focussing on, Chika A. (2015).

The purpose of the study was to empirically determine the influence of macroeconomic factors on foreign exchange rate fluctuations and the value of the Zambian kwacha. The study investigated data in respect of interest rates, inflation rate, exchange rate, Balance of Payment and Gross Domestic growth rate for each year from 1993 to 2018 as independent variables and the value of the kwacha against the United States Dollar as dependent variable. The secondary data was sourced from Bank of Zambia and Central Statistical Office (Zambia Statistics Agency) and constituted annual average figures.

The study adopted the quantitative research design, the Purchasing Power Parity theory and the International Fisher Effect analyse the data.

The research was restricted because the figures used for Gross Domestic Product growth rate are based on the old data framework since Zambia Statistics Agency has yet to rebase the GDP.

1.8 Research Organisation

The research is organised as follows; chapter one provides the research background to the study, chapter two gives the literature review, chapter three gives the theoretical and conceptual framework of the study and chapter four outlines the research methodology.

Chapter five outlines data analysis, findings and interpretations whilst chapter six gives research conclusion and recommendations

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter looks at the foreign currency exchange systems. It will also discuss the literature describing the effects of foreign currency fluctuations on the value of a currency. The chapter also reviews articles and journals by various researchers in respect of macroeconomic factors such as interest rates, inflation rates, Gross Domestic Product growth and Balance of Payment.

2.1 Overview of Foreign Exchange Rates

This section looks at a discussion of the concepts of foreign exchange theory. It provides an insight on the concepts of foreign exchange rates in general. It also looks at the various foreign exchange regimes Zambia has used.

2.1.1 Currency markets

The foreign exchange market provides the physical and institutional structure through which the money of one country is exchanged for that of another country, the rate of exchange between currencies is determined, and foreign transactions are physically completed. A foreign currency exchange transaction is an agreement between a buyer and a seller that a given amount of one currency is to be delivered at a specific rate for some other currency Will K. (2018).

2.1.2 Foreign currency exchange rates

Foreign exchange rates can be nominal or real exchange rates. According to Arkolakis (2014), a nominal exchange rate is the price of a foreign currency in terms of the home currency. It measures the relative worth of the two countries' currencies. While a real exchange rate is the nominal exchange rate multiplied by the inverse of the relative price levels. A real exchange rate has also been defined as the rate at which two countries' goods trade against each other (Twarowska, 2014).

Exchange rates can be quoted as either direct or indirect quoting. A direct quote is one which states the number of units of the domestic currency needed to buy one unit of the foreign currency. For example the quote 7.40ZMW/US$ is a direct quote in Zambia.

2.2 Fixed exchange rate systems

This is a type of exchange rate system where the government and the central bank operates in the foreign currency exchange market to ensure that the rate of exchange is maintained at a fixed or per-rate.

However, under this system the degree of fixity has varying levels. The government through the central bank will be required to maintain an official level of reserves. These reserves are required for financing any current account deficit or a fall in reserves or surplus or a rise in reserves that occur. The reserves are also for intervention in the foreign currency exchange market to maintain the fixed or par value of the currency. The reserves will be used to buy the currency if the exchange rates fall and sold in exchange for reserves when the exchange rates rise.

It should however be noted that there is no exchange rate regime that is truly fixed for all the time. The issue is the degree of fixity. Under the gold standard system, the rates of exchange where fixed. However, under the Breton woods system, the exchange rates were fixed within narrow limits but with the possibility of occasional changes of the fixed or par value, Will K, (2018).

2.2.1 Floating exchange systems

In a floating exchange rate system, unlike the fixed rate, the foreign currency exchange rate is determined by private market through the forces of supply and demand. The floating rate is often termed as self-controlling, as any difference in the supply and demand will automatically be corrected in the market. The floating rate constantly changes.

Under the floating exchange rate regime the government has no obligation to maintain the rate of exchange at some declared level but leaves its determination to the forces of demand and supply for the currency. However, there are degrees to which governments will allow the forces to determine the rate of exchange for their currency. The floating currency exchange system can either be free floating exchange or a managed floating exchange rate Chileshe.P.M. (2018).

2.2.2 Free floating exchange rate

This is where the government leaves the determination of the exchange rate entirely to the market forces. There is no official intervention in the foreign exchange markets and hence no need of keeping official reserves. However, in practice it is unlikely that governments would have no interest in the rate of exchange, as a large change in the rate has important economic implications. The appreciation of a currency reduces international competitiveness and has employment and output implications. The depreciation of a currency raises the prices of imports and has implications for the rate of inflation, Will K. (2018).

2.2.3 Managed floating

This is a system where the government through the central bank intervenes in the determination of the currency to smooth out exchange rate fluctuations. The government will allow markets to determine day to day movements in the exchange rates but may intervene to prevent very large changes. The system of managed float is also known as “dirty float”.

There are two approaches that government may use in managed float. The government may allow the rate of exchange to fluctuate between very large bands which are often not publicly stated but intervene if the currency looks like moving outside of these bounds. The other approach is for the government to allow the market to determine the trend, in the exchange rate but intervene to limit fluctuations around the trend, Will K. (2018).

2.3 Currency Volatility

Currency volatility refers to the depreciation or appreciation of currency value of any country in comparison to foreign currency (Abrams et al, 2008). These days, the currency volatility is one of the principle and essential issues universally (Bordo and Harold, 2006). Outside trade market is undoubted, the world's biggest money related market and the issue of cash instability is a serious issue particularly to growing economies. It happens when nation is taking after gliding swapping scale framework. A floating rate of exchange implies that the worldwide venture advertise decides the estimation of a nation's money. As indicated by Devarajan (2013), the rate of exchange among different monetary forms changes each day as speculators rethink new data. While a nation's legislature and national bank can attempt to impact its

currency conversion scale with respect to different currencies, at last it is the free market that decides the actual swapping scale.

2.4 Review of studies affecting foreign exchange rate

There has been a continuous verbal confrontation on the proper conversion standard arrangement in developing nations. It concentrates on the level of fluctuations in the value of currency even with inner and outside shocks. Rate of exchange thus is probably going to decide financial execution (Devarajan et al., 2003). An unpredictability (or deterioration) of the local cash may invigorate monetary development through the hidden augmentation in the cost of outside stock in regard to home items. By growing the all-inclusive forcefulness of neighbourhood organizations, transformation standard unpredictability occupies spending from outside stock to family unit items.

Dornbusch (2008,) the accomplishment of money volatility in advancing exchange adjust to a great extent relies on upon exchanging request in legitimate heading and sum, and additionally on the limit of the home economy to take care of the extra demand by providing more merchandise (Frankel, 2008). Changes are acknowledged around an unfaltering state incline that is steady with variety in large scale monetary essentials after some time. Vulnerability enters the model as aggravations to both total demand and total supply. Inside this system, total demand is influenced by currency volatility through exports, imports and the demand for local currency. Total supply is influenced through the cost of imported moderate products (Kandil, 2010).

A key issue in the outline of a global money related framework is the impact of the decision of rate of exchange administration on desires. For instance, an administration's affirmation of a story on its rate of exchange may balance out the market, yet then again it might destabilize the market by giving a simple focus to examiners (Wilcoxon, 2010). The approach developments of the major industrialized countries after 2000 and the extending significance of the European Monetary System (EMS), which incorporates the use of confined, unequivocal money bunches, drove Paul Krugman to apply stochastic process hypothesis to the examination of floating rates inside gatherings (European Central Bank, 2003). Krugman's 1987 paper has vivified amazing further research into the effects of exchange anticipates showcase desires, however quite a bit of this has yet to show up in distributed frame.

Notwithstanding unique creators, Miller and Sutherland battled that the desire of a modification in organization emphatically influenced the dollar advantage of sterling. They noted first that the example valuation for sterling, which others had seen as exogenous, likely reflected the contemplate altering of money related system remembering the ultimate objective to accelerate sterling's landing to gold. Second, the expiry of the Gold and Silver Act toward the end of 1925 surmised that the relationship between the swapping scale and the essentials should represent a period subordinate segment, pushing sterling towards the pre-war fairness of $4.86. Their essential issue, in any case, was that esteem drowsiness was a key part that had been expelled by past studies, and they offered an alternative show with esteem inertness and variable general forcefulness (Krugman, 2000).

The national Bank of Kenya has experienced inconveniences in a split second affecting excess holds in sort of money outside banks - one of the key section of spare trade out Kenya, and perhaps the case for other national banks in Africa. Affecting coin outside banks through Open Market Operations (OMO) must be impacted by higher financing costs upheld over a long extend time, where the all-inclusive community will respond by decreasing their money property for stores. High normality in coin outside banks associated with the all-inclusive community's ubiquity for cash, especially in the midst of festivities and when extension is high due to transient components occasioned by opposing effects of drought on sustenance swelling and also rising world oil costs on fuel costs, has in like manner constrained liquidity organization using open market operations (CBK, 2009).

A quantitative macroeconomic framework used in various forms by a number of authors to gauge the effect of stabilisation policies in developing countries is the monetary equilibrium model developed by Khan,(1981)., which is based on the monetary approach to the balance of payments. The domestic rate of inflation relative to the foreign exchange rate is assumed to be positively related to the excess supply of real money balances and a negative function of the deviation of the domestic prices from their purchasing power parity equilibrium.

Robicheck (1967), observed that in implementing a financial programme, one has to be aware of the need to frame programmes that are compatible with the aspirations for rapid growth. International Monetary Fund (IMF) programmes are controversial. Governments that enter

with the IMF claim that it is better, yet incidences of strikes, riots and ransacking of super-markets manifest that IMF programmes mobilise some resistance. In Zambia, the riots that took place in 1986 forced authorities to abandon the IMF programme in 1987(Mwenda, 2003). Scholarly, opinion is also divided: statistical findings range over a spectrum of possible conclusions. Khan and Hague (1998), concluded that IMF programmes are generally successful in stabilising the economies. On the other hand, Przeworski and Vreeland (2000), claim to have found evidence that programme participation lowers growth.

Khan and Hague (1998), argued that there is no theoretical guarantee that Fund adjustment packages will achieve their desired outcomes. They describe Fund programmes as complex packages of policy measures, which combine aggregate demand policies with supply enhancing, relative price policies. The theory underlying the dynamic link between the policy package and a set of multiple macroeconomic variables is not well established. They also argue that the Fund supported programmes are only one of the macroeconomic "shocks" to a country with a programme. External shocks such as changes in the terms of trade and the cost of servicing debt will also affect the country's ability to achieve the objectives of the programmes.

