DETERMINANTS OF FOREIGN EXCHANGE RATE IN SOUTH SUDAN

BY

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DECLARATION

This thesis is my original work and has not been presented for an award of a degree in any other University.

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I dedicate this work to my family for the sacrifice they made for me to complete this thesis. Their love, care, concern, support, encouragement and enthusiasm inspired me to achieve this goal. Special gratitude goes to my dear husband and our lovely children.

ABSTRACT

In the year 2013 the Bank of South Sudan announced a 34 percent devaluation of the currency but reversed the decision immediately because of strong pressure from vested interests. On December 2015, the exchange rate in South Sudan increased from 2.9623 SSP per dollar to 18.5 SSP per dollar. It is therefore important to understand the determinants of foreign exchange rate in South Sudan. Even though various studies have been conducted on the determinants of foreign exchange rate in other countries different countries are governed by different policies and hence the findings of these studies cannot be generalized to South Sudan. More specifically, the study sought to determine whether interest rates, inflation, terms of trade and public debt determine foreign exchange rate in South Sudan. This study used a causal research design. The results showed that interest rates do not influence foreign exchange rate in South Sudan (β_1=-0.4290188, p-value=0.632. In addition, the study found that inflation is a determinant of foreign exchange rate in South Sudan (β_2=-0.0317558, p-value=0.000). The study further established that public debt has a positive and significant effect on foreign exchange rate in South Sudan (β_3=0.2615654, p-value=0.013). Also the study revealed that terms of trade has no significant effect on foreign exchange rate in South Sudan (β_4=-0.4873149, p-value=0.711). Positive relationship between inflation and exchange rates can also be explained by the theory of Purchasing Power Parity that explains that the exchange rates are established in a country depends on the ratio of the prices of goods and services a country. The study concludes that inflation and public debt are determinant of foreign exchange rate in South Sudan, but interest rates and terms of trade are not. The study recommends that there should be policies to curb inflation rate to around levels that stimulate investment. In addition, there should be policies to guide increased openness to foreign trade so that the domestic enterprise sector can participate fully in the global economy. Also, lack of prudent debt management strategies as evidenced in this study, will partly lead to increase exchange rate volatility. Policies should be made to ensure that both the level and rate of growth of external public debt is sustainable, that is, the debt sustainability indicator external debt to GDP ratio is at low levels and pursues strategies that will reduce excessive accumulation of external public debt. In addition, policies should be made to ensure that borrowed funds are put in projects/ investments with higher rate of returns.

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LIST OF ABBREVIATIONS

ADF: Augmented Dickey Fuller

ASEAN: Association of Southeast Asian Nations

CBR: Central Bank Rates

CPI: Consumer Price Index

ERPT: Exchange Rate Pass Through

FER: Foreign Exchange Reserve

GDP: Gross Domestic Product

GDP: Gross Domestic Product

IFE: International Fisher Effect

IMF: International Monetary Fund

IRP: Interest Rate Parity

MENA: Middle East and North Africa

PPP: Purchasing Power Parity

REER: Real Effective Exchange Rate

RER: Real Exchange Rate

SSP: South Sudanese Pound

USA: United States of America

USD: United States Dollar

VECM: Vector Error Correction Model

WPI: Wholesale Price Index

OPERATIONAL DEFINITIONS OF TERMS

Foreign exchange rate: the rate that specifies how much the currency of a nation is worth in terms of the currency of another nation (Wel, 2016).

Terms of trade: this refers to the relative price of imports in terms of exports and is defined as the ratio of export prices to import prices (Kibiy & Nasieku, 2016).

Public debt: this is the total debt of all governmental units, including those of state and local governments (Bunescu, 2014).

Inflation rate: is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling (Kibiy & Nasieku, 2016).

Interest rate: it is the amount charged, expressed as a percentage of principal, by a lender to a borrower (Insah & Chiaraah, 2013).

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CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter covers the introduction to the study on the determinants of foreign exchange rate. Specifically, it covers background of the study, statement of the problem, objectives of the study, study hypotheses, significance of the study and scope of the study.

1.2 Background of the Study

Exchange rate between two currencies is the value which a currency of one country is traded against that of another country. This rate is also termed as the foreign exchange rate. Foreign exchange rate is divided into the buying rate and the selling rate. Existence of a forex market is very essential due to international dealings which include traveling abroad and international trade. This market has made it easier to facilitate global trade (Praveen, Khan & Ismail, 2012). In addition, exchange rate stability is one of the main factors that promote investments, price stability and stable economic growth. Foreign exchange rate is one of the most important determinants of a country's relative level of economic health, ranking just after interest rates and inflation. Exchange rates play a vital role in a country's level of trade, which is critical to almost every free market economy in the world. It is widely believed that changes in exchange rates have important implication for financial decision making and for the profitability firms (Danga & Kiptui, 2016).

Before 1972 all countries of the world were operating a fixed exchange rate regime where each country currency had a fixed exchange rate relative to the USA dollar

(Akhter & Faruqui, 2015). Thereafter, foreign exchange rate in most countries around the world were liberalized and hence keep on fluctuating (Wan-Mohd, *et al.,* 2016). Changes of fluctuations in the rate of exchange of a countries currency against foreign currency can lead to a currency crisis. After the end of the First World War, some countries in Western Europe and the United States suffered economic problems due to the falling in the value one of their currencies on the international market. The fall in value of the sterling pound, 30% of its initial value by 1931, led to the onset of the great depression. Countries in Asia experienced a problem in exchange rates in the period between 1997 and 1998 (Udoye, 2013). The Asian financial crisis affected the four Tigers-Hong Kong, Taiwan, Singapore and South Korea- Indonesia, Malaysia and Thailand. This currency crisis caused a slump in domestic asset markets, bank failures on a widespread scale and insolvency of various business firms. The currency crisis in Asia followed two prior crises which began with the European Monetary system crisis of 1992 to 1993 and the Mexican Peso crisis of 1994.

In Africa, several countries have had challenges with the exchange rate fluctuations on their currency. Nigeria suffered a currency crisis in the early 1980s after the decline in oil revenue that had put Nigerian currency on the success path since the 1970 oil crisis (Chowa & Chenb, 2012). This crisis forced Nigeria to adopt the Structural Adjustment Programs (SAP) as dictated by the World Bank and the International Monetary Fund (IMF) (Ahmed, 2011). The crisis reversed what the country had gained in its previous policy of indigenization. This crisis devalued the Naira value to the dollar by 30%.

In order to ensure stability in foreign exchange rates, central banks must develop monetary policies based on the key determinants of foreign change rates. Studies conducted in different parts of the world have outlined different determinants of

foreign exchange rates. In Japan Chowa and Chenb (2012) found that political factors, economic growth, interest rates and public debt had a significant influence on fluctuation of foreign exchange rates. In Pakistan, Raja and Naeem-Ullah (2014) found that increase in interest rates and adverse trade balance has a negative significant impact on exchange rate while terms of trade and increase in net capital inflow results in favorable exchange rate for the home country. In Bangladesh, Kazi *et al.*, (2013) found that that stock of money and increase in debt service burden results in a real depreciation of currency, while increasing foreign exchange reserve results in a real appreciation of currency. Moreover, Political instability has a significant negative effect on the value of domestic currency. In another study, Ahmed (2011) found that changes in inflation rate, interest rate and Gross Domestic Product (GDP) have effect on foreign exchange rate of Pakistan.

In Ghana, Insah and Chiaraah (2013) found that the main determinants of real exchange rate volatility were government expenditure as well as domestic and external debts. Both domestic and external debts were negatively related to real exchange rate volatility. Current external debt and a four-year lag of domestic debt had significant impacts on real exchange rate volatility. In Nigeria, Udoye (2013) established that gross domestic product growth rate, interest rates, inflation and trade openness long run relationship with real exchange rate. In a study conducted in Association of Southeast Asian Nations (ASEAN) Wan-Mohd *et al.* (2016) found that although Export had shown a significant relationship with exchange rate fluctuations, other factors like interest rate, and inflation rates had no significant influence.

In Kenya, Kibiy and Nasieku (2016) found that External public debt and money supply were both found to have an effect on the volatilities of the KES/EUR and KES/USD exchange rates while interest rates and inflation were found not to be

statistically significant to their volatilities. Money supply had the most impact with a negative effect on the volatility of the two exchange rates while external public debt was found to have a lower contribution with a positive effect. However, these findings are contrary to Danga and Kiptui (2016) findings that money supply, foreign exchange reserves, interest rate differentials are significant determinants of nominal exchange rate in Kenya while current account balance is not significant determinant.

The Government's decision to peg its new currency, the South Sudan Pound (SSP) to the US dollar, was largely intended to protect against oil price volatility. Amidst falling oil prices and the outbreak of civil war, the Government rapidly depleted its USD reserves and spurred the emergence of a currency black market. This blog argues that the decision taken to float the exchange rate, by the Bank of South Sudan and the Ministry of Finance and Economic Planning on 15th December 2015, was the best option to avoid collapse of the SSP and the dollarization of the economy (International Growth Center, 2015).

Shortly after South Sudan became an independent country on 9 July 2011, it adopted a new currency: The South Sudan Pound (SSP) which, like its predecessor, (the Sudanese pound) was maintained at a fixed exchange rate. Over 90% of the Government's revenues come from oil exports, a fixed exchange rate provides a buffer to the domestic economy against volatile oil prices and protects against the risks of Dutch Disease that befall many mineral exporting economies (Gathoni, 2015).

The Sudanese Pound was fixed at a rate of 2.9623 to the US Dollar (USD), and the SSP has been pegged at the same rate. Maintaining a fixed peg requires sufficient foreign exchange reserves to back the exchange rate. At independence this was not much of an issue, as the country had more than 2 billion USD in reserves, oil

production was flowing, and oil prices were still relatively high (International Growth Center, 2015). In January 2012, a dispute over unpaid transit fees with Sudan led South Sudan to shut down oil production. With halted oil exports, South Sudan's main source of revenue fell very quickly. As the demand for dollars began outstripping the available supply at the official rate, it led to the emergence of a parallel black market (Gathoni, 2015).

Initially, the divergence between the official and the parallel rate was relatively small, with the parallel rate hovering around 4 SSP to the USD. However, the situation deteriorated as in December 2013 a civil war broke out in South Sudan. This led to large increases in spending, particularly on defense. It also led to renewed shut downs of some of the oil fields as these were in areas of some of the strongest fighting. As Government spending ramped up, its main source of revenue dried up. This was further compounded by a fall in world oil prices (International Growth Center, 2015).

By October 2015, the Government was only able to fund about a third of its spending from revenues. To fund the growing deficit, the Government of South Sudan drew initially on accumulated reserves. Reserves were rapidly depleted from a position of over 2 billion USD at independence to less than 60 million USD by October 2015 (Wel, 2016). The reserves left would be insufficient to cover even one week's worth of imports. The Government then started borrowing from the Bank of South Sudan, which began printing SSP to meet the demand [International Monetary Fund, 2017]. The additional influx of nearly 600 million SSP per month into the economy started to severely affect the exchange rate, the money supply and inflation. In the year 2015, South Sudan allowed the South Sudanese pound to trade freely in the market against the US dollar and other foreign currencies (Gathoni, 2015).

The effectiveness of official intervention in foreign exchange market is a crucial policy issue for South Sudan. The Bank of South Sudan abolished its fixed exchange rate regime due to gross overvaluation of it currency, the South Sudanese Pound. Since the abandoning of the fixed exchange rate regime and the introduction of a manage float in 2015, the Bank of South Sudan introduced the monthly and sometimes quarterly auctioning of foreign exchange. In the new regime, the Bank instructed commercial banks to report their daily exchange rates. In the face of the underdeveloped interbank foreign exchange market, the weighted average of commercial banks daily rates, enable the Bank of South Sudan to obtain market-based official exchange rate (Wel, 2016).

The introduction of the auctions was the consequence of the country's shallow and underdeveloped interbank market for foreign exchange. Intervention in foreign exchange market changes the balance between domestic and foreign currency denominated in the markets, which induces the investors to adjust their portfolio, changing the exchange rate. Furthermore, the information contained in interventions modifies expectations regarding the future spot exchange rate, leading to an immediate adjustment to the current exchange rate (Deng, 2013).

The relationship between official and black market rates since the introduction of a managed float in 2015 has been rather conflicting. The expectation was that auctions will exert influence on the black market resulting to fall in the black market rate. The sharp depreciation of South Sudanese Pound since the introduction of the new policy implies that the Bank of South Sudan intervention was associated with higher black market rate volatility. The Bank sales of foreign exchange through auctions are

associated with depreciation of South Sudanese Pound against the US dollar, rather than appreciation (Wel, 2016).

1.3 Statement of the Problem

South Sudan has had a currency problem ever since it gained independence from Sudan in July 2011. Since independence, the government of South Sudan had pegged its exchange rate. However, with the economy experiencing the 2012 oil production/export shutdown and civil war, leading to higher defense spending, disruptions of oil production, and the collapse in oil prices, the pegged exchange rate became unsustainable (Deng, 2013). Due to the low money supply to the economy, the Government was only able to fund about a third of its spending from revenues. To fund the growing deficit, the Government of South Sudan drew initially on accumulated reserves in 2015 (Kibiy & Nasieku, 2016). Reserves were rapidly depleted from a position of over 2 billion USD at independence to less than 60 million USD by October 2015. The Government then started borrowing from the Bank of South Sudan, which began printing SSP to meet the demand (International Monetary Fund, 2017). The additional influx of nearly 600 million SSP per month into the economy started to severely affect the exchange rate (Mosel & Henderson, 2015).

