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Evaluation of effects of real exchange rate on economic growth of Malawi: Empirical analysis

McDonald Simtowe

Abstract
This study examined effects of real exchange rate on Economic growth of Malawi. Time series annual data for the period of 1980-2014 was used, whereby trends on Real exchange rate, Inflation, Real interest rate, and Real gross domestic product were obtained from Reserve Bank of Malawi, Terms of trade openness and Private investment from Malawi Ministry of Industry and Trade, finally Human capital trends from International monetary fund. Dickey–fuller unit root test and Johansen test for co-integration was conducted, whereby data was stationary after first differencing and co-integrated of order1.The VECM was employed and used OLS technique in analysis of regression models. Results showed that real exchange rate was significant and negatively correlated with Economic Growth. The study recommends among other things, the monetary authorities and Malawian Government to formulate sound macroeconomic policies that are capable of restoring the economy on track with stable rates that promote growth.

Keywords: economic growth, real exchange rate, malawi

1. Introduction
Economic growth and real exchange rate (RER) are two macroeconomic variables that cannot be separated from each other, thus from the dependency point of view the tow variables have a behind hand in each other, positively and negatively. Most of the literature presents that there is a correlation between economic growth and real exchange rate, and that all the variables are significant in each other's determination. Other economists on the same have termed the relationship between the two variables as a two way relationship. Economic growth is the increase in the final value of the total output in the country (RGDP), while real exchange rate (RER) also known as the foreign exchange rate (FER) is described as the price of one currency in relation to another in the foreign exchange market. The selection of the exchange rate regime remains a crucial point in crisis especially for developing and upcoming economies. There are several factors that influence, rather affect country's real gross domestic product (RRGDP), which have been tested and proven to be significant by many scholars. These factors include Human capita, Terms of Trade, Real Interest Rate, Inflation, Private Investment, Balance of Payment, Government Expenditure, and Taxation. But for the purpose of this sturdy not all the variables will be included, we are only going to select a few in additional to the real exchange rate (RER).
Foreign exchange (FER) represents the process of trading domestic currencies for foreign currency in a foreign exchange market (FEM) at different exchange rates (ER). Mostly foreign exchange (FER) is the component that is widely used on daily basis for settlement of international transactions and international bills. Exchange rate (ER) is also described as a price of one currency to another. Madura (2006) [29] defined real exchange rate as the actual exchange rate adjusted for inflation effects in two countries. The (RER) is determined in the foreign exchange market (FER), which is open to large number of buyers and sellers, where currency trading is continuously done. There are several types of exchange rate, which includes Spot exchange rate (SER), defined as the current exchange rate. Forward exchange rate which refers to an exchange rate that is quoted and traded today but for delivery and payment in the future time. The purpose of real exchange rates has traditionally found prominence in the literature on export-led growth. The orthodox view postulated that, a

temporary departures of the (RER) from its equilibrium level distorts growth by disturbing a key relative price in the economy.

According to theory exchange rate and economic growth, postulates that Real exchange rate is determined independently to the economic growth rate, and that there here is a negative correlation between RER and RGDP. Aizenman *et al*. (2010) [26], investigated the effects of exchange rate to the individual in the traded goods sector, and found that a weak real exchange rate is needed to support the production of tradable goods, they further argued that in those models used, an exchange rate ndervaluation acts like a subsidy to the tradable sector. Rodrik (2008) [14], found that a weak real exchange rate compensates for institutional weaknesses and market failures, for example knowledge spillovers, credit market imperfections, among others. Which lead to underinvestment in the traded goods sector in developing countries. According to Di Nino *et al*. (2011), mentioned that nominal depreciation has persistent real effects on output growth in a model with Bertrand competition and increasing returns to scale, and also conclude that there is a positive relationship between undervaluation and economic growth for a panel dataset covering the period 1861-2011. In addition, the authors showed that undervaluation supported growth by increasing exports, especially from high-productivity sectors, in Italy in 1861-2011. A study by Kappler *et al*. (2011), on the relationship between exchange rate and output, found that that the effect on output is limited. The negative effect on the level of output is only one percent after six years, and results are statistically insignificant at a business cycle Frequency. On the other hand, Nouira and Sekkat (2012) found no evidence that undervaluation promotes growth for developing countries, after excluding overvaluation episodes.

According to Chen (2012) on the role of the real exchange rate in economic growth and in the convergence of growth rates among provinces in China, found the positive effect of real exchange rate appreciation on economic growth in the provinces, the results also showed that the real exchange rate appreciation had a negative effect on economic growth, which was more marked in coastal provinces than in inland provinces. According to F. McPherson and Rakovskipaper. (2000), on the relationship between economic growth and exchange rate in Kenya. Based on data for the period of 1970 to 1996, they analyzed the possible direct and indirect relationship between the real and nominal exchange rates and GDP growth. They found that there is not a statistically significant direct relationship between economic growth and exchange rate.

Different exchange rate regimes characterized the Malawi economy from 1980 to 2014.The period before 1994 largely the Malawi economy had been under fixed exchange rate regime, under this period as figure 1 above presents, there was a huge acceleration in real economic growth which is measured by RGDP, from 1981 to85 before there was an adjustment in the fixed rate from that period to 1990 and there was slowed growth in the economy. A free float, though not strict, operated in the period 1997-2003 but was abandoned for a managed float due to economic instability arising from the low foreign exchange inflow resulting from drought and suspension of the IMF PRGF in 2000 and 2001 respectively.

From Figure 1 it can also be noted that over the period 1994-2010, economic growth trends were fairly stable as compared to real exchange rates. Between 1994 and 1995 the rand exchange was fairly stronger followed by a sharp depreciation notably in 1996 where the real exchange rate of the US dollar was at a low. During this period, economic growth was table but increasing in nature from 1994 to 1996. The economic performance of the post 1997 period has been quite week, with a drastic decline in the RGDP as illustrated in figure1. With an averaging growth in real gross domestic product (RGDP) of 1.1 in 1998 and 0.8 percent in 2000.

