PUBLIC DEBT, HUMAN CAPITAL DEVELOPMENT AND ECONOMIC GROWTH IN MALAWI

MASTER OF ARTS (ECONOMICS) THESIS

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MASTER OF ARTS (ECONOMICS) THESIS

By

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DECLARATION

I, GIFT MBIRI MATABWA, hereby make this declaration that this thesis is my original work and is not a replication of any other work submitted to any other institution for similar purposes. Acknowledgements have been made where other people's work has been used.

GIFT MBIRI MATABWA

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Name

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Signature

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Date

CERTIFICATE OF APPROVAL

The signatories below verify that this thesis is a representation of the student's own work and effort and has been submitted with our approval.

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Second Supervisor

DEDICATION

In loving memory of my father Elia Matabwa Senior and my grandmother Modestar Anana Joseph.

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First and most importantly, all the honour, praise and exaltation are due to God Almighty for making all this a possibility. Second, I thank my family for the love and support in all my life projects including this study. I do not take it for granted.

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ABSTRACT

Although the theoretical postulations that public debt is dynamically growth dampening are well developed, empirical evidence is mixed and country specific. Using Malawi as a case study, this study examines this relationship using a theoretically guided estimation approach that differs from previous studies: thus, the study uncovers both direct and indirect effects of public debt through human capital development. We estimate these relationships using Autoregressive Distributed Lag Model (ARDL) in a two-step approach applied on time series annual data covering the period 1984 to 2019. While we find evidence of a human capital development channel, the results reveal that high stocks of public debt do not directly influence growth in Malawi, contrary to economic theory. Specifically in the long run, a 1 percent increment in public debt influences economic growth only through dampening human capital development by 0.65 percent on average ceteris paribus. And in the short run, the same percentage increase in public debt dampens economic growth through dampening human capital development by 0.42 percent on average all else being equal. By inference therefore, funds borrowed by Government should be used in human capital stimulating sectors of the economy in order to improve economic growth.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AfDB	African Development Bank
APK	Average Product of Capital
ARDL	Autoregressive Distributed Lag Model
CDSS	Community Day Secondary School
COVID-19	Coronavirus Disease
DF	Dickey-Fuller Test
DFGLS	Dickey-Fuller with GLS De-trending
DSA	Debt-Sustainability Analysis
ECT	Error Correction Term
EEI	Education Enrolment Index
EQUALS	Equity with Quality Education at Secondary
ERS	Elliot-Rothenberg Stock Test
ESIP	Education Sector Investment Plan
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GLS	Generalised Least Squares
GMM	Generalised Method of Moments
HDI	Human Development Index
HESLGB	Higher Education Students' Loans and Grants Board
HIPC	Heavily Indebted Poor Countries
HIV	Human Immunodeficiency Virus
IMF	International Monetary Fund
ISEM	Improving Secondary Education in Malawi
KPSS	Kwiatkowski, Phillips, Schmidt and Shin
KUHES	Kamuzu University of Health Sciences
LM	Lagrange Multiplier
LUANAR	Lilongwe University of Agriculture and Natural Resources
MAIC	Ng-Perron Modified Akaike Information Criteria
MDRI	Multilateral Debt Relief Initiative
MGDS	Malawi Growth and Development Strategy
MoE	Ministry of Education

MoF	Ministry of Finance
MPK	Marginal Product of Capital
MSCE	Malawi School Certificate of Education
MUBAS	Malawi University of Business and Applied Sciences
MUST	Malawi University of Science and Technology
MZUNI	Mzuzu University
NARDL	Non-linear Autoregressive Distributed Lag Model
NCHE	National Council for Higher Education
ESP	National Education Sector Plan
NPV	Net Present Value
NSO	National Statistical Office
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
OSS	Open Secondary School
PRGT	Poverty Reduction Growth Trust
PSLCE	Primary School Leaving Certificate of Education
PTA	Preferential Trade Area
RBM	Reserve Bank of Malawi
RESET	Ramsey's Regression Specification Error Test
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SGMM	System Generalised Method of Moments
SSA	Sub-Saharan Africa
UECM	Unrestricted Error Correction Model
UNIMA	University of Malawi
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background

Public debt is by definition the total financial liabilities of government measured as a stock (Chouraqui et al., 1986). Government borrows from the public and/or foreign entities by issuing government securities. The amount of the outstanding debt at a point in time is equivalent to net borrowing made by the government. Public debt involves Government selling its local or international creditors securities that clearly state the terms of the loan. The terms categorically state the initial amount borrowed (principal), the cost of borrowing the principal (interest rate), and the debt servicing schedule. There has been no shortage of government borrowing in Africa, the Sub-Saharan African region especially. The most significant reason for borrowing has been to finance persistent fiscal deficits. Malawi is no exception to the topic of excessive public debt. In fact, Malawi is one of the countries that received the Heavily Indebted Poor Countries (HIPC) support in 2006 (IMF, 2017). The Government of Malawi has a whole department of Debt and Aid under the Ministry of Finance in conjunction with Financial Markets department of the Reserve Bank of Malawi tasked with momentous task of managing and alleviating the burden of debt.

Malawi Government has been accumulating debt over time and there are usually fears that Government debt is at unsustainable levels every fiscal year begging the question "Does Government repay its debt?". The capacity to repay public debt depends on the Government's ability to mobilize revenue which also depends on productivity and hence economic growth, and what the debt is used for (recurrent expenditure or development expenditures). The Government will be able to repay its debt obligations if it is able to mobilize more revenue and if previous debt is spent on development which increase the tax base in the end.

Patillo et al (2004) observed arguments by economists that high stocks of debt hindered countries from achieving Sustainable Developmental Goals (SDGs) because debt and its servicing absorbed resources from important spending that could reduce poverty, and reduced resources available for public investment in sectors such as education and health. As a result, many developing countries have pressure in terms of fiscal space manoeuvres which disturb growth potentials for such countries. A review of the past budgets for Malawi including the 2020/21 fiscal year budget reveals that budgetary allocations to debt servicing are 100 percent more than total allocations to human development (Health and Education). For instance, the 2020/21 budget proposed an allocation to debt servicing of 295 percent above the total allocation to human capital development (MoF, 2021).

The effects of the 2007/08 global financial and economic crises on economic growth and development mostly in emerging economies suggested of how growth dampening massive public debt levels and fiscal imbalances can be worldwide (Kgakge-Tabengwa, 2014). In order for developing countries to achieve potential growth, human capital development is fundamentally important because it ensures efficiency, competitiveness and attracts foreign direct investment which requires a great deal of proficiencies (Collin & Weil, 2018). The study therefore assesses relationships among public debt, human capital and economic growth in Malawi.