There is consensus from various studies that the value of the kwacha is exceptionally susceptible to global commodity prices, especially that of copper prices. This is supported by case studies such as Muhanga, Zulu and Adam (2004), who focussed on the short – run in structural vector auto regression, or Bova (2009) and Chipili (2015b), who both focussed on long- run cointegrating relationships and infer an equilibrium relationship between the price of copper and the exchange rate. Similarly, Cashin, Cespedes and Sahay (2002) test for a long – run relationship between main export commodities and exchange rate in a sample of 58 countries, and concluded that the Zambian kwacha is a 'commodity currency'. However, Pamu (2011), rejected this classification on the basis of being unable to disdain a relationship between the price of copper and the exchange rate.

Small changes in exchange rate may translate into prices differently than large changes in exchange rate (Aron et al., 2014), for several reasons. Menu costs may imply that producers in the exchange rate retailers absorb small changes in exchange rate through their output profit

margins, and will only adjust prices once a certain threshold has been surpassed. A large depreciation such as in 2015would then surpass these threshold across sectors and forms, leading to a larger exchange rate pass- through (ERPT). Similarly, in times of large exchange rate fluctuations, retailers pay increased attention to the exchange rate and may adjust prices at a higher frequency. Anecdotal evidence suggest that this was the case during 2015, with some retailers, informally declaring prices in United States Dollars (US$), and converting them into kwacha based on the daily exchange rate for every purchase. This practice mechanically leads to a complete exchange rate pass through for these transactions, Aron J., Macdonald R., and Muellbaver, J. (2014).

Polak, (2001) has argued that economic agents can get rid of excess holdings of money in two ways, by buying foreign goods or much more easily by repaying domestic credit to the banking system. Whether and to what extent credit creation leads to one or the other will, to begin with, depend on how it takes place. When credit creation takes place in the form of open market operations in a fully equilibrated credit market, the Johnsonian assumption that the operation has no effect on the demand for money may approximate reality. In those circumstances, however, they are most likely to react to imbalance in their position by the repayment of loans from the domestic banks and only a small part of the credit creation will lead to a loss of reserves – unless the linkage of the country to the international capital markets is so perfect that most of the newly created money will at once flow abroad. In many developing countries, however, credit is rationed and credit creation is associated with the creation of additional incomes. The Fund's monetary approach takes credit creation as a proxy for an autonomous increase in demand. While the IMF approach also finds that the full amount of credit creation will over time leak out through the balance of payments, their model does not support Johnson's dictum that the loss of reserves reflects the excess of money in the economy. Polak has argued that the increase in the rate of credit creation or the higher level of exports caused, for example by an increase in the price of an economy's main export staple will raise the money supply only gradually as the new economic situation persists. But this impulse will, more or less at once, raise the annual level of incomes of those who benefit from it and thereafter, income in the country will continue to rise as a result of successive spending rounds. As the demand for holding money increases correspondingly, the economy will experience a shortage of money, to be met only gradually by an increase in its supply. Yet

inspite of this shortage of money, money will be spent to pay for additional imports as expenditure is partially adjusted to the higher income level. In the step by step approach of the Polak model, the stock of money remains below its income equivalent until the end of its income period. If one accepts the basic model that the demand for money is a function of the level of income, and that the supply of money builds up only gradually over time. The conclusion must be that any cause that raises income while creating additional money will be accompanied by a shortage of money. In an equilibrated money market, the shortage of money would be reflected by the rate of interest.

While the traditional view indicates that depreciation is expansionary, the new structuralism school stresses some contractionary effects. Meade (1951) discusses this theoretical possibility, if the Marshall – Lerner condition is not satisfied, currency depreciation could produce contraction. Hirschman (1949) points out that currency depreciation from initial trade deficit reduces real national income and may lead to a fall in aggregate demand. Currency depreciation gives with one hand, by lowering export prices, while taking with another hand, by raising export prices. If trade is in a balance and the terms trade are not changed, these price changes affect each other. But if imports exceed exports, the net result is a reduction in real income within the country, Cooper (1971) confirms this point in a general equilibrium.

Diaz – Alejandro (1963) introduced another argument for contraction following devaluation. Depreciation may rise the windfall profits in export and output competing industries. If money wages lag the price increase and if the marginal propensity to save from profits is higher than that from wages, natural savings will go up and real output will decrease. Krugman and Taylor (1978), and Barbone and Rwera – Baliz (1987) have formalised the same views.

The supply side channels further complicate the effects of currency depreciation in economic performance. Bruno (1979) and Van Wijnbergen (1989) postulate that semi industrialised countries where inputs for manufacturing are largely imported and cannot be easily produced domestically, firm's input cost will increase following devaluation. As a result, the negative impact from higher cost of imported inputs may dominate the production stimulus from lower relative prices for domestically traded goods. Glylfason and Schmidt (1983), provide evidence

that the final effect depends on the magnitude by which demand and supply curves shifts because of devaluation.

Critic of existing literature

Regarding the literature on the macroeconomic factors such as inflation, interest rate, Balance of Payment and Gross Domestic Product growth effecting the value of the Zambian Kwacha, a lot of studies have been on forecasting rather than identification of underlying mechanic and main drivers Chipili (2015b); Mbao (2015). Exceptions include Mutoti et al. (2011), who established the importance of oil price and money supply as determinants of inflation, and Chileshe (2015), who shows that the fiscal shocks can have a great impact on consumer prices.

2.5 Lessons Learnt from existing Literature

Currency depreciation increases the cost of imported inputs and the cost of production. Devaluation of the kwacha will improve the trade balance if Zambia's demand elasticity for imports and the foreign demand elasticity for exports exceeds 1 in line with the Marshall – Lerner conditions of trade, Kandil M, Mirzaiel I. (2003).

The terms of trade is related to current account and the balance of trade. If the price of a country's exports rises by a greater rate than that of its imports, its terms of trade have favourably improved. Increasing terms of trade show' greater demand for the country's exports. This in turn, results in rising revenues from exports, which provides increased demand for the country's currency (and an increase in the currency's value). If the price of exports rises by a smaller rate than that of its imports, the currency's value will decrease in relation to its trading partners Adam, Christopher and David (1996).

Interest rates, inflation and exchange rates are all highly correlated. By manipulating interest rates, Central Banks exert influence over both inflation and exchange rates, and changing interest rates impact inflation and currency values. Higher interest rates offer lenders in an economy a higher return relative to other countries. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise. The impact of higher interest rates is mitigated, however, if inflation in the country is much higher than in others, or if additional factors serve to drive the currency down. The opposite relationship exists for decreasing

interest rates, that is, lower interest rates tend to decrease exchange rates Bleaney and Micheal (1996).

CHAPETR THREE: THEORETICAL AND CONCEPTUAL FRAMEWORK

3.0 Introduction

This chapter presents the theoretical and conceptual framework in order to provide a basis for the study and the concepts. In addition, the chapter highlights theories guiding the study, determinants of the value of the Zambian Kwacha, empirical studies thereby illustrating the research gap after which it presents the summary of empirical literature.

3.1 Theoretical Framework

Every study must be anchored by some theories and in this study; the researcher shall use the following theories;

3.1.1 Purchasing Power Parity Theory

Purchasing Power Parity (PPP) theory was proposed by Gustav Cassel in 1918. It is a hypothesis of conversion standard assurance and proposes an approach to examination of exchange rates between nations (Reid, 2005). The theory states that homogeneous goods in different states cost the same in the very same state when measured in terms of the same currency. The theory is linked to the arbitrage hypothesis that states that if two homogeneous goods are purchased at different prices in different countries, it leads to Purchase Power Parity (Majok, 2015).

The theory assumes that there are no transactional costs, no barriers to trade and the commodities being traded are homogeneous. However, the main limitation of this belief is in measuring Purchasing Power Parity constructed from price indexes given that different countries use different goods to determine their price level (Reid, 2005).

3.1.2 The International Fisher Effect

The international Fisher effect was introduced by the economist Irving Fisher in the1930s. It holds that the difference in returns between two countries is just equal to the difference in inflation rates (Feldstein, 2007). As indicated by International Fisher Effect, ostensible hazard free loan costs contain a genuine rate of return and expected swelling. The International Fisher Effect hypothesis recommends that remote monetary forms with moderately high loan costs

will have a tendency to deteriorate in light of the fact that the high ostensible financing costs reflect expected rate of expansion (Madura, 2000). Along these lines, this hypothesis recommends that adjustments in the swapping scale between two nations will likewise have a tendency to liken the distinctions to their greatest advantage rates (Demirag and Goddard, 1994). This theory is relevant for this study as it explains the purchasing power of each currency which captures the inflation across countries to ensure that at equilibrium exchange rates, the basket of goods and services purchased by one unit of a country's currency equals to those purchased in the second country.

3.1.3 Special Considerations – The Gold Standard

Between 1870 and 1914, there was a global fixed exchange rate. Currencies were linked to gold, meaning that the value of local currency was fixed at a set exchange rate to gold ounces. This was known as the gold standard. This allowed for unrestricted capital mobility as well as global stability in currencies and trade. However, with the start of World War I, the gold standard was abandoned. Ayesha I. (2017).

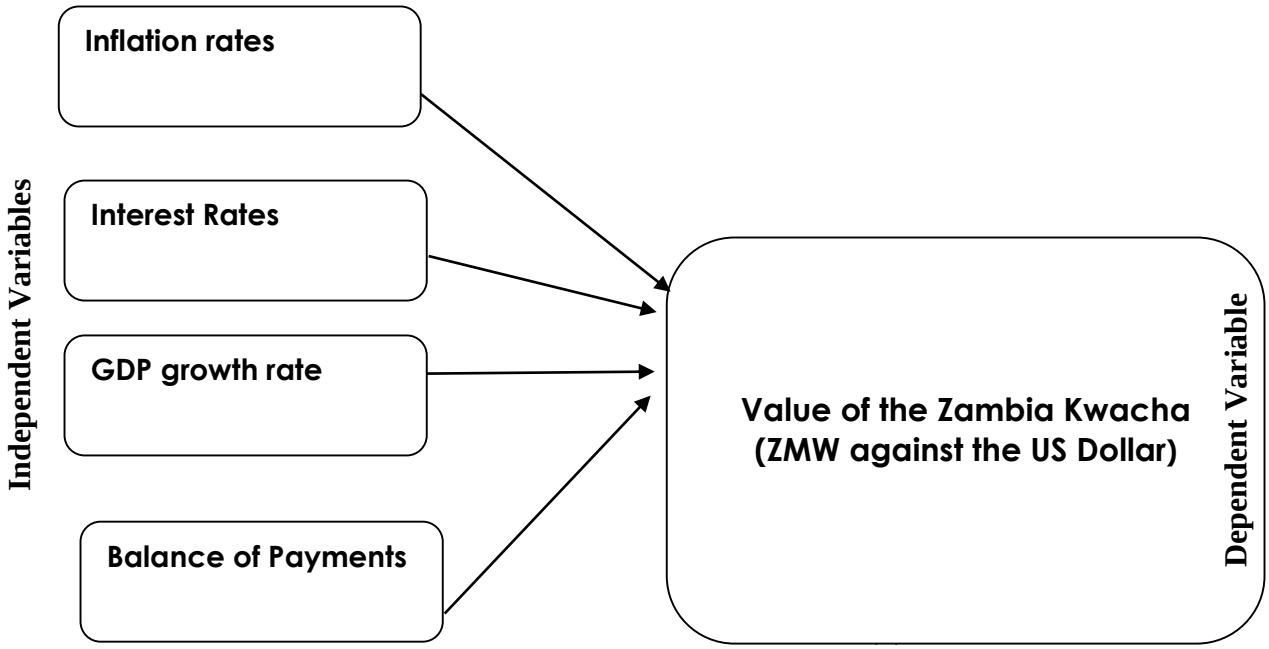
At the end of World War II, the conference at Bretton Woods, an effort to generate global economic stability and increase global trade, established the basic rules and regulations governing international exchange. As such, an international monetary system, embodied in the International Monetary Fund (IMF), was established to promote foreign trade and to maintain the monetary stability of countries and, therefore, that of the global economy.

