Human Capital Investment's Contribution Towards Economic Growth in Malawi

SA Milanzi and IP Mongale
University of Limpopo, South Africa

OD Daw
North West University, South Africa

Abstract: Human capital investment is viewed as one of the drivers of social development and industrial growth in every country. It enriches the poor and the inferior groups in the economy as it equips them with equal opportunities to take part in local and national development. The purpose of this study was to investigate the effects of Human capital investment on economic growth in Malawi by means of the annual time series data covering the period 1995 to 2017 obtained from the World Bank website. The study employs the Autoregressive Distributed Lag (ARDL) to estimate the link between the variables. This approach was found to be relevant because of its ability to generate robust and reliable results even if the sample size is small or finite like in the case of this study. Literature review evidence has revealed that there are limited studies done in this area in the context of Malawi. Therefore, this paper aims to contribute to this research gap and also to contribute to the policy formulation in the relationship between human capital investment proxied by government expenditures on education and health sectors and economic growth. The empirical results showed that total government expenditure on public and private education has a negative relationship with growth whilst total government expenditure on health sector is positive. Based on this, the study recommends that the government has to balance between education and health expenditures as the main route towards growth. The study supports the projection of budget structure in the year 2016-2017 towards education and health sectors.

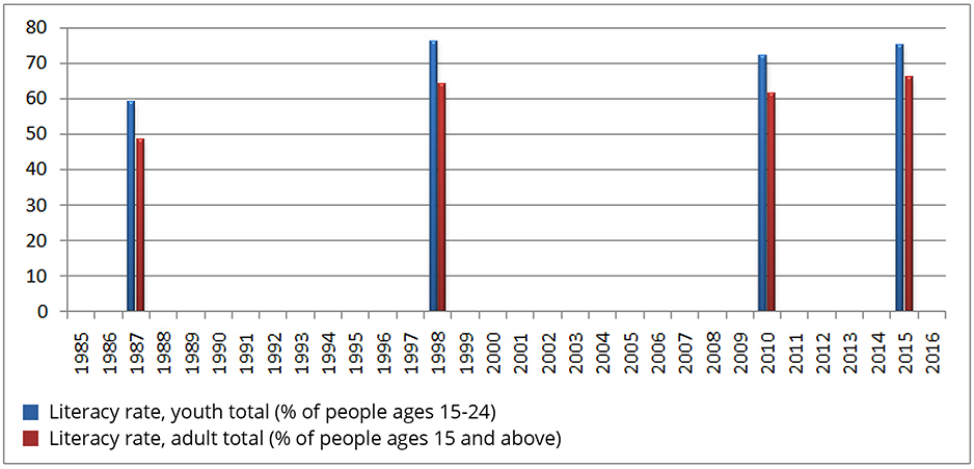
Keywords: ARDL, Education, Government Expenditure, Health, Human Capital Investment, Labour

1. Introduction

The experience of the newly industrialised economies suggests that human capital investments will be a vital ingredient of the transition from middle income to high income. Those investments can also affect equity and public finances. Estimates indicate that a 20% increase in human capital spending per capita can raise labour productivity by up to 3.1% and narrow labour income inequality by up to 4.5% (Park *et al*., 2017) and (Abrigo *et al*., 2018). Likewise, human capital development is viewed as one of the fundamental factors in determining the wealth and the quality of life the citizens of any country. Development Economists indicate that human capital consists of education, health, and other human abilities that can enhance productivity (Ehimare *et al*., 2014). In 2015, the Economic Co-operation and Development (OECD) saw a slow but rising health spending growth, albeit still below the growth rates seen in the years before the economic crisis. While generally health spending growth remains below the pre-crisis rates, it has nevertheless tended to follow economic growth more closely since 2013. This was in contrast to the years leading up to the economic crisis, that is, the period between 2001 and 2005 where growth in health spending strongly outpaced the rest of the economy (OECD, 2017).