This growth trend after 2000 was an improvement, compared with the rates of the 1985 to 1994 period, where the respective average rates were too low. The recovery continued in the period between 2001 and 2008 although it was not stable where growth rates of 1.8 percent in 2002 and 7.6 percent in 2008 were recorded, respectively. Many researchers have worked on various aspects of foreign exchange rate in relation to Malawi's economy but not one the of the conducted studies has determined the relationship between Malawi Kwacha exchange rate and Economic growth and the impact of monetary policy instruments on price and exchange rate movement in Malawi. Thus in the view of the above this study is set out to examine the effects of the real exchange rate RER on the economic growth of Malawi. In this sturdy it was hypothesized that there is significant of the real exchange rate changes to the overall growth of Malawi's economy and that the two variables are negatively correlated with each other. Not only that but also that strong currency values are associated with economic strength and that real exchange rate (RER) has significant relationship with inflation rate in Malawi's economy.

The main objective of the study is to investigate the effects of Real exchange rate on economic growth in Malawi. The specific objectives are: (i) To address the issue of weak currency, and come up with masseurs that the governments and the monetary authorities put in place in managing and maintaining a strong currency power can use to promote economic growth and development. (iii) To find out the link between real exchange rate and real interest rate.

The following are the research questions in regards to this study: (1) how does the government of Malawi stimulate economic growth? (2) What is the impact of the real exchange rate on economic growth? (3) What are the other conditioning factors for the link between the real exchange rate and economic growth?

The study would be of great value to several entities, which includes the Government of Malawi and other monetary institutions and other policy makers, which would use the study findings in formulating sounder exchange rate policies that would stimulate economic growth. That is, it will provide a guiding tool in proper exchange rate policy formulation. Not only that but also the study will be of more benefit to students, academicians and researchers, in such a way that the findings of this research would provide material for their reference besides suggested areas for further research. Not leaving out the future scholars, they would find this research of great value to them in such a way that this study identifies areas for further research which future scholars can undertake

2. Methodology

2.1 Data type and source

This study has been done on the basis of time series annual

data from the year 1980 to 2014. The data was obtained from the Reserve Bank of Malawi, on real interest rate, real exchange rate, inflation and real GDP growth per capital, data on human capita was obtained from the, IMF and data on terms of trade and private investment was obtained from Malawi ministry of transport and trade

2.2 Theoretical Framework

Based on the theoretical and empirical literature reviewed, the methodology adopted by this study was anchored on the model of Acar, (2000) that found the significant relationship between Real exchange rate and economic growth. This model, which is different from the traditional sticky price monetary model (SPMM), is based on a specification pioneered by Frankel (1979).

2.3 Model Specification

In examining the effect of real exchange rates on economic growth in Malawi, the explanatory variables conceded in this study are, Human capital (*HC*), Private investment as the percentage of *RGDP (PVTI%RGDP),* Real interest rate (*RIR)* Terms of trade openness (*TO Top),* and real exchange rates (RER).This paper modifies the model of (Acar, 2000) in older to conduct the study. The reduced form equation for output in the Acar model was formally specified below as:

$$Log\,\Delta\,Y_t = \sum_{i=0}^{n}(\,\alpha\, +\, \gamma\, T +\, \beta_1 \Delta\, Gs_t +\, \beta_2\, \Delta Ms_t +\, \beta_3 \Delta ToT_t\, +\, \beta_4\, \Delta E_t +\, \varepsilon_t) \ldots\ldots\ldots (2.1)$$

Where:

Y_t : is Real output, α :is a Constant term; *Y:* Parameter that captures the trend rate of growth; *T*: Time period; ΔGs: is Relative size of government (the ratio of government expenditures to nominal output); ΔMS_t is Money supply term (the difference between actual and expected rate of growth of nominal money supply); ΔToT_t, Terms of trade ;ΔE_t is Real exchange rate and $\mathcal{E}_t$ is the Error term with mean zero and constant variance. For the purpose of the study, an output growth model is thus specified by adding the Human capita (*HC*), real interest rate (*RIR*), and Inflation rate, (*INF*), to the set of explanatory variables of Acar model and removing the , the government expenditure, and money supply from the original Acar 2000 model. In this study, the dependent variable is economic growth which is measured and represented by (*RGDP*), as a function of real exchange rate (*RER*) which is the main explanatory variable , Human capital (*HC),* real interest rate *(RIR*), Private investment (*PVTI % RGDP*), terms of Trade openness (*TOT op*) and Inflation rate (*INF*) are the controls in model.

The model is specified as follows:

$$RGPD = \int \begin{pmatrix} \sum_{i=1}^{i} RER, \sum_{i=1}^{i} RIR, \sum_{i=1}^{i} INF, \sum_{i=1}^{i} \\ PVTI\%RGDP, \sum_{i=1}^{i} HC, \sum_{i=1}^{i} ToT\,, \end{pmatrix} \ldots\ldots\ldots Eq\ (2.2)$$

$RER = \sum NER - \frac{P}{P*} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ Eq\ (4.3)$, where RER, is real exchange rate, NER is the nominal exchange rate, P , is the domestic price level, and P* is the foreign price level.

More explicitly the model is represented as:

$$\Delta RGPD_t = \beta_0 + \sum_{i=1}^{i} \beta_1\ \Delta RER_t\ + \sum_{i=1}^{i} \beta_2\, \Delta RIR_t + \sum_{i=1}^{i} \beta_3\, \Delta\, INF_t\ + \sum_{i=1}^{i} \beta_4\ \Delta PVTI\%RGDP_t + \sum_{i=1}^{i} \beta_5\, \Delta HC_t + \sum_{i=1}^{i} \beta_6\, \Delta ToT_t + \varepsilon t) \ldots Eq\ (2.4)$$

Where by:

β_0 *is* the intercept, β_1, to β_6 are Coefficients of the explanatory variables; $\mathcal{E}_t$: is the Error term with mean zero and constant variance, which represents all the variables that have not been included in the model but they affect the dependent variable. $\Delta RGDP_t$, is the differenced Parameter that captures growth rate trends, β_0 is Constant term, Δ RER_t is the differenced value of real exchange rate, ΔHC_t is differenced value of Human capita, ΔRIR_t is differenced value of real interest rate, $\Delta PVTI\ \%\ RGDP_t$ is differenced value of private investment, $\Delta TO\ Top_t$, is differenced value of Terms of trade openness. To obtain elasticity coefficients and remove the effect of outliers, the variables were transformed into natural logarithms. In log linear form the function was specified as:

$$\Delta InRGPD_{t-1} = \beta_0 + \sum_{i=1}^{f} \beta_1\, \Delta InRER_{t-1}\ + \sum_{i=1}^{g} \beta_2 \Delta In\ RIR_{t-1} + \sum_{i=1}^{h,} \beta_3 \Delta In\ INF_{t-1}\ + \sum_{i=1}^{k} \beta_4 \Delta InPVTI\%RGDP_{t-1} + \sum_{i=1}^{m} \beta_5 \Delta InHC_{t-1} + \sum_{i=1}^{n} \beta_6\, \Delta InToT_{t-1}\ +\ \varepsilon_1\, InRER_{t-1} + \varepsilon_2\, In\ RIR_{t-1} + \varepsilon_3\, In\ INF_{t-1} + \varepsilon_4\, InPVTI\%RGDP_{t-1} + \varepsilon_5\, InHC_{t-1} + \varepsilon_6\, InToT_{t-1} \ldots\ldots Eq\ (2.5)$$

Where:
F, g, h, k, m and *n*, indicate optimal lag length of Variables under investigation
$\Delta InRGDP_{t-1}$: is the differenced and lagged logarithmic value of real gross domestic product that is the measure of economic growth of Malawi.
β_0: the constant
$\Delta InRER_{t-1}$: differenced and lagged logarithmic value of Real exchange rate of Malawi.
$\Delta InRIR_{t-1}$: the differenced and lagged logarithmic value of real interest rate of Malawi.
$\Delta InINF_{t-1}$: differenced and lagged logarithmic value of inflation in Malawi.
$\Delta InPVTI\%RGDP_{t-1}$: differenced and lagged logarithmic value of private investment as % of RGDP.
$\Delta In\ HC_{t-1}$: differenced and lagged logarithmic value of human capital in Malawi.
$\Delta InTOTop_{t-1}$: differenced and lagged logarithmic value of terms of trade openness of Malawi.
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$, are short run coefficients to be estimated.
$\mathcal{E}_1, \mathcal{E}_2, \mathcal{E}_3, \mathcal{E}_4, \mathcal{E}_5\ \mathcal{E}_6$, are long run coefficients to be estimated.

3. Mpirical Findings and Discussions

3.1 Descriptive statistics

From table 3.1 below, the number of observation is 35 for each variable. The mean average for economic growth *(RGDP)* for the period was 3.643% with standard deviation of 4.933 ranging from -10.30 to 13.80. The average real exchange rate *(RER)* for the period under study was 74.60 percent which is so high, and not good for the promotion of private investment and economic growth in the country. The mean Inflation rate (*INF)* was at 19.85% with the standard error of 14.90 this average mean inflation rate is relatively higher than the recommended single digit number inflation for a stable economy, this is not good for the economic growth of Malawi. The average real interest rate *(RIR)* for the period was 8.621% with standard deviation of 9.905, this rate is only important when the economy is recovering from recession; Private investment had an average of 25.25% with the standard error of 89.19. human capital *(HC*) was averaged at 1.520% with the standard error of 0.149.The terms of trade openness had an average mean of 9.0.49%, this is not a bad rate for the developing countries in that there is a potation to grow more on exports than the imports

Table 3.1: Descriptive statistic

Variables	N	Sum	Mean	Sd	Min	Max	Skewness
RGDP	35	127.5	3.643	4.933	-10.30	13.80	-0.791
RER	35	2,611	74.60	102.9	0.800	424.9	1.882
RIR	35	301.7	8.621	9.905	-16.90	35.90	0.0545
INF	35	694.8	19.85	14.90	3.400	83.33	2.393
PVTI % GDP	35	883.8	25.25	89.19	1.300	536	5.596
HC	35	53.20	1.520	0.149	1.300	1.800	0.192
TOTop	35	316.6	9.047	5.895	2.590	34	2.175

***Source*:** By author, computed from the collected data using STATA

3.2 Stationarity Test

In order to justify the theories behind the models, it is important to test for the stationerity properties of the variables. Many time series analysts confirm that most time series variables are stationary after the first difference. This is what has happened in this study, as well. Table 3.2 below shows stationary data after First differencing. The results from the table implies that the data is stationary if integrated of order one. The first order integrated series according to (Gujarati and Porter, 2010) ensure that economic data is stationary for the purpose of avoiding spurious regressions after conducting the Augmented Dickey-Fuller test and prove that the variables were stationary We then conduct the Johansen test for co-integration.

Table 3.2: Augmented Dickey-Fuller Unit Root Test after first difference

Order of integration	Variables	Intercept	Trend and Intercept	NoTrend, No intercept
1st Difference	$D\Delta InRGDP_{t-i}$	-2.726**	-12.553 **	-12.890 **
1st Difference	$D\Delta InRER_{t-1}$	-11.828 **	-4.589 **	-7.085 **
1st Difference	$D\Delta InRIR_{t-1}$	-10.475 **	-10.306 **	-10.603 **
1st Difference	$D\Delta InINF_{t-1}$	-6.153 **	-6.055 **	-6.249 **
1st Difference	$D\Delta InPVTI\%RGDP_{t-1}$	-9.645 **	-9.494 **	-9.799 **
1st Difference	$D\Delta InHC_{t-1}$	-6.669 **	-6.605**	-5.657 **
2nd Difference	$D2\Delta InTOTop_{t-1}$	-8.211 **	-8.081 **	-8.341 **
Values marked with ** represent that the variable is stationary at 5% significance level				

Source: By author computed from the collected data, using STATA

3.3 Co-integration Test

Since all the variables are integrated of the same (order 1) order, it is very important to determine whether there exists a long-run equilibrium relationship amongst them. For the purposes of this study co-integration examines the long run relationship between the real gross domestic product (*RGDP)* and its determinants. Since all variables are stationary after first difference, the next procedure is to test for the existence of long run relationships among the variables in the model, by using Johansen test for co-integration, which requires the estimation of a VAR equation.

Under the Johansen test we use the two statistics, and that is the Trace statistic and the Max statistic, to find out whether or not the variables have long run relationships, the assumptions under the Johansen test are: When the trace statistic is greater than the critical value at 5% (t>5%) then it follows that the variables are not co-integrated, and when the Trace statistics is less than the critical value at 5% (t<5%) then it follows that the variables are co-integrated. 1

in the Johansen test means that the variables have one co-integration, and 2 also means two co-integration, the same applies to any number that follows. From the table 3.4 below, all the variables from Trace statistics and Max statistics proved that they are co-integrated and that all are of 1 co-integration, in other words they are co-integrated of older 1, and with this result we have the confidence to run the vector error correction model (VERCM) since the variables proved to be co-integrated. When the variables are not co-integrated you can only run the VAR model.