In the year 2013, South Sudan devalued its pound currency against the dollar by 34 percent (Deng, 2013), but reversed the decision immediately because of strong pressure from vested interests. In addition, Gathoni (2015) reported that South Sudan devalued its currency by 84 percent as the government allowed the pound to trade freely, surrendering to prices charged in the black market. In addition, Wel (2016) reported that on the year 2015, the exchange rate in South Sudan increased from 2.96 SSP per dollar to 18.5 SSP per dollar (Wel, 2016).

With monetary expansion and parallel exchange rate depreciation, the inevitable result has been a jump in inflation (Deng, 2013). By October 2015, Wel (2016) reports that inflation had increased by 80%. In addition, South Sudan's imports doubled the value of its exports with the 2014 net-import position estimated at more than 4 billion SSP. In financial institutions, interest rates have been increasing for the last five years. To stabilize foreign exchange rate, the government of South Sudan needs to formulate targeted policies based on empirical evidence. It is therefore important to understand the factors affecting foreign exchange rate in South Sudan.

Various studies have been conducted on factors affecting foreign exchange rate. In India, Pareshkumar *et. al.*, (2013) conducted a study on factors affecting currency exchange rate and found that factors responsible include interest rates, terms of trade and economic growth. In Pakistan, Parveen *et. al.,* (2012) conducted an analysis of the factors affecting exchange rate variability and established that economic growth and export and import ratio affect exchange rate. In Kenya, Kibiy and Nasieku (2016) carried out a study on the determinants of exchange rate volatility of the Kenyan Shilling against World Major Currencies and established that the main determinants include external public debt, interest rates and inflation. However, different countries are governed by different policies and hence the findings of these studies cannot be generalized to South Sudan. This study therefore sought to investigate the determinants of foreign exchange rate in South Sudan.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study was to investigate the determinants of foreign exchange rate in South Sudan

1.4.2 Specific Objectives

The specific objectives of the study were to;

i. To determine the effect of interest rates on foreign exchange rate in South Sudan

ii. To establish the effect of inflation on foreign exchange rate in South Sudan

iii. To assess the effect of terms of trade on foreign exchange rate in South Sudan

iv. To find out the effect of public debt on foreign exchange rate in South Sudan

1.5 Study Hypotheses

H_{01}: Interest rates have no significant effect on foreign exchange rate in South Sudan

H_{02}: Inflation has no significant effect on foreign exchange rate in South Sudan

H_{03}: Terms of trade have no significant effect on foreign exchange rate in South Sudan

H_{04}: Public debt has no significant effect on foreign exchange rate in South Sudan

1.6 Significance of the Study

The findings of this study are of great importance to various stakeholders, including the government of South Sudan and policy makers, Investors in South Sudan as well as future researchers and academicians.

South Sudan economy mainly depends on export of oil and therefore fluctuations in exchange rates significant influence the economy of the country. Therefore, to the government of South Sudan and policymakers, the study provides information on the effect of interest rates, terms of trade, public debt and inflation on foreign exchange

rate that can be used to develop strategies based on the main factors affecting foreign exchange rate. In addition, the findings of this study may be used to strengthen monetary policy initiatives and stabilize interest rates, terms of trade, public debt and inflation rates.

Foreign exchange rate is one of the main factors affecting foreign trade and foreign investors in a country. This study therefore provides information on how interest rates, terms of trade, public debt and inflation affect foreign exchange rate that they can use to make decisions on whether to make investments and when to invest in South Sudan.

The scholars will benefit from the research as a source of literature in foreign exchange, interest rates, inflation, terms of trade and public debt. In addition, the study adds more information to the body of knowledge on the determinants of foreign exchange rate in South Sudan. The study also provides a base upon which further studies can be conducted on determinants of foreign exchange rates.

1.7 Scope of the Study

The study was limited to four determinants of foreign exchange rate, which include interest rates, inflation, terms of trade and public debt. This research study was conducted in South Sudan. Data was collected from the World Bank data bases on both the independent variables and the dependent variable. The study covered a period of 6 years, on monthly basis starting from January 2012 to December 2017.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of literature on the determinants of foreign exchange rate. The chapter begins with theoretical framework, empirical review of literature and conceptual framework.

2.1 Concept of Foreign Exchange Rate

The exchange rate is defined as the number of units of domestic currency, the need to buy one unit of foreign currency. In other words, the exchange rate at which one currency in one country can be exchanged for other currencies. The exchange rate is very important, because it allows for the conversion of national currency into another, thus it can facilitate international trade for goods and services and the transfer of funds between countries and it also allows comparison of prices of goods at the same in different countries. In general, the price difference between similar goods determines the goods traded and where they were sent. However, the currency could stir volatility it depends on the economic situation in the foreign exchange market in particular.

Fluctuations in exchange rates may have an adverse effect on the economy. Exchange rate fluctuations or stability are major concerns about the direction of foreign trade. Exchange rate volatility is defined as the risk related to unexpected movements in exchange rates. Macroeconomic variables such as interest rates, inflation, balance of payments, tax rates, imports, exports, gross domestic product (GDP) and the money supply can play a major role in determining foreign exchange rate.

The value of the currency of each country can be managed using different mechanisms. These mechanisms narrow down to the exchange rate regime which applies to the currency. The currency of a given country can either be said to be free floating, fixed or a hybrid (Chowa & Chenb, 2012). A free floating currency operates in a laissez faire kind of a market. The currency is left to respond to the market forces. It is allowed to fluctuate against other currencies in response to the demand and supply forces. However, there are instances where the central banks have to intervene in order to regulate the appreciation and depreciation of the currencies. In such a case, these systems are called managed float and they are different to the system where no intervention is done at all. In cases where there is no intervention, it is called free float (Danga & Kiptui, 2016).

Free-floating exchange rate is based on market forces and it will always change whenever the components of demand and supply change. A currency becomes more valuable if the demand for it is more than the supply that is available. The fixed exchange rate regimes are those which have a direct convertibility towards the currency of another country (Chowa & Chenb, 2012). The government of a given country tries to always keep the value of the currency to be constant. The country gives the currency its worth in terms of a basket of other currencies, in terms of a fixed weight of gold or a fixed amount of another currency. Hybrid exchange rate regime consists of the crawling pegged system and horizontal pegged system. The market forces do not favor the use of a fixed exchange rate in absolute measures (Lee *et al*., 2016). At the same time, allowing the flexible free floating system may expose a country's currency to the volatility associated with exchange rates. The hybrid system is therefore necessary for a combination of the two regimes. This allows for the currency fluctuation but is guards against exposing it to the volatile markets.

A pegged float exchange rate regime is where the currency of a country is pegged to a given brand or a given value. This regime pegs the currency value around some band. It can either be a crawling band or horizontal band (Wallace, 2017). Under crawling band, the rate is made to fluctuate in a band around a central value. This value undergoes periodic adjustment. This kind of adjustment happens in a controlled way in response to some economic indicators. As opposed to the crawling pegs, the horizontal peg allows the rate to fluctuate in a fixed band which is bigger than 1 % around a central value. The central value could a basket-of-currencies (Yee & Ramirez, 2016).

A basket- of- currencies is a composite currency created by different countries in their exchange rate regimes. For example, the Euro zone pegs its Euro to the US dollar. Some countries can have important trading partners or can just be cautious of some currency being volatile over a long period of time (Jiang, Bahmani-Oskooee & Chang, 2015). As such, they can decide to peg their currencies to weighted average of currencies from different countries. A fixed quantity of SA dollars, Euros, Japanese Yen and British Pounds is the most widely used basket-of currencies. A country which uses this as a basket-of-currencies then has to maintain reserves of one of more of them so as to satisfy the excess demand or supply in the exchange market (Madura, 2010).

There are the good sides and the downsides of fixed exchange rate regimes. When fixing the exchange rate of the home currency, this has a potential in minimizing instability in real economic activities. In a country which is awash which currency speculators, fixed exchange rate regime helps to stabilize the market whenever effects of speculation take place. Fixing exchange rates also curbs volatility and instability of

market prices (Ames, Bagnarosa & Peters, G. 2017). On the negative side, fixed exchange rate regime fails to reconcile the announced exchange rate and the market equilibrium exchange rate. This may lead to an excess in demand or in supply. More so, the chances of automatic correction of imbalances of the balance of payment of a given country become very minimal in a fixed exchange regime. The currency is not allowed to appreciate or depreciate as dictated by the forces of the market (Deng, 2013).

Insah and Chiaraah (2013) sought to explain the mechanism under which exchange rates work whereby the central bank of a given country starts by announcing an exchange rate for the currency and agrees to buy and sell it at the announced value. For a market equilibrium exchange rate to be arrived at, the supply and demand should be equal. This is known as the spot rate in a flexible exchange rate system. In case the exchange rate regime is fixed, the exchange rate may not coincide with the market equilibrium. A foreign exchange market can be intervened by the central banks. The central banks hold gold reserves and foreign exchange currencies which they can sell or releases in order to intervene in the market deficit or excesses (Kazi *et al.*, 2013).

The central banks can easily accommodate the changes in demand for the currency occasioned by transactional demand. For speculative demand, it is a bit complicated for the central banks top control (Kibiy & Nasieku, 2016). Here, the banks have to adjust the interest rates. When the banks adjust the interest rates to go high, the supply of the currency becomes limited. This will in turn strengthen the value of the currency. When the banks adjust the interest rates to become low, the supply of the currency is high. This makes the currency to be less valuable (Mosel & Henderson,

2015). Speculators may create pressure on a given currency and force the central bank to release more currency at lower rates. They can then buy the currency and make profits later.

Central banks can intervene in the exchange rates of the home currency using different means. This could either be through sterilized or non-sterilized intervention. In a sterilized intervention, the country formulates a policy which influences the exchange rate without changing the monetary base (Parveen, Khan & Ismail, 2012). First, the central bank of the country may buy or sell the foreign currency bonds by use of the domestic currency. The effects of the monetary base are then sterilized by buying or selling a corresponding quantity of the domestic currency denominated bonds. This then helps to soak up the initial decrease or increase in the home currency (Udoye, 2013).

Non sterilized intervention has been said to be effective by some economists. Here, this policy influences the interest rates by induction of changes in the monetary base stock (Wan-Mohd *et, al*., 2016). This then changes the monetary aggregates in a broad sense, shifts the interest rates, the market expectations and ultimately the rate of exchange. A case in point is the purchase of the foreign –currency bonds. This leads to the increase in home-currency money supply which decreases the rate of exchange.

In ASEAN countries, Mohd *et, al*., (2016) conducted a study on the macroeconomic factors that influence exchange rate fluctuation. The data on Export, Interest Rate, and Inflation Rates were taken from the World Bank Data and International Monetary Fund bank for the period 2005-2014. The results indicated that only export had shown a significant relationship with exchange rate movement. Compare the results for other two variables such interest rate and inflation rate shown insignificant relationship.

In Bangladesh, Akhter and Faruqui (2015) conducted a study on the effects of macroeconomic variables on exchange rates. Four major independent variables have been considered i.e. export amount, remittance, import amount and foreign currency reserve and independent variable is exchange rate. The results showed that macroeconomic variables significantly influenced the exchange rate. The study concluded that after adopting the floating exchange rate regime Bangladesh experienced positive impacts on macroeconomic development of the country but to manage efficiently free floating exchange rate regime in developing countries like Bangladesh the central bank and the government may establish strict control over the foreign exchange business, to control inflation rate, to increase export, reduce trade deficit and increase foreign currency earnings.

In Kenya, Jattani (2013) conducted a study on the relationship between exchange rates and selected macro-economic variables in Kenya. This study adopted a quantitative research design. Secondary data involved the collection and analysis of published material and information from other sources such as the Central Bank of Kenya, Kenya National Bureau of Statistics, Ministry of The National Treasury and Ministry of Commerce and Tourism. The study found that the exchange rate is high in Kenya and that it is on the increase. The study further established that exchange rates in Kenya are significantly affected by political factor, balance of payment, average annual interest rate and inflation rates.

2.2 Theoretical Perspectives

The theoretical review section of this study outlines and discusses theories on foreign exchange rate, interest rates, inflation, terms of trade and public debt. The study was

anchored on three theories: Interest Rate Parity, International Fisher Effect (IFE) and Purchasing Power Parity.

2.2.1 Purchasing Power Parity Theory

The Purchasing Power Parity (PPP) theory was first developed by the Swedish economist Cassel in 1920s to examine the relationship between the exchange rates of different countries. The starting point of exchange rate theory is purchasing power parity (PPP), which is also called the inflation theory of exchange rates. The PPP holds if and when exchange rates move to offset the inflation rate differentials between two countries (Yee & Ramirez, 2016). The Purchasing Power Parity asserts that the exchange rate between two currencies should be equal to the ratio of the price level of identical goods and services in the two countries.