1.2 Problem Statement and Justification

Just like all other developing countries, Malawi is encouraged to prioritize human capital improvements in order to achieve Sustainable Development Goals (SDGs)[1] and specifically the Malawi Agenda 2063, attain high output and competitiveness through efficiency gains from accumulation of knowledge which leads to sustainable growth. However, developing countries are confronted with fiscal challenges, in this case, public debt in prioritizing human capital and sustainable growth. Very key for sustainable growth is human capital and economic growth linked with Government's revenue mobilization capacity is essential for debt repayment. There is evidence that human capital development is crucial to economic growth and empirical studies find a positive relationship between human capital development and economic growth (Ogundri & Awokuse, 2018; Rengin, 2012; Wang, 2011; Baltagi & Moscone, 2010;

[1] Refer to the SDGs booklet (UNDP, 2015)

Hongyi & Huang, 2009; Agiomirgianakis et al, 2002; Abbas & Nasir, 2001; Bils & Klenow, 2000; Mankiw et al, 1992). But there are fears of debt levels reaching unsustainable levels every financial year in Malawi even after the Government received the Heavily Indebted Poor Countries (HIPC) support in 2006 which led to an overall debt alleviation. Theory predicts that in the long run there is a negative relationship between public debt and economic growth as proposed by Elmendorf & Mankiw (1998), Overlapping Generations model by Samuelson (1958) and Krugman's (1988) Debt Overhang condition. However, Elmendorf & Mankiw (1998) also propose a possibility of a positive relationship between public debt and economic growth in the short run. Empirical evidence in support of the negative relationship between public debt and economic growth among others include Sanusi et al (2019), Lartey et al (2018), Chicherita-Westphal & Rother (2012) and Modigliani (1961). The Figure 1.1 and Table 1.1 below show the relationship between public debt and annual GDP per capita growth in Malawi;

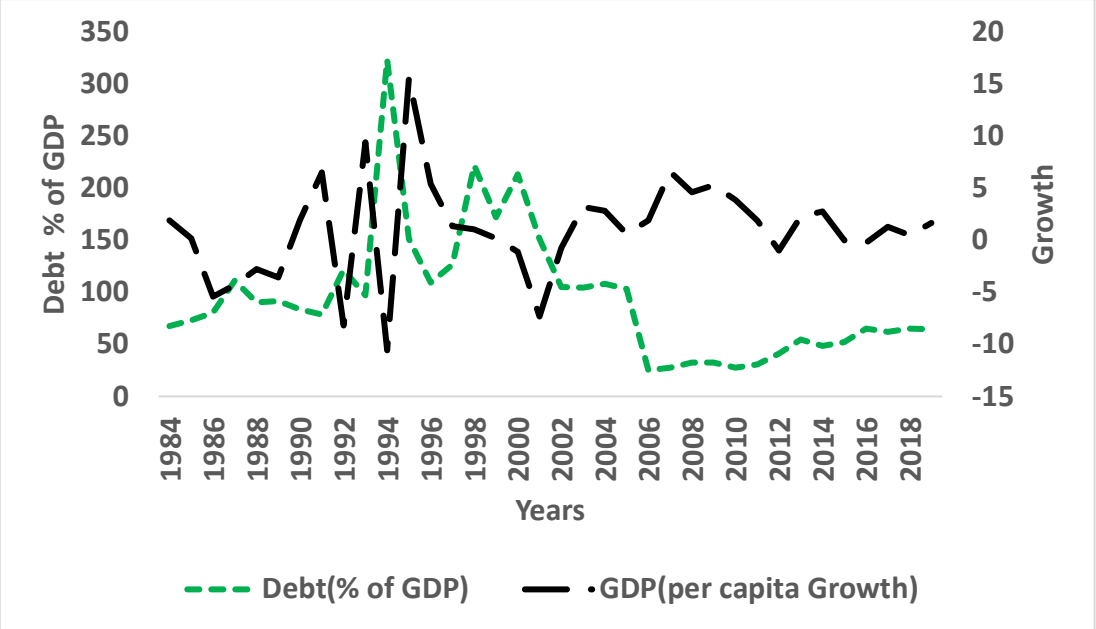

Figure 1. 1: Debt as a percentage of GDP and GDP per capita growth: 1984-2019
Source: Author's computations using data from World Bank (2019) and RBM (2020)

Table 1. 1: Average Debt percentage of GDP and Average GDP per capita Growth

Period in years	Average Debt (%GDP)	Average GDP per capita Growth (%)
1984-1994	110.8	-1.3
1995-2005	142.4	1.9
2006-2010	53.8	4.4
2011-2019	29.0	1.0

Source: Author's computations using data from World Bank (2019) and RBM (2020)

It can be observed that economic growth averaged 4.4 percent of GDP in the period after debt relief reaching 6.6 percent in 2007 as measured by annual GDP per capita growth. In fact, Malawi was recorded as the fastest growing economy during this period begging the question, could this growth be ascribed to the reduction of public debt? Other periods such as 1984-1994 and 2011-2019 also seem to associate high debt accumulation with low rates of growth. Oddly, with an average debt of 110.8 percent of GDP growth was negative 1.3 percent in the period 1984-1994 and yet growth was 1.9 percent in the period 1995-2005 with an average debt of 142.4 percent of GDP. The years 1995 and 1996 are also of particular interest, recording high debt levels of 151.2 percent and 109.3 percent of GDP against high growth rates of 15.6 percent and 5.4 percent, respectively. These observations bring uncertainty on how public debt affects economic growth in Malawi. Does debt really matter for economic growth in Malawi? Given this narrative, the prima facie expectation is that understanding the relationship between public debt and economic growth is imperative. The study therefore interrogates the effects (direct or indirect) of public debt on economic growth in Malawi.

1.3 Objectives of the Study

The main objective of the study is to assess the interactions among public debt, human capital and economic growth in Malawi.

1.3.1 Specific Objectives

The study is driven by the following specific objectives in pursuing the main objective;

a) Assessing the impact of public debt on human capital development.

b) Examining the impact of human capital development on economic growth.
c) Evaluating the direct impact of public debt on economic growth.

1.3.2 Research Questions

a) Does public debt directly affect economic growth in Malawi?
b) Does public debt affect economic growth via human capital development in Malawi?

For purposes of enhancing the internal validity of the study, stylized variables were controlled for in order to limit their influence on variables of interest. Capital, labour Government health expenditure per capita and Government education expenditure per capita were the confounding variables controlled for in the study. This helped in determining a correlational or causal relationship between variables of interest.

1.4 Organization of the Study

The paper has been structured as follows; Chapter 1 has presented the introduction which includes the background, the problem statement and justification, the objectives of the study and the research questions being answered by the study. Chapter 2 presents the context of the paper by discussing the overview of the economy of Malawi and the variables of interest to the study. The theoretical and empirical literature review is undertaken in Chapter 3. Chapter 4 presents the methodology employed in the study which also includes the sources of data used. The results of the study are presented and discussed in Chapter 5. Finally, Chapter 6 concludes the paper and offers policy recommendations and areas for further study.

1.5 Summary

The chapter set out to introduce the issues public debt, human capital development and economic growth. It has been observed that public debt has been growing over time for developing countries and particularly in Malawi because of deficit budgets by looking at its trend. The chapter has touched though in passing on the effect of public debt on economic growth. A possibility of indirect impact of public debt via human capital development has also been touched. Theories on the relationship between public debt and economic growth have been mentioned and we have seen that they mostly point towards a negative relationship with a probability of a positive relationship valid in the

short run. Therefore, the aim of this study is to assess the relationships among public debt, human capital and economic growth. Specifically, the study assesses the direct impact of public debt on economic growth and investigates the indirect impact of public debt on economic growth via the channel of human capital development.

CHAPTER 2

OVERVIEW

2.1 Introduction

This chapter provides a context and discusses areas of interest of the study. Section 2.2 gives a brief overview of the economy of Malawi. Section 2.3 takes a glance at economic growth in Malawi. Section 2.4 explores the trend of domestic and external debt in Malawi. The trend and nature of human capital development is discussed in Section 2.5. Lastly, Section 2.6 summarizes the chapter.

2.2 The Economy of Malawi

The economy of Malawi largely depends on rain-fed agriculture. Despite decreasing marginal contributions to Gross Domestic Product (GDP) in the previous three years, the biggest contribution to GDP still remains the agricultural sector (MoF, 2020). It comprises two main subsectors: smallholder farmers and estate farmers. According to Matthews (2003), about 80 percent of food in Malawi is produced by smallholder farmers while their contribution to exports is 20 percent but have the most inadequate resources. The bigger fraction of foreign exchange in Malawi mainly comes from the estate subsector. He reports the exact opposite for the estate subsector contributing approximately 20 percent to the food produced in Malawi but earns Malawi a great deal of foreign exchange from above 80 percent of agricultural exports. Examples of agricultural exports include tobacco, sugar, tea, tung oil, coffee and macadamia. Malawi's staple food crop, maize, is the main source of calories and is the most cropped food crop (Ecker & Qaim, 2011). As of 2019/2020 cropping season, 76 percent of all plots cultivated in Malawi were under maize, on an average plot area of 0.8 acres (NSO, 2020).