Table 3.4: Johansen Test for Co-integration

Maximum Rank	Parms	LL	eigen value	Trace Statistic	5%crit value
0	56	-58.223	.	211.721	124.24
1	69	-27.171	0.856	149.6161	94.15
2	80	-0.431	0.812	96.1367	68.52
3	89	17.144	0.667	60.985	47.21
4	96	30.605	0.569	34.0631	29.68
5	101	40.373	0.457	14.5278*	15.41
6	104	44.884	0.246	5.5047	3.76
7	105	47.636	0.158		
Maximum Rank	**Parms**	**LL**	**eigen value**	**Max Statistic**	**5%crit value**
0	56	-58.223	.	62.1047	45.28
1	69	-27.1713	0.856	53.4795	39.37
2	80	-.4315	0.812	35.1514	33.46
3	89	17.144	0.666	26.9222	27.07
4	96	30.605	0.569	19.5353	20.97
5	101	40.373	0.457	9.0232	14.07
6	104	44.884	0.246	5.5047	3.76
7	105	47.637	0.15804		

***Source*:** By author computed from the collected data, using STATA

3.4 Vector Error Correction Model (VECM)

After running the Johansen test of co-integration and prove that the variables are stationary and that are co-integrated, there after we run the vector error correlation model (VECM), to find out whether the long run and the short run relationships exist within the variable. That is the vector error correction model brings out the nature of relationship that exists between the dependent and the independent variables.

In contrast to the unrestricted vector auto regression model (VAR) The VECM is a restricted VAR where the restrictions imposed is the existence of long run relationship. the determination of the VECM is so much different , in that more attention is paid to Ce1 in the model, in other words it is the err correction term of the Ce1 that tells whether the long run relationship exits or not. When the error correction term is negative and the probability is less than 5% then we can say there is the long run relationship in the model running from the independent variable to the dependent variable, or to the variable being conceded. For the short run we want to know whether or not the independent variable can cause the dependent variable.

For our study the VECM is specified as:

$$\Delta In\ RDPG_{it} = \emptyset_1 \sum_{a-1}^{g} \emptyset\, \Delta(lnRDPG_{it})_{t-a} + \sum_{b-1}^{h} \emptyset_b \Delta\,(lnRER_{it})_{t-b} + \sum_{c-1}^{m} \emptyset_c \Delta\,(lnRIR_{it})_{t-c} + \sum_{d-1}^{m} \emptyset_d \Delta\,(lnINF_{it})_{t-d} + \sum_{e-1}^{q} \emptyset_e\, \Delta\,(lnHC_{it})_{t-e} + \sum_{f-1}^{k} \emptyset_f\, \Delta\ \ (lnPVTI\%RGD_{it})_{t-f} + \sum_{i-1}^{g} \emptyset_i \Delta\,(lnTOTop_{it})_{t-h} + (\gamma_1 ECT)_{t-1} + \mu it \quad (3.1)$$

$$\Delta(lnRER)_{it} = \omega_1 \sum_{a-1}^{r} \omega_a \Delta\,(lnRER_{it})_{t-a} + \sum_{b-1}^{d} \omega_b \Delta\,(lnRIR_{it})_{t-b} + \sum_{c-1}^{z} \omega_c \Delta\,(lnINF_{it})_{t-c} + \sum_{d-1}^{q} \omega_d\, \Delta\,(lnHC_{it})_{t-d} + \sum_{e-1}^{i} \omega_e\, \Delta\,(lnPVTI\%RGD_{it})_{t-e} + \sum_{f-1}^{g} \omega_f \Delta\,(lnTOTop_{it})_{t-f} + \sum_{i-1}^{g} \omega_i\, \Delta(lnRDPG_{it})_{t-i} + (\gamma_2 ECT)_{t-1} + \mu it \quad (3.2)$$

$$\Delta(lnRIR_{it})_{it} = \gamma_1 \sum_{a-1}^{j} \gamma_a \Delta\,(lnRIR_{it})_{t-a} + \sum_{b-1}^{o} \gamma_b \Delta\,(lnINF_{it})_{t-b} + \sum_{c-1}^{w} \gamma_c\, \Delta\,(lnHC_{it})_{t-c} + \sum_{d-1}^{l} \gamma_d\, \Delta\,(lnPVTI\%RGD_{it})_{t-d} + \sum_{e-1}^{n} \gamma_e \Delta\,(lnTOTop_{it})_{t-e} + \sum_{f-1}^{g} \gamma_f\, \Delta(lnRDPG_{it})_{t-f} + \sum_{g-1}^{r} \gamma_g\, \Delta(lnRER_{it})_{t-g} + (\gamma_3 ECT)_{t-1} + \mu it \quad (3.3)$$

$$\Delta(lnINF_{it})_{it} = \vartheta_1 \sum_{a-1}^{c} \vartheta_a \Delta\,(lnINF_{it})_{t-a} + \sum_{b-1}^{s} \vartheta_b \Delta\,(lnRIR_{it})_{t-b} + \sum_{c-1}^{t} \vartheta_c\, \Delta\ \ (lnHC_{it})_{t-c} \sum_{d-1}^{p} \vartheta_d\, \Delta\,(lnPVTI\%RGD_{it})_{t-d} + \sum_{e-1}^{u} \vartheta_e \Delta\,(lnTOTop_{it})_{t-e} + \sum_{f-1}^{e} \vartheta_f\, \Delta(lnRDPG_{it})_{t-f} + \sum_{g-1}^{\hat{Y}} \vartheta_g\, \Delta\,(lnRER_{it})_{t-g} + (\gamma_4 ECT)_{t-1} \mu it \quad (3.4)$$