It was agreed that currencies would once again be fixed, or pegged, but this time to the U.S. dollar, which in turn was pegged to gold at $35 per ounce. This meant that the value of a currency was directly linked with the value of the U.S. dollar. So, if you needed to buy Japanese yen, the value of the yen would be expressed in U.S. dollars, whose value, in turn, was determined in the value of gold. If a country needed to readjust the value of its currency, it could approach the IMF to adjust the pegged value of its currency. The peg was maintained until 1971 when the U.S. dollar could no longer hold the value of the pegged rate of $35 per ounce of gold. From then on, major governments adopted a floating system, and all attempts to move back to a global peg were eventually abandoned in 1985. Since then, no major economies have gone back to a peg, and the use of gold as a peg has been completely abandoned Ayesha I. (2017).

3.2 Conceptual Framework

A conceptual framework is a structure which the researcher believes can best explain the natural progression of the phenomenon to be studied (Camp, 2001). It is the researcher's explanation of how the research problem would be explored. The dependent valuable is the Zambian Kwacha against the United States Dollar and independent variables are inflation rates, interest rates, GDP growth rates and balance of payments.

Conceptual Model



Source: (Lielir and Smith, 1999).

3.3 Statement of Hypothesis

Further, the researcher developed the hypothesises as follows;

a) Inflation rates

Null Hypothesis (H_0): Inflation rates have no negative effect on the performance of the Kwacha in Zambia.

Alternative Hypothesis (H_1): Inflation rates have a negative effect on the performance of the Kwacha in Zambia.

b) Interest rates

Null Hypothesis (H_0): Interest rates have no negative effect on the performance of the Kwacha in Zambia.

Alternative Hypothesis (H_1): Interest rates have a negative effect on the performance of the Kwacha in Zambia.

c) GDP growth rates

Null Hypothesis (H_0): GDP growth rates have no negative effect on the performance of the Kwacha in Zambia.

Alternative Hypothesis (H_1): GDP growth rates have a negative effect on the performance of the Kwacha in Zambia.

d) Balance of payments

Null Hypothesis (H_0): Balance of payments has no negative effect on the performance of the Kwacha in Zambia.

Alternative Hypothesis (H_1): Balance of payment has a negative effect on the performance of the Kwacha in Zambia.

3.4 Chapter Summary

This chapter discussed the importance of theoretical and conceptual frameworks in a research. It has given enough justifications on why their inclusion in a research is indispensable because they heighten the quality of a research. Also, it has thoroughly explained the meanings of the two frameworks, their distinctive roles that they play in the research process, their differences, how they are constructed and where they must be presented in a dissertation or thesis research write-up. Researchers and students must tactfully incorporate theoretical and/or conceptual framework in their research inquires to increase their robustness in all its aspects.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.0 Introduction

In chapter three of the proposal, we discussed the theoretical and conceptual framework of the factor affecting the value of a currency. The chapter discussed the main theories and models used in analysing the various factors involved in the determination of foreign exchange rates or the value of a currency. It also stated the hypothesis and discussed the conceptual framework or the relationship between the value of the Kwacha and foreign currency exchange rate fluctuations.

4.1 Research Design

The study adopted quantitative research design since the aim is to identify any casual links between factors or variables that pertain to the research problem. The main objective of this study was to investigate or explore factors affecting foreign currency exchange rate fluctuations and the value of the kwacha. The study adopted a quantitative approach by using regression model to achieve its objectives Imran K (2016).

4.2 Data Collection

The researcher used information from secondary data as main data source. Data collected from Bank of Zambia and Zambia Statistic Agency in respect of interest rates, inflation rates, and balance of payment data and Gross Domestic Product growth rate for each year from the period 1993 - 2018 constituted annual average figures, (Bank of Zambia, 2019).

4.3 Data Analysis

Data was analysed using quantitative methods and E.views and presenting the data using a variety of statistical tools such as percentages and tables. The study used multiple linear regression formula in showing the relationship between rates of interest, rates of inflation, Gross Domestic Product growth rate, balance of payment rate and Zambian kwacha volatility against the US dollar. Multiple linear regressions were used to model the relationship between the variables.

4.4 Model Specification

To analyse linear relationship between dependent and independent variables, the two stage least square method has been used (Parveen, Qayyum and Ismail, 2012). Following in the given model.

The equation;

$$Yi= b0 + b1x1 + b2x2+ b3x3+b4x4 \varepsilon$$

Where:

Yi = Monthly Zambian Kwacha volatility against the U.S dollar

b0, is constants to be estimated by the model

b1, b2, b3 and b4 are coefficients

X1 = Interest Rates, (will measured in duration of financial instruments in respect to the sensitivity of their values to interest rate changes in ZMW, Monthly)

X2 = Inflation Rates (Consumer price index in ZMW, Monthly)

X3= GDP growth rate (will measured in duration of financial instruments in respect to the sensitivity of their values to interest rate changes in ZMW, quarterly)

X4= Balance of payment (Import/Export price indexes in ZMW)

ε= Error terms

4.5 Test of Significance

According to Kothari, (2004) results are said to be measurably significant inside the 0.05 level, which implies that the noteworthiness esteem must be littler than 0.05. The importance was controlled by the t-value, which shows what number of standard blunder implies the example wanders from the tried esteem. The model significance was tested using the ANOVA, t-tests, F-tests and the chi-square at confidence of 95%.

4.5.1 Unit root test

To avoid spurious results, the first step taken was to test for stationarity in each of the variables in the model. The test statistic that was used in testing for stationarity is the Augmented Dickey Fuller (ADF) test (Afshan and Batul, 2014; Parveen, Qayyum and Ismail, 2012).

4.5.2 The test for autocorrelation

Autocorrelation, if present may lead to inefficient linear and unbiased estimators relative to those free of autocorrelation. As a result the usual t, F and the X2 may not be valid. Thus it is important to check if the model under consideration does not exhibit auto correlation. The Breusch Godfrey (BG) test was used for detecting serial correlation (Gujrat, 2004).

4.5.3 The test for misspecification

This was carried using the Chow test to measure structural change in the relationship between the performance of the kwacha and the explanatory variables. The Ramsey test to test of specification error called RESET (regression specification error test)

4.6 Chapter Summary

Chapter four looked at the methodology that will be used in research project. A discussion of the research design, the data collection methods and the model used where discussed. The multiple regression models were used. Secondary data was for the study.

CHAPTER FIVE: DATA ANALYSIS, FINDINGS AND INTERPRETATION

5.0. Introduction

This chapter focused on the analysis of the collected data from the Central Bank of Zambia and the Central Statistical Office in order to establish the factors affecting performance of Zambian kwacha. This was based on the Using descriptive statistics and regression analysis, Firstly, the results for test of stationarity using Augmented Dickey Fuller (ADF)will be presented in order to avoid non spurious or nonsense regression, followed by diagnostic tests before proceeding with the estimation of the regression model.

5.1. Results for unit root test and their implication

The Augmented Dickey Fuller (ADF) is used to test for stationarity .The test was based on pure random walk model, implying that both intercept and trend were not included. The main aim of this test is to avoid spurious regression .The hypothesis under this test is as follows;

H_0: $\beta=0$ (unit root exists or non-stationary)

H_1: $\beta \neq 0$ (no unit root or stationary

Table 5.1: Results for the stationarity test

Variable	ADF in levels	ADF in the first difference	lags
ER	0.392875	-4.147841	0
GDP	0.198571	-4.0854226	0
INF	-2.129622	-3.637404	0
IR	-1.356453	-4.990306	1
BOP	0.402852	-3.992620	1

Table 5.2: Critical values for the ADF statistics

Level of Significance	Value of ADF Statistic
1%	-2.816740
5%	-1.952344
10%	-1.601144

Based on the results , the decision rule is that null hypothesis H_0 is rejected if the ADF statistic in absolute terms is greater than critical value of ADF Statistic of -1.952344. Otherwise, H_0 is accepted if the ADF statistic in absolute terms is less than the critical value at 5% .Therefore, it can be concluded that all the variables had no unit root in the first differnce,however, INF had no unit root in both levels and in the first difference.

5.3. Test for Autocorrelation

The Breusch Godfrey (BG) or Langrange Multiplier (LM) test of autocorrelation is a general test in the sense that it allows for (1) nonstochastic regressors, such as the lagged values of the regressand; (2) higher-order autoregressive schemes, such as AR (1), AR (2), etc.; and (3) simple or higher-order moving averages of white noise error terms. This test was used to detect autocorrelation under the hypothesis:

H_0: No serial correlation of any order.

H_1: There is serial correlation.

The test statistic is given by (n-p)$R^2 \sim \chi^2$ The lag length was determined to be zero. Therefore, the computed $\chi 2$= 4.950686 with a probability value of 0.0841 is less than 5.99147. Therefore, we fail to rejecte the null hypothesis of no serial correlation at 5% level of significance.

5.4. Test for heterscedasticity

In order to make to come up with conclusions that are drawn or inference without been misled, a pure White test (no crossing) procedure will be conducted. A White heteroscedasticity test is conducted under the following hypothesis;

The procedure

H_0: there is no pure Heterscedasticty

H_1: there is pure Heterscedasticty

The chi-square value observed for the white heterscedasticty in the model with no cross was 1.225306 and the critical chi-square value at 5% level of significance and 4 degrees of freedom was 9.48773 with a probability value of 0.8739 . It can be concluded that there was no pure heterscedasticty because the observed chi-square value is less than the critical value.

5.5. The Tests For Misspecification

This test is aimed at ensure that the model is correctly specified and determine the stability of variables.The Ramsey-RESET (regression specification error test) Test was used. This test is concerned with the specification errors, which include omitting relevant variables, including irrelevant variable, incorrect functional form and correlation between explanatory variables and residuals. The null hypothesis is that the model is correctly specified against the alternative that it is mis-specified.

