EFFECTS OF CURRENCY DEPRECIATION ON GROWTH IN ZAMBIA

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APPROVAL

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ABSTRACT

This study empirically investigated the impact of currency depreciation on economic growth in Zambia using the Johansen cointegration technique in a bivariate specification. The study used annual time-series data over the period 1985-2016. Gross domestic product (GDP) was used as a proxy for economic growth. The estimation results revealed the existence of a negative relationship between the real exchange rate and GDP. These empirical results signify the importance of a systematic exchange rate policy in order to promote stability and sustainability of economic growth.

Keywords: Economic Growth, Exchange Rate Depreciation, Cointegration.

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ACRONYMS AND ABBREVIATIONS

ADF	Augmented Dickey Fuller
AR	Autoregression
CPI_{USA}	Consumer Price Index for the United States of America
CPI_{Z}	Consumer Price Index for Zambia
LRGDP	Log of Real Gross Domestic Product
GLS	Generalised Least Squares
NER	Nominal Exchange Rate
GDP	Gross Domestic Product
GDPDEF	Gross Domestic Product Deflator
LRER	Log of Real Exchange Rate
OLS	Ordinary Least Squares
RGDP	Real Gross Domestic Product
RER	Real Exchange Rate
VAR	Vector Autoregression
VECM	Vector Error Correction Mechanism

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

The United States Dollar (US $) has maintained its role as one of the major currencies on the international market. The growing role of the US dollar as an anchor currency for most African countries poses the question on the pros-and-cons of exchange rate movement against the dollar, as well as the effects that it may have on the domestic economy. Today, along with being the most important reserve currency worldwide, the US dollar remains the dominant international currency serving as a vehicle for clearing international payments between banks, as a unit of account for international trade in goods and services, and as a reserve cum intervention currency for governments (Pocklington 2010).

Existing empirical evidence confirms that exchange rates like other financial time series exhibit non-linear behaviour (Koutmos and Theodossiou 1994). Over time, exchange rates, if left unregulated by the authorities, will fluctuate according to changes in the underlying market conditions. This is usually reflected by different rates and interest rates between countries

Considering that exchange rates could affect inflation and interest rates as stated above, questions can be asked as to whether exchange rates have a direct effect on economic growth? Economists have used different approaches in explaining the effects of exchange rate on economic growth. The traditional approach (also known as Keynesian view), is one of the dominant views that tries to explain that exchange rate depreciation has an expansionary effect on the economy. The other view that explains the effects of exchange rates on economic growth is the monetarists' view which explains that exchange rate depreciation has no effect on economic growth. Another approach is the structuralist approach, their argument is different from the traditionalist. The structuralists believe that depreciation of exchange rates results in a contractionary effect on output. Therefore from the above we can deduce that different scholars have different views on the effects of exchange rate on growth.

Existing empirical evidence reveals that fluctuations in exchange rates can potentially generate distortions in the economy (Chipili, 2010). Thus, the paper aims to contribute to the empirical literature on the effects of depreciation of the Zambian Kwacha/United States Dollar (ZMW/ USD) exchange rate and its impact on economic growth.

1.2 Overview of the Zambian Economy

Exchange rate regime in Zambia

The exchange rate system in Zambia was broadly characterized by both fixed and floating exchange rate policies. From independence in 1964 to 1982, and from 1987 to 1991, the monetary authorities adopted a fixed exchange-rate regime. This regime was sustained by an occasional adjustment of the exchange-rate system and other measures such as the issuing of import licenses instead of official interventions in the exchange-rate market (Kalyalya 2007). Between 1983 and 1985, the Zambian Kwacha was pegged to a basket of its major trading partners' currencies with a monthly crawl of one per cent. A flexible exchange rate regime was adopted in the early 1990s as part of the economic reforms. Since the adoption of the flexible exchange rate regime in Zambia, the Zambian Kwacha has been fluctuating against major currencies especially the United States Dollar.

Some of the major trading currencies Zambia has traded with over the past 51 years include the; Great British Pound, US Dollar, Euro and South African Rand. In 1995, 2006 and 2008 the Zambian Kwacha/ US Dollar exchange rate experienced huge fluctuations, due to exogenous shocks in the economy. Chipili (2015) explains that the shocks were as a result of; supply shocks (drought) as well as banking crises that induced demand for foreign assets, improvements in the performance of the external sector and positive sentiments following the attainment of the Highly Indebted Poor Countries Initiative Completion Point (HIPC) and the Multilateral Debt Relief Initiative that attracted portfolio flows and negative shocks that reflected the political uncertainty surrounding the illness and eventual passing of the Republican President and subsequent Presidential by-elections, worsening of the global financial crisis and deterioration in copper prices.

Gross Domestic Product

Gross domestic product (GDP) measures the national income and output for a given country's economy. Gross domestic product (GDP) is equal to the total expenditures for all final goods and services produced within the country in a stipulated period of time. GDP in Zambia averaged USD 6.04 billion (2.94 percent) from 1960 to about the year 2000, reaching an all-time high of USD 26.97 billion in 2014 and a record low of USD 0.68 billion in 1961 (World Bank 2017).

Real Gross Domestic Product (GDP) declined by 2% in 1998 after two consecutive years of positive growth. The fall in output in agriculture, mining, construction, wholesale and retail trade mainly accounted for this poor performance (Bank of Zambia 1998). This was due to the inadequate supply of foreign exchange owing to low export earnings (metal and non-metal) and the withholding of donor balance of payment support and poor performance of the agricultural sector due to bad weather. By 1999, real GDP had risen to 4.7%.

During 2004, the performance of the Zambian economy was impressive, as reflected in the growth of 5% in real GDP, which compared favourably with the 5.1% recorded in 2003 (Bank of Zambia 2004). In 2005, the economy showed further improvement, posting an estimated annual growth rate of 5.0%, which was comparable to the 5.4% growth rate recorded in 2004. This marked the seventh consecutive year of positive real growth of the economy. Contributing to this outturn was the favourable performance in most sectors, including mining, which continued to be driven by rising copper prices and increased production, despite operational problems experienced at some mines. Manufacturing, construction, transport and communications, and trade were the other key sectors that contributed to the growth in the economy (Bank of Zambia 2005). In 2007, the global economy grew by 4.9% compared to 5.0% in 2006. Favourable developments in the global and domestic economies led to Zambia recording growth in real GDP of 5.7%. The observed growth in GDP was driven by continued investment in various sectors of the economy, notably, transport and communications, construction, mining, manufacturing, tourism, and agriculture. During the year 2007, the Zambian economy continued to benefit from higher copper prices, which underpinned the continued growth of the mining and other sectors connected to mining. Further, continued confidence in the local economy led to a sustained increase in foreign direct investment. (Bank of Zambia 2007).

The real Gross Domestic Product (GDP) grew by 6.7% in 2013 compared with 7.3% in 2012. This was mainly driven by expansions in transport, storage and communications; construction; community, social and personal services; financial institutions and insurance; as well as manufacturing sectors (Bank of Zambia 2013). In 2014 real GDP growth was at 6.0% compared to 6.7% in 2013. Although GDP growth slowed, performance of the Zambian economy in 2014 continued to be positive. This growth largely emanated from the expansion in construction and service sectors, coupled with a rebound in the agriculture sector (Bank of Zambia 2014). Real GDP growth slowed down to 3.2% in 2015 from 6.0% in 2014. The growth outturn was significantly lower than the 7.0% target for the year. Growth was mainly constrained by the electricity supply

deficit, weak international copper prices, and high production costs associated with the increase in fuel prices and the sharp depreciation of the Zambian Kwacha (Bank of Zambia 2015). These effects were felt into the year 2016 but begun to improve at the end of the year.

1.3 Statement of the Problem

Policy makers aim to maintain financial system and price stability in the economy (Robinson and Robinson 1997). This also means that there should be exchange rate stability in an economy. Exchange rate stability in this case means maintaining the exchange rate at a particular rate or avoiding major fluctuations in the domestic currency in comparison to other currencies. Unfortunately, this has not been the case for Zambia as fluctuations in the exchange rate have continued to date since 1985. The Zambian government has in the past announced measures to stabilise the foreign exchange market following periods of sharp depreciations such as the introduction of a broad-based interbank foreign exchange market (IFEM) system in July 2003.

Despite the Central Bank's efforts to stabilise the foreign exchange markets, the GDP growth rate has continued to increase at a slow rate as seen in Figure 1.