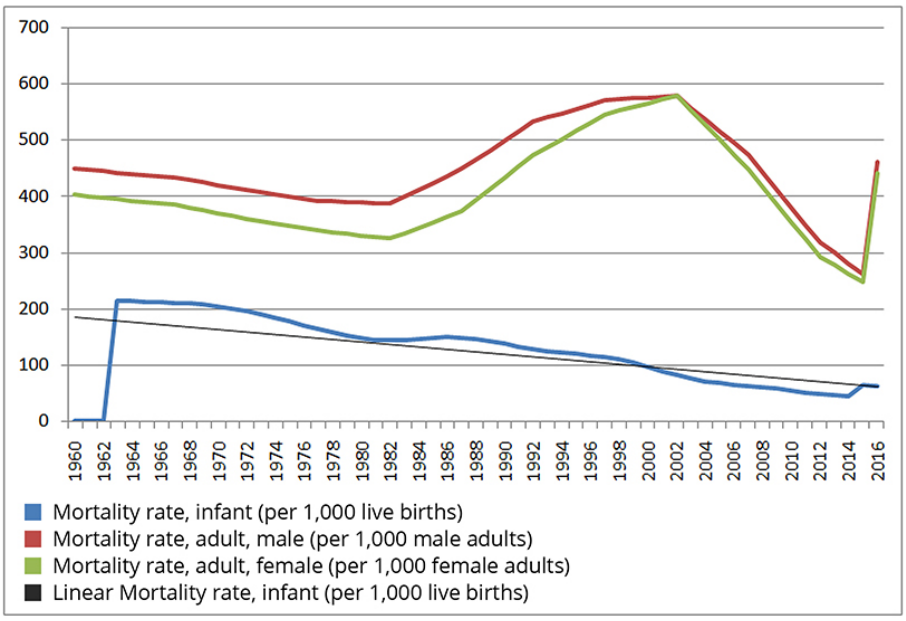
As out lined by Diop *et al.* (2012) in the Second Malawi Growth and Development Strategy (MGDS II) 2011-2016 report, education is valued for social development and industrial growth in every country in the world. It enriches the poor and inferior groups in the economy as it equips them with equal opportunity to take part in local and national development. In addition to that rapid development in all sectors, in line with Becker (1962) every economy requires highly skilled labourers, healthy and educated work force. MGDS II indicates that in order to show keenness in the education side, the Malawian government implemented universal primary education which resulted into high enrolment into public primary schools from 73% in 2006 to 83% in 2009 only. This resulted in improved literacy rate from 74.9% in 2005 and 84% in 2009 respectively. Such an achievement was attained by constructing additional school infrastructure, recruiting of addition

Figure 1: Literacy Rate From the Year 1987-2016



Source: Computed by data from The World Bank website

Figure 2: Adults and Infants Mortality Rate from 1964-2014



Source: Computed by using Quantec data

well trained teachers and improving technological infrastructure for research and development and other appropriate technologies in the country. The improvement is illustrated in Figure 1, constructed by using data from the World Bank website.

Even though Figure 1 shows that education standard improved by 59% in 1987 for youth aged 15-24, 76% in 1998 and 87% in 2010 and the adult literacy rate rose by 64% in 1998 and 75% in 2010, the MGDS II points out that primarily the country has not yet achieved universal access to primary education due to social problems.

In considering the livelihood of the citizens in Malawi, the strategy focused as well on taking part in improving the health sector. The economy will never improve if the citizens are not healthy enough. Thus a healthy population is regarded to be necessary for sustainable economic growth and development. It is therefore imperative for the government to implement strategies to ensure that the economic participants are healthier. This can be achieved by strengthening the initiatives for preventions and availability of health equipment as well as proper training staff and good service delivery. Diop *et al.* (2012) recorded that a high child mortality rate in Malawi was due to lack of enough facilities and enough training among the nurse. With this regard the MGDS II covered the strategies on maternal health which improved the sector by declining the infant mortality rate from

76 deaths per 1000 live births in 2004 to 66 per 1000 live births in 2010. Furthermore, the under-five mortality rate got declined from 133 deaths per 1000 live births in 2004 to 112 live birth per 1000 live births in 2010 respectively. This helped to improve the HIV prevalence and Tuberculosis cases from 2005 to 2009.

As illustrated in Figure 2 on the previous page, female and male adult mortality rate has a decreasing trend from 1964 to 1986. The situation changed in the mid 1988 where adult mortality rate rose up to 520,000 adults per 1000 adults. This was probably due to HIV/AIDS pandemic and lack of awareness of the disease among the citizens. Due to improved sanitations in the country, the rate got reduced to 390,000 adults per 1000 adults in 2012. Youth mortality has been on a decreasing rate from 1964 to 2014. This was a result of availability of enough health centres and well trained nurses.