Under the hypothesis:

H_0: the model is correctly specified

H_1: the model is not correctly specified

The results for the test are in the table below.

Table 5.3a: Ramsey RESET Test

F-statistic	0.749784
Probability.	0.4198

The Ramsey Reset test for misspecification gives an F-statistic 0.749784 with a probability of 0.4198 is less than the critical value of 5.99 . This result indicates that the model is correctly specified because we fail to reject the null hypothesis of no misspecification with a probability (42%) of obtaining such an F-statistic, thus indicating that the model is correctly specified.

One of the most important elements of modeling is meeting the correct characteristics of a model in relation to relevant theory; that is, must make good economic sense. THE CHOW TEST was used to check for structural change in the relationship between the regressand and the regressors, this may arise as a result of the values of the parameters in the model not remaining the same through the entire time period.

Table 5.3b Chow Breakpoint Test:

Observed statistic	**Prob Value**
1.523553	0.4417

H_0: there is no structural change

H_1: there is structural change

The null hypothesis is not rejected since the F-statistic is 1.523553 which is is less that critical value of 19.3 and has a p-value of 0.4417 which is not statitistically significantly.

Descriptive Analysis

Table 5.4: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ER	25	3.60	5.21	4.5200	.50057
INF	25	6.44	25.93	14.9554	6.65649
IR	25	15.80	48.70	28.2846	9.34040
GDP	25	3.00	10.30	6.4308	2.39457
BOP	25	-2797827613350.00	8992564145125.00	1411244732406.6924	3609494124947.38230
Valid N (list wise)	25				

Descriptive statistics (Table 5.6) gives a presentation of the minimum, maximum and mean values of variables applied together with their standard deviations in this study. The table shows the descriptive statistics for the variables applied in the study. The results of all the variables were obtained by the use of E.Views software version 22 for the period of 25 years (1993-2018) on an annual basis. The minimum value for Exchange rate against US dollar, Inflation rate, Interest rate, Gross Domestic Product growth and Balance of Payment, were 3.60, 6.44, 15.80, 3.00 and -2,797,827,613,350.00 respectively, while the maximum values were 5.21, 25.93, 48.70, 10.30, 8,992,564,145,125 respectively. Exchange rate against US dollar ER had a mean of 4.5200 with the standard deviation of 0.50057. The mean of Inflation rate was calculated at 14.9554 with standard deviation at 6.65649. Meanwhile, the Interest rates had a mean of 28.2846 with standard deviation of 9.0418. GDP Growth Rate had a mean of 6.4308 and standard deviation 2.39457. Lastly, the Balance of Payment had a mean of 1,411,244,732,406.6924 and standard deviation of 3,609,494,124,947.38230

5.7 Regression Analysis

The Error correction model provides a short run model which considers the residuals. Thus, a regression was run in E-views 9 where all the variables were differenced according to the results obtained from stationarity. The results obtained were as follows

D(ER) = 0.359693236594 + 3.07768609182e-14*D (BOP) - 0.128962824714*D (GDP) + 0.14246047915*D (INF) - 0.00350977045121*D (IR) + 1*RES

T values = (3.40E+15) (7.54E+14) (-2.24E+15) (4.09E+15) (-3.66E+14) (3.37E+15)

R^2 = 36 %

The t-statistics in the brackets show that all variables in the model including other factors represented by residuals were significantly affecting value of the kwacha in the short run, since they are all greater that the critical t value of 1.895. Further, the R^2 shows that the model explains about 36 % of variability in the value of the kwacha in the short run. The results show that there exist a very strong relationship among the independent variables of the developed model and the performance of the kwacha.

5.8 Analysis of Variance

Table 5.8a: Analysis of Variance

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.912	5	.182	.581	.716[b]
Residual	1.885	6	.314		
Total	2.797	11			

a. Dependent Variable: ER

b. Predictors: (Constant), RES, BOP, IR, GDP, INF

F-test and its significance

The significant value is 0.716 is greater than P=0.05. This implies that the model was not statistically significant in predicting the value of the kwacha in the period of study. This is also because the computed F-value is less than the critical value of 4.39. This suggests that the overall multiple regression models is not statistically significant, it is not a suitable

prediction model for explaining how the selected independent variable affects the performance of the kwacha.

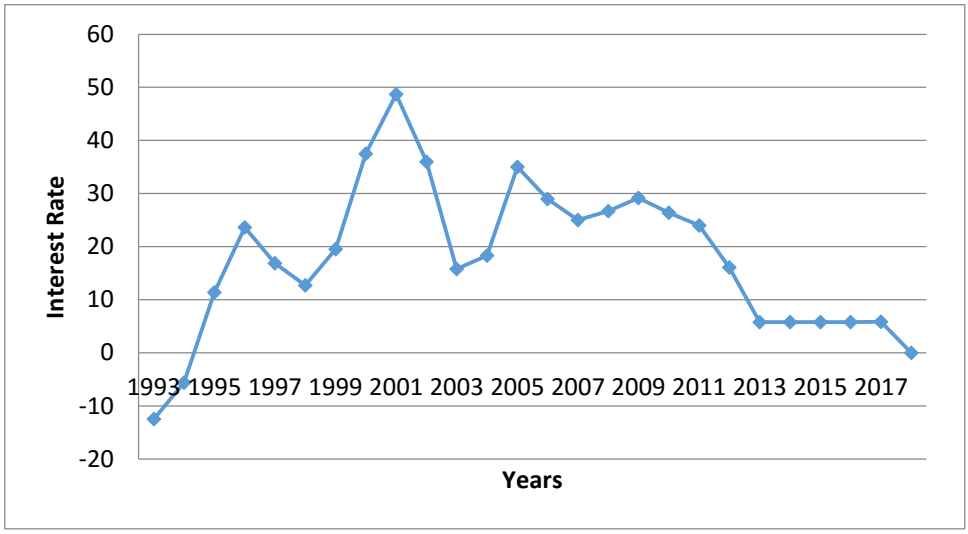
5.9 Discussion of Research Findings

5.9.1 The relationship between interest rates and the values of the Zambian Kwacha

Holding other variables constant, the first difference of the coefficient of the interest rates was -0.003510 and was negatively statistically significant. This shows that influence of interest rate on the value of the Zambian Kwacha was significant at the 5% level of significance. The elasticity of the value of the kwacha with respect to the interest rates was about 0.0035 holding other variables constant, suggesting that if interest rates went up by 1%, on average, the amount of the kwacha declines by K0.0035 and vice-versa within the relevant period. This percentage change in the value of the kwacha is not very responsive to the change in interest rates. This means that the interest rate elasticity of the amount of the kwacha is actually inelastic due to the fact that it is less than 1 in absolute terms. This is in line with the developed alternative hypothesis that Interest rates have a negative impact on the performance of the Kwacha in Zambia. This suggest that there is a negative relationship between Interest rate and the performance of the Kwacha in Zambia

The exchange rate is driven by foreign monetary policy in relation to movements in domestic short – term interest rates, Open market operations which involve selling of treasury bills could affect rates and therefore impacting the value of the kwacha. In addition, a contractionary policy which leads to selling of treasury bills would lead to an increase in short-term interest rate leading to an appreciation of the kwacha. A depreciation will occur if the foreign interest rate is greater than the domestic rate, John W. and Mungule K.O. (2013). Monetary instruments such as treasury bills and sterilised interventions in the foreign exchange market may be used by Government to appreciate or depreciate the kwacha since the market is small.

Table 5.9a: Interest rate trend – 1993 to 2018



Source: Bank of Zambia (2018)

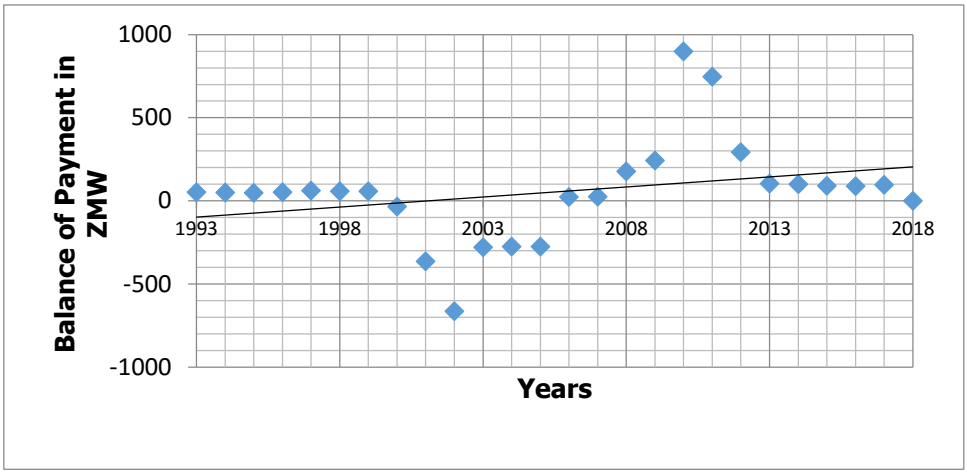
5.9.2 The effects of Gross Domestic Product growth on the value of the Zambian Kwacha

The cofficient of Gross Domestic Product is -0.128963 and was negatively significant at the 5% level of significance. The elasticity of the value of the Zambian Kwacha with respect to the GDP growth was about 0.13% holding other variables constant, suggesting that if GDP grew up by 1%, on average, the the amount of the Zambian Kwacha declines by K0.13 and vice-versa. Hence the value of the Zambia Kwacha was also not very responsive to changes in GDP growth in the period 1993 to 2018. This implys that the GDP elasticity of the amount of the Zambian Kwacha is actually inelastic due to the fact that it is less than 1 in absolute terms.This is in line with the alternative hypothesis that the GDP growth rates have a negative impact. Therefore, we can conclude that Gross Domestic Product growth rate has a negative effect on the performance of the Kwacha in Zambia.

The Zambian economy grew by 3.7% in 2018 compared to 3.5% in 2017. The slight increase in growth reflects strong performance of services(in particular wholesale and retail, pensions and imformation and communication). However, the current account deficit widened from 1.5% of GDP in 2017 to 2.6% in 2018, reflecting increased deficits in income and services accounts amidists narrowing trade surplus. With reduced capital inflows, the overall balance of payments was financed by a drawdown in official reserves. Gross official reserves therefore fell to US$1.6 billion (1.8 months of imports) at the end of December, 2018 from US$2.1

billion at the end of 2017 as at end of June, 2019. The current account registered a deficit of US$414 million in H1 of 2019,reflecting higher interest repayments on public debt, which outweighed the recorded trade surplus. Correspondingly, the exchange rate has faced some pressures during 2019, depreciating by about 10% to about ZMK 13.00/US$, and reserves fallen to US$1.4 billion (1.7 months of imports (Bank of Zambia, 2020).