2.3 Economic Growth

Malawi is among the world's poorest countries and indeed the poorest as per 2018 per capita GDP categorisation. As of 2017, about 51.5 percent of Malawians were living below the national poverty line and 18.5 percent of the multidimensionally poor in severe poverty (NSO, 2018). Economic growth has slowed down averaging about 1.5 percent between 2019 and 2020 down from 5.1 percent growth rate registered in 2019

(RBM, 2021). The slowdown in GDP growth was on account of COVID–19 outbreak, which subjected the economy to a partial lockdown thereby slowing down economic activities. The tourism, the accommodation and food subsectors, transportation, agriculture, manufacturing and mining & quarrying were the most affected sectors. Malawi's tobacco, inflows of foreign direct investment (FDI) and other agricultural exports were negatively affected by weak global demand. RBM further reports that the fiscal deficit was estimated at 7.7 percent of GDP in 2020 from 4.7 percent deficit estimated in the preceding year. The fall was on justification of 345 million US dollars expenditure in response to COVID-19, 5.3 percent of GDP worth of interest payments, and the fresh presidential elections (RBM, 2021). As a result, the debt to GDP ratio rose from 62 percent as reported in 2019 to 65 percent as at June 2020 with borrowing and aid as sources of financing. However, following administration of COVID-19 vaccines, GDP growth is projected to rebound to 6.1 percent should business go back to normal.

Economic inequality at national level as measured by the GINI coefficient[2] remains considerably big at 0.42 and it extends to aspects of political participation, employment, education, and health. Likewise, gender inequality remains high at 0.619, way above the sub-Saharan average of 0.569. Below is Figure 2. 1 depicting a chart of GDP per capita mapping economic growth from 1960 to 2019; The slow economic growth and indeed low-income nature of the country exacerbate problems of high rising debt stock and under developed human capital.

[2] Higher values indicate more inequitable distribution of income.

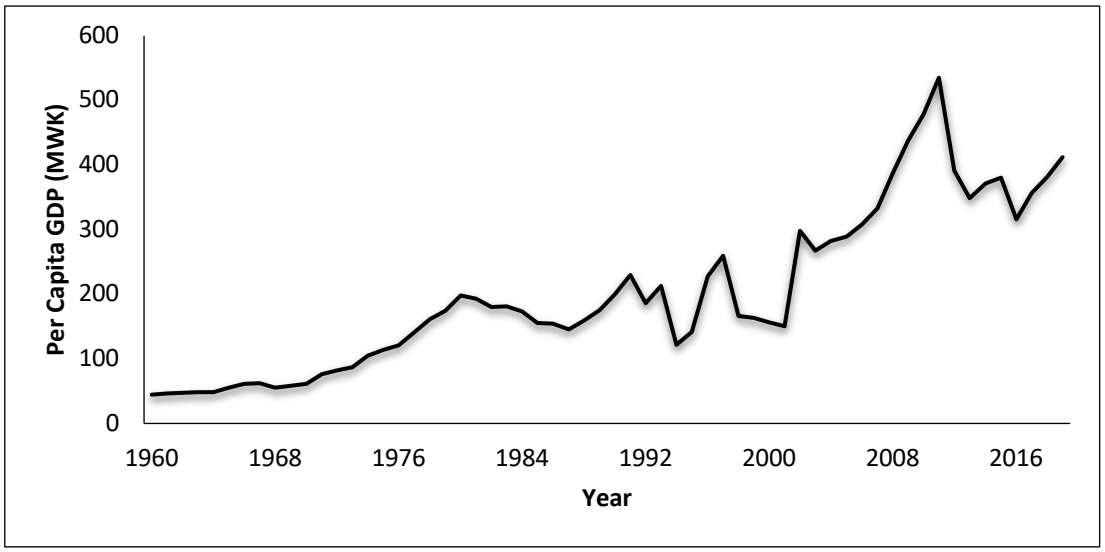

Figure 2. 1: Economic Growth trend: 1960-2019
Source: Author's computations using data from World Bank (2019)

The slowdown in economic growth due to COVID 19 in Malawi did not start until March 2020 and hence not captured by the World Bank data which goes up to 2019. So, the graph above does not depict such a slowdown.

2.4 Public debt: Domestic and External Debt in Malawi from 1984 to 2018

According to the African Development Bank (2019), the repeated weather-related shocks, not limited to the 2019 cyclone Idai and the infamous COVID 19 in Malawi have resulted in tenacious fiscal imbalances and high public debt. The Bank reported that external sources, domestic debt, and official reserves as sources of financing the 243 million US dollars gap representing 2.9 percent of GDP recorded in October 2020 and the 3.9 percent of GDP financing requirements of the COVID 19 pandemic. In the following Figure 2.2, the orange line represents external debt in millions of US dollars (US' Million) to remove noise from changes in the exchange rate in the trend. The green line represents external debt converted to billions of Malawi Kwacha (MK'Billion) for easy comparison with domestic debt. The blue line represents domestic debt in billions of Malawi Kwacha (MK'Billion). A discussion on different periods follows below.

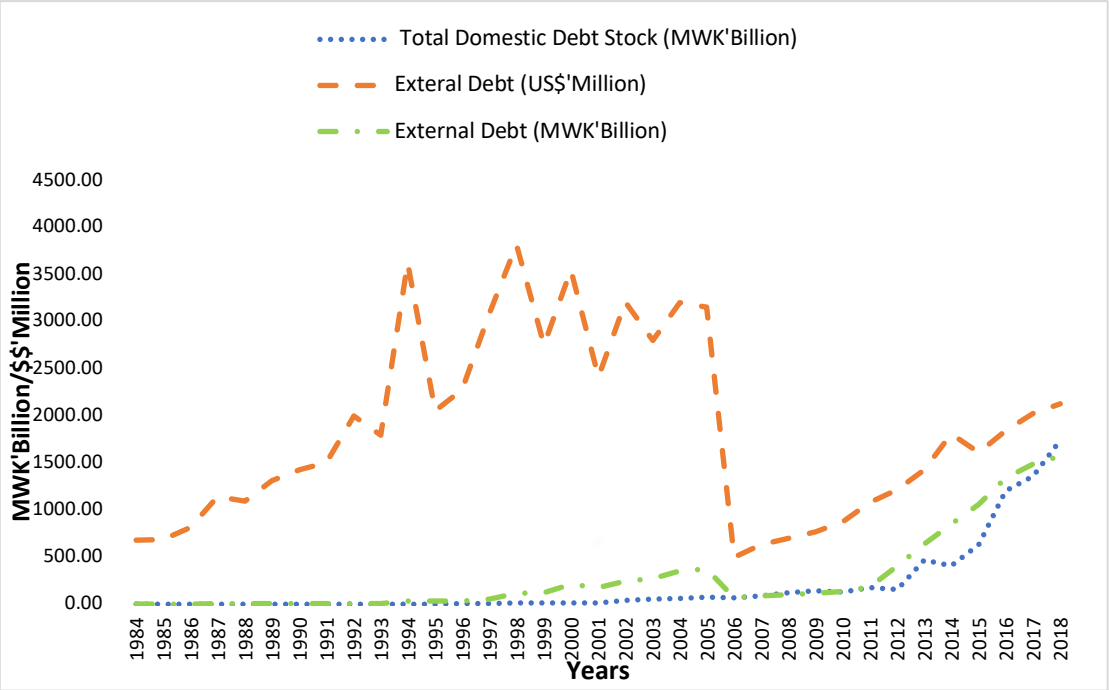

Figure 2. 2 : Domestic and external debt trend in Malawi: 1984-2018
Source: Author's computations using data from Reserve Bank of Malawi (2019)

2.4.1 Period 1984-2004

Starting the observation from the year 1984, it can be seen that domestic debt and external debt were roughly at par with external debt slightly more. This trend continued until 1997 when external debt started to visibly trend above domestic debt. Malawi became part of the Heavily Indebted Poor Countries (HIPC) Initiative. Period between 1993 and 2004 was characterized by volatility in external debt. The sharp increase in external debt in 1993 is speculated to have been on account of referendum, campaign and election costs as Malawi moved from one party system to multiparty system of Government. Another reason for the sharp increase was the noise in the exchange rate thus the Kwacha depreciated following full financial liberalization in 1989.