In considering the budget structure outlook, the country has put much effort in integrating the education sector rather than agriculture and health sector. The government allocated Malawian Kwacha (MK) 127.9 billion towards education in the fiscal year 2014-2015. This shows that the department received 18% of overall budget making it the highest sector to receive such an amount. Meanwhile the health department received MK65.2 billion making it to be on third position after education and agriculture respectively. In considering the projection done by the government in the year 2016 and 2017 respectively, it shows that the plan was to reduce the expenditure on agriculture and food security by 1% every year from 2016 to 2017 in order to initiate the increase in the department of education, science and technology by 2% increment in 2017. The department of public health, sanitations, Malaria and HIV/AIDS is expected to have been allocated an addition of 3% of the total budget in the year 2016 and 1% increase in the year 2017.

According to Abrigo *et al*. (2018), the positive effect between human capital investments and growth is stronger for poorer households and, hence, beneficial for equity. They suggest that human capital investments have a positive effect on labour productivity and, hence, output. The literature review section showed some contradictions about the relationship between human capital investment and economic growth. While other studies such as Duraisamy (2002), Haizheng (2003) and Li and Huang (2009) indicate positive results, others such as Weil (2014) and Granados (2012) revealed negative association between growth and some of the proxies of human capital. Despite the importance of this relationship, there is a limited number studies done in developing countries, therefore, this paper aims to contribute to this research gap by focusing in Malawi. In addition, the paper is envisaged to contribute to the policy formulation in the relationship between human capital investments and economic growth.

The central objective of this paper was to examine the effect of human capital investment and economic growth in Malawi and the rest of the paper is organised as follows: Section 2 focuses on the literature review which covers both the theoretical and perspective of human capital investment and growth. Section 3 the presents the empirical framework, that is, data and the model used for analysis, section 4 reports and discusses the empirical results obtained from section 3 and section 5 is the conclusion.

2. Literature Review

Human capital is viewed as a set of skills that increase a worker's productivity. In that sense the human capital theory stipulates that formal education is highly instrumental and necessary to improve the productive capacity of a population. Based on Becker (1962) human capital is directly useful in the production process and it increases a worker's productivity in all tasks, though possibly differentially in different tasks, organisations and situations. The implication is that an educated population is a productive population because education increases the productivity and efficiency of workers. On the other hand, the Schultz/Nelson-Phelps view is that human capital is viewed mostly as the capacity to adapt. It postulates that human capital is especially useful in dealing with "disequilibrium" situations, or with situations in which there is a changing environment, and workers have to adapt to this (Saito, 2007). Hence most of the human capital theorists, including Becker and Schultz maintain that human capital will be valued in the market because it increases firms' profits.

Finally, this study aligns itself with Becker's (1962) notion that broadly speaking human capital can be construed as a set of knowledge, skills, health,

and values that contribute to making people productive. As far as empirical literature is concerned Duraisamy (2002) pointed out that education provides monetary returns to labours in the form of wages and salaries. The study was done in India using national household survey data from the year 1983-1994. The elaborate method and the extended earnings function methods were used in order to assess the rate of returns to education during that period. The results showed that there is hardly any estimate of the monetary returns to schooling in the labour market in India based on national level representative data for the recent period. Hence the returns to education increase up to the secondary level and decline thereafter. In a similar study with a household survey data from 1995, Haizheng (2003) discovered that returns in education in China are low thus by looking at annual earnings. Furthermore, Li and Huang (2009) conducted a study on the impact of health and education on economic growth. The panel data models were used in the estimation based on the provincial data from 1978-2005. The results postulate that both health and education have positive significant effects on economic growth. This seems to be in tandem with Rengin (2012) who argued that education and health complement each other and that it is compulsory to make similar investments in health as those made in physical capital and education regarding the development of the country.

Fersterer and Winter-Ebmer (2003) added that returns on education are sometimes difficult to notice as some residents conceal personal income during survey and declining quality of education. The study employed cross-section data from the year 1981-1997 collected from Mikrozensus in Australia. Estimating quantile regressions provide further interesting insights in the study. In addition, Dee (2004) suggests that educational attainment has large and statistically significant effects on subsequent voter participation and support for free speech. The study also showed that additional schooling appears to increase the quality of civic knowledge as measured by the frequency of newspaper readership and participation in research and development. The findings were based on the study done by using data from the 1972-2000 and General Social Surveys estimate were used.