Table 5.9b: Balance of Trade trend – 1993 to 2018



Source: Bank of Zambia (2018)

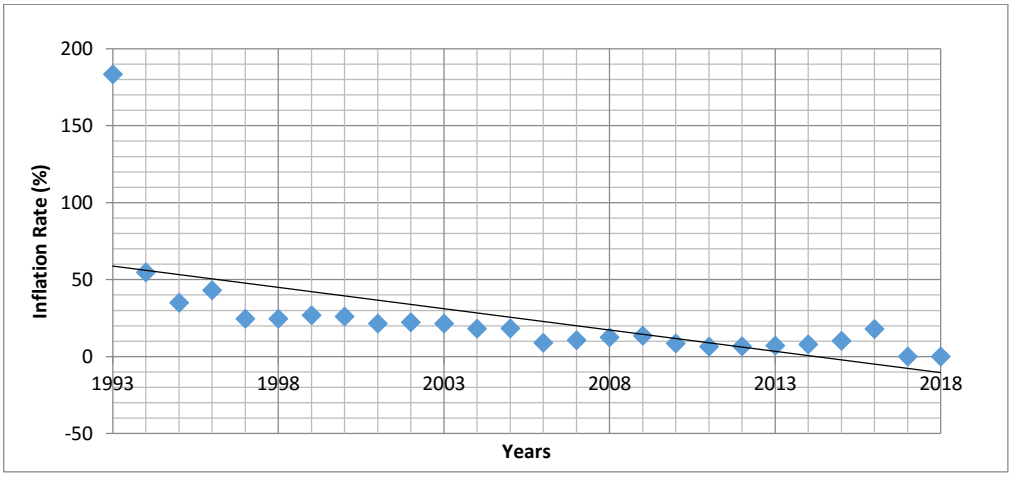
5.9.3 The extent to which inflation rate influence the value of the Zambian Kwacha

Inflation rates had a coefficient value of 0.142460, holding other variables constant and was positively statistically significant at α=0.05. The elasticity of thevalue of the Zambian Kwacha with respect to the inflation rates was about 0.14, implying that if, on average, the inflation rates went up by 1%, on average, the amount of the Zambian Kwacha depreciates by K0.13 and vice-versa in the time period under study. The change in the value of the kwacha was also not very responsive to the change in inflation rates. This suggests that the inflation rate elasticity of the value of the kwacha was actually inelastic from 1993 to 2018 as it is less than 1 in absolute terms. This is against the developed null and alternative hypothesizes Hence, it can be concluded that Interest rates have a positive impact on the performance of the Kwacha in Zambia. Inflation rate positively influence the performance of the Kwacha in Zambia.

According to Gerlach, and Smets (2010) Inflation/deflation is connected with money devaluation. As per Purchasing Power Parity theory, the exchange rates between two countries

will be adjusted in such a way so as to make them at par with the purchasing power of each other, Damani and Vora (2018). When the rate of inflation is relatively high in Zambia, Zambia's competitiveness and ability to trade with global markets will reduce. This in turn will reduce the demand of Zambia's currency in the international market, thus affecting the exchange rate adversely. Holding this theory, lower inflation is preferred for a strong exchange rate (kwacha).

Table 5.9c: Inflation rates trend – 1993 to 2018



Source: Bank of Zambia (2018)

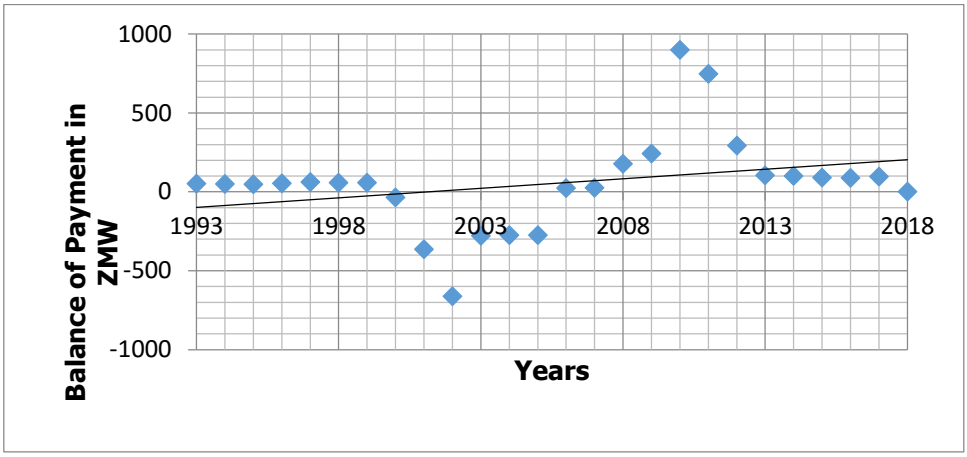
5.9.4 The impact of the Balance of Payment on the the value of the Zambian Kwacha

The results of the study shows that the BOP has a positive sign and statistically significant at the 5% level of significance on the econmic growth of Zambia. However, the elasticity of BOP with respect to the the value of the Zambian Kwacha approximately negligable with the value of about 3.07768609182e-14, holding other variables constant, suggesting that if BOP went up by K1 million, on average, the value of the kwacha depeciates by about 3.08e-14. Based on the results, the value of Zambian Kwacha was not very responsive to changes in the BOP in the period 1993 to 2018.

The current account reflects balance of trade and earnings on foreign investment. A deficit in the current account due to spending more of its currency on importing productsthan it is earning through sale of exports causes depreciation. Balance of Payments fluctuates exchange

rate of its domestic currency, Muhanga, Zulu and Adam (2004) empirically supported through the use of short – run structural vector auto regression.

Table 5.9d: Trend in the Balance of Payments in ZMW 1993 to 2018.



Source: Bank of Zambia (2018)

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents summary and the conclusion of main the findings in the study and The significance of the variables in study will be used as policy implication in guiding in the government policies aimed at enhancing the performance of the kwacha. Recommendations will then be given based on the findings to ensure the general objective of this study is achived .Lastly, suggestions for further research will be given to help in the undertaking of more efficient research by other researchers.

6.1 Summary of Findings

The aim of the study was to find out the factors influencing the foreign currency exchange rate fluctuations on the performance of the Zambian kwacha. The independent variables for the study were inflation rates, interest rates, Balance of payment and the GDP Growth rate. The study adopted a statistical approach by using regression analysis. Secondary data was obtained from the Central Bank of Zambia analysed using E. Views version 22. The study used annual quantitative data for a time series of 25 years running from 1993 to 2018. Augmented Dickey- Fuller test was applied to check for stationarity in the data.

Based on Breusch Godfrey (BG) or Langrange Multiplier (LM) test , the results indicated that there was no serial or auto correlation in the model that was developed. Further, Auxiliary regressions of each independent variable on the rest of other independent variables suggest that Multicollinearity was not a serious problem. The coefficient of the determinant R-square was found be to be 0.6 which means that 36 **percent** of the variation in the performance of the kwacha is explained by the independent variables in the developed regression model. However, ANOVA results show that the F statistic was not significant at 5% level of significance as the calculated P is 0.716 was greater than 0.05. This implies that the overall relationship between the dependent variable and the independent variable was not statistically significant.

In addition, the regression results shows that all the independent variable were statistically significant, with Gross Domestic Product growth and interest rates having a negative significance on the performance of the kwacha. On the other hand, inflation rate and Balance

of Payment had a positive significance on the performance of the kwacha in the period of the study that is from the year 1993 to 2018.

6.2 Conclusions

Based on the findings of the study, we can conclude that both Gross Domestic Product growth and interest rates have a negative relationship with the performance of the kwacha, while, inflation rate and Balance of Payment have a positive relationship with the performance of the kwacha. However, the response of the performance of the kwacha to each independent variable in the developed model was inelastic as the coefficients were less than one in absolute terms. The inelastic of the independent variable on the performance of kwacha seem to be in support of the findings from the F-statistic using the ANOVA which showed that the overall relationship between the independent variables and the dependent variable was not statistically significant.

Export becomes cheaper when currency depreciates and ultimately export increases. The negative impact can be in the form of rise in inflation rate in short- run but in the long run, economy boosts up in the form of increased output. The currency devaluation is not permanent solution for economy improvement.

6.3 Recommendations

To ensure a well performing and strong Zambian Kwacha on the foreign currency exchange market the following recommendations are made;

- Government can use monetary policy to effectively control inflation and stabilise the exchange rate. Monetary instruments such as treasury bills and sterilised interventions in the foreign exchange market may be used to appreciate or depreciate the kwacha since the foreign currency exchange market in Zambia is small.
- Government should use various tools such as fiscal policy aimed at improving the value and performance of the kwacha on the foreign exchange market. Fiscal policy can be used in conjunction with monetary policy to stimulate economic growth, keep inflation low and to stabilize the economy.

- In order for Government to achieve its macroeconomic goals in terms of economic growth, improving the value of the kwacha, job creation, and price stability, balance of payment stability, socially acceptable equitable distribution and poverty reduction, tools that can be used include expansionary (loose) fiscal policy, deflation (tight policy, contractionary fiscal policy.
- Government should formulate and implement strategies to mitigate the extent to which external factors can adversely affect the Zambian currency. This can be done by revising its economic plans.
- Government should craft measures aimed at boosting the industrial base to ensure that there is value addition to raw materials before exports. This will increase foreign exchange earnings thereby strengthening the value of the kwacha on the foreign exchange market and create jobs for citizens.
- Foreign exchange market should be decentralised to all parts of the country to enable efficient and timely participation of all stakeholders.

6.4 Suggestion for further research

Further research could be conducted by undertaking a comparative study of the performance of different currencies at a regional level. Through a comparative study the performance of the currency in a country can be compared with the performance of other currencies, as this can better give an insight of the factors that affect the performance of the local currency due to different localities. Further studies can add other variables that can affect the performance of the local currency in the country, one possible explaination for this is the significance of the residuals, which suggest that there are other variables that affect the performance of the currency.lastly, due to the small sample based on the annual figures, monthly data could be an added advantage in providing large samples. Hence future studies can be conducted using monthly data as opposed to using annual data.

REFERENCES

Abor, J. (2005). Managing foreign exchange risk among Ghanaian firms. *Journal of Risk Finance* vol. 6 no. 4, Pages.306-318.

Adler, C. & Dumas, F. (2010). Does Fuel Hedging Make Economic Sense? The Case of the US Airline Industry. Financial Management 35, 53-86

Ahmed, F., Arezki, R. and Funke, N. (2006). The composition of capital flows to South Africa. Journal of International Development, 19, 275-294.

Ahn, Y.S., Adji, S.S. and Willett, T.D. (1998). The effect of inflation exchange rate policies on direct investment to developing countries. International Economic Journal. 12(1), 95-104.