The Purchasing Power Parity (PPP) theorem explains the relationship between relative prices of goods and exchange rates. PPP can be traced back to sixteen-century Spain and early seventeen century England, but Swedish economist Cassel was the first to name the theory PPP. Cassel once argued that without it, there would be no meaningful way to discuss over-or-under valuation of a currency (Hamadeh *et, al.,* 2017). Absolute PPP theory was first presented to deal with the price relationship of goods with the value of different currencies. The theory requires very strong preconditions. Generally, absolute PPP holds in an integrated, competitive product market with the implicit assumption of a risk-neutral world, in which the goods can be traded freely without transportation costs, tariffs, export quotas, and so on (Yee & Ramirez, 2016). However, it is unrealistic in a real society to assume that no costs are needed to transport goods from one place to another. In the real world, each economy produces and consumes tens of thousands of commodities and services, many of

which have different prices from country to country because of transport costs, tariffs, and other trade barriers.

According to the PPP, increase in the price level of a country will cause depreciation of its exchange rate relative to other countries, thereby keeping the relative price of identical goods the same across countries. This theory suggests that exchange rate changes are offset by relative price indices/inflation since the Law of One Price should hold (Wallace, 2017). PPP follows from the law of one price, which states that in competitive markets, identical goods will sell for identical prices when valued in the same currency). It relates to an individual product and its generalization is the absolute version of PPP. Relative PPP relates to changes in prices and exchange rates, rather than on absolute price levels. It states that change in exchange rates is proportional to the change in the ratio of the two nations' price levels, structural relationships remaining unchanged (Bentzen, 2015). The assumptions for PPP to hold are that goods are identical, all goods are tradable, there are no transportation costs, information gaps, taxes, tariffs, or restrictions of trade, and exchange rates are influenced only by relative inflation rates. Due to these restrictive assumptions and empirical violation of the law of one price which is the building block of PPP, monetary models of exchange rate determination was adopted. Since currencies are considered assets, exchange rates are asset prices that adjust to equilibrate international trade in financial assets. Like other asset prices, exchange rates are determined by expectations about the future. Since currencies are treated as assets this approach is called the asset approach.

The Purchasing Power Parity (PPP) theory is used in this study to explain the relationship between inflation and foreign exchange rates. According to this theory, foreign exchange rates should be evaluated by the relative prices of a similar basket of

goods between two nations. A possible change in the rate of inflation of a given country should be balanced by the opposite change of country's exchange rate. If prices in the country are surging because of inflation, country's exchange rate should decrease in order to return to parity.

2.2.2 International Fisher Effect (IFE) Theory

This theory was developed by Fisher in his book titled "The Theory of Interest" (1930). It uses market interest rates rather than inflation rates to explain why exchange rates change over time. The International Fisher effect states that exchange rates changes are balance out by interest rate changes (Korab & Kapounek, 2013). The Fisher theory simply argues that real interest rates across countries were equal due to the possibility of arbitrage opportunities between financial markets which generally occurs in the form of capital flows.

Real interest rate equality implies that the country with the higher interest rate should also have a higher inflation rate which, in turn, makes the real value of the country's currency decrease over time. The relationship between relative interest rates and foreign exchange rates is explained within the interest rate theory of exchange rate expectations. Nominal interest rate differentials between two countries tend to reflect exchange rate volatility. Giddy (1977) called this the international Fisher effect, a close relationship to the Fisher effect, a phenomenon observed by Fishe. If the international Fisher effect holds, interest rates in appreciating currencies tend to be low enough, and in depreciating currencies high enough, to offset expected currency gains and losses.

The International Fisher Effect (IFE) theory suggests that foreign currencies with relatively high interest rates will tend to depreciate because the high nominal interest

rates reflect expected rate of inflation (Madura, 2010). Does the interest rate differential actually help predict future currency movement? Available evidence is mixed as in the case of PPP theory. In the long-run, a relationship between interest rate differentials and subsequent changes in spot exchange rate seems to exist but with considerable deviations in the short run. The international Fisher effect is known not to be a good predictor of short-run changes in spot exchange rates.

The International Fisher Effect (IFE) theory is used in this study to explain the relationship between interest rates, inflation and foreign exchange rates. This theory indicates that an expected change in the current exchange rate between any two currencies is approximately equivalent to the difference between the two countries' nominal interest rates for that time. In addition, a spot exchange rate is expected to change equally in the opposite direction of the interest rate differential; thus, the currency of the country with the higher nominal interest rate is expected to depreciate against the currency of the country with the lower nominal interest rate, as higher nominal interest rates reflect an expectation of inflation.

2.2.3 Interest Rate Parity Theory

Interest Rate Parity (IRP) theory was developed by Frenkel Jacob and Levich Richard in 1981. This is a theory in which the differential between the interest rates of two countries remains equal to the differential calculated by using the forward exchange rate and the spot exchange rate techniques. Interest rate parity connects interest, spot exchange, and foreign exchange rates. It plays a crucial role in Forex markets (Boschen & Smith, 2016).

IRP theory comes handy in analyzing the relationship between the spot rate and a relevant forward (future) rate of currencies. According to this theory, there will be no

arbitrage in interest rate differentials between two different currencies and the differential will be reflected in the discount or premium for the forward exchange rate on the foreign exchange. The theory also stresses on the fact that the size of the forward premium or discount on a foreign currency is equal to the difference between the spot and forward interest rates of the countries in comparison.

If IRP theory holds, then it can negate the possibility of arbitrage. It means that even if investors invest in domestic or foreign currency, the return on investment will be the same as if the investor had originally invested in the domestic currency) (Rabitsch, 2016). When domestic interest rate is below foreign interest rates, the foreign currency must trade at a forward discount. This is applicable for prevention of foreign currency arbitrage. If a foreign currency does not have a forward discount or when the forward discount is not large enough to offset the interest rate advantage, arbitrage opportunity is available for the domestic investors. So, domestic investors can sometimes benefit from foreign investment (Ames *et, al.,* 2017).

When domestic rates exceed foreign interest rates, the foreign currency must trade at a forward premium (Rabitsch, 2016). This is again to offset prevention of domestic country arbitrage. When the foreign currency does not have a forward premium or when the forward premium is not large enough to nullify the domestic country advantage, an arbitrage opportunity will be available for the foreign investors. So, the foreign investors can gain profit by investing in the domestic market.

IRP theory is related to this study as it is the fundamental equation that governs the relationship between interest rate and foreign exchange rates. This theory makes an assumption that if two currencies have different interest rates, this difference will lead

to a discount or premium for the exchange rate in order to avoid arbitrage opportunities.

2.3 Empirical Review Literature

This section presents an empirical review on the determinants of foreign exchange rate. Specifically, the section outlines empirical review on the effect of interest rates, inflation, terms of trade and public debt on foreign exchange rate.

2.3.1 Effect of Interest Rates on Foreign Exchange Rate

Interest rate is the price a borrower pays for the use of money they borrow from a lender/financial institutions or fee paid on borrowed assets. Interest rates are fundamental to a 'capitalist society' and are normally expressed as a percentage rate over the period of one year. Interest rate as a price of money reflects market information regarding expected change in the purchasing power of money or future inflation. According to Maina (2014), interest rate risk is the exposure of the firm's financial position due to fluctuations in interest rates. Excessive interest rate fluctuation can pose significant threats to a firm's earnings and capital base changes and increase its operating expenses. Changes of interest rates may also affect the underlying value of assets, liabilities and present value of future cash flows.

Mukopi (2013) conducted a study to determine the relationship between interest rates and foreign exchange rates in Kenya. The study used a descriptive research design and data from June 2006 to June 2013. The research findings revealed an insignificant positive relationship between interest rate and foreign exchange rate. This was however contrary to the general understanding that interest rate and foreign exchange rates have indirect relationship. In addition, Maina (2014) conducted a study on the effect of interest rate differential on the foreign exchange rate in east African Forex

market. The descriptive research design was used in this study and covered Kenya, Tanzania and Uganda. The study used inflation rates in percentage, interest rates in percentage, consumer price indices, monthly inter-bank rates and monthly current account deficit/surplus from 2009-2014. The study found that the main predictor variable in the three countries (Kenya, Uganda and Tanzania), real interest rate differential, accounted for less than 10% of the variation in the dependent variable, real exchange rate (RER). As a result, the study did not find any relationship between real interest rate differential and the real exchange rate and whether the of theories purchasing power parity (PPP) and interest rate parity (IRP) hold to the study.

In another study, Kiruga (2015) aimed at establishing the relationship of Foreign Exchange Rates on Interest rates in Kenya. The descriptive research design was used. The study used monthly average foreign exchange rates and monthly average interest rates. The study found that there was a positive relationship between foreign exchange rates and interest rates in Kenya but not significant. Obondi (2013) carried out a study on the to establish if there is any relationship between Foreign Exchange rate and Central Bank rates (CBR) in Kenya. This study adopted explanatory research design. The findings of the study showed central bank rates for the period of study have a weak positive relationship to the foreign exchange rate and hence have no much effect on the exchange rates. The CBR was thus found not to be an effective tool for exchange rate determination.

2.3.2 Effect of Inflation Rates on Foreign Exchange Rate

Inflation is the rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling. Central banks attempt to stop severe inflation, along with severe deflation, in an attempt to keep the excessive growth of prices to a minimum. High inflation levels in many developing countries

have been a cause of concern to their central banks (Saha & Biswas, 2014). This has led to the adoption of monetary policy frameworks such as inflation targeting to help lower inflation to more sustainable levels. The determinants of inflation are important factors to consider when looking at the different monetary policy frameworks to adopt. One of the major determinants of inflation is exchange rate movements and the degree of sensitivity of domestic prices to these movements. Formally, this is known as exchange rate pass through (ERPT). Semue and Nurina (2015) defines it as the percentage change in the local currency import prices resulting from a one percent change in the exchange rate between the importing and the exporting country. When import prices respond fully to exchange rate movements, that is, at a hundred percent level, pass through is said to be complete. However, if there is a less than hundred percent response of prices, it means that pass through is incomplete.

There are a few causes of inflation where aggregate demand increases faster than aggregate supply, therefore increasing the cost of goods and services. The imbalance of aggregate demand and supply is linked to the government's deficit, expansion of bank's interest rates and the increase of foreign demand. Inflation also increases the price of goods and the price of work labor thus the cost of goods and selling price increases. Inflation has a few indicators such as Consumer Price Index (CPI), Wholesale Price Index (WPI), and Implicit Price Index (deflator GDP).

In the United States, Rogers (2012) conducted a study on foreign inflation transmission under flexible exchange rates and currency substitution. Using a descriptive research design, the study found that has positive effect of foreign exchange rate. In India, Saha and Biswas (2014) conducted a study on inflation and exchange rate volatility during the floating exchange rate regime. The authors

estimated the relationship between exchange rate and inflation using the Vector Error Correction Model (VECM) with monthly data for the period April, 1993 to March, 2012. It is found that inflation had a depreciating effect on exchange rate.

In Indonesia, Semue and Nurina (2015) carried out an analysis of the effect of inflation on exchange rates. The study used a descriptive research design and the results indicated that inflation on foreign exchange rate. This implies that the higher the inflation, the higher the foreign exchange rate. Positive relationship between inflation and exchange rates can also be explained by the theory of Purchasing Power Parity (PPP). PPP theory explains that the exchange rates are established in a country depends on the ratio of the prices of goods and services a country.

In India, Bhatnagar (2013) conducted a study on macroeconomic factors affecting foreign exchange market in India. The multiple regression tests were used in order to analyze the causal relationship among foreign exchange rate, and Inflation. It was found that there is no significant relationship among foreign exchange rate and Inflation.

Using a descriptive research design, Mulwa (2013) sought to investigate the effect of exchange rate volatility on inflation rates in Kenya. This study covered a period of less than 10 years (2003 - 2013). A regression model was applied to determine the relative relationship between exchange rate volatility and Inflation rate. The test indicated that there was moderate and insignificant relationship between foreign exchange rates volatility and inflation rates. Therefore, exchange rates cannot be used to reliably predict movement in inflation rates. This is because the model used by the study showed there was an insignificant relationship between foreign exchange and inflation rates.

2.3.3 Effect of Terms of Trade on Foreign Exchange Rate

Terms of trade is a ratio comparing the export prices to import prices and is related to current accounts and the balance of payments. If the price of a country's exports rises by a greater rate to that of its imports, its terms of trade will be seen to have improved as it shows greater demand for the country's exports. On the other hand, if the price of exports rises by a smaller rate to that of its imports, the currency's value will decrease in relation to its trading partners. Grube and Samanta (2003) states that a higher exchange rate can be expected to lower a country's balance of trade, while declining exchange rate decreases the purchasing power of income and capital gains derived from any returns. Investors need to understand how currency values and exchange rates play an important role in the rate of return on their investments.

Brahmasrene and Jiranyakul (2002) opine that a larger international trade flow foster stronger economic inter relationship between countries. Foreign trade mostly concerns itself with exports and imports. The exports affect domestic economic activities of a state while imports bolter the economic activity that facilitate more exports. Foreign exchange rate is one of the channels that affect the international trade. International trade calls for exchange of one country's currency for another (Nyamwange, 2009). International trade is directly linked trading of goods and services, foreign direct investment, long term investment portfolio flows, hedge funds, mutual funds and the safe haven status of currencies.