2.4.2 Period 2005-2007

In the stated period, it can be seen that Malawi significantly reduced its foreign debt burden among the Heavily Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI). Malawi reached the considered point of completion under the HIPC Initiative in August 2006 and as a result, Malawi was one of the aid recipients from the International Monetary Fund (IMF), the World Bank, the AfDB, and other multilaterals (IMF, 2008). Malawi qualified for HIPC assistance due

to the unanticipated deterioration in the Net Present Value (NPV) of the ratio of debt to exports. Most importantly, Malawi also qualified for debt relief (under IMF's MDRI, WB and AfDB) which reduced total debt service obligations by 1.47 billion US dollars. In total, the assistance under the HIPC Initiative plus the debt forgiven reduced the stock of external debt from 104 percent of GDP in 2005 to 14.2 percent in 2006 (Fund, 2008). Domestic debt, it also dropped from 20 percent of GDP in 2005 to 15 percent in 2006.

2.4.3 Period 2008-2011

At the dawn of 2007, the benefits realized from the HIPC assistance and the MDRI debt relief in 2006 began to be reversed. From 2007 to 2011, external debt stock increased by an average of K22.44 billion per year. Right after debt relief, Malawi's debt stood at 26.7 percent of GDP but reached 30.65 percent of GDP by 2011. Among countries that benefitted from HIPC and MDRI debt relief, Malawi is recorded as to have accumulated debt faster than all (IMF, 2017). Notice that before 2011, domestic and external debt were almost at par and then external debt started to exceed domestic debt from 2011 onwards.

2.4.4 Period 2012-2013

External debt significantly increased by 126 percent from 2011 to 2012 while domestic debt had declined by 12.5 percent all in Malawian currency, the kwacha. From 2012 to 2013, external debt increased further by 57 percent and domestic debt increased by 176 percent. There was a new government in 2012 and it devalued the Malawi Kwacha by 50 percent which was also followed by a floated currency regime (Pauw et al., 2013). It should be noted, however, that the increases in external debt was not on account of additional debt to the stock but rather because the Kwacha was devalued by 50 percent and floated at the same time. Removing the noise from the changes in the exchange rate due to devaluation reveals that external debt increased by 12.6 percent on account of additional debt to the existing stock from 2011 to 2012 and by 17 percent from 2012 to 2013. Due to policies adopted by the new government in 2012, fiscal consolidation was relaxed which led to domestic debt increasing by 163.2 percent in the period 2011 to 2013.

2.4.5 Period 2014-2018

This period was mostly characterised by a progressive increase in Malawi debt, both external and domestic. External debt continued to rise over and above domestic borrowing. This can be justified by the conversion of some of domestic debt into external debt under a 2014 Preferential Trade Area (PTA) debt restructuring transaction where the Malawi government sold about 250 million US dollars debt to PTA Bank (IMF, 2017). And because external debt is defined in terms of residence of the creditor according to Debt Sustainability Analysis, the transaction meant transformation from domestic debt to external debt. However, between 2013 and 2017, Malawi was characterised by huge fiscal deficits, domestic arrears being turned into securities, donor funding withdrawal in 2013 due to public funds rooting termed as 'cashgate' and rolling over of matured debt into new government securities such that the above conversion from domestic debt to external started was to be reversed in 2018.

In general, the trend of public debt in Malawi from 2005 to 2018 reveals that debt has been increasing despite debt relief in 2006 which decreased external debt. With exception of 2006, external and domestic debt were almost at par till 2011 and external debt exceeded domestic debt thereafter. This situation however, was reversed in 2018. The accumulation of gross domestic debt in Malawi can be summarized to have originated from 4 components. These include: financing fiscal shortfalls with domestic resources representing 43 percent; deposits accumulation representing 27 percent; conversion of previous loans into government securities representing 22 percent and public banks' recapitalization representing 8 percent which all in all increased domestic debt to MK718 billion during the period 2011-2016 (IMF, 2017). On the other hand, external debt accumulation is explained by the 2014 Preferential Trade Area (PTA) debt restructuring transaction which transformed domestic debt to foreign in addition to fiscal deficits.

2.5 Human Capital Development

The accumulated aggregate of information, proficiencies and healthy wellness by people over time that enables them to be productive in a society is referred to as human capital (World Bank, 2020). The Human Capital Index (HCI), as part of the Human Capital Project, was developed by the World Bank in 2018. It calculates how much a generation in a particular context may fall short of realizing their full potential. It is

made up of a mix of health and education indicators. Omankhanlen et al. (2014) pointed out that Development Economists suggest that health, education and other human skills responsible for improvement in production make up human capital. Becker (1962) argued for the need for every economy to have highly skilled, educated and healthy workforce. The implication is that economic growth is stimulated by investments in health and education. Equally, diversion of resources from health and education dampens economic growth.

In Malawi, there have been efforts to improve human capital development evidenced by the introduction of free primary education. Malawi also has one of the most affordable tertiary education in Africa. Reporting on the Second Malawi Growth and Development Strategy (MGDS II), Diop et al. (2012) outlines that education is regarded by all countries as a source of social development and industrial growth. They argue that by offering equal opportunities in an economy to contribute to development of their nation, education improves the lives of the poor and the underprivileged groups. In order to achieve universal primary school education, Malawi embarked on school infrastructure development, teachers were well trained and employed and there were efforts to advance infrastructure for research and development. This initiative resulted in high enrolment into public primary schools reaching 83 percent by 2009 while literacy levels reached 84 percent. Although by the MGDS II completion, primary school education was not universal in Malawi, education standards increased by 59 percentage points in 1987 for the young population aged between 15 and 24, in 1998 by 76 percentage points and in 2010 by 87 percentage points while adult literacy rate increased with 64 percentage points in 1998 and by 75 percentage points in 2010 (MGDS II report, 2012). Pupils reaching grade 5 rose from 69 percent to 76 percent between 2000 and 2008 according to the UNDP in 2010. By 2008, about 53 percent of pupils were able to complete primary school up from 26.8 percent recorded in 2005 while dropout rate dropped from 22 percent to 5 percent same period (IDA & IMF, 2012).

In terms of access and equity for secondary school education, enrolment was at 387,569 learners in 2017, a 58.9% growth from 2009. On the other hand, net enrolment rate (NER) was at 15% in 2017 against National Education Sector Plan (NESP) target of 50%. Transition rate from primary to secondary education was at 38.3% in 2018, an

improvement from 36% in 2014, though still depicting limited access to secondary education in the country. About 1.6% of total secondary school enrolments is made up of learners with special needs (SNE Learners). SNE students increased from less than 2,000 students in 2009/10 to 5,000 students in 2017/18 enrolment. In terms of gender parity, there are more male students and teachers in secondary schools than females representing minimal progress on gender representation.