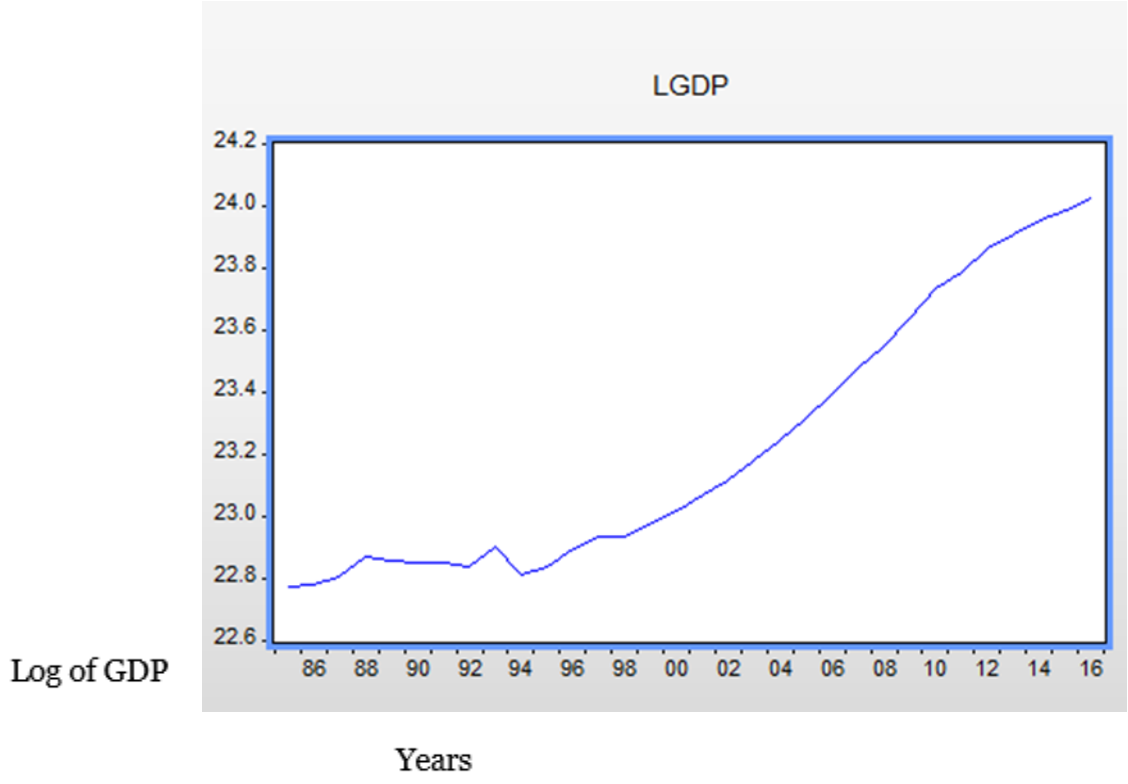


Figure 1: GDP trend from 1985 to 2016 (annual)

Therefore this raises questions as to what impact exchange rates have on the Zambian economy. The Traditional approach to exchange rate holds that depreciation has an expansionary effect on the economy (Salvatore, 2005), while the Structuralist approach to exchange rates, on the other hand, is equally convincing that depreciation has a contractionary effect on the economy (Acar, 2000). The lack of consensus in literature (both theoretical and empirical) justifies the contradictory calls by different scholars on the effects of exchange rate depreciation on growth.

Depreciation has been defined as a decrease in the level of a currency in a floating exchange rate system due to market forces. While devaluation is an official lowering of the value of a country's currency within a fixed exchange rate system, by which the monetary authority formally sets a new fixed rate with respect to a foreign reference currency or currency basket. Mankiw (2008) also defined depreciation as a decrease in the value of a currency as measured by the amount of foreign currency it can buy. Therefore in such a case it is the purchasing power of a currency that is considered. The focus of this study is on the actual purchasing power of the currency in both floating and fixed exchange rate regime and an increase in the currency in both periods will be generally referred to as depreciation in this study. Hence, the Real Exchange Rate is used in the study to take into account of the effects of any structural breaks. The study period covered, which is 1985- 2016 aims to reduce the effects of any structural breaks that may have occurred.

In Zambia, a study was done by Chipili (2013) on the macroeconomic effects of exchange rate volatility and it was established that exchange rate volatility tends to depress trade, increase inflation, discourage short-term capital flows and dampen output although its impact tends to be temporary. In addition, exchange rate depreciation in excess of 1% tends to generate negative effects on the economy.

It is against this background that this study seeks to determine the impact of exchange rate depreciation on economic growth in Zambia. This will help answer the question as to whether exchange rate policy really matters in influencing economic growth in Zambia.

1.4 Objective and Significance of the study

1.4.1 Objective

The main objective of this study was to assess the effects of depreciation of the real exchange rate on real economic growth between 1985 and 2016 in Zambia.

1.4.2 Significance of the Study

Whether depreciation of the exchange rate plays a role in the growth of the economy or not, has been a focus of study for most researchers. The traditionalist view on the expansionary effects of depreciation of the exchange rate is the most dominant view among researchers. Some empirical studies have brought out the ambiguity that still exists on the effects of currency depreciation on output.

In a study conducted by Paul (2006) on the effect of changes in exchange rates by a multinational corporation on innovation, it was concluded that when depreciation occurs, output increases in both domestic and foreign market. There are many more studies done by researchers such as Rodrick (2008) that find similar results which support the theory that depreciation in the exchange rate has an expansionary effect on economic growth. Nawaz (2012) also points out that there has been a contradiction in theoretical literature among researchers based on the effect of exchange rate in determining the net output.

Krugman & Taylor (1978) bring out the ambiguity on the effects of currency depreciation on output and their pioneer work explain the demand side as well as supply side channels through which depreciation may appear as loss in net output. Their argument is that depreciation of the exchange rate induces higher prices of tradable products that appear as a loss in real balance of the economy and ultimately result in less output and growth. Obstfeld and Rogoff's (1998) theoretical work reveals that exchange rate depreciation is indeed costly to the domestic economy through its direct and indirect effects on households and firms, respectively. The former effect is based on the premise that households remain unhappy about exchange rate depreciation because this normally leads to an increase in domestic prices hence the cost of living goes up. For example, Edwards (1986) and Rhodd (1993) found negative (contractionary) short-run effects but in the long-run the output response to depreciation appeared to be positive. El-Ramly and Abdel-Haleim (2008) revealed negative response for several years before expansionary effects appeared. It is also important to note that studies considering multiple countries have often reported different findings. For instance, Bahmani-Oskooee and Miteza (2006) using a panel of 42 countries found that in the long-run depreciation had a contractionary effect in non-OECD countries, while for OECD economies results were mixed.

Zambia has experienced notable fluctuation in the growth rate over the past 54 years. However, despite these fluctuations and slow growth performance in some years, the general growth

performance of the Zambian economy has continued to be positive. The exchange rate became high soon after the foreign exchange market was liberalised in 1994, a reflection of exchange rate adjustment following a long period of misalignment. Exchange rates were unstable in 2001 and for most part in 2003. Thereafter, the exchange rates begun to drop, until the global financial crisis in 2007 that persisted until the end of 2010.

Chipili (2013) in his study was able to conclude that the results underscored the importance of exchange rates in trade and monetary policies and the transmission of exchange rate impulses to the rest of the economy. Therefore with the exchange rate fluctuations that have continued to be experienced, it can be said that the effects of exchange rate depreciation on the economy in terms of growth is important in policy formulation, especially in finding solutions to curb the adverse effects that may occur.

Therefore this study will help us determine whether or not exchange rate policy should be properly developed to promote stability and sustainability of economic growth in Zambia. The next chapter focuses on the literature review, then the methodology that is used in the study is explained thereafter the results and discussion are presented before a conclusion is finally drawn.

CHAPTER 2: LITERATURE REVIEW

Different Scholars have explored the theoretical and empirical aspects of the relationship between exchange rate and economic growth. This chapter, therefore, presents theoretical and empirical literature on the impact of exchange rate depreciation on economic growth. This chapter begins by looking at the different theories that explain how exchange rate depreciation affects economic growth, thereafter some empirical studies are analysed.

2.1 Theoretical Review

The Traditional Approach to Exchange Rates

The traditional view also known as the *keynesian* view is that exchange rate depreciation has an expansionary effect on economic growth. The argument is that depreciation of the real exchange rate promotes capacity expansion in tradables which improves the profitability of the tradable sector and as a result increases economic growth (Rodrik 2008). This is explained by the shift in production of goods from the non-tradable to the tradable sector, which is characterized by higher (marginal social) productivity levels that result in an increase in the overall productivity of an economy. Traditionalists argue that exchange rate depreciation would promote trade balance, alleviate balance of payments difficulties and accordingly expand output and employment provided the Marshall-Lernar condition is met. The Marshall-Lerner condition states that depreciation would lead to expansion in output if the sum of price elasticity of demand for exports and the price elasticity of demand for imports is greater than unity (Davidson 2009). Salvatore (2005) agrees with the traditional view and explains that by causing local goods to be cheaper abroad, it increases the demand hence leading to an increase in exports. Exports make up gross domestic product; therefore all else being equal an increase in exports will definitely increase GDP.

The traditional approach to exchange rates assumes that exchange rates affect economic growth through two main channels - the total factor productivity growth channel and the capital accumulation channel. The total factor productivity growth channel places the structure of domestic production at the core of the analysis (Eichengreen 2008). The total factor productivity growth channel holds that currency depreciation shifts the output composition of a country from the production of non-traded goods to traded goods. The link is that the depreciated real exchange rate, is equivalent to an increase in the price of tradables relative to non tradables; thus it improves the profitability of the tradable sector. As production moves from the non tradables to the tradable

sector higher productivity levels begin to emanate, the overall productivity in the economy increases. Acar (2000) explains that currency devaluation switches demand from imports to domestically produced goods by increasing the relative prices of imports. Export industries on the other hand become more competitive in international markets by stimulating domestic production of tradable goods and inducing domestic industries to use more domestic inputs.