$$\Delta(lnHC_{it}) = \zeta_1 \sum_{a-1}^{x} \zeta_a\ \ \Delta\,(lnPVTI\%RGD_{it})_{t-a} + \sum_{b-1}^{u} \zeta_b \Delta\,(lnTOTop_{it})_{t-b} + \sum_{c-1}^{d} \zeta_c\, \Delta(lnRDPG_{it})_{t-c} + \sum_{d-1}^{j} \zeta_d \Delta\,(lnRER_{it})_{t-d} + \sum_{e-1}^{a} \zeta_e \Delta\,(lnINF_{it})_{t-e} + \sum_{f-1}^{y} \zeta_f \Delta\,(lnRIR_{it})_{t-b} + \sum_{g-1}^{t} \zeta_g\, \Delta\,(lnHC_{it})_{t-c} + (\gamma_5 ECT)_{t-1} \mu it \quad (35)$$

$$\Delta(lnPVTI\%RGD_{it}) = \alpha_1 \sum_{a-1}^{\gamma} \alpha_a\ \ \Delta\,(lnPVTI\%RGD_{it})_{t-a} + \sum_{b-1}^{\pi} \alpha_b \Delta\,(lnTOTop_{it})_{t-b} + \sum_{c-1}^{\emptyset} \alpha_c\, \Delta(lnRDPG_{it})_{t-c} + \sum_{d-1}^{\mu} \alpha_d \Delta\,(lnRER_{it})_{t-d} + \sum_{e-1}^{\text{ш}} \alpha_e \Delta\,(lnINF_{it})_{t-e} + \sum_{f-1}^{\varepsilon} \alpha_f \Delta\,(lnRIR_{it})_{t-b} + \sum_{g-1}^{T} \alpha_g\, \Delta\,(lnHC_{it})_{t-c} + (\gamma_6 ECT)_{t-1}\, \mu it \quad (3.6)$$

3.5 Vector Error Correction Model (VECM) Results

Any Model that has the dependent variable with the ECT (the error correction term of negative sine and has the probability of less than 5% is said to be possessing the long run relationship running from the independent variable to the dependent variable0. The guideline for the short run is that if the probability is more than 5% when reject the null hypothesis that all the values are zero, and that means that there are no short run relationships in the model.

From table 3.5 below the long run indicated that from the first model, of the Vector error correction model, there is a causality relationship in the model , running from, Term of trade openness to human capital, to the private investment as the percentage of *RGDP* to Inflation , to real interest rate, to the real exchange rate and to real domestic product, this is so because the error correction term (ECT) which is also the speed of adjustment, value is negative with the coefficient of (-0.456) which gives the speed of adjustment.

In this case it reveals that any imbalance or shocks in economic growth (changes in GDP) for Malawi, 45 percent can be adjusted or resolved in the preceding year. The error correction coefficient enables the calculation of the long-term elasticities. And the value is significant at 5 % level, which is the precondition for the long run relationship situation to exist. From another result Inflation (ΔInINFt-1), private investment as percentage of *RGDP*, Terms of trade openness *(*$\Delta InTOTop_{t-1}$), Real interest rate *(*$\Delta InRIR_{t-1}$) and human capital *(*$\Delta InHC_{t-1}$), proved to be more significant at both 1 % and 5%, level and to be more influential to growth. These factors have shown that more manipulate each factor in a positive way, the more the growth for Malawi, this shall all be proven whether or not it holds, when running the OLS regression analysis in the next stage.

Results from table 3.5 below also show that the real exchange rate (ΔInRERt-1) is statistically significant both in the short run and the long run, and negatively correlated with economic growth with the coefficient value -1.67 in the long run, of which is significant at 5% level. Results also show that there is a negative correlation between real interest rate and economic growth in the long run. (The ΔIn PVTI % GDPt-1) is -0.184 and it is significant. Though this shows that the past levels of Private investment as the percentage of GDP, have a negative influence on current growth levels and is significant. This may have been due to worsen poverty levels of the people such that they do not save in older to make investment in the future instead they end up using all for daily consumption, and this can is well explained by the Relative income hypothesis theory which state that households with lower incomes the end up spending more than those with high incomes). The VECM model also reveals that level of human capital is statistically significant both in the short run and long run. The results show that a 5% increase in human capital causes a 2.06 percent increase in economic growth in the short run and 4.009 percent increase in growth in the long run.

This confirms the hypotheses that increase in human capital is positively related to increase in growth. Many studies have also found similar results. However caution has to be applied in the implication of these results because of the reality of most less developed countries like Malawi in which most of labor force is in agriculture and necessarily not skilled. The results also indicate that Inflation is also significant both in the short run and the long run and has a positive sign which is against our expectation of its influence on Economic growth in the short run a 5% percent increase in inflation increase growth by 0.834 percent in short run and a 1% increase in inflation in the long run will reduce Economic growth by -4.76 percent.

This is in contrast to the expectation that increases in prices has an adverse impact on the purchasing power and investment level of the economy. This may be because inflation levels are not that much high and this proves the hypothesis that investors and the business sector does not change investment decision in the short run. This result contradicts the Fischer results of (1993) who found a negative relationship between growth and inflation in African countries in which Malawi was one of the countries. The results shows that a 5% increase in real exchange rate will contribute to (-1.986) percent reduction in economic growth in the short run and -1.67 percent reduction in economic growth in long run.

In the post-independence era, there was an increase in private investment in Malawi mainly in infrastructure (industrial development) not only that but also the government made a lot of investment in the transport sector by building loads and reconverting ports in the country. This may have contributed to higher levels of growth. The results match with the results of Shushanta (2002), Barro (1991) [5] who found investment as one of the most influential factors to economic growth of the country. Our results show that terms of trade openness is positively influencing growth in the short run though it is not significant in the long run, this implies that when terms of trade openness are better say for example in the (Southern Africa Development Community) SADC, this may favor growth in Malawi in such a way that local industries will be able to export more in the SADC region and the after effect is the increased total revenue which when re invested in the economy there will be more growth.