Furthermore, Weil (2014) emphasised that there exists great relationship between health and economic growth. The finding has shown that income per capita is highly correlated with health as measured by life expectancy or a number of other indicators and this was found to be the case in both across and within countries. Another relationship between health and growth was established by Mehrara and Musai (2011) who discovered the existence of a long run relationship between economic growth and health expenditure. They were able to prove the hypothesis that over the period after the revolution, health expenditure in Iran rose at a faster rate than growth. However, their results established an instantaneous and unidirectional causal link running from growth to health spending. Yet, health spending did not Granger-cause per-capita GDP growth with a positive sign. In another study, Granados (2012) used cross-section data collected from England and Wales during 1840-2000. The result showed a negative relationship between health progress and rate of growth of gross domestic product (GDP).

van Zon and Muysken (2001) pointed out that the endogenous growth proves the interaction between health production and growth of generating service of human capital accumulation in an endogenous growth framework. The study further shows that the reduction in income per capita is mostly associated with health preference and aging population. Countries with poor health standards show slow growth.

Wang (2011) used international total health care expenditure data of 31 countries from 1986-2007 in exploring the causality between an increase in health care expenditure and economic growth. The results showed that health care expenditure will stimulate economic growth; however, low economic growth will reduce health care expenditure. Panel data was used in the process. Likewise, Baltagi and Moscone (2010) estimated the long-run relationship between health care expenditure and income using panel data of 20 OECD countries observed from the year 1971-2004. The results showed that health care expenditure is a necessity rather than a luxury, with elasticity much smaller than that estimated in previous studies.

The empirical literature reviewed on this section showed a serious dichotomy about the relationship between human capital investment and economic growth. Some of the results revealed that increased expenditure on growth stimulates the economy and

others indicated that endogenous growth proves the interaction between health production and growth. On the other side of the coin, others illustrated that returns on education are sometimes difficult to notice. Another contrast was experienced by Pelinescu (2015) where his model revealed a positive and statistically significant relationship between economic growth and its proxies of human capital, namely, innovative capacity of human capital and qualification of employees. At the same time the other proxy in the form of education expenditure gave the unexpected results of a negative relationship with growth.

3. Data and Methodology

The essence of compiling this study is to examine the effects of Human capital investment proxied by government expenditure on education and health sectors on economic growth in Malawi. The study uses an annual time series data covering the period 1995 to 2017 obtained from the World Bank website. The choice of the study period is limited by the availability of data of all variables in the model. The Autoregressive Distributed Lag (ARDL) approach developed by Pesaran, Shin and Smith (2001) was chosen to estimate the link between the dependent variable and its regressors. Besides the other advantages of this approach, ARDL was found to be more relevant because of its ability to generate robust and reliable results even if the sample size is a small or finite sample size like in the case of this study. The model was specified as follows;

$$GDP_t = \alpha + \beta_1 POPGrate_t + \beta_2 TEDExp_t + \beta_3 THExp_t + \mu_t \quad (1)$$

where, *GDP* which is used as a proxy for economic growth. In line with studies such as Hanushek and Kimko (2000) and Hoeffler (2002), annual population growth rate *(POPGgrate)* has been introduced as a controlled variable in the model. Meanwhile, *TEDExp* represents the total education expenditure which is comprised of public expenditure on education made up of current and capital public expenditure on education. This includes government spending on educational institutions both public and private sectors. Finally, *THExp* symbolises the total health expenditure which is the sum of public and private health expenditures. The variable covers the provision of health services, that is, both preventive and curative, family planning activities, nutrition activities and also the emergency aid designated for health but does not include provision of water and sanitation.

Prior to model estimation, several econometrics techniques were conducted to determine the characteristics the individual variables and to estimate the model as a whole. They are as follows:

3.1 Stationarity Test

The stationarity test in the form Augmented Dickey-Fuller (ADF) was conducted to determine the properties of the variables under study. The stationarity test is very crucial because the ARDL bounds test is based on the assumption that the variables are integrated of order zero or one, that is I(0) or I(1). Therefore, in this case the objective is to ensure that there are no variables integrated of order two or I(2) so as to avoid spurious results since in the presence of such variables, the values of F-statistics provided Pesaran *et al.* (2001) cannot interpreted. For that reason, the ADF unit root test was estimated for individual series to provide evidence of the order of integration. The results are presented in Table 1 on the next page.