The capital accumulation approach is a view which holds that exchange rates affect economic growth through their effect on savings. This approach claims that real exchange rate depreciation enhances growth through an increase in the capital stock of the economy as a whole (Mbaye 2012). The basis for this view is that a depreciated real exchange rate has a tendency to increase the domestic saving rate. The relationship between a depreciated real exchange rate and the saving rate arises because a depreciated real exchange rate tends to shift aggregate demand away from non-traded to traded goods, requiring an increase in the real interest rate to maintain internal balance (Montiel and Serven 2008). The increase in interest rates constrains aggregate demand in part by raising the domestic saving rate. Thus from this perspective, causation runs from the real exchange rate through the real interest rate to the saving rate which in turn increases economic growth as the rate of capital accumulation is increased. Therefore the higher saving rate that has been induced by depreciation will stimulate growth by increasing the rate of capital accumulation**.**

However as mentioned above certain conditions have to be present in order for the traditionalist approach to apply. The first one is that the Marshall-Lernar condition has to be met. This means that if the sum of price elasticity of demand for exports and the price elasticity of demand for imports is not greater than unity then exchange rate depreciation may not result in an increase in output. The Total Factor Productivity (TPF) growth channel lacks empirical support; Mbaye (2012) for instance argues that there is no empirical investigation on the TFP transmission channel of the effect of real exchange rate depreciation on growth.

Secondly, under the capital accumulation channel of exchange rates, the economy ought to be one that is prone to saving. The validity of the capital accumulation channel is subject to debate, for instance, Bernanke (2005) argues that causation runs from a high saving rate to a depreciated exchange rate not the other way round. Montiel and Serven (2008) believe that the existence of a link between the real exchange rate and the saving rate, as well as the interpretation of that link if it exists is questionable. Thirdly the economy should be one that is able to easily switch from

imports to domestically produced goods. Therefore if these conditions are not present, then the theory may not hold.

The traditional approach poses a challenge when it comes to less economically developed countries which rely mostly on imported capital goods and infrastructure. In as much as depreciation of the currency makes exports cheaper for external buyers, imports become expensive for local producers/manufacturers especially for those who rely on imported capital goods. Therefore, this rise in production costs is then passed on to consumers through an increase in prices thus leading to inflation, which in turn has a negative effect on savings. This argument became the basis for the structural approach which we will now consider.

The Structuralist Approach

The structuralist approach to exchange rates is a view that holds that exchange rate depreciation can have a contractionary effect on growth. The approach considered the structural problems of LDC's hence referred to as "structuralist". This approach explains that the contractionary effect is due mainly to an increase in price levels through two channels namely; the demand side and the supply side channels. This view argues that currency depreciation might have a contractionary effect on output and employment, especially for less economically developed countries. The argument is that depreciation increases the cost of imports in particular, and the cost of domestic production in general, through imported inputs (Acar 2000). If the costs of inputs rise, it is possible that they may be a rise in the cost of production and firms will pass this on to consumers through an increase in prices. This is because, firms can only get rid of an increase in the cost of production by increasing their prices which subsequently increases the general price level. Due to the lack of enough inputs and increasing costs, production will slow down, leading to a contraction in total supply. In this case, depreciation would be contractionary in that it causes a slowdown or decrease in the growth rate of output in the economy. This approach is also explained by the reduction in real wealth or real balances, in that a depreciation will cause the price of the traded goods to increase relative to non-traded goods and as prices rise, real money balances (M/P) decline (Acar, 2000). The larger the share of traded goods in the consumption chain, the more severe the increase in general price level and decrease in real money supply. As real money balances go down, expenditures also fall and in turn growth also declines.

In order for the Structuralist approach to hold true, there has to be a huge dependence on imported inputs in the production of domestic goods. Therefore this means that this view may not hold for

countries that are not import dependent, for example, developed economies. This is because countries that are not import dependent will not experience a huge increase in domestic prices hence the real money balances (M/P) remain unchanged. Developed economies on the contrary may stimulate domestic capital/industries if supported by right policies, hence depreciation may boost their local businesses and improve the domestic economy.

The Monetarist View

The monetarists argue that exchange rate changes have no effect on real variables in the long run. Their view is that exchange rate depreciation affects real magnitudes mainly through real balance effect in the short run but leaves all real variables unchanged in the long run (McPherson and Rakovski 2000). This approach is based on the assumption that the Purchasing Power Parity (PPP) holds. The PPP theory is simply an application of the law of one price to national price levels rather than to individual prices. This implies that under the PPP theory, exchange rates between any two countries are adjusted to reflect changes in the price levels of the two countries (Haidar 2011). It predicts that in the short run an increase in the exchange rate leads to increase in output and improves the balance of payments (BOP) but in the long run the monetary consequence of depreciation ensures that the increase in output and improvement in BOP is neutralized by the rise in prices. This is because as much as the exporting countries depreciate their currencies to make exports cheaper and reduce imports, this strategy invokes retaliation by other countries which may lead to exchange rate wars, were countries involved also depreciate/devalue their currencies. Furthermore they argue that any employment induced by depreciation is at worst temporary because monetary effects are neutral. Their standpoint is that money supply is neutral meaning it does not increase or decrease as a result of a devaluation or depreciation in the exchange rate, hence inflation caused by depreciation will not affect the real side of the economy or real variables (employment, economic growth and output).

Because the Monetarist approach is based on the assumption that the Purchasing Power Parity (PPP) holds, it therefore means that if the exporting countries cannot adjust (devalue) their currencies to reflect the change in price levels then this theory may not hold for an economy that has a flexible exchange rate system. In addition the economy has to be one that is a largely exporting country.

2.2 Empirical Studies

Acar (2000) studied the effects of depreciation on growth in less developed countries (LDCs). A simple macro model was used to analyze the effects of depreciation on real output. Economic growth (GDP) was used as a dependent variable explained by movements in the explanatory variables, namely; real exchange rate, terms of trade, government expenditure and money supply. The results indicated that depreciation created a contractionary effect on output in the first year, whereas it had an expansionary effect in the following year.

Rodrick (2008) provided evidence that depreciation (a high real exchange rate) stimulates economic growth. The study was done on seven countries (China, India, South Korea, Taiwan, Uganda, Tanzania, and Mexico) during 1950-2004. Two categories of explanations were presented focusing on; (a) institutional/contractual weaknesses, and (b) market failures using a formal model. The findings indicated that an increase in real exchange rate causes an increase in output of tradeables (relative to non tradeables) resulting in an increase in growth. His second explanation was that depreciation is a second-best mechanism for alleviating market failures in that, an increase in the real exchange rate causes an increase in output of tradables (relative to nontradables) which will cause an increase in growth because: information and coordination externalities are rampant in low-income economies and tradables are more subject to market imperfections.

The OECD Development Center (2011) employed Generalized Method of Moments as an econometric technique to model the effect of real exchange rate on economic growth in the coastal provinces and in land provinces of China. It was observed that real exchange rate deprecation led to higher economic growth. The model simply estimated the effect of capital intensity, share of employment, education level, export share, share of industrial production, and contribution of FDI to fixed capital and relative importance of state owned enterprises on the real exchange rate. The derived interaction term was then employed in the final model for determining economic growth together with the other explanatory variables as controls. It was found that, except for importance of state owned enterprises, all control variables positively influenced economic growth.

Nawaz (2012) studied the impact of the exchange rate on output level for Pakistan using the bounds testing or autoregressive distributed lag (ARDL) approach using time series data between 1972 and 2010. It was observed that there was a bi-directional granger causality between the real exchange rate and real GDP in Pakistan. Cointegration was present among the variables specified

in the ARDL model in the long-run. Furthermore, the nominal exchange rate was found to be inversely related to the output level in the long-run. The implication was that depreciation resulted in higher cost expenditures on the supply side in form of higher expenditure on capital imports. These results indicated that nominal depreciation is not the best way to increase the output level in the long-run.

Kogid et al (2012) studied the effect of nominal and real exchange rates on economic growth in Malaysia using time series data spanning from 1971 to 2009. The major objective was to show the effects of the nominal exchange rate versus those of the real exchange rate on economic growth using the ARDL method and an ECM based ARDL for short run adjustments. The results of ARDL bounds test suggested that long-run cointegration exists between both nominal and real exchange rates and economic growth with a significant positive coefficient recorded for real exchange rate. In addition, the results of ECM-based ARDL also revealed that both exchange rates have a similar causal effect towards economic growth. These findings eventually suggested that a systematic exchange rate policy should be properly developed to promote the stability and sustainability of economic growth in Malaysia.

Jayachndran (2013) investigated the impact of the exchange rate on trade and gross domestic product in India using annual time series data from 1970 to 2011. The Johansson cointegration technique was employed in the analysis and the results indicated that exchange rates positively and significantly impacted on the economic growth in the long run periods. But the variable did not significantly impact on economic growth in the short run periods.