To increase access to secondary education, the Ministry of Education (MoE) introduced Open Secondary Schools (OSS) that offer secondary education to students who pass the Primary School Leaving Certificate of Education (PSLCE) but are not selected into secondary schools due to limited space. This increased total number of secondary schools from 1,127 in 2009/10 to 1,487 in 2017/18, representing a 31.9% increase in secondary schools. Over the past six years, the average breakdown between private and public is 24% and 76% respectively. The Education Sector Investment Plan (ESIP II) had intended for private education to increase to about 33% of all secondary schools. MoE introduced the secondary school bursary scheme in order to increase access and retention of boys and girls in secondary education especially orphans and vulnerable students. Beneficiaries of secondary school bursaries increased by 288% from 3,165 to 14,499 between 2010 and 2018.

Improvements in the quality and relevance of secondary education have also been visible. For instance, the secondary school curriculum was successfully reviewed in 2014, the number of unqualified teachers in secondary system was decreased, ratio of secondary students to qualified teachers improved from 62:1 to 41:1 between 2007 and 2018 holding specialization constant. By 2019, various construction efforts intended to provide the additional spaces for expanded enrolment were underway. The Equity with Quality Education at Secondary (EQUALS) and Improving Secondary Education in Malawi (ISEM II) activities provided institutional development components to improve the programming in secondary education, particularly in Community Day Secondary Schools (CDSSs), where there are the majority of secondary students. Some of the interventions by development partners were; the expansion of 21 CDSSs by European Union worth EUR 36.5 million; Construction of 250 new CDSSs by USAID worth 90 million US dollars; Expansion of 10 CDSSs in cities by SAVE the Children worth 15 million US dollars; Construction of 5 CDSSs by World Food Programme worth 5

million US dollars; Provision of WASH facilities, formation of Girls' Education Trust Fund by UNICEF worth 5 million US dollars World Bank EQUALS improving Secondary Education project worth 90 million US dollars.

Despite all these efforts, the dropout rate at secondary education level has been on the rise and it was at 10.9% in 2018 with more girls dropping out compared to boys (13.4 % girls, 8.5% boys) on account of tuition fees. Other challenges to secondary education are lack of access and equity of secondary education, low quality and relevance of secondary education and poor governance and management of Secondary Education.

Tertiary education (especially public universities) is highly competitive in Malawi requiring high scores in the Malawi School Certificate of Education (MSCE) examination. For those who get access to higher education, costs are of paramount consideration. The needy students have access to student loans through the Higher Education Students' Loans and Grants Board (HESLGB). The number of students from both public and private universities accessing loans has increased over the years reaching a total of 13,035 students (8,212 males and 4,823 females) by 2018. However, recovery of due loans remains a challenge which in turn makes new student loan offers to all eligible students impossible.

The Higher Education sub-sector comprises six public universities: University of Malawi (UNIMA), Kamuzu University of Health Sciences (KUHES), Malawi University of Business and Applied Sciences (MUBAS), Mzuzu University (MZUNI), Lilongwe University of Agriculture and Natural Resources (LUANAR) and Malawi University of Science and Technology (MUST). In addition, there are about 30 private universities under the higher education subsector out of which, 15 universities had been registered and accredited by the National Council for Higher Education (NCHE) by 2019. NCHE was established to champion the quality and access of higher education through accreditation of both public and private institutions which has increased the number of private higher education institutions in the country. Student enrolment in higher education institutions increased from 8,168 to 30,972 between 2008 and 2018, while female enrolment in public universities increased from 33% in 2008 to 37.5% in 2018 as a result of Government's affirmative action. However, female enrolment remains lower than male students again.

The establishment of a number of public universities in the recent past has increased access to higher education. There has also been expansion of the existing universities to increase space and therefore accommodate more students. For example, the Ministry established the Malawi University of Science and Technology and Lilongwe University of Agriculture and Natural Resources and expanded the physical infrastructure in existing public universities such as Mzuzu University and the former University of Malawi. Further, innovative ODL approaches in higher education increased further access to higher education in Malawi. The constituent colleges of the University of Malawi have been delinked into three new universities (University of Malawi, Kamuzu University of Health Sciences and Malawi University of Business and Applied Sciences) to further increase access to higher education and improve governance and management of the public universities. Other initiatives to improve access to higher education include new private sector funded scholarships, and industrial attachment programmes, industry involvement in curriculum reviews, expanded distance and eLearning programmes, more computers, and progress on support and retention of girls and disadvantaged students. The community colleges program in districts of Malawi is also another area that has increased access to higher education. These initial actions suggest other emergent possibilities and directions for the facilitation of academic work that is relevant to Malawi and expansion of opportunities for research. As these actions are evaluated, better focus may be possible and a wider array of institutions may activate mechanisms that have a proven track record. Research will become more prominent in higher education to contribute to a pool of knowledge and development thus human capital development will increase.

To improve quality, the subsector has also established the Africa Centres of Excellence for Eastern and Southern Africa in Malawi. At Lilongwe University of Agriculture and Natural Resources (LUANAR) there is an Africa Centre of Excellence for Aquaculture and Fisheries Science (Aqua Fish) Centre that add resources and skill possibilities. The purpose is to foster innovation and entrepreneurship to enhance food, nutrition, and economic security in this region. The KUHES' Africa Centre of Excellence for Public Health and Herbal Medicine conducts research in public health to achieve treatment of malaria, maternal health, HIV, and AIDS, and non-communicable diseases. This

increases opportunities for talented researchers and students, which will benefit Malawi.

The three keys to university education contribution to societal and individual development are the legal bases of university education, its access and equity, and its quality, including the fostering of a research culture. The Higher Education Bill and Higher Education Qualification Framework have been drafted. These are expected to help organize university and college delivery. The challenges facing tertiary education are the same as those facing secondary education but with a bigger magnitude.

In health sector, improvements against the MGDS II were apparent especially in maternal health. Infant mortality dropped from 7.6 percent as recorded in 2004 to 6.6 percent as recorded in 2010 while under five mortality rate dropped from 13.3 percent to 11.2 percent same year. As a result, between 2005 and 2009, the incidence of HIV reduced and so did the cases of Tuberculosis. Life expectancy has improved from 45 years in 1984 to 64 years in 2020.

It is expected that HIV/AIDS has affected human capital through the key complex social sectors such as health and education both directly and indirectly. The reasons for separately identifying these two social sectors as already mentioned are obvious. Improvements in education and in health are both seen as critical inputs for achieving sustainable development, while at the same time they are useful indicators of the success or otherwise of the development strategies actually followed by governments and donors. The HIV epidemic has made it even more difficult for countries to achieve their objectives in education and health, both directly and indirectly. Most households affected by HIV/AIDS face deepening poverty which negatively affect decisions on school attendance. This makes it more difficult to achieve educational objectives in general, but most obviously in the case of education of girls, where the need for additional enrolments is greatest. There is evidence in some countries of declining school enrolments, mainly due to intensified poverty in households affected by AIDS, with disproportionate effects on the education of girls. Risk behaviours for HIV are enhanced under conditions where employment opportunities are constrained due to low levels of education and skills.

Similarly, HIV and AIDS have direct and indirect effects on the healthiness of populations, with adverse consequences for morbidity and mortality. Even functioning health care systems are increasingly unable to sustain the capacity to meet higher levels of demand for health care. But a functioning health care system is essential if the needs of those living with HIV are to be met, and if essential services such as those relating to diagnosis and treatment of sexually transmitted infections are to be available. The HIV epidemic not only raises the demands on health systems but also simultaneously erodes the capacity to provide services. Education and health clearly interact: a better educated population will generally be a healthier one. In part this is related to the fact that improvements in education will lead to greater understanding of health factors, such as hygiene and nutrition. In part it relates to improvements in environmental conditions, such as housing and better access to health care, that accompany rising living standards. The improvements in living standards reflect the investment in human capital, with expenditure on education and health being essential to the process. This crucial interaction of health and education has for some time been threatened by the HIV epidemic, while at the same time improvements in both are essential for effective responses to the conditions in which the epidemic thrives. It is very important to be aware that it is possible that education and health systems might be dysfunctional. Thus, investments in these sectors with the aim of developing human capital might not bear fruits.