Akinboade, O.A., Niedermeier, E.W. and Siebrits, F.K. (2012). The dynamics of inflation in South Africa: implications for policy. In: 75th Anniversary Conference of the Economic Society of South Africa, September 13, 2012, Johannesburg South Africa. AERC.

Akinboade, O.A., Siebrits, F.K. and Roussot, E.N. (2006) Foreign direct investment in South Africa, in Ajayi (ed.) Foreign direct investment in Sub-Saharan Africa – Origin, targets, impact and potential. Nairobi: African Economic Research Consortium.

Albright, S.C., Winston, W.L. and Zappe, C. (2006) Data analysis and decision making with Microsoft Excel. 3rd ed. USA: Thomson Learning.

Alfaro, L. (2003). Foreign direct investment and growth: Does the sector matter? Harvard Business School. April 2003

Antweiler, W. (2006) Foreign currency units per 1 US Dollar, 1948 – 2006, PACIFIC Exchange Rates Service, University of British Columbia. [Internet.] Available at http://fx.sauder.ubc.ca/etc/USDpages.pdf (accessed 29/8/2019)

Arias, J., Rubio-Ramirez, J. F., & Waggoner, D. F. (2014). Inference based on SVARs Identified with sign and zero restrictions: Theory and applications.

Aron, J., Macdonald, R., & Muellbauer, J. (2014). Exchange rate pass-through in developing and emerging markets: A survey of conceptual, methodological and policy issues, and selected empirical findings. Journal of Development Studies, 50(1), 101-143.

Baldini, A., Beneš, J., Berg, A., Dao, M., & Portillo, R. (2012). Monetary policy in low income countries in the face of the global crisis: The case of Zambia. IMF Working Paper 12/94.

Barber, D., Cemgil, A. T., & Chiappa, S. (2011). Inference and estimation in probabilistic time series models. Bayesian Time Series Models, 1.

Barrell, R. and Pain, N. (1996). An econometric analysis of U.S. foreign direct investment. The Review of Economics and Statistics, 78(2), 200-207.

Baumeister, C., & Hamilton, J. D. (2015). Sign restrictions, structural vector auto regressions, and useful prior information. Econometrical, 83(5), 1963-1999.

Bénassy-Quéré, A., Fontagné, L. and Lahrèche-Révil, A. (2012) Exchange rate strategies in the competition for attracting foreign direct investment. Journal of the Japanese and International Economies, 15, 178-198.

Bernanke, B. S. (1986). Alternative Explanations of the Money-Income Correlation. NBER Working Paper, (w1842).

Binning, A. (2013). Under identified SVAR models: A framework for combining short and long-run restrictions with sign restrictions. Available at SSRN 2350094.

Bjørnland, H. C., & Halvorsen, J. I. (2014). How does monetary policy respond to exchange? rate movements? New international evidence. Oxford Bulletin of Economics and Statistics, 76(2), 208-232.

Blalock, G. and Gertler, P.J. (2012). Foreign direct investment and externalities: The case for public intervention, in Moran, Graham &Blamestorm (ed.) Does Foreign Direct Investment Promote Development? Will Belington,

DC: Institute for International Economics and the Centre for Global Development.

Blanchard, O. J., & Watson, M. W. (1986). Are business cycles all alike? In The American business cycle: Continuity and change (pp. 123-180). University of Chicago Press.

Bleaney, M. & Fielding, D. (2002). Exchange rate exposure and industry Characteristics: Evidence from Canada, Japan and the USA, Journal *of International Money and Finance* (vol.12, no.1, pp. 29–45). Rate of exchange regimes, inflation and output volatility

Blonigen, B.A. (1997) Frim-specific assets and the link between exchange rates and foreign direct investment. The American Economic Review, 87(3), 447-465.

Borensztein, E., De Gregorio, J. and Lee, J.W. (1997). How does foreign direct investment affect economic growth? Journal of International Economics, 45, 115-135.

Bova, E. (2009). Is the Zambian Kwacha a Commodity Currency? The Co-Movement between Copper Prices and the Exchange Rate. NCCR Trade Regulations SWISS National Centre of Competence in Research Working Paper, (2009/11).

Brealey, Richard A., Myers, Steward C. & Allan, Franklin. (2008). Principles *of Corporate finance* (9th Ed.) McGraw-Hill. REF ID: 27

Campa, J.M. (1993) Entry by foreign firms in the United States under exchange rate uncertainty. The Review of Economics and Statistics, 75(4), 614-622. Carkovic, M. and Levine, R. (2009) Does foreign direct investment accelerate economic growth? The World Bank. [Internet.] Available from http://siteresources.worldbank.org/INTFR/Resources/fdi.pdf (accessed on 12/11/2019)

Cashin, P., Céspedes, L. F., & Sahay, R. (2004). Commodity currencies and the real exchange rate. Journal of Development Economics, 75(1), 239-268.

Chileshe, P. M. (2015). The Dynamic Effects of Fiscal Policy Shocks on Inflation and Economic Activity. The BoZ Reader, 2(1), 10-27.

Chipili, J. M. (2015a). Copper Price and Exchange Rate Dynamics in Zambia. Journal of International Development. 28(6), 876–886.

Chipili, J.M. (2015b). Inflation Forecasting: A disaggregated Approach. The BoZ Reader, 2(1), 1-9.

Choudhri, E. U., & Hakura, D. S. (2006). Exchange rate pass-through to domestic prices: does the inflationary environment matter? Journal of International Money and Finance, 25(4), 614-639.

Conroy, R., Li, W., O'halloran, E.F. &Lleras, M.P. (ed.) Investing in emerging markets. Charlottesville, Virginia: The Research Foundation of AIMR.

Cooper, R. N. (2007). Currency Devaluation in Developing Countries, Essays in International Finance, *International Finance Section, Princeton University*, No. 86,

Felix (2012). *The impact of rate of exchange fluctuations on FDI in Kenya*. Thesis at Kenyatta University.

Forbes, K., Hjortso, I. M., & Nenova, T. (2015). The shocks matter: improving our estimates of exchange rate pass-through. Available at SSRN 2689737.

Garelli, S. (2006) Competitiveness of nations: the fundamentals. IMD World Competitiveness Yearbook 2006 [internet]. Available from http://www.imd.ch/research/centers/wcc/competitiveness_fundamentals.cfm (accessed on 13/11/2019)

Glaister, K.W. and Atanasova, H. (1998). Foreign direct investment in Bulgaria: patterns and prospects. European Business Review, 98(2), 122-134.

Gouws, R. (2012) Rudolf Gouw's Curriculum Vita. [Internet.] Available from http://www.homecomingrevolution.co.za/woza/Rudolf%20Bio.doc (accessed on 29/11/2019)

Hill, C.W.L. (2012) International Business: Competing in the Global Marketplace. 7th ed. New York: McGraw-Hill / Irwin.

Hoyer-Ellefsen, R. (2003). Characteristics of emerging markets, in Bruner, R.F.,

Jenkins, C. and Thomas, L. (2009). Foreign direct investment in Southern Africa: determinants, characteristics and implications for economic growth and poverty alleviation, University of Oxford [internet.] Available from http://www.csae.ox.ac.uk/reports/pdfs/rep2009-02.pdf (accessed on 29/11 /19)

Kandil, M. (2010). The asymmetric Effects of Rate of exchange Fluctuations: Theory and Evidence from Developing Countries. *IMF Working Paper* 00/184 (Washington: International Monetary Fund).

Kimani, S. W. (2007). Efficiency of Foreign Exchange Market in Kenya: The Rational Expectation Approach. *UON-MBA Project, Nairobi*. School of Business.

Kiplagat J. (2007). An Investigation of Arbitrage Opportunities of Cross Listed Stocks in East Africa. *UON-MBA Project, Nairobi. School of Business*.

Kiptoo. C. (2007). Real Exchange Rate Volatility, and misalignment in Kenya, 1993-2003, Assessment of its impact on International Trade, and investments, unpublished Ph.D. Thesis, *University of Nairobi Levich*,

Kiptui J. & Kipyegon P. (2008). Real Exchange Rate Volatility, and Misalignment in Kenya1993- 2003, Assessment of its impact on International Trade, and investments; unpublished PhD Thesis, *Moi University*.

Kiptui, M. (2007). Does the Rate of exchange matter for Kenya's Exports? *Presented at the African Econometric Society Conference*, Cape Town.

Kyereboah-Coleman, A. and Agyire-Tettey, K.F. (2012). Effect of exchange-rate volatility on foreign direct investment in Sub-Saharan Africa: The case of Ghana. The Journal of Risk Finance, 9(1), 52-70

Lahrèche-Révil, A. and Bénassy-Quéré, A. (2009) China in a regional monetary framework, In: ECB Seminar, December 12, 2009, Paris, France. The Development Research Centre in Beijing.

Laura & E. Kodres (1996). Foreign Exchange Markets: Structure and Systemic Risks. *Journal of Finance and Development*, p.22-24.

Lessard, W. (2007). The practice of financial risk management: an International comparison. *Thunderbird International Business Review*, 365–378.

Mbao, F. Z. (2015). Bayesian Vector Auto-Regression Short-Term Inflation Forecasting Model for Zambia. The BoZ Reader, 2(1), 91-99.

Memoranda 018, Maastricht: MERIT, Maastricht Economic Research Institute on Innovation and Technology.

Miller, R.L. & Benjamin, D.K. (2004). The Economics of Macro Issues; Boston, MA; *Pearson - Addison Wesley*.

Mishkin, F., (2008), Rate of exchange Pass-through and monetary policy *NBER.Working Paper* No. 13889.

Moore, D.S., Notz, W.I & Flinger, M.A (2013). The basic practice of Statistics (6th Ed.). New York, NY: W.H. Freeman and Company. Page (138).

Morón, E. & Winkelried, D., (2013). Monetary Policy Rules for Financially Vulnerable Economies: *GDP growth rates. P.* 39.

Mugenda and Mugenda (2003). Quantitative and Qualitative Approaches, *African Centre for Technology Studies*, Nairobi, Kenya

Muhanga, I., Zyuulu, I., & Adam, C. S. (2014). Monetary Policy and the Exchange Rate in Zambia. Zambia: Building Prosperity from Resource Wealth, 110.

Musila, J.W. and Sigué, S.P. (2006) Accelerating foreign direct investments flow to Africa: from policy statements to successful strategies. Managerial Finance, 32(7), 577-593.

Musyoki D, Ganesh P. & Pundo M. (2012).The impact of real rate of exchange Volatility on economic growth: *Kenyan evidence BEH*.

Mutoti, N., Zgambo, P., Mbao, F. Z., Kapembwa, C., Chokwe, E., & Kachingwe, N. (2011). Oil Prices and Consumer Price Inflation in Zambia. Issues on the Zambian Economy, 60.