Sibanda et al (2013) examined the impact of real exchange rates on economic growth in South Africa. The paper used quarterly time series data for the period of 1994 to 2010. The Johansen cointegration and vector error correction model were used to determine the impact of real exchange on economic growth in South Africa. The explanatory variables in the study were real exchange rates, real interest rates, money supply, trade openness and gross fixed capital formation. The results of the study revealed that real exchange rates had a dampening long run impact on economic growth in South Africa. From the results, it was noted that depreciation of the currency significantly hampers growth in the long run, whilst it significantly enhances economic growth in the short run. As such, the policy of depreciating exchange rates to achieve higher growth rates was only effective in the short run and was not sustainable in the long run. Based on the findings of this study, the authors recommended that in a fixed exchange rate system misalignment

(overvaluation and undervaluation) of the currency should be avoided at all costs. In addition, the results of the study showed that interest rates also had a significant impact on growth and since interest rates had a bearing on the exchange rate, it was recommended that the current monetary policy of inflation targeting be maintained in South Africa.

Obeng et al (2013) examined the relationship between GDP growth rate and exchange rate in Ghana for the period 1980 to 2012. They established the correlation between GDP growth rate and exchange rate using the Pearson's Product Moment Correlation Coefficient (PPMC) and estimated the simple linear regression using OLS. It was strongly concluded that there was a positive relationship between GDP growth rate and the rate of exchange in Ghana. This implies that as exchange rate increases, GDP growth rate also increases. These results confirm the theory that high exchange rate stimulates economic growth in the short run. Therefore, they recommended that policy makers should stabilise monetary and fiscal policies in the long run.

Uddin et al (2014) investigated causality between exchange rate and economic growth proxied by real gross domestic product (RGDP) in Bangladesh for a period of 41 years ranging from 1973 to 2013 by using time series econometric technique. They employed a bivariate granger causality test and augmented it with the error correction term. The results indicated that there was a significant positive correlation between exchange rate and economic growth. The results also indicated the presence of long-run equilibrium relationship between exchange rate and economic growth.

Draunivudi and Mocevinaka (2014) studied the relationship that depreciation has on economic growth in Fiji. The study focused on a simple econometric model with exchange rate being the independent variable. The regression analysis conducted showed that the relationship between exchange rate and GDP was such that a percentage increase in the value of Fijian dollar would significantly induce a positive increase in GDP per capita hence an expansionary effect. The paper concluded that the depreciation of the Fiji dollar had a positive effect on growth. It was recommended that Fiji needed to increase its level of investment and encourage the Fijian people to consume more local produce instead of relying on import items. Furthermore, the government should encourage policies apart from devaluation that would improve trade balances like import substitutions.

Aslam (2016) tested the impact of exchange rate on economic growth in Sri Lanka using annual time series data from 1970 to 2015. The variables used included gross domestic product, exchange

rate, inflation and interest rates. A multiple regression model using the ordinary least square method was employed and the results indicated that exchange rate positively impacted on economic growth in Sri lanka.

This study follows the bivariate analysis similar to Uddin et al (2014). The relationship between currency depreciation and economic growth in Zambia has not been addressed, therefore this study can be used for guidelines for the similar studies in years ahead.

CHAPTER 3: METHODOLOGY AND DESCRIPTION OF VARIABLES

3.1 Methodology

The aim of this paper is to investigate the effects of a depreciated real exchange rate on growth in Zambia over the period 1985 to 2016. A bivariate analysis using the co- integration method was used in order to determine the relationship between the two variables which are the real exchange rate and economic growth (GDP). The paper follows the cointegration and vector error correction modelling (VECM) by Johansen (1988) and Johansen (1991, 1995) and it applied the maximum likelihood estimation to a vector error correction (VEC) model to simultaneously determine the long run and short run determinants of the dependent variable in the model.

3.1.1 Vector Error Correction Model

The VECM was chosen because it is instrumental in analysing the short and long run effects of depreciation on economic growth. Vector error correction or equilibrium correction models (VECMs) offer a convenient framework for separating long-run and short-run components of the data generation process. The long-run or co-integration relations are often associated with specific economic relations which are of particular interest whereas the short-run dynamics describe the adjustment to the long-run relations when disturbances have occurred. The process of estimating the VECM begins by estimating a vector autoregressive (VAR) model. The VAR model is a general framework used to describe the dynamic interrelationship among stationary variables. So, the first step is to determine whether the levels of the data are stationary. It is important to note that over the period of study, Zambia has gone through different exchange rate regimes: fixed, managed flexibility and freely floating, these are bound to introduce structural breaks in the data. Hence the use of the Real Exchange Rate in the study and the period covered is 1985 to 2016 in order to reduce the effects/occurrence of structural breaks. The Vector Error Correction (VEC) was then used as it also takes into account any cointegrating relationships among the variables. After determining the number of cointegrations, the VECM was then estimated.

3.2 The Econometric Model

The basic model that tries to establishes the relationship between exchange rates and economic growth can be expressed as follows.

$$GDP_t = \alpha + \beta RER_t + \varepsilon \qquad \textbf{Equation 1}$$

Where GDP_t is the real GDP and RER_t is the real Kwacha / US$ exchange rate and ε is the error term.

Similar to the Sibanda et al. (2013), Equation (1) is modified and the estimated empirical model is specified in the following logarithm equation

$$LGDP_t = \alpha + \beta LRER_t + \varepsilon_t \qquad \textbf{Equation 2}$$

To determine both the short and long – run real exchange rate effects on growth, a bivariate vector equilibrium correction model (VECM) in $LGDP_t$ and $LRER_t$ is estimated over the period 1985 to 2016 using the Johansen cointegration method. This is preceded by the analysis of time series properties of the two data series using the augmented Dickey-Fuller (ADF) and Phillips Perron (PP) unit root tests. Where the structural breaks are known the ADF test can be adjusted by including dummy variables. However in this case no structural breaks were included in the data series. The determination of the lag length of the VAR in levels is carried out this ensures that residuals are free of serial correlation.

Thus, given Equation (2), the stochastic vector process is defined as Z_1= ($LGDP_{t,}$ $LRER_t$) and re-parameterised as a VECM

$$\Delta Z_t = \omega D_t + \pi_{Zt-1} + \sum T\Delta Z_{t-1} + \varepsilon_t \qquad \textbf{Equation 3}$$

Where Δ is the difference operator; Z_t is an (n x 1) vector of non-stationary variables in levels; D_t is an (nx1) vector of deterministic variables; intercept, time trend, seasonal or interventional dummies; ω is a matrix of coefficients on deterministic variables; $\pi = -(\pi_1 - \pi_2 - \ldots. \pi_p - 1)$ is an (n x n) impact matrix of unknown coefficients, a product of α and β' matrices, that contains information about the long-run relationships among z_t variables; $T_i = (I - T_1 - T_2 - \ldots. - T_p)$, the short run response matrix with i = 1,2,3, … p, is a matrix of parameter coefficient on lagged first difference of Z_t variables; εt is an (n x 1) vector Gaussian innovations; p is the lag length for the VAR ; and t = 1,2, …T, α is an (n x r) matrix of coefficients reflecting how quickly each variable

in Z_t adjusts toward the equilibrium once a disequilibrium occurs while β' is an (r x n) matrix representing cointegrating vector(s) with long- run coefficients among Z_t. The rows of β' also known as the cointegration rank (r) of π form r distinct cointegrating vectors such that the elements in $\beta' Z_t$ are stationary even though Z_t is itself non- stationary. The null hypothesis of r cointegrating vectors (Ho: $\pi = \alpha\beta'$) is tested using the trace (γ_{trace}) and maximal eigenvalue (γ_{max}) tests.

For simplicity let

LGDP = Y

LRER = X

Hence equation 2 can be re written as:-

$$Y_t = \alpha + \beta X_t + \varepsilon_t$$

With co-integration confirmed, causality must exist in at least one direction. This can be established using the VEC procedure suggested by Engle and Granger (1987) as follows:

$$\Delta Y_t = c_1 + \sum_{i=1}^{p-1} \delta_{1i} \Delta Y_{t-1} + \sum_{i-1}^{p-1} \omega_{1j} \Delta X_{t-i} + \rho_{11} ecm_{t-1} + \varepsilon_t \qquad \textbf{Equation 4}$$

$$\Delta X_t = c_2 + \sum_{i=1}^{p-1} \delta_{2i} \Delta Y_{t-1} + \sum_{j=1}^{p-1} \omega_{2i} \Delta X_{t-j} + \rho_{21} ecm_{t-1} + \mathcal{E}'_t \qquad \textbf{Equation 5}$$

where c_1 and c_2 are constant terms; ρ_{11} and ρ_{21} are error correction terms corresponding to the co-integrating Equation (3); and εt and ε′ t are serially uncorrelated disturbance terms.Y_t is Granger caused by X_t if all the ω_{1j} in Equation (4) are non-zero (Granger non-causality or short-run causality) or if ρ_{11} is non-zero (long-run causality/weak exogeneity test). Similarly, X_t is Granger caused by Y_t if all the δ_{21} in Equation (5) are non-zero (Granger non-causality or short-run causality) or if ρ_{21} is non-zero (long-run causality/weak exogeneity test). Bi-directional long-run causality exists when weak exogenity is rejected for two variables. Weak exogeneity implies that a weakly exogenous variable does not adjust to re-establish the long-run equilibrium following a shock.