The study by the Malawi Institute of Management in 2000 revealed the impact of the HIV epidemic on human resource in Malawi. It looked at different ministerial departments such as Ministry of Education Science and Technology, Ministry of Agriculture and Irrigation, Ministry of Health and Population, Malawi Police Service and Ministry of Water Development, which accounted for 80 per cent of the public sector in terms of employment. By far, the largest of the ministries covered was Education with over 62,000 staff in post in 2000. It was found that HIV epidemic affected these departments a great deal affecting staffing and public service delivery. Death was the highest cause of attrition, varying between 40 per cent and 58 per cent between years 1990 and 2000. Deaths were among staff aged 30-34 years which would have continued to contribute to national output for a further 20-30 years in the normal employment cycle, but were unable to do so due to HIV-related mortality. The report concluded that, “all occupational categories experienced excess mortality, with higher

mortality rates among professional staff than among junior technical staff…deaths among Research Scientists and Agriculture Officers are double the average mortality rate in Malawi".

However, there have been improvements in combating HIV/AIDS in Malawi over time. The introduction of ARVs has seen people living with HIV live longer and contribute to national output. There have also been strides in nutritional status, healthcare and awareness that has made the populace more knowledgeable about HIV/AIDS. Over the last decade, impressive efforts to reduce the HIV epidemic have been made at both national and local levels. In 2018, 90% of people living with HIV in Malawi were aware of their status, of whom 87% were on treatment. Of these people, 89% were virally suppressed, meaning the country is very close to reaching the UNAIDS 90-90-90 targets. This equates to 78% of all people living with HIV in Malawi on antiretroviral treatment (ART) and 69% of all people living with HIV virally suppressed. Among children (0-14 years) treatment coverage is lower at only 61% of HIV-positive children accessing ART. New infections have dramatically declined from 66,000 new infections in 2005, to 38,000 in 2018. An impressive prevention of mother-to-child transmission (PMTCT) programme in Malawi has also driven down new HIV infections among children (ages 0-14). In 2018 there were 3,500 new paediatric infections, compared with 15,000 in 2010. Although not adequate, efforts to improve the country's education sector and health sector, there are the first 3 biggest sharers of national budget with agriculture sector. The following is the chart of human capital index for Malawi from 1984 to 2019.

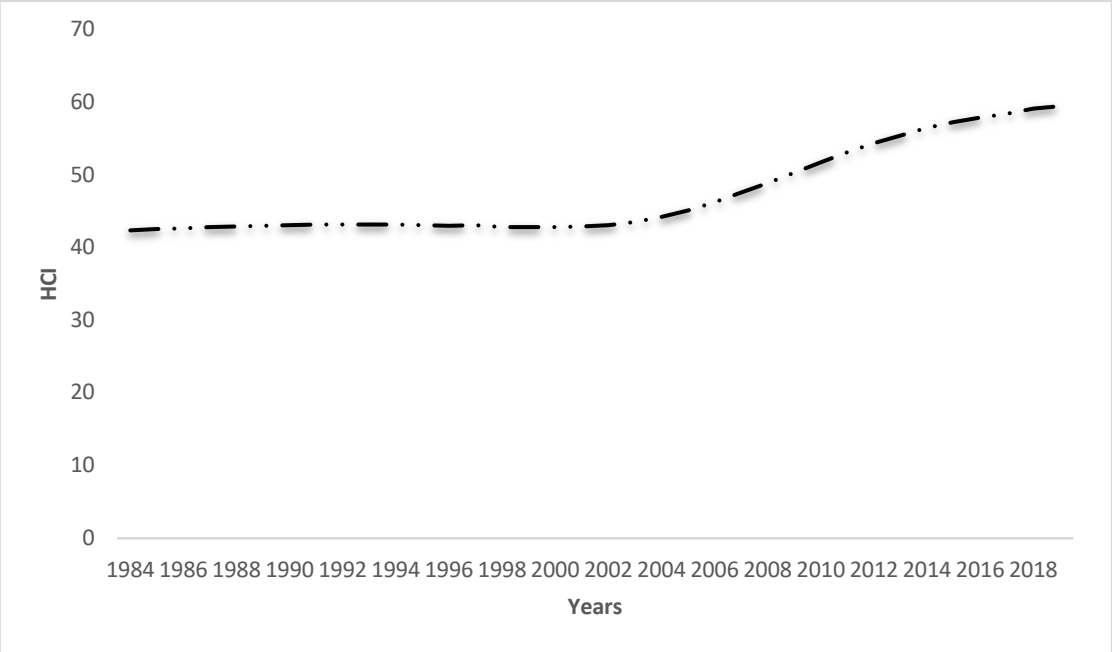

Figure 2. 3: Human Capital Index 1984-2019
Source: Author's computations using data from National Statistical Office (2020)

The Human Capital Index measures how much a generation in a particular context may fall short of realizing their full potential (World Bank, 2020). Countries are scored between 0 and 1 (0 and 100 percent), with 1 or 100 percent implying maximum potential reached. In Malawi, the Human Capital Index estimates that children will be just 40 percent as productive as they could have been had they enjoyed full health and complete education. However, human capital has been increasing in Malawi as demonstrated by in the increasing Human Capital Index value for Malawi from 1984 and 2019 thus from 42.4 to 59.6 (or 0.42 to 0.6). According to a policy brief for Malawi in 2020, a healthy and nourished population is a key driver of human capital.

2.6 Summary

The chapter has provided the genesis of issues of public debt and the state of the economy of Malawi. It has described agriculture's proportion in the GDP and food production in the country. Further, the discussion of economic growth and GDP per capita has revealed that the slow economic growth in the country is caused among others by high economic inequality. The inequality extends but not limited to policy participation, employment, education and health. This has been exacerbated by the COVID 19 pandemic.

Given the aforementioned, it is now contextualized why the government resorts to borrowing as the chapter has shown that public debt has been growing over time for purposes of financing deficits that run every financial year. The chapter has also discussed human capital development in Malawi. This is cognisant of the fact that human capital development is fundamental to sustainable growth. However, human capital development is faced with fiscal challenges such as public debt.

CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

This chapter outlines and reviews some of the relevant theoretical and empirical literature. The most available literature touch on two areas, first the effect of public debt on economic growth and second the effect of human capital on economic growth. Little or none of the literature has looked at the impact of public debt on human capital development. There is far from adequate literature in Malawi which is the focus area of this study on the topic of interest. Section 3.2 discusses the theoretical literature and section 3.3 considers the empirical literature. Contribution of the study to literature is provided in section 3.4. Finally, section 3.5 gives the contribution to literature of the paper.

3.2 Theoretical Literature

Public debt and human capital development relationship

A positive relationship between public debt and human capital development is deduced from Becker's (1962) production function view of how firms spend on activities that produce human capital. Becker (1962) focused on activities that affect future real income through making people resourceful. He referred to such activities as 'investing in human capital'. Examples of human capital investments are among others healthcare, education, on job training, and acquisition of knowledge of trends in fundamentals of the economy[3]. Although Becker's (1962) arguments were at the firm level, they can be extended to the macroeconomy without loss of generality. An economy that invests more in its education and health improves the human capital of its citizenry.