Narula, R. and Marin, A. (2003). Foreign direct investment spill overs, absorptive capacities and human capital development: Evidence from Argentina. Research

Ng, T.H. (2007). Foreign direct investment and productivity: Evidence from Sub- Saharan Africa.

Nonnemberg, M.B. and Cardoso de Mendonça, M.J. (2004). The determinants of foreign direct investment in developing countries. ANPEC. [Internet.] Available from http://www.anpec.org.br/encontro2004/artigos/A04A061.pdf (assessed on 2/01/20.

Nwankwo, A. (2006). The determinants of foreign direct investment inflows (FDI) in Nigeria. 6th Global Conference on Business & Economics, October 15-17, 2006, Gutman Conference Centre, USA.

Ortiz, A. and Sturzenegger, F. (2007). Estimating SARB's policy reaction rule. South African Journal of Economics, 75(4), 659-680

Pamu, E. M. (2011). Does the copper price explain the deviation of the real exchange rate from the purchasing power parity equilibrium in Zambia. Issues on the Zambian Economy, 1(6), 38-44.

Qin, J. (2008) Exchange rate risk and two-way foreign direct investment. International Journal of Finance and Economics, 5, 221-231.

Quinn, J.B. (2012). Intrepid investors look to 'frontier' markets. Business Day, 24/04 [internet.] Available from http://www.businessday.co.za/articles/world.aspx? ID=BD4A755265 (accessed on 29/11/2019).

Rahman, Z. and Bhattacharyya, S.K. (2003) Sources of first mover advantages in emerging markets – an Indian perspective. European Business Review, 15(6), 361-371.

Ramey, V. A. (2016). Macroeconomic shocks and their propagation (No. w21978). National Bureau of Economic Research.

Razin, A., Sadka, E. and Yuen, C.W. (1999). Excessive FDI flows under asymmetric information.NBER Working Paper No. 7400.National Bureau of Economic Research. Cambridge, MA.S&P (2012)

Rogoff, K. and Reinhart, C. (2009) FDI to Africa: The role of price stability and currency instability. In: The Annual World Bank Conference on Development Economics, April 29-30, 2009, Will Belington DC, USA. International Monetary Fund.

Shambaugh, J. (2008). A new look at pass-through. Journal of International Money and Finance, 27(4), 560-591.

Sims, C. A. (1980). Macroeconomics and reality. Econometrica: Journal of the Econometric Society, 1-48.

Stock, J. H., & Watson, M. W. (2015). Factor models and structural vector auto regressions in macroeconomics. Forthcoming Handbook of Macroeconomics, eds. John B. Taylor and Harald Uhlig.

Uhlig, H. (2005). What are the effects of monetary policy on output? Results from an Agnostic identification procedure. Journal of Monetary Economics, 52(2), 381-419.

World Bank Group (Ed.). (2016). World Development Indicators 2016. World Bank Publications.

Zgambo, P. (2015). Exchange rate Pass-through to Domestic Prices in Zambia. The BoZ Reader, 2(1), 28-55.

Zikmund, William G. (2000). Business research methods (6th Ed.). Fort Worth: Harcourt College Publishers. (Page 512).

APPENDICES

OUTPUT FROM E. VIEWS

APPENDIX 1: UNIT ROOT TEST

Null Hypothesis: ER has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.392875	0.7807
Test critical values:	1% level	-2.771926	
	5% level	-1.974028	
	10% level	-1.602922	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ER)
Method: Least Squares
Date: 03/19/19 Time: 10:41
Sample (adjusted): 1993 – 2018
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ER(-1)	0.014324	0.036460	0.392875	0.7019

R-squared	-0.016369	Mean dependent var	0.094167
Adjusted R-squared	-0.016369	S.D. dependent var	0.561968
S.E. of regression	0.566549	Akaike info criterion	1.781149
Sum squared resid	3.530757	Schwarz criterion	1.821558
Log likelihood	-9.686896	Hannan-Quinn criter.	1.766188
Durbin-Watson stat	2.552675		

Null Hypothesis: D(ER) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.147841	0.0007
Test critical values:	1% level	-2.792154	
	5% level	-1.977738	
	10% level	-1.602074	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ER,2)
Method: Least Squares
Date: 03/19/19 Time: 10:45
Sample (adjusted): 1993 -2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ER(-1))	-1.254101	0.302350	-4.147841	0.0020

R-squared	0.631871	Mean dependent var	0.034545
Adjusted R-squared	0.631871	S.D. dependent var	0.941842
S.E. of regression	0.571450	Akaike info criterion	1.805229
Sum squared resid	3.265552	Schwarz criterion	1.841401
Log likelihood	-8.928759	Hannan-Quinn criter.	1.782427
Durbin-Watson stat	1.833922		

Null Hypothesis: GDP has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.198571	0.7264
Test critical values:	1% level	-2.771926	
	5% level	-1.974028	
	10% level	-1.602922	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 12

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 03/19/19 Time: 10:46
Sample (adjusted): 1993 - 2018
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.014599	0.073521	0.198571	0.8462

R-squared	-0.053149	Mean dependent var	0.383333
Adjusted R-squared	-0.053149	S.D. dependent var	1.678112
S.E. of regression	1.722130	Akaike info criterion	4.004656
Sum squared resid	32.62306	Schwarz criterion	4.045065
Log likelihood	-23.02794	Hannan-Quinn criter.	3.989696
Durbin-Watson stat	2.502971		

Null Hypothesis: D(GDP) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.085426	0.0008
Test critical values:	1% level	-2.792154	
	5% level	-1.977738	
	10% level	-1.602074	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares

Date: 03/19/19 Time: 10:47
Sample (adjusted): 1993 - 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.291584	0.316144	-4.085426	0.0022

R-squared	0.624383	Mean dependent var	0.136364
Adjusted R-squared	0.624383	S.D. dependent var	2.833822
S.E. of regression	1.736780	Akaike info criterion	4.028451
Sum squared resid	30.16406	Schwarz criterion	4.064623
Log likelihood	-21.15648	Hannan-Quinn criter.	4.005650
Durbin-Watson stat	2.014169		

Null Hypothesis: INF has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.129622	0.0369
Test critical values:	1% level	-2.771926	
	5% level	-1.974028	
	10% level	-1.602922	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 25

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 03/19/19 Time: 10:48
Sample (adjusted): 1993- 2018
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.115496	0.054233	-2.129622	0.0566

R-squared	0.113282	Mean dependent var	-1.614167
Adjusted R-squared	0.113282	S.D. dependent var	3.356406

S.E. of regression	3.160584	Akaike info criterion	5.219046
Sum squared resid	109.8822	Schwarz criterion	5.259455
Log likelihood	-30.31427	Hannan-Quinn criter.	5.204085
Durbin-Watson stat	2.548113		

Null Hypothesis: D(INF) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.637404	0.0019
Test critical values:	1% level	-2.792154	
	5% level	-1.977738	
	10% level	-1.602074	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 03/19/19 Time: 10:49
Sample (adjusted): 1993- 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.077904	0.296339	-3.637404	0.0046

R-squared	0.567172	Mean dependent var	0.396364
Adjusted R-squared	0.567172	S.D. dependent var	5.610972
S.E. of regression	3.691438	Akaike info criterion	5.536417
Sum squared resid	136.2671	Schwarz criterion	5.572590
Log likelihood	-29.45029	Hannan-Quinn criter.	5.513616
Durbin-Watson stat	1.981511		

Null Hypothesis: IR has a unit root
Exogenous: None
Lag Length: 2 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.356453	0.1518
Test critical values:	1% level	-2.816740	
	5% level	-1.982344	
	10% level	-1.601144	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IR)
Method: Least Squares
Date: 03/19/19 Time: 10:50
Sample (adjusted): 1993 - 2018
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR(-1)	-0.098848	0.072872	-1.356453	0.2171
D(IR(-1))	0.174197	0.205349	0.848294	0.4243
D(IR(-2))	-0.639899	0.191101	-3.348485	0.0123

R-squared	0.663099	Mean dependent var	-1.990000
Adjusted R-squared	0.566841	S.D. dependent var	9.373301
S.E. of regression	6.169019	Akaike info criterion	6.720282
Sum squared resid	266.3976	Schwarz criterion	6.811057
Log likelihood	-30.60141	Hannan-Quinn criter.	6.620701
Durbin-Watson stat	2.063775		

Null Hypothesis: D(IR) has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.990306	0.0002
Test critical values:	1% level	-2.816740	

	5% level	-1.982344
	10% level	-1.601144

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IR,2)
Method: Least Squares
Date: 03/19/19 Time: 10:51
Sample (adjusted): 1993 - 2018
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IR(-1))	-1.438734	0.288306	-4.990306	0.0011
D(IR(-1),2)	0.659580	0.200303	3.292905	0.0110

R-squared	0.756534	Mean dependent var	0.480000
Adjusted R-squared	0.726100	S.D. dependent var	12.39084
S.E. of regression	6.484797	Akaike info criterion	6.753655
Sum squared resid	336.4208	Schwarz criterion	6.814172
Log likelihood	-31.76827	Hannan-Quinn criter.	6.687268
Durbin-Watson stat	1.970980		

Null Hypothesis: BOP has a unit root
Exogenous: None
Lag Length: 2 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.402852	0.7798
Test critical values:	1% level	-2.816740	
	5% level	-1.982344	
	10% level	-1.601144	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BOP)
Method: Least Squares
Date: 03/19/19 Time: 10:51
Sample (adjusted): 1993 - 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BOP(-1)	0.187508	0.465453	0.402852	0.6991
D(BOP(-1))	0.034003	0.479414	0.070927	0.9454
D(BOP(-2))	-0.968411	0.573388	-1.688928	0.1351

R-squared	0.481154	Mean dependent var	3.59E+11
Adjusted R-squared	0.332912	S.D. dependent var	3.30E+12
S.E. of regression	2.70E+12	Akaike info criterion	60.32810
Sum squared resid	5.09E+25	Schwarz criterion	60.41887
Log likelihood	-298.6405	Hannan-Quinn criter.	60.22852
Durbin-Watson stat	1.688655		

Null Hypothesis: D(BOP) has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.992620	0.0011
Test critical values:	1% level	-2.816740	
	5% level	-1.982344	
	10% level	-1.601144	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BOP,2)
Method: Least Squares
Date: 03/19/19 Time: 10:52
Sample (adjusted): 1993 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BOP(-1))	-1.590397	0.398334	-3.992620	0.0040
D(BOP(-1),2)	0.773694	0.291866	2.650854	0.0292