3.2 ARDL Bound Test for Cointegration

Moreover, the bound test of the ARDL is conducted in order to identify the evidence of long-run relationship amongst the variables. The decision rule of this test is based on the calculated F-statistics which is compared with the Critical Value as tabulated by Pesaran et *al.* (2001). If F-statistics is greater than the upper critical value, then the decision will be to reject the null hypothesis of no long-run relationship. On the other hand, if it falls below a lower critical value, then the null hypothesis cannot be rejected and if it falls within these two critical bounds, then the result is inconclusive (Pesaran *et al*., 2001).

The ARDL model is therefore specified as follows:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta GDP_{t-i} + \sum_{i=1}^{m} \beta_2 \Delta POPGrate_{t-i} + \sum_{i=1}^{m} \beta_3 \Delta TEDExp_{t-1} + \sum_{i=1}^{m} \beta_4 \Delta THExp_{t-i} + \alpha_1 GDP_{t-1} + \alpha_2 POPOGrate_{t-1} + \alpha_3 TEDExp_{t-1} + \alpha_4 THExp_t + \mu_{t-1} \quad (2)$$

where β_0 to β_4 and α_1 to α_4 are the coefficients of the independent variables, Δ is the first difference of the operator and μ_t is a white-noise disturbance term. The ARDL model in Equation 2 indicates

Table 1: Augmented Dickey Fuller Test Results

Variables	Model	Lag -length	t-statistics	P-value	Order of integration	Decision
GDP	Intercept	4	-4.153975***	0.0043	I(0)	Stationary
	Trend & intercept	4	-3.987941***	0.0251	I(0)	
	None	4	-3.130368***	0.0033	I(0)	
POPGrate	Intercept	4	-3.368786	0.0266	I(0)	Stationary
	Trend & intercept	4	-6.626720***	0.0003	I(1)	
	None	4	-6.475563	0.0000	I(1)	
TEDExp	Intercept	4	-4.644522***	0.0015	I(1)	Stationary
	Trend & intercept	4	-4.568998***	0.0081	I(1)	
	None	4	-4.768598	0.0001	I(1)	
THExp	Intercept	4	-4.083700	0.0053	I(1)	Stationary
	Trend & intercept	4	-4.115489	0.0202	I(1)	
	None	4	-3.772985	0.0007	I(1)	
*Statistically significant at 10% level, **Statistically significant at 5% level, ***Statistically significant at 1% level						

Source: Authors

that economic growth tends to be influenced and explained by its past values and it is separated into two parts. The first part of the equation with β_0 to β_4 denotes the short-run dynamics of the model, while the second part with coefficients α_1 to α_4 signifies the long-run part of the model. The null hypothesis of the foregoing model is defined as $H_0 : \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ which expresses that there is no long-run association among the variables.

Furthermore, the Error Correction Model (ECM) of the ARDL approach is specified as:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta GDP_{t-i} + \sum_{i=1}^{m} \beta_2 \Delta POPGrate_{t-i} + \sum_{i=1}^{m} \beta_3 \Delta TEDExp_{t-1} + \sum_{i=1}^{m} \beta_4 \Delta THExp_{t-i} + \beta_5 ECM_{t-1} + \mu_{t-1} \quad (3)$$

4. Results and Discussion

This section presents the results of all the econometric registrations of dependent and independent variables in the model.

4.1 Stationarity Test Results

In determining the order of integration of the residuals of the variables used in this study, the ADF unit root test was used and the results are reported in Table 1 above. The results show that the null hypothesis of no unit root test has been rejected. The results are further validated by the p-values which are all less than 5% level of significance, thus the variables are showing a mixture of integration because some are I (0) and others are I (1). Since they are not integrated at the same order and there is no evidence of I (2) variables, the ARDL approach was the most appropriate Cointegration technique required to test the long-term relationship among the variables.

4.2 ARDL Bound Test for Cointegration

The ARDL bound test for Cointegration results are presented in Table 2 on the following page.