In economies such as US and the European nations, international trade is priced in the currency of the area concerned unlike in smaller economies like Iceland where imports are priced in foreign currency since the króna is rarely used in international trade. Currency depreciation would therefore have less effect on the price of imported

goods than it does in Iceland. Moreover, due to the small size of the economy, domestic manufacturers compete with imported goods thus making it easier to pass exchange rate movements through to retail prices. Price changes occur more often when exchange rate movements are large and inflation is on the rise.

In Malaysia, Bahmani-Oskooee and Hegerty (2007) conducted a study on exchange rate volatility and trade flows. The results indicated that the increase in exchange-rate volatility since 1973 has had indeterminate effects on international export and import flows. In Pakistan, Khan, Azim and Syed (2014) carried out a study on the impact of exchange rate volatility on Pakistan's Trading Partners. Using a descriptive research design, the results show that when Pakistan employed the US dollar as the vehicle currency with its trading partners, volatility discouraged both imports and exports. In contrast, both the import and export demand functions remained unaffected by volatility distortions when Pakistan traded with its developing partners using bilateral exchange rates valued in domestic currency terms.

In Mexico, Grube and Samanta (2003) conducted a study on the effects of exchange rate uncertainty on Mexican foreign trade. Conventional wisdom holds that appreciation of domestic currency leads to increased trade deficit and vice versa. The aim of the study was to examine the long run equilibrium relation between exchange rate risk and the volume of foreign trade in Mexico. Mexico is one of the countries in Latin America that has been moving towards a free market economy, featuring free trade as the main driving force behind its endeavor for economic development. The results indicated that there was significant relationship between terms of trade and foreign exchange fluctuations.

In Thailand, Brahmasrene and Jiranyakul (2002) explored real exchange rate effects on trade balances. The study adopted descriptive research design and Augmented DickyFuller and Phillips-Perron tests for stationarity followed by the co-integration tests.

By using this non-linear model, the results show that the impact of real exchange rates (Thai baht/foreign currency) on trade balances is significant in most cases. Therefore, the generalized Marshall-Lerner condition seems to hold. Furthermore, the results show that the real exchange rates play a more important role in the determination of the bilateral trade balances than other factors.

Senanayake *et, al.,* (2010) sought to establish the effects of exchange rate movements on trade performance with reference to the Sri Lanka-China trade relationship over the quarterly period from 1993 to 2007. The main finding were that bilateral exchange rate changes and exchange rate volatility do play an active role on trade, while income growth changes have less influence in determining the total exports and imports between two countries. The analysis of data shows that changes in real bilateral exchange rate, income and exchange rate volatility are playing a major role in determining sectoral exports and imports between Sri Lanka and China. Therefore, the findings suggested that the movements of exchange rate between these two countries do have significant effects on total trade as well as sectoral trade between Sri Lanka and China.

In Kenya, Onyancha (2012) carried out a study on the relationship between foreign exchange fluctuations and balance of trade. The researcher used descriptive research design and utilized secondary data on an annual basis between the periods of January 2007 to December 2011. The study found out that there is a long run relationship

between balance of trade and exchange rate. Nyamwange (2009) carried out a study on the relationship between real exchange rates and international trade in Kenya. The study used a descriptive research design and utilized secondary data on an annual basis for the period 1993 to 2007. The results indicated that although there was a relationship between the real exchange rates and exports and imports in Kenya, the relationship was insignificant. The shilling's recent volatility did not appear to have significantly influenced Kenya's exports and imports.

2.3.4 Effect of Public Debt on Foreign Exchange Rate

Government debt is public debt or national debt owned by the central government. A country with government debt is less likely to acquire foreign capital, leading to inflation. Foreign investors will sell their bonds in the open market if the market predicts government debt within a certain country. If a country is perceived to have a high national debt, without a credible plan for dealing with it, that can have a negative impact on the value of its currency (Bunescu, 2014). External debt management and exchange rate policy are an integral part in macroeconomic policy. The existing literature on exchange rate has concentrated on determination of exchange rate rather than volatility. Studies on exchange rate policy and regimes have showed that exchange rate behave differently depending on the regime in place.

In MENA region, Neaime (2009) conducted a study on the sustainability of exchange rate policies and external public debt. This study presented thorough empirical analysis of the sustainability of exchange rate and external public debt using time series econometric models. The empirical results point to sustainable fiscal and exchange rate policies in Tunisia and Morocco, unsustainable external debt but sustainable exchange rate policies in Egypt and Turkey, and unsustainable external

debt and exchange rate policies in Jordan. If Jordan still opts for maintaining a fixed US dollar exchange rate arrangement, it will have to implement crisis-prevention measures, namely by exercising fiscal discipline, and managing properly its external debt and foreign reserves.

In Hungary, Baksay, Karvalits and Kuti (2013) conducted a study on the impact of public debt on foreign exchange reserves and central bank profitability. The results indicated that although foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves, it can cause serious difficulties in the assessment of reserve adequacy, especially during crisis periods. Furthermore, it affects the profit-loss of the central bank. On the other hand, the accumulation of foreign exchange reserves may affect the public deficit and debt as well.

Bleaney and Ozkan (2011) carried out a study on the structure of public debt and the choice of exchange rate regime. Three types of debt (nominal, indexed, and foreign) and two regimes (fixed and flexible) were considered. The results indicated that the real (domestic-currency) value of foreign debt is subject to valuation effects from real exchange rate shocks. The 'fear-of-floating' result, that foreign debt makes pegging more attractive, is shown to hold unambiguously only if the peg is fully credible. If the peg lacks credibility, a critical factor is the perceived likelihood of using the 'escape clause' of a switch to a float, which raises the costs of pegging. Foreign debt increases the temptation to resort to the escape clause, so when a peg is not fully credible (as is almost always the case in reality), pegging tends to be less attractive than floating in the presence of foreign debt.

In Nigeria, Saheed, Sani and Idakwoji (2015) carried out a study on the impact of public external debt on exchange rate. With continuous increase in public

expenditures, and low capital formation in many developing countries, many governments have resorted into borrowing either or both within and outside the country. However, most borrowings come with interest attached, which results in debt servicing. Serving external debt may involve demand for foreign currency which tends to affect the exchange rate of the country. Hence, the study examined the impact of public external debt on exchange rate in Nigeria. The findings reveal that all the dependent variables, that is, external debt, debt service payment and foreign reserve proved to be statistically significant in explaining exchange rate fluctuation in Nigeria within the period of observation, with debt service payment having the strongest effect.

In Kenya, Masaku (2012) conducted an investigation of the effects of Kenya's external debt on exchange rate fluctuations. A correlation design was selected for the study. The population and subsequent sample size was 360 data points covering a period of 40 years from 1971 – 2010 with 9 variables under study. The study found that there was a general upward trend in both external debt and exchange rate fluctuations. Odera (2015) conducted an analysis on the effect of external public debt on exchange rate volatility in Kenya. This study empirically investigated the effects of external public debt on real effective exchange rate (REER) volatility under the complete float regime for period 1993 to 2013 using quarterly data. REER index was constructed using US Dollar and British Sterling Pound. The results showed that external debt to GDP ratio had negative and significant effect on REER volatility. As such, monetary authorities should ensure debt sustainability indicators such as external debt to GDP ratio are at low levels and pursue strategies that reduce excessive accumulation of external public debt.

2.4 Conceptual Framework

The study sought to investigate the determinants of foreign exchange rates in South Sudan. The independent variables were interest rates, inflation, terms of trade and public debt. On the other hand, the dependent variable was foreign exchange rate in South Sudan. The study sought to investigate the association between the independent variables (interest rates, inflation, terms of trade and public debt) and the dependent variable.

Independent Variables   **Dependent Variable**

Interest rates
- Central bank lending rate

Inflation
- Consumer price index

Terms of trade
- Ratio of import prices to export prices

Public Debt
- Debt as Percent of GDP

H_01

H_02

H_03

H_04

Foreign exchange rate in South Sudan
- South Sudanese pound/USD
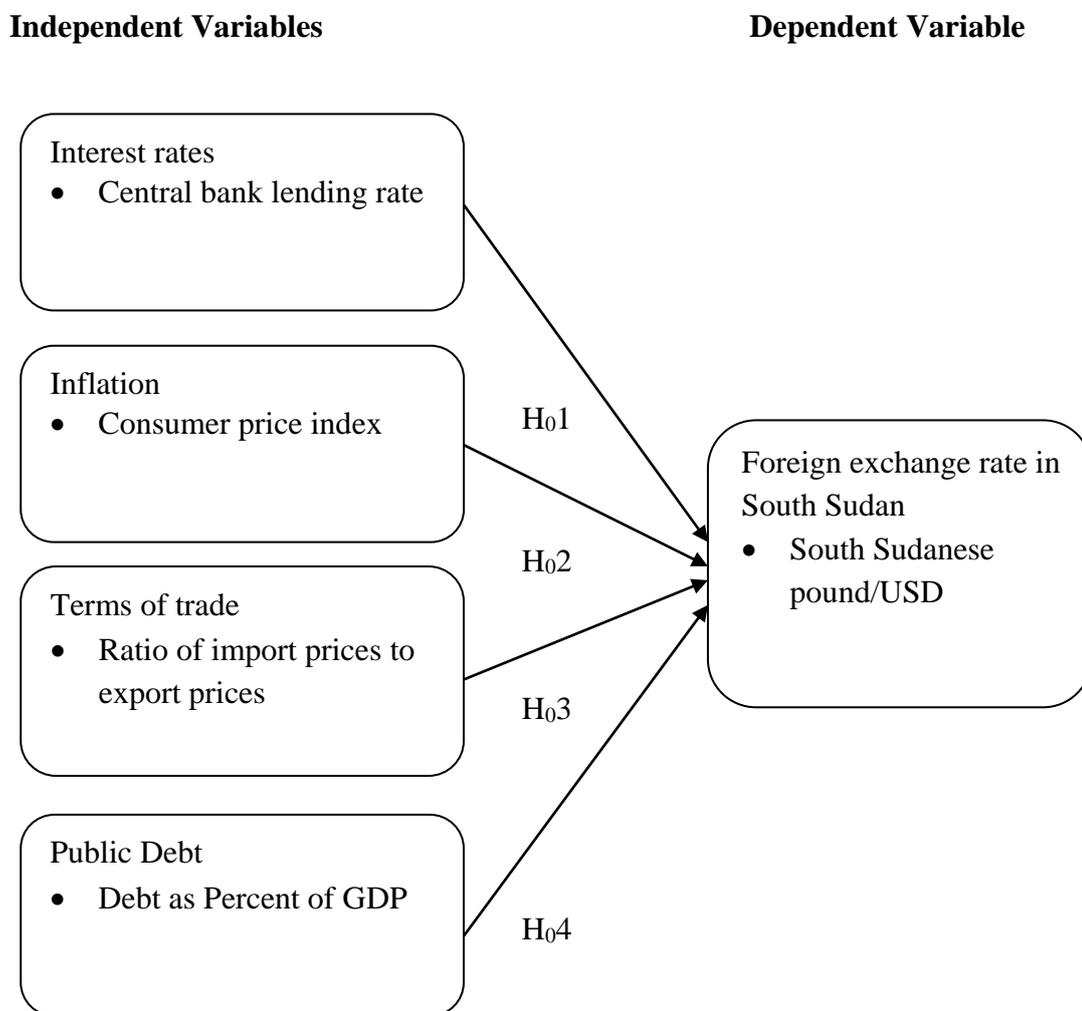
Figure 2.1: Conceptual Framework

Source: Author (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used in this study. The chapter begins with a research design, followed by target population, data collection instruments, data analysis and presentation and expected outcomes.

3.2 Research Design

Bhattacherjee (2012) defines research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to research purpose with economy in procedure. This study used a causal research design. According to Cooper and Schindler (2006), a causal study is designed to establish the influence of one variable(s) on another variable(s) which depicts causation. Causal research is typically structured with a clearly stated objective of discovering associations and causal relationships among different variables. This design is perceived to be suited to this study in that it involves collection, verification, and synthesis of evidence to establish facts that defend or refute a hypothesis.

3.3 Target Population

A population is a group of individuals, persons, objects, or items from which samples are taken for measurement (Bryman & Cramer, 2012). This study was conducted in South Sudan and covered a period of 6 years (2012 to 2017). Monthly data was used starting from year January 2012 to 2017.

3.4 Data Collection Instruments

This study used secondary time-series data, is a dataset in which the behavior of entities is observed across time. Secondary data is the data that have been already collected by and readily available from other sources (Greener, 2008). In this study, secondary data covered a period starting January 2012 to December 2017. This data was obtained from International Monetary Fund (World Economic Outlook Database) and the World Bank and the Central Bank of South Sudan. More specifically, data on foreign exchange rate and interest rates was collected from the Central Bank of South Sudan while data on terms of trade, public debt and inflation will be obtained from International Monetary Fund (World Economic Outlook Database) and the World Bank.

The secondary data was collected by use of a data extraction checklist. The purpose of the data extraction checklist is to provide a guide to reviewers about the type of relevant information that could be extracted from secondary sources (Bryman & Cramer, 2012). The data extraction checklist comprised of 5 columns as per the variables of the study, which include foreign exchange rate, interest rates, inflation, terms of trade and public debt.

3.5 Data Analysis and Presentation

The secondary data was quantitative in nature (continuous data). The collected quantitative data was edited and coded and entered into a Stata version 14 for analysis. Both descriptive and inferential statistics were used to analyze the quantitative data. In descriptive statistics, the study used frequency distributions, mean, standard deviation and percentages.