R-squared	0.662301	Mean dependent var	-4.24E+11
Adjusted R-squared	0.620088	S.D. dependent var	4.14E+12
S.E. of regression	2.55E+12	Akaike info criterion	60.15102
Sum squared resid	5.21E+25	Schwarz criterion	60.21153
Log likelihood	-298.7551	Hannan-Quinn criter.	60.08463
Durbin-Watson stat	1.656959		

Null Hypothesis: RES has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.34746940662673	2.87466949202185e-05
Test critical values:	1% level	-2.79215442912611	
	5% level	-1.97773845973977	
	10% level	-1.60207382002199	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RES)
Method: Least Squares
Date: 03/19/19 Time: 11:16
Sample (adjusted): 1993 - 2018

Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES(-1)	-1.602653441175551	0.252486989300549 4	-6.347469410662673	8.379045840680574e-05

R-squared	0.801153559530361	Mean dependent var	0.001365681654938404
Adjusted R-squared	0.801153559530361	S.D. dependent var	0.581604889596984 4
S.E. of regression	0.259350422351730 7	Akaike info criterion	0.225234769053906 67
Sum squared resid	0.672626415740211	Schwarz criterion	0.261407066580191 3
Log likelihood	-0.238791229791866 66	Hannan-Quinn criter.	0.202433202311919 2
Durbin-Watson stat	1.791325285643665		

Null Hypothesis: RES has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.347469	0.0000
Test critical values:	1% level	-2.792154	
	5% level	-1.977738	
	10% level	-1.602074	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RES)
Method: Least Squares
Date: 03/19/19 Time: 11:16
Sample (adjusted): 1993 - 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES(-1)	-1.602653	0.252487	-6.347469	0.0001

R-squared	0.801154	Mean dependent var	0.001366
Adjusted R-squared	0.801154	S.D. dependent var	0.581605
S.E. of regression	0.259350	Akaike info criterion	0.225235
Sum squared resid	0.672626	Schwarz criterion	0.261407
Log likelihood	-0.238791	Hannan-Quinn criter.	0.202433
Durbin-Watson stat	1.791325		

APPENDIX 2: TEST FOR MUTICOLLINEARITY (AXILLARY REGRESSIONS)

Dependent Variable: D(BOP)
Method: Least Squares
Date: 03/19/19 Time: 11:03
Sample (adjusted): 1993 - 2018
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.62E+11	8.86E+11	-0.747617	0.4761
D(GDP)	4.17E+11	4.76E+11	0.876458	0.4063
D(INF)	-5.28E+11	2.38E+11	-2.222640	0.0569
D(IR)	5.78E+10	8.06E+10	0.716778	0.4939

R-squared	0.434338	Mean dependent var	2.47E+11
Adjusted R-squared	0.222214	S.D. dependent var	3.00E+12
S.E. of regression	2.65E+12	Akaike info criterion	60.30650
Sum squared resid	5.60E+25	Schwarz criterion	60.46814
Log likelihood	-357.8390	Hannan-Quinn criter.	60.24666
F-statistic	2.047571	Durbin-Watson stat	1.393204
Prob(F-statistic)	0.185805		

Dependent Variable: D(GDP)
Method: Least Squares
Date: 03/19/19 Time: 11:04
Sample (adjusted): 1993 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.486329	0.627166	0.775440	0.4604
D(INF)	0.117769	0.210415	0.559697	0.5910
D(IR)	-0.019737	0.058615	-0.336726	0.7450
D(BOP)	2.10E-13	2.40E-13	0.876458	0.4063

R-squared	0.090033	Mean dependent var	0.383333
Adjusted R-squared	-0.251205	S.D. dependent var	1.678112
S.E. of regression	1.877090	Akaike info criterion	4.358524
Sum squared resid	28.18775	Schwarz criterion	4.520160
Log likelihood	-22.15115	Hannan-Quinn criter.	4.298681
F-statistic	0.263842	Durbin-Watson stat	2.438474
Prob(F-statistic)	0.849641		

Dependent Variable: D(INF)
Method: Least Squares
Date: 03/19/19 Time: 11:05
Sample (adjusted): 1993 - 2018
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.487932	0.933937	-1.593182	0.1498
D(IR)	0.039418	0.096295	0.409346	0.6930
D(BOP)	-7.23E-13	3.25E-13	-2.222640	0.0569
D(GDP)	0.319966	0.571677	0.559697	0.5910

R-squared	0.381995	Mean dependent var	-1.614167
Adjusted R-squared	0.150243	S.D. dependent var	3.356406
S.E. of regression	3.094011	Akaike info criterion	5.358015
Sum squared resid	76.58325	Schwarz criterion	5.519651
Log likelihood	-28.14809	Hannan-Quinn criter.	5.298172
F-statistic	1.648292	Durbin-Watson stat	2.262556
Prob(F-statistic)	0.254070		

Dependent Variable: D(IR)
Method: Least Squares
Date: 03/19/19 Time: 11:06
Sample (adjusted): 1993 - 2018
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.929802	3.881101	-0.239572	0.8167
D(BOP)	1.04E-12	1.46E-12	0.716778	0.4939
D(GDP)	-0.708048	2.102745	-0.336726	0.7450
D(INF)	0.520469	1.271465	0.409346	0.6930

R-squared	0.062750	Mean dependent var	-1.783333
Adjusted R-squared	-0.288719	S.D. dependent var	9.903611
S.E. of regression	11.24275	Akaike info criterion	7.938526
Sum squared resid	1011.196	Schwarz criterion	8.100162
Log likelihood	-43.63116	Hannan-Quinn criter.	7.878683
F-statistic	0.178535	Durbin-Watson stat	1.859597
Prob(F-statistic)	0.907983		

APPENDIX 3: TEST FOR SERIAL CORRELATION (AUTO CORRELATION)

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.755733	Prob. F(2,5)	0.2645
Obs*R-squared	4.950686	Prob. Chi-Square(2)	0.0841

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 03/19/19 Time: 11:08
Sample: 1993 - 2018
Included observations: 12
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008395	0.148606	-0.056494	0.9571
D(IR)	-0.001787	0.011874	-0.150529	0.8862
D(BOP)	-2.46E-14	5.78E-14	-0.425049	0.6885
D(GDP)	0.003120	0.110118	0.028334	0.9785
D(INF)	-0.007079	0.057232	-0.123691	0.9064
RESID(-1)	-0.776336	0.583138	-1.331306	0.2406
RESID(-2)	-0.190555	0.864241	-0.220488	0.8342

R-squared	0.412557	Mean dependent var	-8.56E-17
Adjusted R-squared	-0.292374	S.D. dependent var	0.309855
S.E. of regression	0.352251	Akaike info criterion	1.042252
Sum squared resid	0.620403	Schwarz criterion	1.325114
Log likelihood	0.746489	Hannan-Quinn criter.	0.937526
F-statistic	0.585244	Durbin-Watson stat	1.862469
Prob(F-statistic)	0.734241		

APPENDIX 4: TEST OF HETERSCEDASTICITY

Heteroskedasticity Test: White

F-statistic	0.199011	Prob. F(4,7)	0.9311
Obs*R-squared	1.225306	Prob. Chi-Square(4)	0.8739
Scaled explained SS	0.288928	Prob. Chi-Square(4)	0.9905

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/19/19 Time: 11:09
Sample: 1993 - 2018
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.120767	0.066027	1.829044	0.1101
D(IR)^2	-0.000225	0.000312	-0.720715	0.4944
D(BOP)^2	8.19E-28	3.34E-27	0.244880	0.8136
D(GDP)^2	-0.002925	0.007723	-0.378797	0.7161
D(INF)^2	-0.000821	0.001766	-0.464754	0.6562

R-squared	0.102109	Mean dependent var	0.088009
Adjusted R-squared	-0.410972	S.D. dependent var	0.108216
S.E. of regression	0.128544	Akaike info criterion	-0.970755
Sum squared resid	0.115665	Schwarz criterion	-0.768711
Log likelihood	10.82453	Hannan-Quinn criter.	-1.045560
F-statistic	0.199011	Durbin-Watson stat	2.004152
Prob(F-statistic)	0.931075		

APPENDIX 5: TESTS FOR MISSPECIFICATION

Ramsey RESET Test
Equation: UNTITLED
Specification: D(ER) C D(IR) D(BOP) D(GDP) D(INF)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.865901	6	0.4198
F-statistic	0.749784	(1, 6)	0.4198
Likelihood ratio	1.413012	1	0.2346

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.117315	1	0.117315
Restricted SSR	1.056109	7	0.150873
Unrestricted SSR	0.938793	6	0.156466

LR test summary:

	Value	df
Restricted LogL	-2.445369	7
Unrestricted LogL	-1.738863	6

Unrestricted Test Equation:
Dependent Variable: D(ER)
Method: Least Squares
Date: 03/19/19 Time: 11:10
Sample: 1993 - 2018
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.449162	0.171627	2.617091	0.0397
D(IR)	-0.005883	0.012738	-0.461890	0.6604
D(BOP)	4.03E-14	5.40E-14	0.746599	0.4835
D(GDP)	-0.156175	0.080861	-1.931408	0.1016
D(INF)	0.129157	0.047740	2.705420	0.0353
FITTED^2	-0.509169	0.588023	-0.865901	0.4198

R-squared	0.729757	Mean dependent var	0.094167
Adjusted R-squared	0.504555	S.D. dependent var	0.561968
S.E. of regression	0.395557	Akaike info criterion	1.289810
Sum squared resid	0.938793	Schwarz criterion	1.532264
Log likelihood	-1.738863	Hannan-Quinn criter.	1.200046

F-statistic	3.240456	Durbin-Watson stat	3.351680
Prob(F-statistic)	0.092358		

Chow Breakpoint Test
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 1993 - 2018

F-statistic	1.523553	Prob. F(5,2)	0.4417
Log likelihood ratio	18.84558	Prob. Chi-Square(5)	0.0021
Wald Statistic	7.617764	Prob. Chi-Square(5)	0.1786

APPENDIX 6: REGRESSION ANALYSIS (ERROR CORRECTION MODEL)

Dependent Variable: D(ER)
Method: Least Squares
Date: 03/19/19 Time: 11:15
Sample (adjusted): 1993 - 2018
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.359693	1.06E-16	3.40E+15	0.0000
D(BOP)	3.08E-14	4.08E-29	7.54E+14	0.0000
D(GDP)	-0.128963	5.75E-17	-2.24E+15	0.0000
D(INF)	0.142460	3.49E-17	4.09E+15	0.0000
D(IR)	-0.003510	9.60E-18	-3.66E+14	0.0000
RES	1.000000	2.97E-16	3.37E+15	0.0000

R-squared	1.000000	Mean dependent var	0.094167
Adjusted R-squared	1.000000	S.D. dependent var	0.561968
S.E. of regression	3.05E-16	Sum squared resid	5.59E-31
F-statistic	7.46E+30	Durbin-Watson stat	1.186197
Prob(F-statistic)	0.000000		