The results indicate that the coefficient estimated in Table 2 is stable and significant for both dependent and independent variables. This was achieved at lag 2 selection using Akaike Information Criterion criteria, therefore, the bounds F-Statistics test will help to determine the presence of cointegration amongst the variables. Cointegration is used to reconcile the short-run and long-run behaviour of the variables as used in this study and the results are presented in Table 3 on the next page.

The estimated F-statistics of 6.079284 in Table 3 is larger than any of the I (1) values showing that the model is significant and cointegrated. We therefore fail to reject the bound test approach estimated in Table 3 due to suggestion made by Persaran (2001) that we have to accept the null hypothesis when the sample F-statistics is below the associated critical value.

Table 2: ARDL Estimated Coefficient Results

Variables	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.249402	0.287533	-0.867387	0.4027
GDP(-2)	-0.449888	0.185662	-2.423151	0.0321
POPGrate	-1.570240	19.90833	-0.078874	0.9384
POPGrate(-1)	16.68214	25.83427	0.645737	0.5306
POPGrate(-2)	-15.32385	12.83380	-1.194023	0.2555
TEDExp	-0.494549	0.455584	-1.085529	0.2990
TEDExp(-1)	-1.098145	0.629622	-1.744134	0.1067
THExp	0.913239	0.469570	1.944841	0.0756
C	5.612623	19.89083	0.282171	0.7826

Source: Authors

Table 3: ARDL Bounds Cointegration Test

F-Statistics : 6.079284		
Critical value bounds		
Significance levels	**I(0) Bounds**	**I(1) Bounds**
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Authors

Table 4: Short-Run Coefficients of the ARDL Model

Variables	Coefficients	Standard Error	T-statistics	P-value
D(POPGrate)	0.818352	3.085442	0.265230	0.7940
D(TEDExp)	-0.640537	0.323954	-1.977246	0.0645
D(THExp)	0.133417	0.271915	0.490655	0.6299
ECM(-1)	-0.624048	0.155246	-4.019745	0.0009

Source: Authors

The coefficients of the estimated short-run results presented in Table 4 show that the results are statistically insignificant. On the other hand, the ECM term is less than one and it has theoretically correct sign (negative) and significant at 1% level. All these confirm the foregoing long-run relationship among the variables and also imply that in the case of any disequilibrium in the economy the system will correct itself from the short-run towards reaching long-run equilibrium at the rate of around 62% every year.

4.2.1 Estimated Long-Run Coefficient

The short-run estimation was followed by the long-run analysis and the results are presented in Table 5 on the following page.

The regression results in Table 5 (see next page) show that *TEDEx* is positively related to GDP whilst *POPGrate* and *THExp* are negatively to economic growth. Thus a percentage change in population growth in the country results into 1.31% decreases in GDP. Thus a percentage change in total government expenditure on public and private education results into -1.03% decrease in GDP. Lastly total government expenditure on health sector results into an increase in GDP of 0.21%.

To check whether the model is reliable, several diagnostic tests were conducted and the results are presented in Tables 6 and 7 respectively on the following page.

Table 5: Cointegration and Long-Run Form of the ARDL Model

Dependent variable (GDP)				
Variables	**Coefficients**	**Standard Error**	**t-statistics**	**P-value**
POPGrate	1.311360	5.106347	0.256810	0.8004
TEDEx	-1.026422	0.553812	-1.853377	0.0813
THExp	0.213792	0.421483	0.507238	0.6185

Source: Authors

Table 6: Normality Test

Jarque-Bera	Standard Dev.	Skewness	Kurtosis	P-value
14.98206	2.250871	-1.264316	6.154378	0.000558

Source: Authors

Table 7: Serial Correlation and Heteroskedasticity Tests Results

Test	F-statistics	P-Value
Serial correlation	0.219483	0.8067
Heteroskedasticity	0.653963	0.7214
Wald Test (chi-square)	2.303209 (4.606417)	0.1303

Source: Authors

4.3 Residual Diagnostic Test

The residual diagnostic stability tests have been carried out in order to know the stability or otherwise of the model and parameters in the system equation

The residuals of this model are normally distributed since the p-value is significant at 5% and the Jarque-Bera vale is more than 5.99 (chi-square with two differences at the 5% level).