3.5.1 Diagnostic Tests

The time series analysis tests that were performed on the model include normality test, Heteroscedasticity Test, Autocorrelation, Linearity test, Stationarity and Unit Root Test and Co-integration test.

3.5.1.1 Normality Test

The assumption of normality is just the supposition that the underlying random variable of interest is distributed normally, or approximately so. Intuitively, normality may be understood as the result of the sum of a large number of independent random events. There is always an element of error associated with statistical tools and the same applies to the assumption of normality. It is virtually impossible to collect data from an exact normal distribution. However, many naturally occurring phenomena follow a very close approximate normal distribution. To fulfill the requirement of normal distribution, Shapiro Wilk test was used to investigate whether the variables are normally distributed or not (Cooper & Schindler, 2006). The null-hypothesis of this test is that the population is normally distributed; thus, if the p-value is less than the chosen alpha level, then the null hypothesis is rejected and there is evidence that the data tested is not from a normally distributed population; in other words, the data is not normal. On the contrary, if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected.

3.5.1.2 Autocorrelation Test

Autocorrelation leads to bias and thus spurious estimates. To test for this, the study used Breusch-Godfrey Langrage Multiplier test for autocorrelation. Serial correlation usually implies that there is correlation between stochastic random error terms of the

subsequent time periods (Kultar, 2007). Autocorrelation can be remedied through the use of robust standard errors. The null hypothesis is that there is no serial correlation.

3.5.1.3 Heteroscedasticity Test

The study used the residual plot method to investigate whether there is variation of the residuals across all the observations under the study (Greener, 2008). Considering the residual plot method is too subjective, the study further employed Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. Breusch-Pagan/Cook-Weisberg tests the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables.

3.5.1.4 Stationarity Test

In order to check for stationarity of the data, the study employed Augmented Dickey Fuller unit root test (ADF); this was chosen because it is not affected by autocorrelation (Creswell, 2006). If the data is found to contain unit root and require first difference in order to be stationary, then the variable in question may be deemed to have a long run relationship with the dependent variable and may therefore require a co-integration test to be conducted. If the exogenous data is run through ADF test and happens to be stationary at level, the data may be assumed to be affecting the model in the short run.

3.5.2 Model Specification

The regression model was expressed as follows;

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon_t$$

Y_t is the dependent variable (foreign exchange rate in South Sudan), B_0 is the y intercept (Constant), β_1- β_4 and coefficients of determination, X_{1t} is the interest rates,

X_{2t} is the inflation, X_{3t} is terms of trade and X_{4t} is public debt, t represents time and ε_t is an error term.

3.6 Measurement of the Variables

3.6.1 Dependent variable

Foreign exchange rate: Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market (Wel, 2016). It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

3.6.2 Independent variables

Interest rates: the interest rate is a percentage of principal paid a certain number of times per period for all periods during the total term of the loan or credit (Chowa & Chenb, 2012). Interest rates are normally expressed as a percentage of the principal for a period of one year; sometimes they are expressed for different periods like for a month or a day. This study made use of central bank lending rate.

Inflation: This is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling (Bentzen, 2015). This was measured by use of the percentage change in consumer price index. The consumer price index measures the changes in the cost of a basket of consumer goods and services.

Terms of trade: This is a measure of how much imports an economy can get for a unit of exported goods (Bleaney & Ozkan, 2011). This refers to the relative price of

imports in terms of exports and is defined as the ratio of export prices to import prices.

Public debt: Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans (Baksay, Karvalits & Kuti, 2013). It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government. Public debt was measures as a percent of the GDP.

Table 3.1: Summary of the variables measurement

Variable	Measure
Foreign exchange rate	Ratio of South Sudanese pound/USD
Interest rates	Central bank lending rate (%)
Inflation	Percentage change in consumer price index
Terms of trade	Import/export ratio
Public debt	Public debt as a percent of GDP

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION OF FINDINGS

4.0 Introduction

This chapter entails data analysis, results presentation and interpretation of the findings in regard to the general objective and the specific objectives of the study. The main objective of this study is to investigate the determinants of foreign exchange rate in South Sudan. The study specifically sought to determine whether interest rates, inflation, terms of trade and public debt determine foreign exchange rate in South Sudan. The results for both inferential and descriptive statistics were presented in tables and figures (line graphs). The study covered a period of 72 months (January 2012 to December 2017).

4.1 Descriptive Statistics

Descriptive statistics covered the minimum values, maximum values, mean and standard deviation of the independent variables (interest rates, inflation, terms of trade and public debt) and the dependent variable (foreign exchange rate in South Sudan).

Table 4.1: Descriptive Statistics of the Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
FX	72	32.65944	41.43027	2.08	129.26
IR	72	12.16111	1.753673	7	16.7
In	72	887.0114	1263.547	130.77	4590
ToT	72	-2.672814	1.272671	-5.84	-1.091
PD	72	30.37	17.94754	8.91	69.82

Table 4.1 shows that the average monthly foreign exchange rate in South Sudan for the period ranging from January 2012 to December 2017 was 32.65944 and the

standard deviation was 41.43027. The minimum foreign exchange rate was 2.08 and the maximum was 129.26.

In addition, the average monthly interest rate in South Sudan for the period between January 2012 and December 2017 was 12.16111% and the standard deviation was 1.753673%. The minimum interest rate during the study period was 7% and the maximum was 16.7%. Further, the average inflation (consumer product index) in South Sudan for the period between January 2012 and December 2017 was 887.0114 and the standard deviation was 1263.547. The minimum consumer price index during the study period was 130.77 and the maximum was 4590.

Also, the results show that the terms of trade (import/export ratio) in South Sudan for the period between January 2012 and December 2017 was -2.672814 and the standard deviation was 1.272671. The minimum import/export ratio was -5.84 and the maximum was -1.091. The results further show that the average monthly public debt (percent of the GDP) during the study period was 30.27% of the GDP and the standard deviation was 17.94754%. The minimum public debt was 8.91% and the maximum was 69.82%.

4.2 Trend Analysis

The Trend Analysis can help identify trends in the input dataset. This section shows patterns of change in an indicator over time. This section presents the trend analysis for the four independent variables and the dependent variable.

4.2.1 Foreign Exchange Rate

Figure 4.1 shows the trend of foreign exchange rate for the period ranging from January 2012 to December 2017.
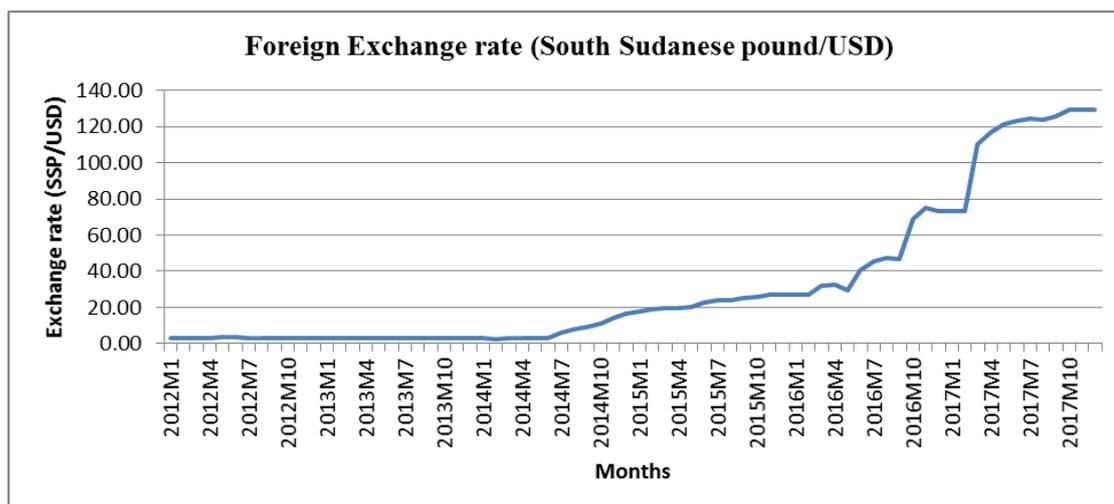
Figure 4.1: Trend of Foreign Exchange Rate

According to the results, foreign exchange rate in South Sudan for the period between January 2012 and August 2015 was below 3.0. It is after this period that South Sudan abandoned a fixed exchange rate and surrendered its currency, the South Sudanese pound, to trade freely in the market against the US dollar and other foreign currencies, to compete with the black market. From the year 2015 August, the foreign exchange rate in South Sudan attaing an increasing trend to 129.26 in Decemeber 2017.

4.2.2 Interest Rates

Figure 4.2 shows the trend of interest rates (central bank lending rate) for the period ranging from January 2012 to December 2017.
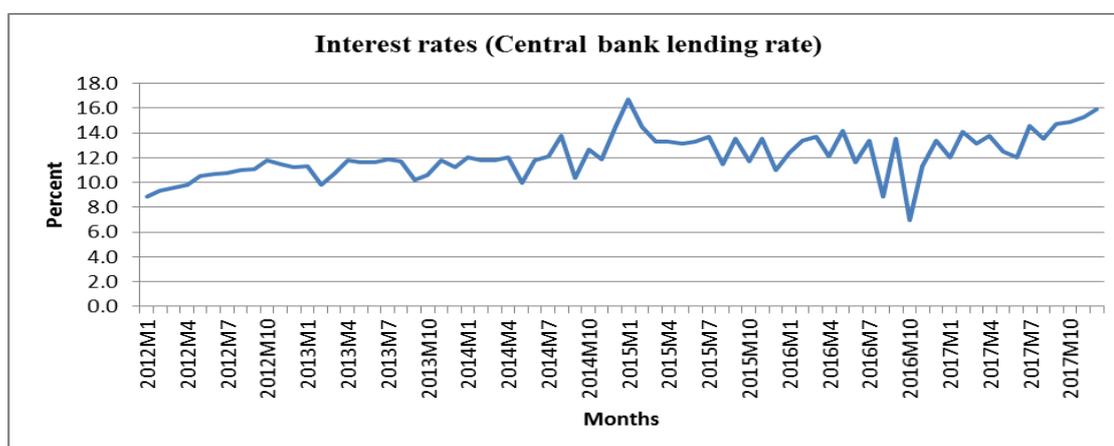
Figure 4.2: Trend of Interest Rates (Central Bank Lending Rate)

The results, as shown in Figure 4.2, interest rates in South Sudan have been fluctuating. The lowest Central Bank Lending Rate was in October 2016 at 7.0 per cent. The highest Central Bank Lending Rate was 16.7 per cent in January 2015. At the beginning of the study period (January 2012) Central Bank Lending Rate was at 8.9 per cent. At the end of the study period (December 2017) was at 15.9 per cent.

4.2.3 Inflation (Consumer Price Index)

Figure 4.3 shows the trend of Inflation (Consumer Price Index) for the period between January 2012 and December 2017.

Figure 4.3: Trend of Inflation (Consumer Price Index)

Generally, inflation in South Sudan has increased significantly during the study period (January 2012 to December 2017). At the beginning of the study period (January 2012), inflation was at 135.56. This figure increased steadily to reach 4590 in November 2017. In December 2017, inflation was at 4500. Conflict and war in South Sudan is one of the major factors that have contributed to the high inflation rate. In time of war, government spending for military purposes stimulates demand throughout an economy, at the same time that a shift of workers from productive labor

into war production causes a decline in aggregate supply. In addition, due to unavailability of certain goods and services which are hampered by war, the demand supply equation gets disturbed and prices increase, leading to inflation.

4.2.4 Terms of Trade

Figure 4.4 shows the trend of the terms of trade (import/export ratio) for the period between January 2012 and December 2017.
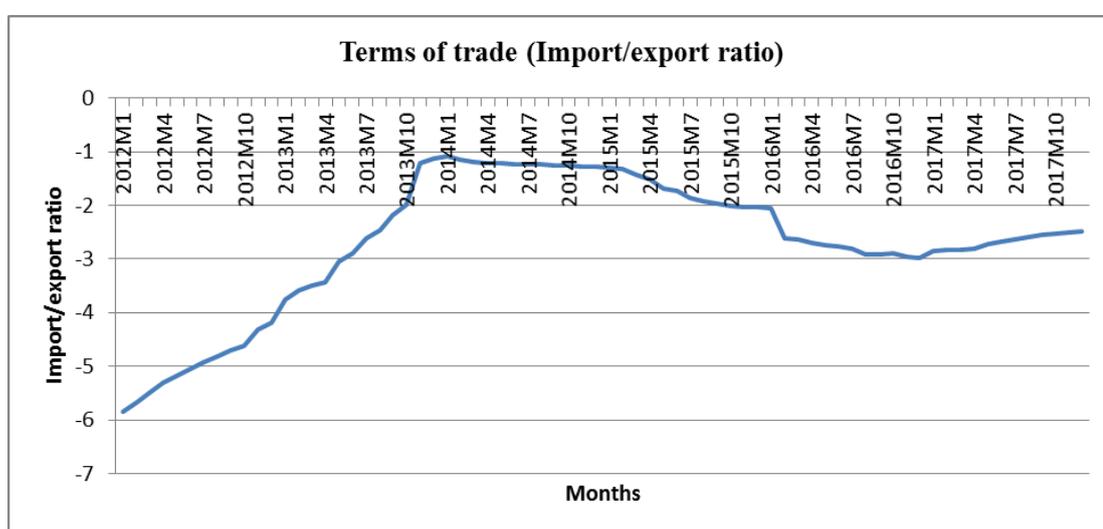
Figure 4.4: Trend of Terms of Trade (Import/Export Ratio)

The results, as shown in figure 4.4, show the terms of trade (import/export ratio) in South Sudan was below zero (0) for the period between January 2012 and 2017. The import/export ratio increased from -5.84 in January 2012 to November 2013 was negative -1.21. This figure then decreased to -2.97 in November 2016. In addition, this figure increased slightly to -2.48 in December 2017. South Sudan is the 209th largest export economy in the world. Over the years South Sudan exported more than it imported, resulting in a negative trade balance.