3.3 Data Types and Sources

In order to avoid the seasonal biases, annual data is used in this study. The log level plot of the annual data of the real exchange rate and real GDP obtained from the data stream are displayed in figure 2 below.

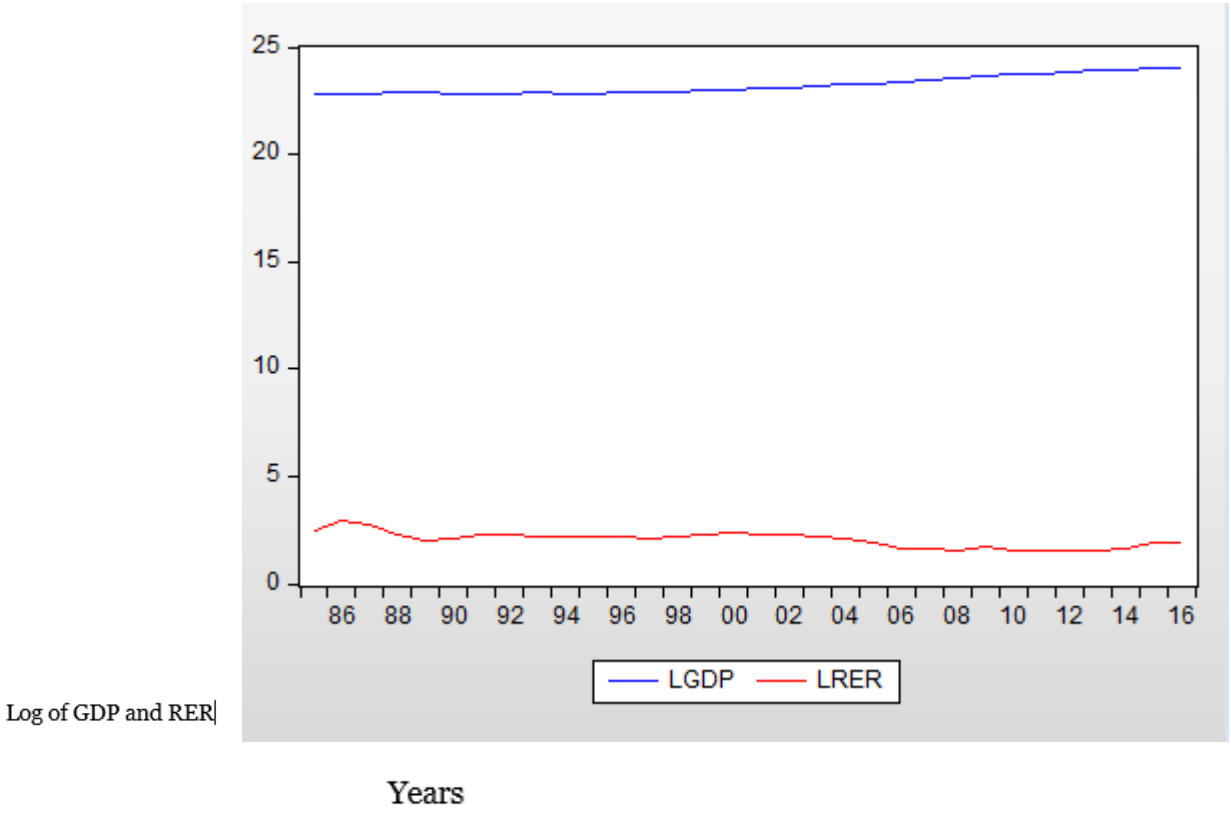


Figure 2: log level plot of RER and GDP (1985-2016)

The nominal GDP is a monetary measure of the value of all final goods and services produced in a period (Callen 2016). This paper uses GDP at constant prices hence this ensured that inflation is taken into consideration. The real exchange rate is defined as the nominal Kwacha/US$ exchange rate deflated by the price ratio of US CPI to Zambia's CPI such that an increase (decrease) represents depreciation (appreciation).

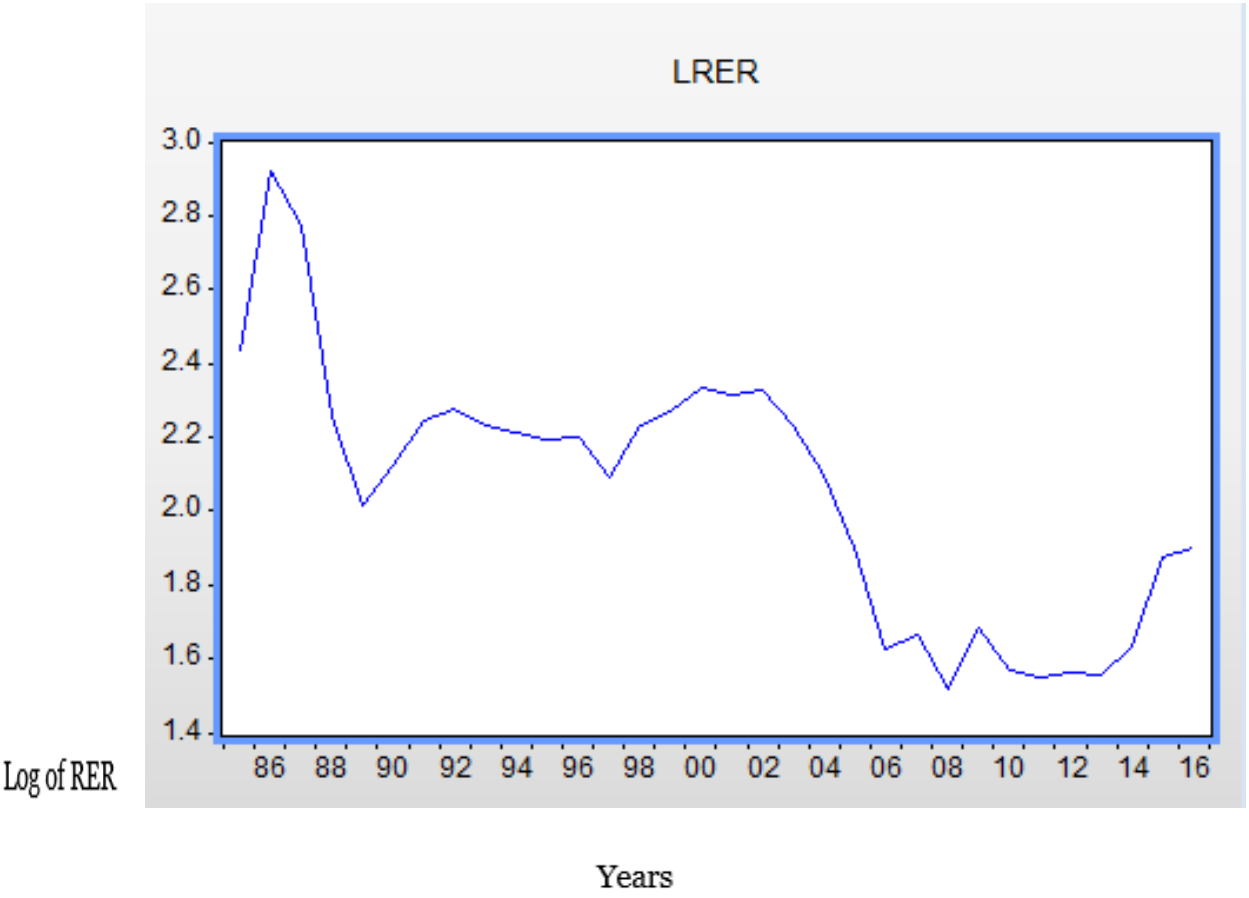


Figure 3: log level plot of RER from 1985 to 2016 (annual)

Figure 3 shows that the exchange rate can be generally observed to be volatile reaching its all-time highest in 1987 and lowest in 2008. After 1987, a downward trend can be seen. The exchange rate is seen to be stable between 1992 and 2002 before it begins a sudden drop after 2002 to 2006. It becomes steady but still remains low from 2010 to 2013. The exchange rate then begins to increase in 2014 to 2016. The general relationship that can be seen in periods that the exchange rate was high (depreciation) is that GDP continued to decrease. Where the exchange rate seems to be decreasing (an appreciation) high growth in GDP can be observed (after 1995).

A formal determination of the direction and strength of the relationship is explored in the empirical analysis. Table 1 below describes the variables used, how they were measured and the source of the data used in this study.

Table 1: Description of Variables

Variable	**Description**	**Unit of Measurement**	**Source**
RER	Real Exchange Rate	Kwacha/ US Dollar x (CPIus/CPIz)	World Bank
GDP	Gross Domestic Product at constant prices	Gross Domestic Product at constant prices	World Bank

CHAPTER 4: DATA ANALYSIS AND DISCUSSION OF THE RESULTS

The main aim of this chapter is to present the results and give an analysis of the impact that exchange rates have on economic growth in Zambia. The chapter is divided into two subsections. The unit root test is presented first before carrying out the cointegration tests which lead to the formulation of the vector error correction model (VECM).