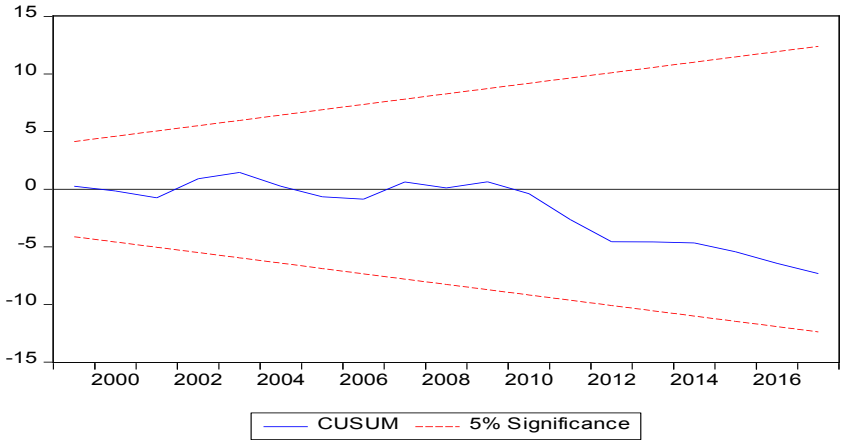
The results of chi-square probabilities of the serial correlation and heteroskedasticity tests estimated in Table 7 are both less than 5% so we accept the null hypothesis of no serial correlation and heteroskedasticity. This is due to the fact that the null hypotheses of all the tests cannot be rejected due to insignificant p-values.

Figures 3 and 4 on the following page indicate the absence of any instability of the coefficients because the plots of both the CUSUM and CUSUMSQ statistics fall inside the critical bands of the 5% confidence interval of parameter stability.

5. Conclusion and Recommendations

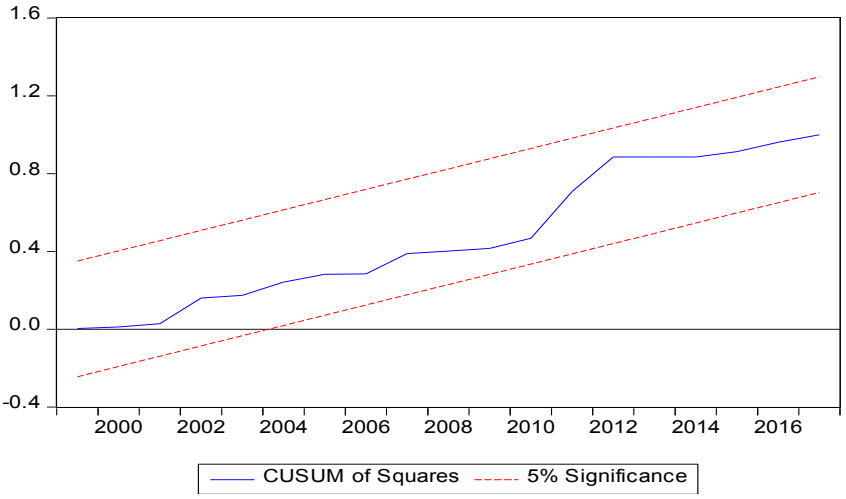
The purpose of this study was to investigate the effects of Human capital investment on economic growth in Malawi by means of the ARDL approach. The unit root tests result showed that the variables had a mixed order of integration, that is, I (0) and I (1) orders of integration. Furthermore, the ARDL bounds cointegration test showed that the model was significant and cointegrated. The ECM term confirmed the foregoing long-run relationship among the variables indicating that in the case of any disequilibrium in the economy, the system will be able to correct itself from the short-run towards reaching the long-run equilibrium. As indicated in the literature review about mixed results on this relationship, the similarly results were obtained about the impact of human capital investment on economic growth in Malawi. In line with Pelinescu (2015), the empirical results of this study showed that total education expenditure has a negative relationship with growth whereas total health expenditure is positive. As the human capital has pointed out, human capital is directly useful in the production process and it increases a worker's productivity in all tasks, therefore the study recommends that the Malawian government has to strive to strike a balance between education and health expenditures as the main root towards growth. Therefore, study supports the projection of budget structure in the year 2016-2017 towards education and health sectors expenditure.