4.2.5 Public Debt (Debt as Percent of GDP)

Figure 4.5 shows the trend of debt (debt as percent of GDP) for the period between January 2012 and December 2017.
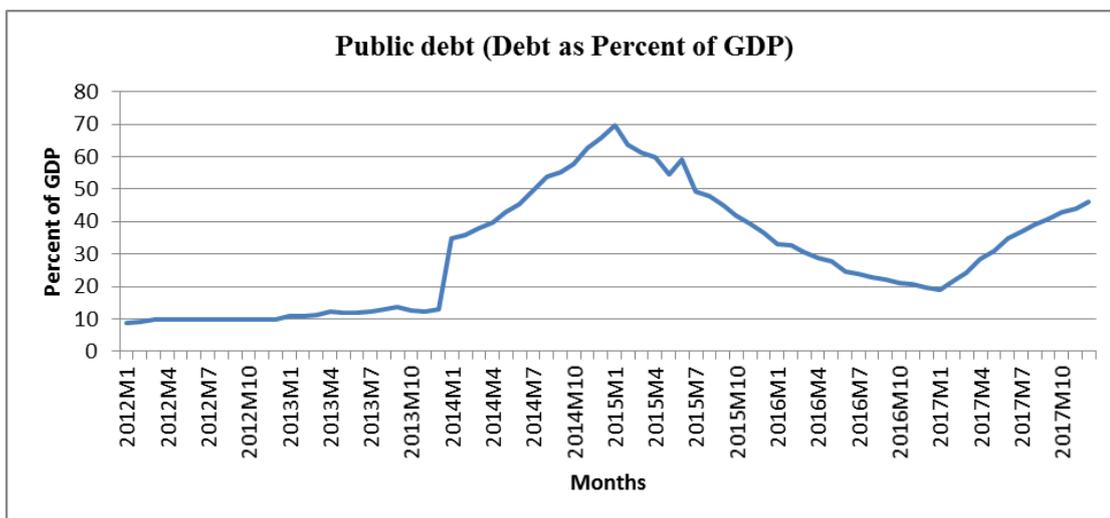
Figure 4.5: Trend of Public Debt (Debt as Percent of GDP)

The results, as shown in figure 4.5, the public debt increased slightly from January 2012 from 8.91 to 12.87 in December 2013. The figure then increased steadily to 69.82 in January 2015. However, between January 2015 and January 2017 the public debt decreased from 69.82 to 18.96. In addition, the figure increased to 45.91 in December 2017. Despite moderate levels of external debt, the combined impact of a civil conflict, a large fall in oil prices, and high levels of fiscal spending has left South Sudan in debt distress. This crisis has caused payment delays on international obligations, on civil servant salaries, and other government obligations.

4.3 Diagnostic Tests

In order to use a linear regression model, the model should conform to the assumptions of linear regression. Linear regression has assumptions that include

normality of data, no or little multicollinearity, no auto-correlation and homoscedasticity. These assumptions were tested by use of diagnostic tests.

4.3.1 Test for Normality

The Shapiro-Wilk test for normality is available when using the Distribution platform to examine a continuous variable. In Shapiro-Wilk W test the null hypothesis is that data is normally distributed. If the chosen alpha level is 0.05 (95% confidence interval) and the p-value is less than 0.05, then the null hypothesis that the data are normally distributed is rejected. If the p-value is greater than 0.05, then the null hypothesis is not rejected. The results were as shown in Table 4.2.

Table 4.2: Shapiro-Wilk W test

Variable	Obs	W	V	Z	Prob>z
Foreign exchnage rate	72	0.99721	0.798	0.682	0.65721
Interest rate	72	0.98828	0.738	0.661	0.74573
Inflation	72	0.94328	0.672	0.612	0.78923
Terms of Trade	72	0.95092	0.698	0.645	0.75623
Public debt	72	0.99891	0.809	0.687	0.56211

The results show that the indipendent variables, interest rate, inflation, terms of trade and public debt were normaly disributed. This is shown by the p-values of 0.74573, 0.78923, 0.75623 and 0.56211, which were greater than the signifcance level (0.05). In addition, the dependent variable (foreign exchange rate) was normally distributed as the p-value was 0.65721, which was greater than 0.05.

4.3.2 Autocorrelation Test

In statistics, the Breusch–Godfrey test is used to assess the validity of some of the modeling assumptions inherent in applying regression-like models to observed data series. In particular, it tests for the presence of serial correlation that has not been included in a proposed model structure and which, if present, would mean that incorrect conclusions would be drawn from other tests, or that sub-optimal estimates of model parameters are obtained if it is not taken into account. The null hypothesis is that there is no serial correlation of any order.

Table 4.3: Breusch-Godfrey Langrage Multiplier test

Breusch-Godfrey IM test for autocorrelation

Lags (p)	Chi2	df	Prob>chi2
1	0.872	1	0.0762

H0: no serial correlation

The results indicated that the p-value (0.0762) is greater than the significance level (0.05) and hence we accept the null hypothesis. This implies that there is no serial correlation among the study variables.

4.3.3 Heteroscedasticity Test

Homoscedasticity describes a situation in which the error term is the same across all values of the independent variables. Heteroscedasticity is present when the size of the error term differs across values of an independent variable. The impact of violating the assumption of homoscedasticity is a matter of degree, increasing as heteroscedasticity increases. Breusch-Pagan/Cook-Weisberg tests the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables.

Table 4.4: Breusch-Pagan/Cook-Weisberg test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

H0: Constant variance

Variables: fitted values of foreign exchange rate

Chi2 (1)   =   1.2411

Prob>chi2   =   0.0981

The results show that the p-value (0.0981) was greater than the significance level (0.05). This means we can accept the null hypothesis of constant variance. This shows that there was constant variance and hence there was homoscedasticity in the data.

4.3.4 Multicolinearity Test

The variance inflation factor (VIF) quantifies the severity of multicollinearity in an ordinary least squares regression analysis. It provides an index that measures how much the variance (the square of the estimate's standard deviation) of an estimated regression coefficient is increased because of collinearity. A VIF of more than 10 is considered severe and necessitates further investigations.

Table 4.5: Variance Inflation Factor

Variable	VIF	1/VIF
PD	2.73	0.366400
ToT	2.23	0.447974
IR	1.97	0.506632
In	1.33	0.750697
Mean VIF	2.07	

According to the findings, the VIFs for the variables, public debt (2.73), terms of trade (2.23), interest rate (1.97) and inflation (1.33) were less than 10. This implies that there was no significant multicollinearity between the independent variables.

4.3.5 Linearity Test

Scatter plots are useful for interpreting trends in statistical data. Each observation (or point) in a scatter plot has two coordinates; the first corresponds to the first piece of data in the pair (that's the X coordinate). The second coordinate corresponds to the second piece of data in the pair (that's the Y-coordinate). The point representing that observation is placed at the intersection of the two coordinates. The value (-1) is used to indicate a perfect negative correlation while the value of (+1) is used to indicate a perfect positive correlation hence when the value is (0) it indicates that the correlation is absolutely absent. When the value is close to -1 or +1, it indicates that the correlation stronger or the relationship between the variable is stronger. Weaker correlation is indicated when the number is very close to 0.
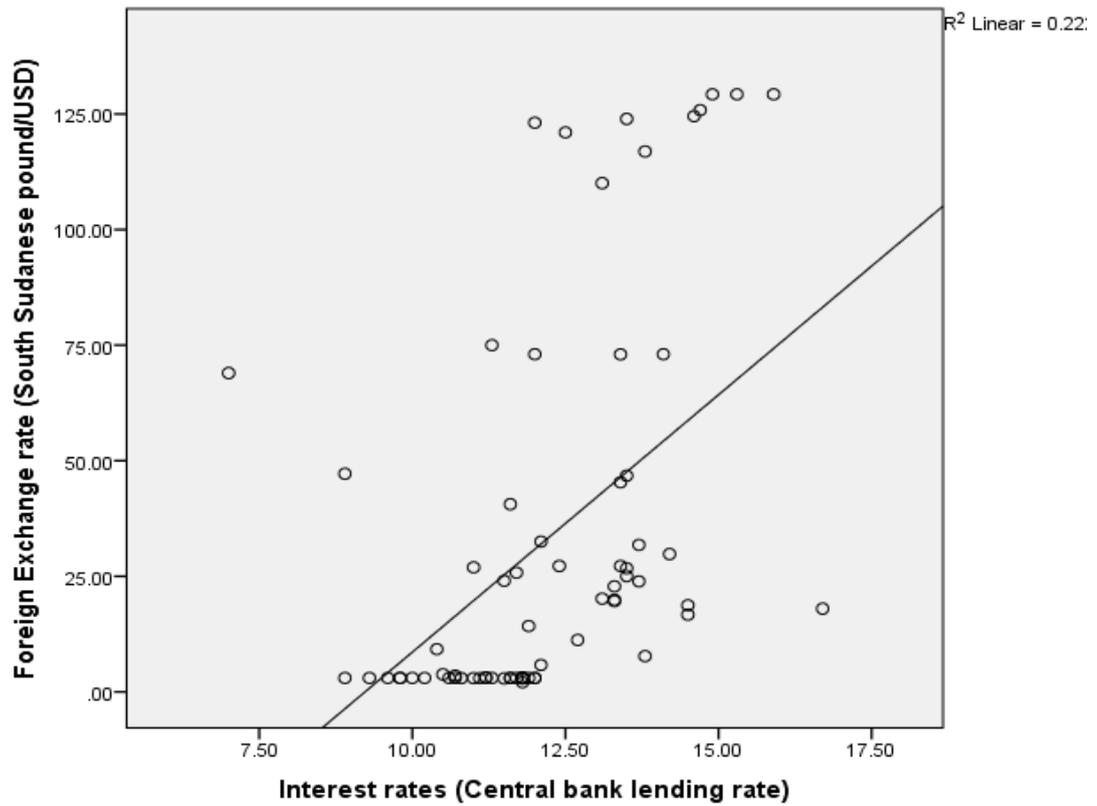
Figure 4.6: Interest Rate and Foreign Exchange Rate

Positive linear association between interest rates (Central Bank Lending Rate) and foreign exchange rate is indicated by the use of scatter plot. In addition, interest rates (Central Bank Lending Rate) can explain 22% (R^2) of the foreign exchange rate in South Sudan.
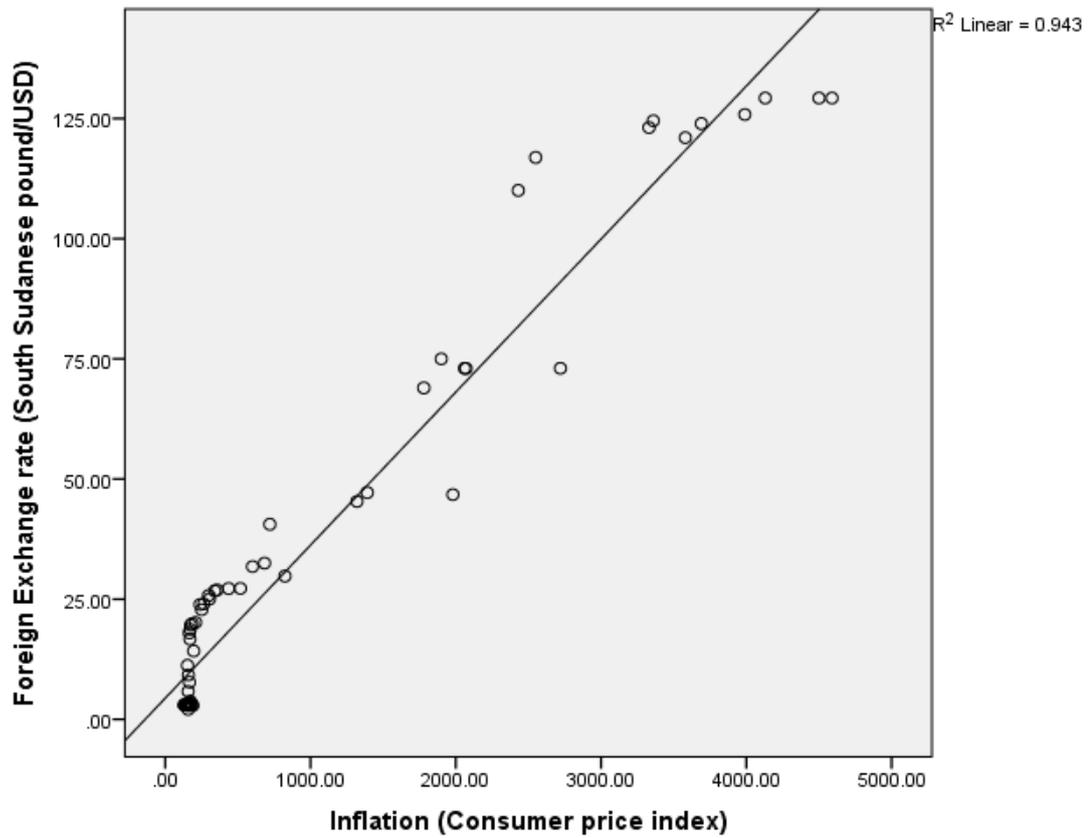
Figure 4.7: Inflation (Consumer Price Index) and Foreign Exchange Rate