Almost every culture has a common slogan that attempts to communicate that "health is wealth" and examples include English, Hausa, Serbian, Yeddish and Malawian proverbs just to name a few. According to the commission for macroeconomics and

[3] For more information, read Becker (1962)

health report published in 2001, health is a source of personal and economic development capacities at individual and household levels. Among many others, the commission reports that health is the foundation for job productivity. Nobel Laureates Theodore Shultz and Gary Becker having shown that health and education are the root of individual's economic productivity, they concluded that the two are keystones of human capital (WHO Commission & WHO, 2001). The WHO argued that a healthy people is very vital for poverty reduction, economic growth, and long-term economic development. While this view is shared by policy analysts and makers, the qualitative and quantitative significance, and investments allocations by developing countries and donors momentously undervalue it. The commission was basically providing linkage between health and economic growth which in short is that less diseases (health) leads to high productivity and high burden of diseases lean towards obstructions of economic progress. This makes investment (or disinvestment) in health and education important (or deleterious) to economic growth. A comparison of Africa to East Asia showed that Africa's stunted growth is statistically on account of disease burden (Bloom & Sachs, 1998). Public debt takes away resources for investment in health leading to increased diseases then low productivity and eventually reduced growth. At macroeconomic level, there is evidence that countries with the weakest conditions of health and education fail to achieve sustainable growth relative to countries with better conditions of health and education (WHO Commission & WHO, 2001).

High debt and debt service withdraws resources that could be used for productive activities such as poverty reduction and therefore funds are diverted away from public investment in areas like and education (Pattillo et al., 2004). The argument is that resources that could be used for human capital development i.e. investment in education and health are used for repayment of previous debt. Public debt therefore, can affect human capital negatively by reducing government expenditure on health and education. It can also be argued that a positive relationship between public debt and human capital is possible if such debt is used for expenditure in education and health.

In his study, human capital formation, public debt and economic growth, Greiner (2008) presented an endogenous growth model in which resources for financing expenditures in the human capital (thus the education sector) come from taxes and public debt. He evaluated that a loose fiscal policy, where debt stabilization is not the main concern for government, only guarantees prolonged growth in the long run if the government is a creditor. Equally, he argues that if the government does not invest adequately in human capital formation, continued growth is also a toll order, with the exception when government is a creditor.

Extending from his own work, Greiner (2016) incorporates a comparative analysis of public debt policies contrary to Greiner (2008). Looking at the impact of diverse fiscal policies on welfare and economic growth, he analyzed the effects of a balanced government budget. He compared such effects to slight deficit policy in which public debt grows at a rate less than GDP as well as to effects of public debt growing at par with GDP and the rest of the rates of endogenous variables. This is referred to as a strong deficit policy. He showed that as far as growth is concerned, the balanced budget policy is the same as slight deficit policy. He also found that the balanced budget policy gives a growth rate that is more than the strong deficit policy in the long run, except when the government is a creditor to the private sector. He deduced a higher growth rate relative to balanced budget and slight deficit policy when public debt is negative.

Public debt in growth model

Theoretical literature skews to a negative relationship between public debt and economic growth (see Elmendorf & Mankiw, 1998; Samuelson 1958; Krugman, 1988). The negative relationship is supported by the conventional view of debt by Elmendorf and Mankiw (1998) and is most applicable in the long run. It posits that an economy facing high debt burden will crowd out private investment (De-Vita, Trachanas, & Luo, 2018; Shahor, 2018; Bahal, Raissi, & Tulin, 2018; Chudik et al., 2017; Kim, Ha, & Kim, 2017). Increased borrowing by Government influences interest rates to increase which discourages investment in the country. Eventually, economic growth decelerates

over time. The conventional view of debt by Elmendorf and Mankiw (1998) most applicable in the long run considered the private sector's budget constraint;

$$Y = C + S + T \tag{3.11}$$

Where Y=national income; C=private consumption; S=private saving; and T=taxes less transfers. They also equate national income to national output;

$$Y = C + I + G + NX \tag{3.12}$$

Where I is domestic investment, G are the government purchases and NX is net exports. Equating Ys in equations 3.11 and 3.12 gives;

$$S + (T - G) = I + NX \tag{3.13}$$

The summation of private and public saving equals the summation of investment and net exports. They also considered the identity that nation's current account balance must equal negative of its capital account balance $NX = NFI$ where NFI is the net foreign investment/negative capital account balance which is the investment by domestic residents abroad less investment by foreign residents. After substitution of NX for NFI, the equation above gives;

$$S + (T - G) = I + NFI \tag{3.14}$$

The standard view is that the private saving rises less than the pubic saving declines so that national savings declines. the implication is that in total, domestic investment and investment abroad decline. Reduced domestic investment over time reduces domestic capital stock and eventually leads to reduced output and income.

Blanchard (1985), Diamond (1965) and Modigliani (1961) explain the negative relationship between debt and economic growth using the overlapping generations

model. The model argues that an increase in public debt uses up savings for a nation that should have been postponed for future generation. As a result of reduced national savings, interest rates will increase and discourage investors implying low build-up of capital hence stagnated growth. The debt overhang as proposed by Krugman (1988) also theoretically explains the linear negative relationship between debt and economic growth. It occurs when the present value of national wealth of a country with high debt obligations is lower than its total amassed debt (Snieška & Burkšaitienė, 2018; Burhanudin et al., 2017; Ewaida, 2017). Shkolnyk & Koilo (2018) cite country's inefficiencies in managing loans as an explanation of why debt overhang occurs. Governments may use loans to settle already accumulated debts or to spend on non-productive activities which are not economic growth stimulating. However, Elmendorf and Mankiw (1998) argued that public debt can also be growth enhancing in the short run. Through generation of employment and productive investment, an exogenous positive shock to public debt encourages aggregate demand and output.

Keynesian view of Government borrowing: Keynesian view of government borrowing is similar to the short run conventional view of debt by Elmendorf & Mankiw (1998). Keynes argued for the need for government borrowing, especially in times of crisis, to finance a sizeable expansion of government spending. With the multiplier a mechanism whereby debt-financed public investment generates matching private saving (net of private investment) plus public saving, Keynes concluded that increasing public debt need not place upward pressure on the level of interest rates, so long as policy can successfully manage the psychology of the debt market (Aspromourgos, 2018). His argument was more concerned with long interest rates and hence the term structure of rates which is Keynes' basis that policy can manage and shape long rates. Thus, Government can spend its way out of debt. "It is not the miser who gets rich; but he who lays out his money in fruitful investment" (Keynes, 1972, p. 123).

According to Keynesian theory, changes in aggregate demand, whether anticipated or unanticipated, have their greatest short-run effect on real output and employment, not on prices. This is well represented by the Phillip's curve that depicts that inflation rises

only slowly when unemployment falls. Keynesians believe that what is true about the short run cannot necessarily be inferred from what must happen in the long run, and we live in the short run. Keynes' argued that in the long run, we are all dead to make the point. Keynesians believe that, because prices are somewhat rigid, fluctuations in any component of spending; consumption, investment, or government expenditures cause output to fluctuate. Holding all elements of spending constant, an increase in government spending increases output. Keynesian models of economic activity also include a so-called multiplier effect that postulate that output increases by a multiple of the original change in spending that caused it.

Other contributions are concerned with the relationship between external debt and economic growth. For instance, "debt overhang" by Krugman, (1988) is understood as a condition where the expected ability of a country to repay its external debt plummets beneath the value of debt at the contract time. Further, a theoretical model by Cohen, (1993) conceives that external debt negatively affects investment, a relationship which extends to economic growth as suggested by Clements et al. (2003).

Human capital and economic growth relationship

The view that human capital is an important driver of economic growth in development economics literature is theoretically supported by the human-capital augmented Solow-Swan model (see Mankiw, Romer and Weil, 1992; Ram, 2007). For purposes of reference let us consider the following fundamental Solow differential equation for capital accumulation (3.15) and the Solow equation (3.16);

$$\dot{k} = \dot{k}(k_t) = sy_t - (n + g_A + \delta)k_t = sf(k_t) - \gamma k_t sk_t^{\alpha} \qquad 4.15$$

where $\gamma \equiv (n + g_A + \delta) > 0$

$$g_k = \frac{\dot{k}}{k} = \frac{sy}{k} - \gamma = sAPK - \gamma = \frac{S}{\alpha} MPK - \gamma \qquad 4.16$$

Where s= the savings ratio; y_t= the intensive output; n= the growth rate of labour; g_A= the growth rate of technology; k_t= the intensive capital; δ= the depreciation rate; APK= the average product of capital; and MPK is the marginal product of capital.