4.1 Unit Root

The vector auto-regression (VAR) model rests on the establishment of the assumption of stationarity of the variables (Woodridge, 2006). If the time series are not stationary, then the VAR framework needs to be modified to allow consistent estimation of the relationships among the series. This test is done because estimating a regression with differently integrated series could result in false correlation in the estimated equation. This study used the Phillips Perron (PP) test and Augmented Dickey Fuller (ADF) to determine the order of integration of the variables. Our results in Table 2 indicate that both the real GDP and the real ZMW/US$ exchange rate are I(1) as they are level non-stationary but first difference stationary (see Table 2). A constant and linear trend was included as this was more applicable for the data set used in the analysis.

Table 2: Unit root tests

Variables	**ADF**			**PP**	
	Level	1st Difference	Lags	Level	1st Difference
LRGDP	0.5246	0.0022***	0	0.8467	0.0018***
LRER	0.4589	0.0069***	0	0.4696	0.0006 ***

Critical values are *MacKinnon (1996) one-sided p-values. ***, ** and * imply 1%, 5% and 10% levels of significance, respectively. Constant Linear trend are included in both ADF and PP unit root tests.

A VAR (1) was estimated to determine the existence of cointegration between the real exchange rate and the real GDP. The optimal lag length of two was chosen based on the Akaike and Schwarz information criteria. Deterministic terms were included in the cointegrating equation and VAR (see Table 2).

Cointegration Analysis

Co-integration is an overriding requirement for any economic model using non-stationary time series data. If the variables do not co-integrate (correlate), then there is the problem of spurious regression and economic work becomes almost meaningless. Thus, it is standard to check for the existence of co-integrating relationships among the variables. This study employed the Johansen co-integration test. In testing for co-integration, the model included a trend and an intercept. This means that there were linear trends in the levels of the data, and specifications were allowed to drift around the intercept (Asteriou and Hall, 2007).

Both the trace and maximum eigenvalue test statistics in Table 3 confirm the existence of one cointegrating relation between the real GDP and the real exchange rate at the 5 per cent significance level consistent with previous studies on the exchange rate – growth relationship (see Rodrick (2008), Kogid et al., (2012) and Jayachndran (2013).

Table 3: Test for number of cointegrating vectors

Sample (adjusted): 1987 2016
Included observations: 30 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: LGDP LRER
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.644436	36.26445	25.87211	0.0018
At most 1	0.160346	5.242967	12.51798	0.5619

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.644436	31.02148	19.38704	0.0007
At most 1	0.160346	5.242967	12.51798	0.5619

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LGDP	LRER	@TREND(86)
-3.405747	-2.963609	0.158948
0.855848	-4.886079	-0.268810

Unrestricted Adjustment Coefficients (alpha):

D(LGDP)	0.012366	-0.013165
D(LRER)	0.091575	0.034808

1 Cointegrating Equation(s): Log likelihood 88.79162

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LRER	@TREND(86)
1.000000	0.870179	-0.046670
	(0.23628)	(0.01064)

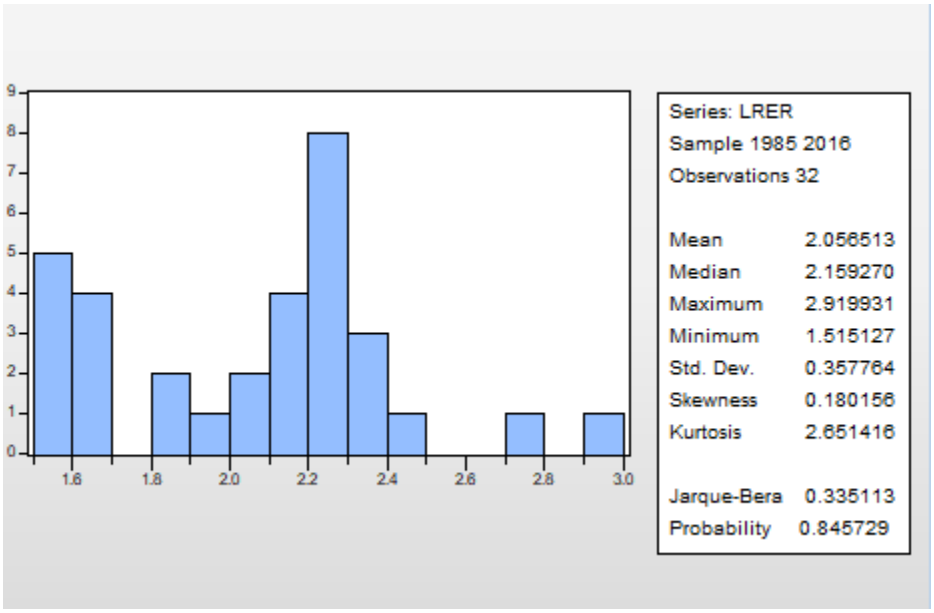
Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.042117
	(0.02280)
D(LRER)	-0.311881
	(0.07372)

The cointegration equation reported in Table 3 fits reasonably well and passes all the misspecification tests. Thus, the null hypothesis of no co-integrating equation was rejected. Therefore the vector error correction model (VECM) could now be applied.

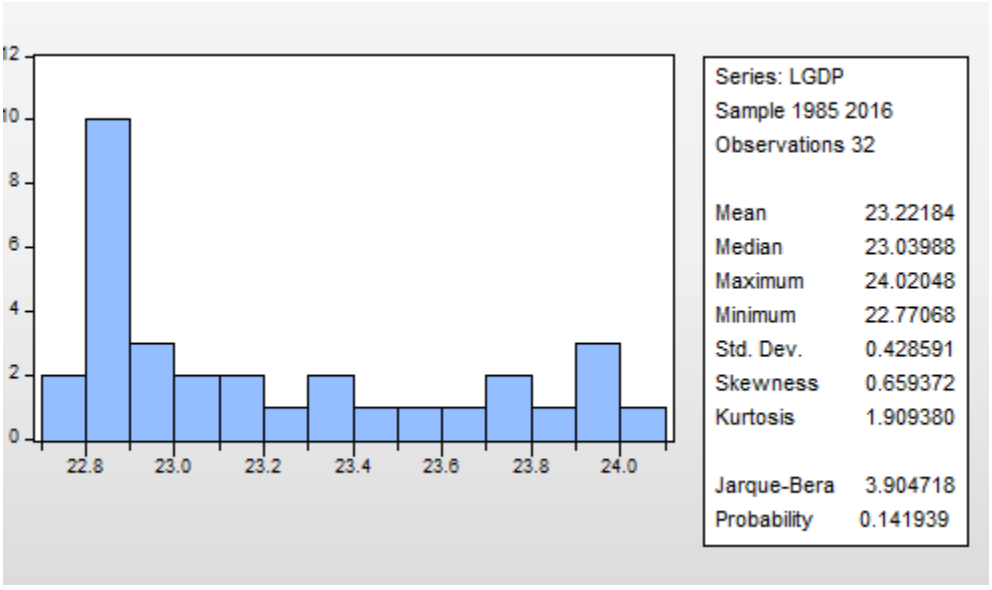
Checks were also done to ensure that the residuals corresponded to the model assumptions, to check for the absence of serial correlation and that the residuals were normally distributed. Table 4 and 5 present the findings and interpretation of the results from the two misspecification tests that were carried out.

Normality was verified by the chi-square probabilities for the Jarque-Bera (JB) statistics for LRGDP and LRER (See Table 4 (a) and 4(b).



Observed value (RER)

Table 4(a): Test for Normality for the Real Exchange rate



Observed value (LGDP)

Table 5(b): Test for Normality for Gross Domestic Product

The results of the normality test show that the variables are normally distributed as the probabilities of the Jarque- Bera are greater than 5% at second difference.

Table 6: Breusch-Godfrey Serial Correlation LM Test

VEC Residual Serial Correlation LM Tests

Null Hypothesis: no serial correlation

Lags	LM-Stat	Prob
1	2.414423	0.6600
2	1.005793	0.9089
3	3.984298	0.4081
4	1.377917	0.8480
5	4.000044	0.4060
6	7.590081	0.1078
7	3.359007	0.4996
8	5.172986	0.2700
9	1.792942	0.7738
10	1.666285	0.7968
11	0.846975	0.9320
12	1.205543	0.8772

H_o = no serial correlation in the residual

H_1 = there is serial correlation in the residual

The p value is greater than 5 % hence failure to reject the null hypothesis. There is no serial correlation in the residual as can be seen from table 5. Therefore this verifies that the assumptions are met in order for the Vector Error Correction Model test to be carried out.

4.2 Long Run Estimation using the Vector Error Correction Model (VECM)

The Vector Error Correction Model (VECM) measures the correction from disequilibrium of the previous period which has a very good economic implication. The disequilibrium error term is a stationary variable and because of this, the error correction model has important implications: the fact that variables are co-integrated implies that there is some adjustment process which prevents the errors in the long run relationship from becoming larger and larger (Asteriou and Hall, 2007).