In Figure 4.7, the scatter plot indicates a positive linear association between inflation (consumer price index) and foreign exchange rate in South Sudan. In addition, inflation (consumer price index) can explain 94.3% of foreign exchange rate in South Sudan.
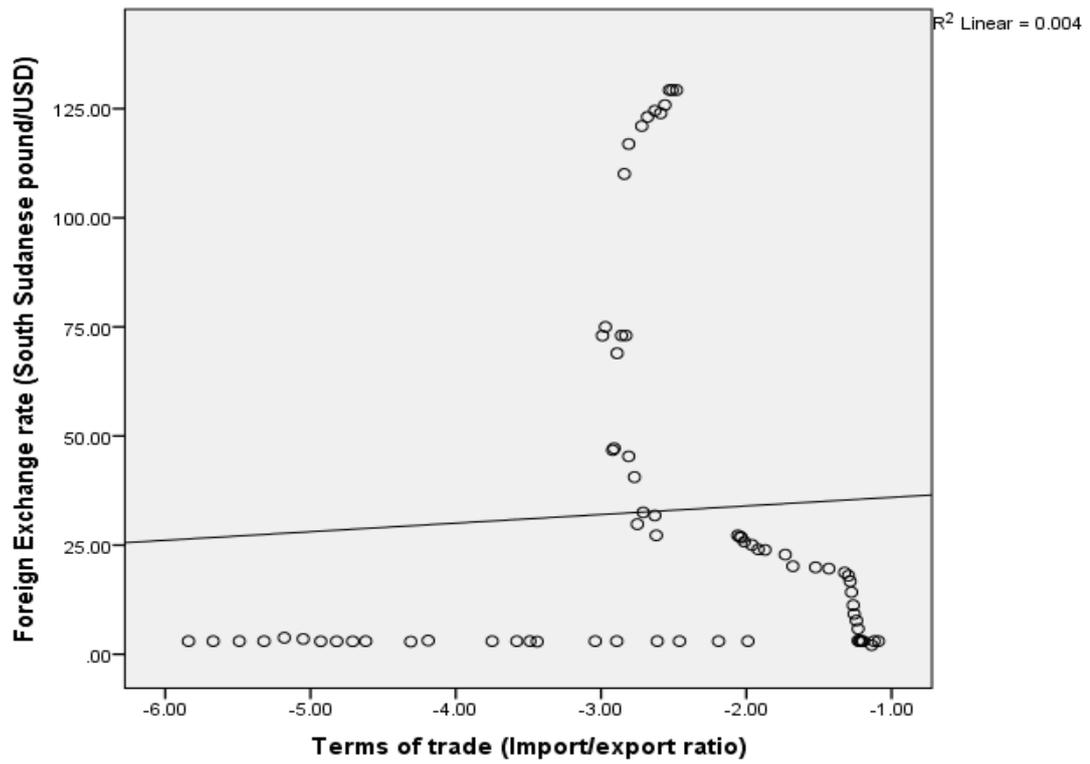
Figure 4.8: Terms of Trade and Foreign Exchange Rate

In Figure 4.8, the scatter plot indicates a positive linear association between terms of trade and foreign exchange rate in South Sudan. Further, terms of trade (import/export ratio) explain 0.4% of foreign exchange rate in South Sudan.
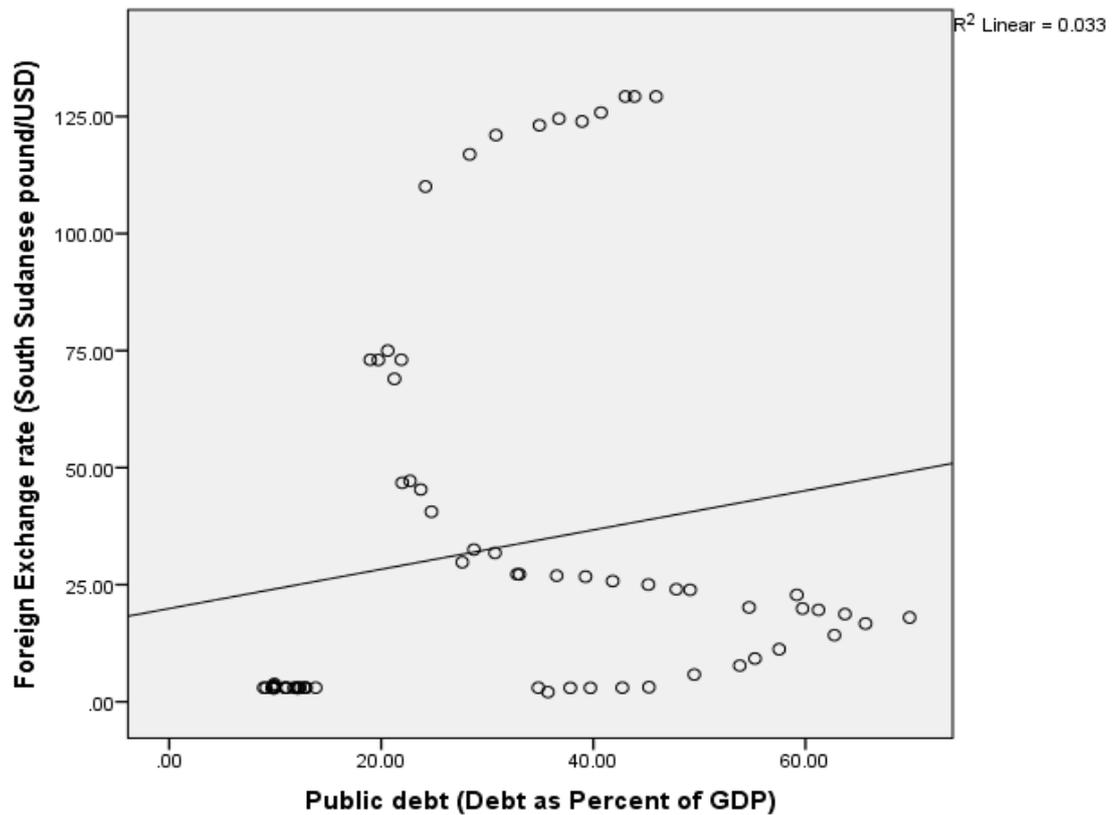
Figure 4.9: Public Debt and Foreign Exchange Rate

4.4 Unit Root

In order to check for stationarity of the data, the study employed Augmented Dickey Fuller unit root test (ADF); this was chosen because it is not affected by autocorrelation as opposed to other tests. The null hypothesis is that the variables are not stationary or they got unit root.

Table 4.6: Augmented Dickey Fuller unit root test

Variable	No of obs	Test Statistic	Ackinnon approximate p-value for z(t)	Interpooled Dickey-Fuller		
				1% critical value	5% critical value	10% critical value
Foreign exchange	71	1.878	0.9985	-3.551	-2.913	-2.592
Interest rate	71	1.578	0.9385	-3.551	-2.913	-2.592
Inflation	71	2.645	0.9991	-3.551	-2.913	-2.592
Terms of trade	71	1.418	0.9125	-3.551	-2.913	-2.592
Public debt	71	-1.050	0.7345	-3.551	-2.913	-2.592

The null hypothesis for the Augmented Dickey Fuller unit root test is that the variables have unit root or they are not stationary. The p-values for the variables foreign exchange, interest rate, inflation, terms of trade and public debt were 0.9985, 0.9385, 0.9991, 0.9125 and 0.7345 respectively. This implies that all the variables (foreign exchange, interest rate, inflation, terms of trade and public debt) had unit root and hence it was important to conduct co-integration.

4.5 Co-integration

Since some of the data was found to have a unit root, the Engel Granger test was used to test for co-integration.

Table 4.7: Granger Causality Test

Equation	Excluded	chi2	df	Prob > chi2
FX	IR	3.2219	2	0.200
FX	In	21.732	2	0.000
FX	ToT	2.2459	2	0.325
FX	PD	.52163	2	0.770
FX	ALL	30.915	8	0.000
IR	FX	3.1894	2	0.203
IR	In	14.444	2	0.001
IR	ToT	.63819	2	0.727
IR	PD	4.8287	2	0.089
IR	ALL	37.077	8	0.000
In	FX	21.404	2	0.000
In	IR	3.7144	2	0.156
In	ToT	.72879	2	0.695
In	PD	6.1648	2	0.046
In	ALL	28.074	8	0.000
ToT	FX	3.2339	2	0.198
ToT	IR	.76376	2	0.683
ToT	In	2.7735	2	0.250
ToT	PD	5.5415	2	0.063
ToT	ALL	11.851	8	0.158
PD	FX	2.576	2	0.276
PD	IR	1.254	2	0.534
PD	In	3.997	2	0.136
PD	ToT	10.509	2	0.005
PD	ALL	16.358	8	0.038

The results as shown in Table 4.7, show that interest rate (Central Bank Lending Rate) does not granger cause foreign exchange rate in South Sudan (p-value=0.200). In addition, foreign exchange rate does not granger cause interest rate (Central Bank Lending Rate) in South Sudan (p-value=0.203). The results also show that inflation (consumer price index) granger causes foreign exchange rate in South Sudan (p-value=0.000). Similarly, foreign exchange rate granger causes inflation (consumer price index) in South Sudan (p-value=0.000).

Further, the results show that terms of trade (import/export ratio) do not granger cause foreign exchange rate in South Sudan (p-value=0.325). Similarly, terms of trade do not granger cause foreign exchange rate (p-value=0.198). Also, the results show that public debt (per cent of GDP) does not granger cause foreign exchange rate in South

Sudan (p-value=0.770). Similarly, foreign exchange rate does no granger cause public debt (per cent of GDP) in South Sudan (p-value=0.276).

4.6 Regression Analysis

Regression analysis was used to measure the weight of the association between the independent variables and the dependent variable. The basic model was specified as follows:

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon_t$$

Y_t is the dependent variable (foreign exchange rate in South Sudan), B_0 is the y intercept (Constant), β_1- β_4 and coefficients of determination, X_{1t} is the interest rates, X_{2t} is the inflation, X_{3t} is terms of trade and X_{4t} is public debt, t represents time and ε_t is an error term.

Table 4.8: Regression Coefficients

Source	SS	df	MS		
Model	115961.706	4	28990.4264		
Residual	5907.47538	67	88.1712744		
Total	121869.181	71	1716.46734		

Number of obs = 72
F(4, 67) = 328.80
Prob > F = 0.0000
R-squared = 0.9515
Adj R-squared = 0.9486
Root MSE = 9.39

FX	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
IR	-.4290188	.8927702	-0.48	0.632	-2.210996	1.352958
In	.0317558	.0010179	31.20	0.000	.0297241	.0337876
ToT	-.4873149	1.308253	-0.37	0.711	-3.098599	2.123969
PD	.2615654	.1025774	2.55	0.013	.05682	.4663108
_cons	.4627653	11.0591	0.04	0.967	-21.61128	22.53681

From the results, the regression model was as follows;

$$Y_t = 0.4627653 - 0.4290188 X_{1t} + 0.031755 X_{2t} - 0.487314 X_{3t} + 0.261565 X_{4t}$$

The R-squared of the regression is the fraction of the variation in your dependent variable that is accounted for (or predicted by) the independent variables. A shown in Table 4.8, the R-squared in this study was 0.9515, which implies that interest rates, inflation, terms of trade and public debt can explain 95.15%% of the foreign exchange rate in South Sudan. These findings imply that 4.85% of the foreign exchange rate in South Sudan can be explained by other factors not included in this study. In addition, the p-value for the F-statistic was 0.000, which implies that the model can be used in predicting the influence of the four independent variables (interest rates, inflation, terms of trade and public debt) on the foreign exchange rate in South Sudan.

The results show that interest rate does not determine foreign exchange rate in South Sudan as shown by a regression coefficient of -0.4290188. The p-value (0.632) was more than the significance level (0.05) and hence we can accept the null hypothesis indicating that "interest rates have no significant effect on foreign exchange rate in South Sudan". These findings agree to Kiruga (2015) there was a positive relationship between foreign exchange rates and interest rates in Kenya but not significant.

Further, the results show that inflation determines effect on foreign exchange rate in South Sudan as shown by a regression coefficient of 0.0317558. The p-value (0.000) was less than the significance level (0.05) and hence we can reject the null hypothesis indicating that "inflation has no significant effect on foreign exchange rate in South Sudan". These findings disagree with Bhatnagar (2013) findings that inflation has no significant effect on foreign exchange rate in India. The findings also disagree with Mulwa (2013) findings that inflation rate has an insignificant effect on foreign exchange in Kenya.