Table 3.3: Vector error Correction Model

	Short run							**Long Run**
Dependent variables	**$\Delta InRGDP_{t-1}$**	**$\Delta InRER_{t-1}$**	**$\Delta InRIR_{t-1}$**	**$\Delta InINF_{t-1}$**	**$\Delta InPVTI\%GDP_{t-1}$**	**$\Delta InHC_{t-1}$**	**$\Delta InTOTop_{t-1}$**	**ECT_{t-1}**
$\Delta InRGDP_{t-1}$		-1.986** (0.010)	0.77 ** 0.050)	0.834** (0.020)	0.001 (0.27)	2.06*** (0.003)	2.31** (0.26)	-.456** (0.030)
$\Delta InRER_{t-1}$	-1.67** (0.002)		0.076** (0.210)	0.676** (0.030)	-0.199 (0.059)	-0.535 (0.75)	0.49** (0.41)	-.621** (0.338)
$\Delta InRIR_{t-1}$	5.802*** (0.006)	11.32*** (0.001)		1.43 (0.21)	7.81*** (0.002)	4.98*** 0.001	0.3621 (0.57)	-3.70* (0.009)
$\Delta InINF_{t-1}$	-4.76*** (0.013)	3.48** (0.035)	1.67** (0.04)		0.27 (0.76)	0.63* (0.021)	1.182* 0.011	-.97*** (0.001)
$\Delta InPVTI\%GDP_{t-1}$	-0.184 (0.0614)	-0.6943 (0.95)	0.441 (0.77)	1.583** (0.032)		9.71** (0.001)	1.053** (0.043)	0.084 (0.930)

$\Delta InHC_{t-1}$	4.009** (0.041)	0.1850** (0.042)	0.0049 (0.82)	0.024 (0.374)	0.010 (0.391)		0.083 (0.241)	.0675** (0.038)
$\Delta InTOTop_{t-1}$	-0.105** (0.012)	-3.305 (0.657)	-0.143 (0.081)	0.160*** (0.01)	1.0412 (0.260)	-1.004 (0.08)		0.0767 (0.677)

Note. *, **, *** represent statistical significance at 10%, 5% and 1% level
Source: By Author computed from the collected data, using STATA

3.6 Diagnostic Checks

Before we run the OLS estimation, we conducted autocorrelation and multicolinearity test whereby the model proved not to be having any problem.

3.7 OLS Estimation

Results from table 3.4 below, shows the R squared of 0. 2568 implies that 25.6 percent of the variation in the economic growth which is the dependent variable have been explained by the variations in the independent variable, this value to a large extent is a true reflection of the reality that economic growth (*RGDP*) has so many determinants, or in other words *RGDP* has so many influencing factors and out of the many, we just picked few that only explain 25.6% variations.

The R squared does not show whether we should add a variable or not in the model because as more and more of the variables are being added the R squared just keeps on increasing, but also this fails short in such a way that sometimes the variables might have very lower values that when calculated you may end up getting the lower R squared as it is given by the function as:

Table 4.9, also proves the already proposed relationship between economic growth and real exchange rate , and that is the two variables are negatively correlated to each other, from the regression result in the table 4.9, indicates that ΔInRERt-1 is statistically significant at 95 percent (%) because its t-stat is greater than the p-value, the result also indicates that a 1% increase in the real exchange rate (ΔInRERt-1) will lead to -0.833 decrease in the Economic growth (ΔInRGDPt-1), on the other hand human capital is statistical significant and is positively correlated with the economic growth, this is so because the more the human capital the more the production activities in the economy, since production mostly depends on human labor and skills, and from the table 9, a one percent increase in the human capital will cause the economic growth to increase by 12.95 which is a great value when it comes to economic growth.

The regression results also indicate that there is a negative correlation between inflation and economic growth, and that it is statistical insignificant because its t-stat (-0.18) is less than the P- value (0.859), a one percent unit change in inflation causes economic growth to reduce by 0.0366 percent this is so because when the inflation rate is high in the economy it implies that most of liquidity people have cannot be save anymore but rather spent because the prices for all goods do up, this in the long run slows down the production in the economy there by reducing the (RGDP), at the same time this indicates that with negative inflation in an economy there would be minimal or zero growth. Terms of trade openness ($\Delta InTOTop_{t-1}$) is statistical significance because its t- statistic (1.09) is greater than the p value (0.287) at 95 percent level of significance. A one percent change in the ($\Delta InTOTop_{t-1}$) will cause the ($\Delta InRGDP_{t-1}$) to increase by 0.446 percent; this implies that as more better the terms of trade are much more the growth of the economy can be stimulated. From the results we also found that the real interest rate (RIR) is positively correlated with economic growth with the t- stat of 0.69 and the p-value of 0.496 at 95% level of significance, a one percent change in *RIR* will cause the economic growth (RGDP) to increase by 0.0932 percent.

Table 3.4 Regression Results of Model (3.5)

	Dependent variable is $\Delta InRGDP_{t-1}$					
	$\Delta InRGDP_{t-1}$	**$\Delta InRGDP_{t-1}$**	**$\Delta InRGDP_{t-1}$**	**$\Delta InRGDP_{t-1}$**	**$\Delta InRGDP_{t-1}$**	**$\Delta InRGDP_{t-1}$**
$\Delta InRER_{t-1}$	-0.576	-0.591	-0.584	-0.590	-1.123	-0.833
	(-0.77)	(-0.78)	(-0.73)	(-0.73)	(-1.47)	(-1.03)
$\Delta InRIR_{t-1}$		0.0658 (0.46)	0.0656 (0.45)	0.0646 (0.44)	0.105 (0.77)	0.0932 (0.69)
$\Delta InINF_{t-1}$			-0.008** (-0.03)	-0.0155*(-0.07)	-0.0613 (-0.30)	-0.0366 (-0.18)
$\Delta InPVTI\%GDP_{t-1}$				-0.0201 (-0.21)	-0.003** (-0.04)	0.002** (0.02)
$\Delta InHC_{t-1}$					13.65* (2.67)	12.95* (2.52)
$\Delta In\ TOTop_{t-1}$						0.446 (1.09)
cons	0.124	0.120	0.119	0.121	0.0868	0.0301
	(0.69)	(0.65)	(0.63)	(0.63)	(0.50)	(0.17)
N	34	34	34	34	34	34

T statistics in parentheses* *p<0.05,* ** *p<0.01,* *** *p<0.001, R-squared=0.2568, Adj R-squared = 0.0916 (Note. *, **, *** represent statistical significance at 10%, 5% and 1% level)*
Source: By author computed from the collected data by STATA

4. Conclusion and Recommendations

This chapter comprises of three sections, whereby in the first section covers the discussion on summary and conclusion of the study, and the second section discuses the policy implication and recommendations, lastly the third section discusses the limitations of this study. The purpose of this study was to examine the effects of real exchange rate (*RER*) on economic growth which was measured by real gross domestic product growth rate *(RGDP*) of Malawi. The study used time series annual data corrected from the reserve bank of Malawi, Malawi ministry of industry and trade and International Monetary Fund (*IMF*) as illustrated in the data section earlier on, covering the period of 1980 to 12014. The variables were first staionalized before any estimation of their parameters was conducted, that is the VECM, and the OLS regression estimations and all the variables were taken into consideration inform of growth rate percentages.