Table 7: Vector Error Correction Estimates

Sample (adjusted): 1987 2016

Included observations: 30 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	
LGDP(-1)	1.000000	
LRER(-1)	0.870179	
	(0.23628)	
	[3.68286]	
@TREND(85)	-0.046670	
	(0.01064)	
	[-4.38693]	
C	-24.22323	
Error Correction:	**D(LGDP)**	**D(LRER)**
CointEq1	-0.042117	-0.311881
	(0.02280)	(0.07372)
	[-1.84721]	[-4.23040]
D(LGDP(-1))	0.167150	-1.591877
	(0.19928)	(0.64436)
	[0.83878]	[-2.47049]
D(LRER(-1))	0.032745	0.193891
	(0.04021)	(0.13002)
	[0.81430]	[1.49120]
C	0.035276	0.034021
	(0.01039)	(0.03359)
	[3.39622]	[1.01298]
R-squared	0.207401	0.436031
Adj. R-squared	0.115947	0.370957
Sum sq. resids	0.034958	0.365498
S.E. equation	0.036668	0.118565
F-statistic	2.267826	6.700602
Log likelihood	58.75376	23.54722
Akaike AIC	-3.650251	-1.303148
Schwarz SC	-3.463425	-1.116322
Mean dependent	0.041420	-0.033977
S.D. dependent	0.038999	0.149491
Determinant resid covariance (dof adj.)		1.23E-05
Determinant resid covariance		9.21E-06
Log likelihood		88.79162
Akaike information criterion		-5.186108
Schwarz criterion		-4.672336
Number of coefficients		11

Table 6 shows the existence of cointegration between the real GDP and the real exchange rate implies that deviations from the long-run relationship are self-correcting. In the long-run, a 1 per cent increase in the real exchange rate (depreciation) leads to about 0.9 per cent decrease in the real GDP. These results are similar to the results found by Nawaz (2012), whose study found that depreciation resulted in higher cost expenditures on developing countries and did not increase output. The statistical significance of the elasticity of the real exchange rate with respect to the real GDP renders support that the real exchange rate does affect the movements in real GDP over time.

Fluctuations in the real exchange rate typically entail an adjustment in the real GDP. The error correction term reflecting the disequilibrium GDP indicates a speed of adjustment whereby about 0.4 per cent of a disequilibrium value of the real GDP is removed every year. This means that the underlying variables have a long-run stochastic trend, also known as cointegration. This relates to the fact that in the last-period's deviation from a long-run equilibrium, the error, influences its short-run dynamics. Thus the error correction term directly estimates the speed at which GDP returns to equilibrium after a depreciation in the real exchange rate.

While the real exchange rate and real GDP move in opposite directions in the long-run, in the short-term, the exchange rate has a weak short-run influence on real GDP as reflected in the VECM results in Table 5 which indicates that the real GDP rate is driven by its own past values. The weak relationship is as a result of the price elasticity of demand for exports and price elasticity of demand for imports. The Marshal-Lerner condition states that; in order for a depreciation to improve the trade balance, the sum of price elasticity of demand for exports and price elasticity of demand for imports have to be greater than one. Acar (2000) explains that if domestic demand does not increase at the same time to offset this deterioration in trade balance, the overall effect on output will be negative. Given that imports exceed exports, price increases of traded goods reduce the home country's real income and raise the real income of the outside world, since foreign exchange payments (import costs) exceed foreign exchange receipts (export revenues). In other words depreciation increases the cost of imports in domestic currency terms. Authorities from least developed countries (LDCs) as well as some economists have long argued that these elasticities of LDCs are low such that it is not easy to increase exports and decrease imports in the short run. Acar's (2000) results indicate that depreciation creates a contractionary effect on output. Therefore

in the long run the Structuralist view tends to be true. Depreciation does have a contractionary effect on the economy due to the increase in costs of inputs.

Zambia has a history of consuming imported goods, therefore a change in tastes from non-traded to traded goods due to a depreciation in the exchange rate does not occur. Rhodd (1993) explains that this effect is partly due to a countries historical taste for imported goods, and partly to real wages which decline with real depreciation, expenditure switching does not take place in the short-run period, this causes aggregate demand and GDP to decline with real depreciation. These results therefore explain why the growth rate was constrained which agrees with Obstfeld and Rogoff's (1998) theoretical work that revealed that exchange rate are indeed costly to the domestic economy based on the premise that households remain unhappy about exchange rate movements because it leads to an increase in domestic prices hence the cost of living goes up.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

This study examined the effects of exchange rate depreciation on economic growth in Zambia over the period 1985 to 2016 against the background of mixed theories and mixed findings from empirical studies that have been conducted. The dominant theory is that exchange rate depreciation has an expansionary effect on output while other scholars argue that it has a contractionary effect on output and a few have argued that exchange rates have no effect on output.

A cointegration analysis using the Johansen cointegration test was employed, similar to Sibanda, et al (2013). The Johansen test was chosen because we were testing several time series and our variables were integrated of the same order.

The empirical results established the existence of a long-run equilibrium relationship between the real exchange rate and the real GDP and confirmed that the exchange rate depreciation does decrease the GDP of Zambia. This is mainly because Zambia's production relies greatly on imported inputs/products hence this increases the cost of production. An increase in the real exchange rate (depreciation), leads to a decrease in the real GDP in the long run pushing it to a new equilibrium level. However a weak short run relationship exists on the impact of exchange rates on growth. From the results obtained the Marshall-Lerner condition and total factor productivity growth channel can be assumed not to hold since depreciation leads to a reduction in output. The price elasticity of imports is greater than that of the exports.

Therefore the findings are in line with the structualist view in that depreciation of the exchange rate decreases output in the economy as a result of increased production costs from imports. This increase in production costs makes production off goods expensive which will lead to reduction in production of exports hence a decrease in the trade flow of goods. This does have a negative effect on the Balance of payment as Zambia is a large exporter of copper which plays a significant role in Zambia's economy as it contributes to over 70% of total export earnings in 2016 (IMF, 2012) IMF. 2012. IMF Country Report No.12/200, Zambia-2012 Article IV Consultation, July, International Monetary Fund, Washington, DC: USA,

The empirical results from this study signify the important role that exchange rate movements play in the growth of the Zambian economy. Since the exchange rate regime is a floating exchange rate

system the Central Bank needs to closely monitor exchange rate movements to ensure that the correct policies in place that cushion the negatives effect of depreciation in order to foster growth in the economy. The overall recommendation is that policy makers should incorporate a systematic exchange rate policy in the macroeconomic policy framework. This is because a depreciation in the exchange rate leads to a reduction in production because the cost of production becomes high as there is a large dependence on imported inputs used in production. Additionally, Zambia imports most finished goods and does not manufacture them domestically, hence when the exchange rate depreciates, the cost of goods becomes generally high which inadvertently reduces the purchasing power and savings rate. Thus, an increase in imports means that prices of goods too will increase as this is passed on directly to consumers. As mentioned earlier, the Bank of Zambia in 2015 attributed the growth constraint to high production costs associated with the increase in fuel prices and the sharp depreciation of the Zambian Kwacha. However, if there is a switch in demand from imported goods and services to locally produced outputs, then exchange rate depreciation will not have such a negative impact on the economy. The government should work on ways to stimulate growth in domestic industries/manufacturers as this will result in an improvement in trade balances as there will be an increase in exports compared to imports. Exports, among other products make up a component of the GDP of Zambia thus an increase in exports will increase the GDP of the country as long as the amount of imports is low. The overall results of this study agrees with the findings by Chipili (2013) which established that exchange rate depreciation in excess of 1% tends to generate negative effects on the economy.

It can be concluded that currency depreciation in the case of Zambia, increases the price of imports as Zambia is an import dependent country, therefore the ratio of traded goods to imports is highly unbalanced. In such a case the Marshall-Lerner condition does not hold as currency depreciation does not lead to expansion in output but a decrease in output. Which means that the sum of price elasticity of demand for exports and the price elasticity of demand for imports is not greater than a unit in the case of Zambia. In light of this, the Central Bank should closely monitor exchange rate movements in order to design appropriate policy responses for economic growth to improve. However this will only be effective if there is an increase in the level of local investments and production of domestic goods in the country and consumption of local produce should be encouraged instead of relying on imported items, as manufacturers in Zambia greatly rely on imported inputs. Other ventures that could improve Zambia's trade balance could be explored such as import substitutions. The Central Bank should also implement a systematic exchange rate policy

developed to promote stability and sustainability of economic growth in Zambia especially that Zambia is currently an import dependent country that has a floating exchange rate system.

5.1 Areas for Further Research

This study did not consider structural breaks in detail as it covered a shorter period of time. This limitation therefore creates a need for further research that gives a detailed inclusion of the structural breaks in the analysis. It also focused only on the bivariate relationship of the two variables GDP and RER, however there are other factors that impact on growth such as labour and capital that can be included by researchers who wish to study this topic further.