The results show that terms of trade does not determine foreign exchange rate in South Sudan as shown by a regression coefficient of -0.4873149. The p-value (0.711) was more than the significance level (0.05) and hence we can accept the null hypothesis indicating that "terms of trade has no significant effect on foreign exchange rate in South Sudan". These findings are contrary to Bahmani-Oskooee and Hegerty (2007) findings that international export and import flows have a significant influence on exchange rate volatility in Malaysia. Also, the findings are contrary to Brahmasrene and Jiranyakul (2002) argument that bilateral trade balances influence real exchange rate in Thailand.

The results show that public debt determines foreign exchange rate in South Sudan as shown by a regression coefficient of 0.2615654. The p-value (0.013) was less than the significance level (0.05) and hence we can reject the null hypothesis indicating that "public debt has no significant effect on foreign exchange rate in South Sudan". These findings agree with Baksay, Karvalits and Kuti (2013) findings that external public debt influences foreign exchange rate in Hungary. Similarly, Saheed, Sani and Idakwoji (2015) found that external debt, debt service payment and foreign reserve proved to be statistically significant in explaining exchange rate fluctuation in Nigeria.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is integrated in the summary of key data findings, conclusion drawn from the findings and the recommendations that were reached at. The conclusions and recommendations drawn were focused on addressing the purpose of this study was to investigate the determinants of foreign exchange rate in South Sudan. The study also sought to determine whether interest rates, inflation, terms of trade and public debt determine foreign exchange rate in South Sudan.

5.2 Summary of the Findings

This section summarizes the study results on the influence of interest rates, inflation, terms of trade and public debt on foreign exchange rate in South Sudan.

5.2.1 Interest Rates and Foreign Exchange Rate

The study found that interest rate determines foreign exchange rate in South Sudan. These findings agree with Mukopi (2013) findings that there is an insignificant relationship between interest rate and foreign exchange rate in Kenya. Similarly, the findings concur with Kiruga (2015) findings that interest rates have no significant effect on foreign exchange rates in Kenya. However, when interest rates in a country are high, the yields (or returns) on offer for investing in that country also tend to be high. That encourages people to invest there, which require them to buy that country's currency.

That in turn raises the value of the currency, because it's more in demand. If a country can manage to achieve a successful balance of increased interest rates without an accompanying increase in inflation, then the value and exchange rate for its currency is more likely to rise. Interest rates alone do not determine the value of a currency. Two other factors that are often of greater importance are political and economic stability and the demand for a country's goods and services.

5.2.2 Inflation and Foreign Exchange Rate

The study established that that inflation in South Sudan has been increasing over the study period. The study found that inflation determines foreign exchange rate in South Sudan. These findings agree with Saha and Biswas (2014) findings that inflation had a significant influence on exchange rate in India. Positive relationship between inflation and exchange rates can also be explained by the theory of Purchasing Power Parity (PPP). PPP theory explains that the exchange rates are established in a country depends on the ratio of the prices of goods and services a country.

Theoretically a low inflation rate scenario will exhibit a rising currency rate, as the purchasing power of the currency will increase as compared to other currencies. Inflation and interest rates are highly correlated. Higher inflation generally means higher interest rates in an economy. If the inflationary effects of exchange rate changes are large, the authorities will have to implement monetary and fiscal policies that offset the inflationary consequences of exchange rate changes.

5.2.3 Terms of trade and Foreign Exchange Rate

The study revealed that terms of trade does not determine foreign exchange rate in South Sudan. The import/export ration in South Sudan was less than 0 for the period

ranging from January 2012 to December 2017. The findings are contrary to Grube and Samanta (2003) findings that there is significant relationship between terms of trade and foreign exchange fluctuations in Mexico. In addition, Onyancha (2012) found that there is a long run relationship between balance of trade and exchange rate in Kenya. a country's balance of trade between imports and exports can be a much more crucial determining factor for currency value. Greater demand for a country's products means greater demand for the country's currency as well.

However, the study findings agree with Grube and Samanta (2003) states that a higher exchange rate can be expected to lower a country's balance of trade, while declining exchange rate decreases the purchasing power of income and capital gains derived from any returns. If the price of a country's exports rises by a greater rate to that of its imports, its terms of trade will be seen to have improved as it shows greater demand for the country's exports. On the other hand, if the price of exports rises by a smaller rate to that of its imports, the currency's value will decrease in relation to its trading partners.

5.2.4 Public Debt and Foreign Exchange Rate

The study established that public debt determines foreign exchange rate in South Sudan. These findings agree with Neaime (2009) findings that external public debt has a significant influence on foreign exchange rate in the Middle East and North Africa region. Similarly, the findings concur with Baksay, Karvalits and Kuti (2013) findings that public deficit and debt affects foreign exchange reserves and foreign exchange rate in Hungary. With continuous increase in public expenditures, and low capital formation in many developing countries, many governments have resorted into borrowing either or both within and outside the country. However, most borrowings

come with interest attached, which results in debt servicing. Serving external debt may involve demand for foreign currency which tends to affect the exchange rate of the country.

A country with government debt is less likely to acquire foreign capital, leading to inflation, which in turns influences foreign exchange rate. Foreign investors will sell their bonds in the open market if the market predicts government debt within a certain country. If a country is perceived to have a high national debt, without a credible plan for dealing with it, that can have a negative impact on the value of its currency. External debt management and exchange rate policy are an integral part in macroeconomic policy.

5.3 Conclusion

In addition, the study concludes that interest rates do not determine foreign exchange rate in South Sudan However, when domestic interest rate is below foreign interest rates, if the interest rates in one country increases, then the currency value of that country will increase as a reaction. If the interest rates decrease, then the opposite effect of depreciating currency value will take place. The study concludes that inflation is a determinant of foreign exchange rate in South Sudan. This implies that an increase in inflation rate would lead to an increase in foreign exchange rate. Inflation is more likely to have a significant negative effect, rather than a significant positive effect, on a currency's value and foreign exchange rate.

The study established that public debt determines foreign exchange rate in South Sudan. This implies that an increase in pub debt would lead to an increase in foreign exchange rate in South Sudan. The study revealed that terms of trade has no significant effect on foreign exchange rate in South Sudan. However, the balance of

trade influences the supply and demand for foreign exchange. When a country's trade account does not net to zero – that is, when exports are not equal to imports – there is relatively more supply or demand for a country's currency, which influences the price of that currency on the world market.

5.4 Recommendations

The study found that interest rates do not determine foreign exchange rate in South Sudan. The study however recommends that the government and the Bank of South Sudan should ensure the rates of interest rates charged by banks do not have an adverse effect on other macroeconomic factors, which might affect exchanges rates. This can be done by developing polices to cap interest rates.

The study found that inflation rates determine foreign exchange rate. Negative inflation rates discourage investors due to lower rate of return in profits. The study therefore recommends that the government of South Sudan should come up with policies (monetary and fiscal) to curb inflation rate to around levels that stimulate investment.

Both fiscal and monetary policies geared towards encouraging FDI in South Sudan would enable the country to witness high and sustainable growth. A policy recommendation is to attract export oriented FDI into the industrial sector. In addition, the country should come up with strategies to increase oil export, by reducing conflict, reducing oil prices and promoting peace, so as to increase import export ratio and hence economic performance.

The government should work towards increased openness to foreign trade so that the domestic enterprise sector can participate fully in the global economy. As trade

openness has been proved to be a significant factor has influence FDI flow in the country. The government should implement more liberalization policies to attract foreign investment.

The findings of this study have significant policy implication in the management of external public debt. Lack of prudent debt management strategies as evidenced in this study, will partly lead to increase exchange rate volatility. Policy makers need to ensure that both the level and rate of growth of external public debt is sustainable, that is, the debt sustainability indicator external debt to GDP ratio is at low levels and pursues strategies that will reduce excessive accumulation of external public debt. In addition policy makers should ensure that borrowed funds are put in projects/ investments with higher rate of returns.

5.5 Areas for Further Research

The study found that interest rates, inflation, terms of trade and public debt determine 95.15% of foreign exchange rate in South Sudan. This implies that there are other factors that determine foreign exchange rate in South Sudan. This study therefore suggests that further studies should be conducted on whether other factors determining foreign exchange rate in South Sudan. In addition, the study found that terms of trade (import/export ratio) does not determine foreign exchange rate in South Sudan. However, import/export ratio influences the flow of foreign currency including USD into the country. Therefore, further studies should be conducted to investigate the relationship between terms of trade and foreign exchange rate in South Sudan.

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APPENDICES

Appendix I: Checklist

Year	Month	Foreign Exchange rate (South Sudanese pound/USD)	Interest rates (Central bank lending rate)	Inflation (Consumer price index)	Terms of trade (Import/export ratio)	Public debt (Debt as Percent of GDP)
2012	January	3.00	8.90	135.56	-5.84	8.91
2012	February	3.00	9.30	130.77	-5.67	9.12
2012	March	3.00	9.60	133.60	-5.49	9.78
2012	April	3.00	9.80	132.17	-5.32	9.89
2012	May	3.78	10.50	171.14	-5.18	9.91
2012	June	3.50	10.70	174.06	-5.05	9.88
2012	July	2.96	10.80	170.26	-4.93	9.87
2012	August	2.96	11.00	170.33	-4.82	9.72
2012	September	2.95	11.10	170.80	-4.71	9.78
2012	October	3.00	11.80	159.14	-4.62	9.81
2012	November	2.90	11.50	189.66	-4.31	9.87
2012	December	3.15	11.20	169.63	-4.19	9.89
2013	January	3.00	11.30	183.55	-3.75	10.91
2013	February	3.00	9.80	162.23	-3.58	10.98
2013	March	3.00	10.70	152.43	-3.49	11.11
2013	April	2.90	11.80	153.33	-3.44	12.12
2013	May	3.00	11.60	155.32	-3.04	11.98
2013	June	3.00	11.60	154.74	-2.89	11.78
2013	July	3.00	11.90	153.96	-2.61	12.18

2013	August	3.00	11.70	153.61	-2.46	12.89
2013	September	3.00	10.20	158.51	-2.19	13.82
2013	October	3.00	10.60	161.01	-1.99	12.72
2013	November	3.00	11.80	163.16	-1.21	12.34
2013	December	3.00	11.20	154.72	-1.12	12.87
2014	January	3.00	12.00	166.83	-1.09	34.81
2014	February	2.08	11.80	157.52	-1.14	35.72
2014	March	2.97	11.80	153.02	-1.20	37.82
2014	April	2.97	12.00	151.46	-1.21	39.72
2014	May	3.00	10.00	150.71	-1.22	42.73
2014	June	3.12	11.80	155.67	-1.23	45.24
2014	July	5.82	12.10	157.98	-1.23	49.51
2014	August	7.72	13.80	166.90	-1.24	53.81
2014	September	9.23	10.40	159.02	-1.26	55.24
2014	October	11.23	12.70	152.86	-1.26	57.52
2014	November	14.23	11.90	195.94	-1.28	62.73
2014	December	16.71	14.50	170.01	-1.29	65.66
2015	January	18.00	16.70	165.57	-1.30	69.82
2015	February	18.72	14.50	170.95	-1.32	63.72
2015	March	19.62	13.30	174.04	-1.43	61.23
2015	April	19.91	13.30	186.51	-1.52	59.72
2015	May	20.17	13.10	208.61	-1.68	54.68
2015	June	22.82	13.30	250.91	-1.73	59.19
2015	July	23.91	13.70	239.91	-1.87	49.12
2015	August	24.03	11.50	264.80	-1.92	47.82
2015	September	25.04	13.50	304.13	-1.96	45.18
2015	October	25.78	11.70	299.11	-2.01	41.82

2015	November	26.73	13.50	340.13	-2.04	39.26
2015	December	26.92	11.00	356.78	-2.04	36.54
2016	January	27.22	12.40	436.27	-2.06	33.03
2016	February	27.24	13.40	517.19	-2.62	32.81
2016	March	31.80	13.70	600.83	-2.63	30.72
2016	April	32.50	12.10	683.32	-2.71	28.73
2016	May	29.80	14.20	824.07	-2.75	27.63
2016	June	40.58	11.60	720.08	-2.77	24.73
2016	July	45.34	13.40	1320.00	-2.81	23.72
2016	August	47.18	8.90	1390.00	-2.91	22.71
2016	September	46.76	13.50	1980.00	-2.92	21.98
2016	October	68.97	7.00	1780.00	-2.89	21.24
2016	November	75.00	11.30	1900.00	-2.97	20.61
2016	December	73.00	13.40	2070.00	-2.99	19.72
2017	January	73.04	12.00	2060.00	-2.86	18.96
2017	February	73.04	14.10	2720.00	-2.83	21.89
2017	March	110.04	13.10	2430.00	-2.84	24.16
2017	April	116.90	13.80	2550.00	-2.81	28.34
2017	May	121.02	12.50	3580.00	-2.72	30.81
2017	June	123.12	12.00	3330.00	-2.68	34.91
2017	July	124.53	14.60	3360.00	-2.63	36.75
2017	August	123.94	13.50	3690.00	-2.59	38.93
2017	September	125.85	14.70	3990.00	-2.56	40.72
2017	October	129.26	14.90	4130.00	-2.53	43.01
2017	November	129.26	15.30	4590.00	-2.51	43.88
2017	December	129.26	15.90	4500.00	-2.48	45.91