4.1 Summary and Conclusion

Economic growth is one of the major macroeconomic variables that the Governments of the word pay much attention to, for the prosperous of their nations, there are so many variables that influence growth in a country which includes the ones considered by this study. In this dissertation the major focus was to examine the real exchange rate and growth relationship and effect in Malawi. A theoretical analysis was first undertaken to explain the relationship between real exchange rate and economic growth followed by an empirical analysis that discussed estimation results. The study revealed that real exchange rate (RER) played an important role in the determination of economic growth, whereby it was found to be significant and negatively correlated with the RGDP from the OLS regression model (3.5) and also in the VECM, with the coefficient value of -1.986in the short run and -1.67 in the long run and respectively from the VECM, which also satisfies what the economic theory postulates on the relationship between the two variables, and made us accept the null hypothesis (H1) that was setup in the study. The results from the OLS model regression results (3.5) also showed that as the real exchange rate increased by one percent the Economic growth (RGDP) reduced by -0.833 percent, this implies that as the currency of the country becomes weak in the foreign exchange market it becomes so crucial for the local producers to increase their export and also import more production materials that would increase their output, which in retune would have a positive impact on total growth. Thus results of the study reject the alternative hypothesis (H1) that was set up in the early stage of the study, that the Real exchange rate do not affect economic growth (RGDP) and therefore accepts the null hypothesis(H0) that real exchange rate (RER) has an effect on growth, it is statistical significant and that the tow variables are negatively correlated to each other, there by revealing the negative impact of real exchange rate on growth, by the negative sign in the regression model (3.5) and the vector error correction model.

The study was also able to find out that Economic growth (*RGDP*) has got other important variables that affect its variability in Malawi, Whereby the findings show that private investment (*PVTI % RGDP*) positively affects economic growth both in short run and long run, from our OLS regression model (3.5) results it showed that a one percent (1%) increase in the (*PVTI % RGDP*) leads to 0.00172 percent (%) increase in economic growth. This implies that more capital accumulation such as infrastructure enhances growth by accelerating the production of outputs. The results have also revealed that both in the short run and the long-run human capital (*HC*) is positively correlated with economic growth, in Malawi and statistical significant in influencing *RGDP*, thus an increase in human capital increase economic growth both in the short and long run.

The study also observed that terms of trade openness (*TO Top*) was positively correlated with economic growth both in the short run and long run and significant both from the OL Sand the VECM, this supports the arguments by Grossman and Helpman (1992), where they suggested that a country's openness to trade plays a pivotal role in technological change and hence growth, since opening of an economy tends to improve the standard of living and the quality of life for residents, further more it enables them to import more goods and services from abroad. On the other hand in order to increase economic growth there is need to increase the level of investment, and this can be achieved through creating a suitable, stable exchange rate that suits investment environment and promotes economic growth in additional to the development of good infrastructure, and stable macroeconomic environment such as low interest rates, low business taxes.

Results from model (3.5) also showed that the real interest was statistical significant and more influential in the exchange rate determination decisions in the Malawi's economy. We therefore postulate that real interest rate reforms should be a component of the broad package aimed at facilitating financial inter-mediation and monetary management as well as enhancing economic growth in developing countries. Inflation *(INF)* was found to be negatively correlated with the economic growth, and this also is a great verification as postulated by economic theory, that the always inflation has a negative impact in that higher price level makes people to have less purchasing power in the economy.

4.2 Policy Implication and Recommendations

From the results obtained in this study, it was observed that Real exchange rate have serious consequences on the levels of economic growth; therefore policies implemented should be aimed at stablelizing real exchange rate, so as to promote growth in the economy. There is need for the adoption of restrictive monetary policies by the central bank of Malawi, in which supply of money must be constrained. The other policy implication of the study is that the government of Malawi should come up and implement policies that are aimed at increasing GDP in the country, in older to fully support domestic based programs that transform a country in a an explicitly developed direction with no dependency on the donor funds.

Another policy suggestion is that neither institutional reforms nor macroeconomic transformations alone can effectively induce economic growth. The government of Malawi must pay more attention in developing more human capital mechanisms that will stimulate growth in the country. The government should find ways to promote local Production (local private investment sector) in older to increase country's gross domestic product GDP, that is the Malawian government has to set out policies that favor locally based industries. Many local companies are currently operating below capacity because of the dilapidated state of machines and equipment; the government can intervene to boost production of those companies.

The government can also help to promote local production through research and gathering of essential information that can affect the performance of industries. This can also help to reduce research and information cost to local companies. Observations from this study also indicate that a certain level of inflation, especially single digit inflation, is desirable to stimulate growth in the economy. Negative inflation rates discourages investment due to lower rate of return in profits, hence the government of Malawi should control and regulate inflation rate around levels that stimulate investment to induce more output. Efforts should be made to revitalize the growth of the economy and attain macroeconomic stability in older to increase the return on investment and reduce uncertainty. The Government of Malawi should improve on development expenditures, to

minimize the cost of production of private sectors which increase their profits and output. So development expenditures must be improved to support the private investment. Similarly government should make efforts to use aid for the development projects which helps to appreciate private investment.

4.3 Limitations of the study and direction for further Research

Accessibility to secondary data was very much difficult because you cannot access into the website of Reserve bank of Malawi and download data. Data for early years of 1960 and 70s were not available, for that reason we were forced to reduce the number of years under study, thus why the study used data from 1980. The study also used year data but economic theory suggests that to get more information from regression analysis we should use quarterly data. Like any analysis of research this study has relatively little to say on the transmission channels. Future research may want to focus on the transitional effects of the exchange rate on growth. Thus these limitation offers direction for further research.