APPENDICES

VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LGDP LRER
Exogenous variables: C
Date: 11/14/18 Time: 21:00
Sample: 1985 2016
Included observations: 28

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4.845206	NA	0.005590	0.488943	0.584101	0.518034
1	76.47687	145.2180*	2.24e-05	-5.034062	-4.748590*	-4.946790
2	81.35713	8.017580	2.11e-05*	-5.096938*	-4.621151	-4.951485*
3	83.58138	3.336362	2.43e-05	-4.970098	-4.303996	-4.766464
4	86.74282	4.290527	2.65e-05	-4.910201	-4.053784	-4.648386

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Data Set

Years	gdp	s	cpiz	cpius	rer
1985	7,747,804,048.28	0.00	0.01	49.33	11.43
1986	7,803,889,933.50	0.01	0.02	50.27	18.54
1987	8,012,695,628.61	0.01	0.03	52.11	15.97
1988	8,515,952,929.90	0.01	0.05	54.23	9.56
1989	8,428,791,999.33	0.01	0.10	56.85	7.50
1990	8,388,243,438.74	0.03	0.22	59.92	8.37
1991	8,385,212,482.54	0.06	0.43	62.46	9.42
1992	8,240,070,980.38	0.17	1.14	64.35	9.73
1993	8,800,171,186.76	0.45	3.23	66.25	9.30
1994	8,041,117,529.34	0.67	4.99	67.98	9.12
1995	8,274,122,490.67	0.86	6.73	69.88	8.97
1996	8,788,652,644.31	1.21	9.63	71.93	9.02
1997	9,123,852,515.06	1.31	11.98	73.61	8.08
1998	9,088,657,605.64	1.86	14.91	74.76	9.33
1999	9,511,297,429.70	2.39	18.91	76.39	9.65
2000	9,881,983,406.64	3.11	23.83	78.97	10.31
2001	10,407,395,447.25	3.61	28.93	81.20	10.14
2002	10,876,354,172.31	4.40	35.36	82.49	10.26
2003	11,631,714,139.79	4.73	42.92	84.36	9.30
2004	12,449,702,236.77	4.78	50.64	86.62	8.17
2005	13,350,512,768.13	4.46	59.92	89.56	6.67
2006	14,405,696,504.14	3.60	65.32	92.45	5.10
2007	15,608,923,120.22	4.00	72.28	95.09	5.27
2008	16,822,344,541.49	3.75	81.28	98.74	4.55
2009	18,373,423,318.25	5.05	92.16	98.39	5.39
2010	20,265,556,273.58	4.80	100.00	100.00	4.80
2011	21,393,258,426.97	4.86	106.43	103.16	4.71
2012	23,018,636,259.41	5.15	113.43	105.29	4.78
2013	24,183,235,704.91	5.40	121.34	106.83	4.75
2014	25,318,838,464.91	6.15	130.82	108.57	5.11
2015	26,058,118,446.56	8.63	144.04	108.70	6.51
2016	27,037,168,289.17	10.31	169.78	110.07	6.69

REFERENCES

Acar, M. "Devaluation in Developing Countries: Expansionary or Contractionary?" *Journal of Economic and Social Research*, 2000: 59-83.

Alagidede, P, and M Ibrahim . "On the Causes and Effects of Exchange rate Volatility on Economic Growth Evidence from Ghana." *International Growth Centre*, 2016.

Arize, A C, O Thomas, and D J Slottje . "Exchange-Rate Volatility and Foreign Trade: Evidence from Thirteen LDC's." *Journal of Business & Economic Statistics, American Statistical Association* 18 (2000): 10-17.

Aslam , L M. "Impact of Exchange Rate on Economic Growth in Sri Lanka." *World Scientific news*, 2016.

Bai, Jushan, and Pierre Perron. "Computation and analysis of multiple structural change models." *Journal of Applied Econonometric*, 2003: Vol. 18: 1-22.

Bank of Zambia . *Annual Report.* Lusaka: Bank of Zambia, 2007.

Bank of Zambia . *Annual Report.* Lusaka: Bank of Zambia, 2013.

Bank of Zambia. *Annual Report.* Lusaka: Bank of Zambia, 2014, 2.

Bank of Zambia. *Annual Report.* Lusaka: Bank of Zambia, 2004.

Bank of Zambia. *Annual Report.* Lusaka: Bank of Zambia, 2005.

Bank of Zambia. *Annual Report.* Lusaka: Bank of Zambia, 2015.

Bernanke, B.S. "The Global Saving Glut and the US Current Account Deficit." *Remarks at the Sandridge Lecture, Richmond.* Virginia, 2005.

Callen, T. "Gross Domestic Product: An Economy's All." IMF, 2016.

Chipili , Jonathan M. "Macroeconomic EffMacroeconomic Effects of Exchange Rate Volatility in Zambia ." 2010.

Chipili, J M. "Exchange Rate Volatility and Its Effects on Macroeconomic Management in Zambia." *Comesa Monetary Institute*, 2013.

Clark , P, N Tamirisa, S Wei, A Sadikov, and L Zeng. "A new look at exchange rate volatility and trade flows." (International Monetary Fund) 2004.

Davidson, P. *The Keynes Solution: The Path to Global Economic Prosperity.* New York: Pagrave Macmillan, 2009.

Draunivudi, S, and M Mocevinaka. "The effect of Devaluation on Economic growth in Fiji." *Research gate publications*, 2014.

Eichengreen, B. "The Real Exchange Rate and Economic Growth." *University of California, Berkeley Revised*, 2008.

Haidar, J I. "Currency Valuation and Purchasing Power Parity." *World Economics* (v) 12, no. 3 (2011).

Jayachndran, G. "Impact of exchange rate on trade GDP for India: A study of last four decades." *International journal of marketing, financial & management research*, 2013: 154-170.

Johansen, S. "Statistical Analysis of Cointegration Vectors." *Journal of Economic* (Journal of Economic), 1988.

Kalyalya, D H. *Key Developemnts In The Financial Sector And Oulook For the Medium Term Launch Of The Culture Remodelling.* Economic information Exchange Forum, 2007.

Kogid, M, R Asid, J Lily, D Mulok, and N Loganathan. "The Effect of Exchange Rates on Economic Growth: Empirical Testing on Nominal Versus Real." *The IUP Journal 8 of Financial Economics*, 2012.

Koutmos, G, and P Theodossiou. *Time-Series Properties and Predictability of Greek Exchange Rates.* Vol. 15, in *Managerial and Decision Economics*, 159–167. 1994.

Krugman, P, and L Taylor. "Contractionary Effects of Devaluation." *Journal of International economics*, 1978: 445 - 456.

Mankiw, Gregory N. *Principles of Macroeconomics.* South Western Educational Publishing , 2008.

Mbaye, S. "Real Exchange Rate Undervaluation and Growth: Is there a Total FactorProductivity Growth Channel? ." *CERDI Clermont Ferrand*, 2012.

McPherson , M F, and T Rakovski. "Exchange Rates and Economic Growth in Kenya." 2000.

Ministry of Finance. *Zambia Vision 2030.* Lusaka: Republic of Zambia, 2006.

Montiel, P J, and L Serven. "Real Exchange Rates, Savings and Growth: Is there a link?" *The World Bank, Development Research Group, Macroeconomic and Growth Team*, 2008.

Munthali, T, K Simwaka, and M Mwale. "The Real Exchange Rate and Growth in Malawi: Exploring the Transmission Route." *Journal of Development and Agricultural*, 2010.

Nawaz, M. " Impact of Exchange Rate on Output Level: Bounds Testing Approach for Parkistan ." *Pakistan Institute of Development Economics*, 2012.

Obeng, P A, P Enu, F Gyimah, and C D K Opoku. "An Econometric Analysis of the Relationship between Gdp Growth Rate and Exchange Rate in Ghana." *Journal of Economics and Sustainable Development*, 2013.

Obstfeld, M, and K Rogoff . "Risk and Exchange Rates." *National Bureau of Economic Research*, no. 6694 (1998).

OECD Development Centre. "The economic and social effects of real exchange rate: Evidence from the Chinese provinces." *OECD Development Centre*, 2011.

Paul, S. "Devaluation, Innovation, and Prices." *The International Trade Journal*, no. 7583 (2006).

Pocklington, J. "Implications of the Dollar as the World Reserve Currency.' Global system science." 2010.

Rhodd, Rupert. "The Effect of Real Exchange Rate Changes on Output: Jamaica's Devaluation Experience." *Journal of International Development*, 1993.

Robinson , W, and J W Robinson . "The Transmission Mechanism of Monetary Policy in the Jamaican Economy." *Annual Conference of the Caribbean Centre for Monetary studies*, 1997.

Rodrik, Dan. "The real exchange rate and economic growth." *Brookings Papers on Economic Activity*, 2008: 365- 412.

Salvatore, D. "The Euro-dollar Rate Defies Prediction African." *Journal of Policy*, 2005.

Sibanda, K, R Ncwadi, and C Mlambo. "Investigating the Impacts of Real Exchange Rates on Economic Growth: A Case study of South Africa." *Mediterranean Journal of Social Sciences*, 2013.

Takaendesa, P. "The Behaviour and Fundamental Determinants of the Real Exchange Rate in South Africa." *Rhodes University*, 2006.

Uddin, K M, M M Rahman, and G M Quaosar . "Causality Between Exchange Rate And Economic Growth In Bangladesh." *European Scientific Journal*, 2014.

World Bank. *Trading Economics.* World Bank, 2017.