Figure 3: CUSUM Test Results



Source: Authors

Figure 4: CUSUM of Squares Test Results



Source: Authors

References

Abrigo, M.R.M., Lee, S.-H. & Park, D. 2017. *Human Capita, Spending, Inequality, and Growth in middle income Asia*. Available at: https://doi.org/10.1080/1540496X.2017.1422721.

Abrigo, M.R.M., Lee, S.-H., & Park, D. 2018. Human Capital Spending, Inequality, and Growth in Middle-Income Asia. *Emerging Markets Finance and Trade*, 54(6):1285-1303. Available at: https://doi.org/10.1080/1540496X.2017.1422721.

Baltagi, B.H. & Moscone, F. 2010. Health care expenditure and income in the OECD. reconsidered: Evidence from panel data. *Economic Modelling*, 27(4):804-811. Available at: https://doi.org/10.1016/J.ECONMOD.2009.12.001.

Becker, G.S. 1962. Investment in Human Capital: A theoritical analysiss. *The Journal of Political Economy*, LXX, (5):9-49.

Dee, T.S. 2004. Are there civic returns to education? *Journal of Public Economics*, (88):9-10, 1697-1720.

Diop, M., Owen, D. & Ghura, D. 2012. *Second Malawi Growth and Development Strategy (MGDS II) 2011-2016*. Available at: http://documents.worldbank.org/curated/en/399931468089371016/pdf/691340PRSP0P120Official0Use0Only090.pdf.

Duraisamy, P. 2002. Changes in returns to education in India, 1983-94: by gender, age-cohort and location. *Economics of Education Review*, 21(2002):609-622.

Ehimare, O.A., Ogaga-Oghene, J.O., Obarisiagbon, B.E.I. & Okorie, U.E. 2014. The Nigerian Government Expenditure on Human Capital Development: An Efficiency Analysis. *European Journal of Business and Social Sciences*, 3(7):1-13.

Fersterer, J. & Winter-Ebmer, R. 2003. Are Austrian returns to education falling over time? *Labour Economics*, 10(1):73-89.

Granados, J.A.T. 2012. Economic growth and health progress in England and Wales: 160 years of a changing relation. *Social Science & Medicine*, 74(5):688-695.

Haizheng, L. 2003. Economic transition and returns to education in China. *Economics of Education Review*, 22(3):317-328.

Hanushek, E.A. & Kimko, D.D. 2000. Schooling, Labor Force Quality, and the Growth of Nations. *American Economic Review*, 90(5):1184-1208.

Hoeffler, A.E. 2002. The augmented Solow model and the African growth debate. *Oxford Bulletin of Economics and Statistics*, 64(2):135-158.

Li, H. & Huang, L. 2009. Health, education, and economic growth in China: Empirical findings and implications. *China Economic Review*, 20(3):374-387.

Mehrara, M. & Musai, M. 2011. The causality between health expenditure and economic growth in Iran. *International Journal of Business Management and Economic Research,* (2):13-19.

OECD. n.d. Health Expenditure –OECD. Retrieved 12 May 2018. Available at: http://www.oecd.org/els/health-systems/health-expenditure.htm.

Park, D., Abiad, A., Estrada, G., Han, X. & Tian, S. 2017. Transcending the middle-income challange. In *Asian Development Outlook* 2017. Philipines: World Bank.

Pelinescu, E. 2015. The Impact of Human Capital on Economic Growth. *Procedia Economics and Finance*, (22):184-190.

Pesaran, M.H., Shin, Y. & Smith, R.J. 2001. Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3):289-326.

Rengin A.K. 2012. The Relationship between Health Expenditures and Economic Growth : Turkish Case. *International Journal of Business Management and Economic Research*, 3(1):404-409.

Saito, M. 2007. The Basic Theory of Human Capital. *Journal of International Cooperation in Education*, (10):165-182.

van Zon, A. & Muysken, J. 2001. Health and endogenous growth. *Journal of Health Economics*, 20(2):169-185.

Wang, K.-M. 2011. Health care expenditure and economic growth: Quantile panel-type analysis. *Economic Modelling*, *28*(4):1536-1549.

Weil, D.N. 2014. Health and Economic Growth (pp. 623-682). Available at: https://doi.org/10.1016/B978-0-444-53540-5.00003-3.