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6. References

1. Ajab Amin Aloysius. Long term Growth in the CFA Franc Zone Countries Research in Progress no 25. UNU/WIDER Publication 6B. Helsinki, finland, 2000.
2. Arindam Bandopadhyaya. Managing Exchange Rates Journal of Internationa Busines, Volume 2 February, 2010.
3. Bahodirjon Boykorayev. Factors That Determine Nominal Exchange Rates and Empirical Evidence of Cross-Sectional Analysis Jornal of Economics and Zakaria Institute, 2008.
4. Baldwin RE. Empirical Relationship between Openness and Growth World Bank Research Observer. 2003; 15:99.
5. Barro RJ. Government Spending in a Simple Model of Endogenous Growth Journal of Political Economy. 1991; 98: 103-126.
6. Barro RJ. Determinants of economic growth a cross-country empirical study Lionel Robbins lectures. Cambridge, Mass: The MIT Press, 2001.
7. Barro RX. Sala-i-Martin Economic Growth, McGraw-Hill New York, 1995.
8. Becker GS, Murphy KM, Tamura R. Human capital, fertility and economic growth Journal of Political Economy. 1990; 98(2):S12.
9. Calamitsis DD, Ghura A, Basu Adjustment and Growth in Sub-Saharan Africa IMF Working Paper 99/ Washington: International Monetary Fund. 1999.
10. Chang R. Kalteni Linda. Loayza Norman Openness Can be good for Growth, The Role of Policy Complementarities NBER WP/11787, 2009.
11. Chi-Wei-Su, the Relationship between Exchange Rate and Macroeconomic Variables in Chaina Zb. rad. Ekon. fak. Rij. 2012; 30(1):33-56.
12. Chris Mulhearn. Economics for Business Palgrave Foundations Series published by Palgrave Macmilla, March, 2001.
13. Clark TE, Cross Country Evidence on Long Run Growth and Inflation Federal Bank of Kansa City. Research Working, 1993, 93-05.
14. Dani Rodrik. The Real Exchange Rate and Economic Growth Brookings Papers on Economic Activity, August, 2008.
15. Dornbusch R. Fisher The theory Of Flexible Exchange Rate Mass: MIT press, 1976.
16. Edwards S. Real Exchange Rate, Devaluation, and adjustment Cambridge, Fisher theory of exchange rate, 1986.
17. Edwards S. Real Exchange Rates, Devaluation and Adjustment: Exchange Rate Policy in Developing Countries Mit Press, Cambridge, Massachusetts, 1989.
18. Edwards, Sebastian. The Great Exchange Rate Debate after Argentina" Journal of Economics and Finance. 2001; (13):237-252.
19. Eduardo Yeyati L, Ederico Sturzenegger. Flexible Exchange Rates as Shock Absorbers: An Empirical Investigation jornal of European Economic, 2002, 2079-2105.
20. EL Mustapha Kchirid. Is there a dynamic relationship between the real exchange rate and the fundamental variables on the Case of the Algerian economy Journal of Index Net, 2013.
21. Fleming JM. Domestic Financial policies under fixed and floating exchange rate IMF staff paper. 1962; 9:369-77.
22. Gianluca Benigno. Risk Monetary Policy and the Exchange Rate University of Chicago. 2015, 978-0-226-00214-9.
23. Haberger A. Economic Adjustment And The real Exchange, In in Developing Countries journal of applied research. 1986; 48:12.
24. Jacob Frenkel, Morris Goldstein1 Exchange Rate Volatility and Misalignment: Evaluating Some Proposals for Reform National Bureau of Economic Research, Inc, NBER Working, 1989, 2894.

25. Jeffrey frankel. Determinants of the South African exchange Rate South African Journal of Economics. 2007; 75:3.
26. Joshua Aizenman, Jaewoo Lee. Real Exchange Rate, Mercantilism and the Learning by Doing Externality Journal of Pacific Economic Review, 2010, 15.
27. Kevin B, G Rier. Faustohernández-Trillo the Real Exchange Rate Process and Its Realeffects: The Cases of Mexico and the USA Journal of Applied Economics, 2003, Vii (I).
28. Krugman, Maurice Obstfeld. Analyzing *exchange rate* dynamics, an Published Journal of Political Economy. 1995; 102:624-660.
29. Madura. Exchange Rate Determination International Financial Management South-Western/Thomson Learning. 2006, 4.
30. Michael B. Devereux, Charles Engel Fixed vs. Floating Exchange Rates: How Price Setting Affects the Optimal Choice of Exchange-Rate Regime NBER Working, 1998, 6867.
31. Michael Mussa. Nominal exchange rate regimes and the behavior of real exchange rates: Evidence and implication Carnegie-Rochester Conference Series on Public policy, 1986, 25.
32. Michael Adler, Bruce Lehmann. Deviations from Purchasing Power Parity in the Long Run Journal of Finance, 1983, 38.
33. Michael Devereux B. Giovanni Lombardo the Optimal Choice of Exchange-Rate Regime: Price-Setting Rules and Internationalized Production Working, 1998, 6992.
34. Michael Papaioannou. Exchange Rate Risk Measurement and Management: Issues and Approaches for Firm Journal of South Eastern Europe Journal of Economics November, 2006.
35. Muhammad Arshad Khan, Abdul Qayyum. Exchange Rate Determination in Pakistan: Evidence Based On Purchasing Power Parity Theory Journal of Economic Cooperation and Development. 2011; 32:67-96.
36. Peleg Litali Ambunya. The Relationship between Exchange Rate Movement and Stock Market Returns Volatility at the Nairobi Securities Exchange Journal of international economics. 2012, 360(345).
37. Philippe Aghion. Exchange rate volatility and productivity growth: The role of financial development Journal of Monetary Economics. 2009, 56.
38. Razzaque Bhatti H. A Correct Test of Purchasing Power Parity: The Case of Pak-Rupee Exchange Rates The Pakistan Development Review 35. 1996; 4(II):671-682.
39. Rodrick D. The Real Exchange rate and economic growth: Theory and Evidence Harvard University, 2007.
40. Simwaka K. The Effectiveness of Official Intervention in foreign exchange market in Malaw MPRA, 2007, 1123.
41. Thomas M. The real exchange rate and growth in Malawi: Exploring the transmission route Journal of Development and Agricultural Economics. 2010; 2(9):303-315.
42. Williamson John. The Exchange Rate System Cambridge, Mass: MIT Press, 1983.
43. Yeyati L, Sturzenegger F. Exchange Rate Regimes and Economic Performance Paper presented at the first IMF Research Conference (Washington, DC. 2000, 9-10, 62-95.