Human capital accumulation: We suppose that the proportion of time individuals spend working in the production of goods is u and their human capital per unit of labour available to the economy is a stock h, then the human capital accumulation process is modelled with constant returns to h in the function:

$$\dot{h}_t = \eta h_t(1-u) \tag{4.17}$$

where $\eta =$ positive scalar
$(1-u) =$ fraction of time spent on skill acquisition which has constant growth rate below

$$g_{\bar{H}} = \frac{\dot{h}_t}{h_t} = \eta(1-u) \tag{4.18}$$

The intensive production function in the goods industry is specified as;

$$y_t = Ak_t^{\propto}(uh_t)^{1-\propto} \tag{4.19}$$

Given the Solow-like actual and required investment schedules, the fundamental equation of motion is stated as:

$$\dot{k} = s[Ak_t^{\propto}(uh_t)^{1-\propto}] - (n+\delta)k_t = \Phi k_t^{\propto} h_t^{1-\propto} - (n+\delta)k_t \tag{4.10}$$

Where $\Phi = \mathrm{sA}u^{1-\propto}$
Growth rate of capital per worker is given by;

$$g_{\bar{K}} = \frac{\dot{k}}{k} = \Phi(\frac{k}{h})^{\propto -1} - (n + \delta) \quad 4.1$$

The economy will converge to a constant steady-state growth if the capital stock grows at the same constant rate of skill acquisition.

From (3.19) using (3.20) and (3.21), the growth of per capita income is positively driven by both the level and growth rate of human capital:

$$g_{\bar{Y}} = \propto g_{\bar{K}} + (1-\propto) g_{\bar{H}} = \propto \left[\Phi \left(\frac{k}{h}\right)^{\propto -1} - (n + \delta)\right] + \eta(1-\propto)(1 - u) \quad 4.122$$

This means that the greater the previously accumulated skill levels (scale effect) and the greater the fraction of time devoted to such skill acquisition the greater the contribution of such skills in permanently raising future prosperity.

3.3 Empirical Literature

Public debt, Human capital and economic growth

Kgakge-Tabengwa (2014) using panel data from 1980-2013 assessed how shocks to public debt and government expenditure would affect human capital and economic growth of emerging economies including Malawi. She intended to capture fiscal challenges i.e., public debt which developing countries are confronted with when it comes to improving human capital as it is fundamental to sustainable growth. It was found that high public debt stock, beyond 30-40 percent debt stock to GDP ratio, reduce the effect of human capital on the growth of output by restricting resources available for government to spend in developing human capital. Instead of looking at shocks, our study looks at direct and indirect effects (through human capital) of public debt on economic growth specifically for the case of Malawi.

Human Capital Development and Economic Growth

Development economics literature reveals human capital to be crucial in driving economic growth (Mankiw et al., 1992; Romer, 1986; Barro & Sala-i-Martin, 2004; Gyimah-Brempong & Wilson, 2004; Hanushek & Woessmann, 2008; Qadri &

Waheed, 2014). Many authors differ in how they measure human capital, some prefer using education to be the standard human capital metric thus primary, secondary and higher education enrollment rates. Some prefer to use health as a measure instead. Recently, scholars are advocating using both education and health to measure human capital which is also adopted for purposes of this study. Literature reviewed below concerns the impact of human capital on economic growth.

A study by Milanzi (2018) used ARDL on time series data bridging the period 1995 to 2017 to investigate how investments in human capital affects economic growth in Malawi. He found that education expenditure by government dampens growth whereas total government expenditure on health sector is growth stimulating.

Ogundari and Awokuse (2018) studied the effect of human capital on economic growth in Sub-Saharan African region (SSA). They considered health and education as separate in order to proxy human capital. Employing a dynamic model based on the system generalized method of moments (SGMM), they analyzed panel data from 35 countries for the period 1980 to 2008. Their empirical results revealed that both health and education as human capital metrics are growth stimulating, with health contributing relatively more than education. They present that the finding underscores the need to use both health and education to proxy human capital which confirms literature that none of the two measures is more important than the other. Our study partly learns from this paper and combines health and education.

In their study on 'the role of human capital formation in economic growth in Pakistan', Ali et al., (2012) used time series data covering the 1972-73 financial year to 2010-11 financial year. They proxied human capital with education enrollments and found that education enrollment index (EEI) hence human capital positively influences economic growth. Their work was similar to Gong et al., (2004) who identified human capital only as education, our work uses measurement of human capital as adopted by Kgakge-Tabengwa (2014) where human capital constitutes health and education.

Mankiw et al. (1992) used enrollment rates for secondary school to represent human capital and examine its influence on economic growth. They found human capital to be growth stimulating. In addition, using the same education, Bils & Klenow (2000) established that increased school enrollment rates lead to increased long run per capita growth of income. In support of this, they recommended that deliberate efforts to improve the quality of education will boost production and eventually growth over time. These two studies use education, specifically enrollment rates to measure human capital.

Hongyi and Huang (2009) study 'the impact of health and education on economic growth' in China. They used panel data models in their estimation to analyse data ranging from 1978 to 2005. They found that both health and education stimulate economic growth. This confirmed the claim by Rengin (2012) who reviewed the connection of expenditures in health to economic growth in Turkey. He contended that education and health are complementary and health should be treated equal to physical capital and education in terms of investments regarding the development of the country.

Agiomirgianakis et al. (2002) engaged a dynamic panel data approach to assess 'the role of human capital on economic growth.' With a sizable panel data set for 93 countries spanning over 27 years, they revealed that education improves economic growth arguing further increased schooling at all levels increases this effect.

Using international total health care expenditure panel data from 31 countries for the period between 1986 and 2007 in order to investigate how increased expenditure in health care affects economic growth, Wang, (2011) found that spending on healthcare positively influences economic growth but low economic growth lowers expenditure on healthcare. Similarly, Baltagi & Moscone (2010) found a positive relationship after estimating the same relationship using panel data from 20 OECD countries between 1971 and 2004.

In their study on the role of human capital in economic growth in Pakistan and Sri Lanka, Abbas and Nasir (2001) offered a comparative analysis. The results were disaggregated according to primary, secondary and tertiary education as measures of human capital. Secondary school enrolment rates and tertiary education enrolment rates had growth inducing effects for Pakistan and Sri Lanka. On the contrary, primary school enrolment rates had reducing effects on economic growth for the two countries. So generally, human capital was found to have an important function in influencing economic growth of the two countries. The paper was mainly concerned with human capital as measured by education and economic growth.

Contrary to many studies, Granados, (2012) using cross-section data spanning between 1840 and 2000 collected from England and Wales found that improvements in health dampen economic growth. Perhaps the explanation for this is offered by Van Zon and Muysken (2001) who said that the reduction in income per capita is mostly associated with health preference and aging population. Countries with poor health standards show slow growth.

Public Debt and Economic Growth

There seems to be more literature on external debt and economic growth than on "gross public debt and economic growth. Most studies support the existence of a non-linear relationship between external debt and economic growth with detrimental effects only beyond some ratio of debt to GDP. For instance, Pattillo et al. (2002) in his study on external debt and growth using a panel of data for 93 developing countries covering 1969 to 1998 discovered that external debt becomes deleterious to GDP per capita growth at debt to GDP ratio beyond the range 35-40 percent. Equally, Clements et al. (2003) studying external debt, public investment and growth in 55 developing countries from 1970 to 1999 found this ratio of external debt to GDP to be approximately 20-25 percent of GDP. In a study by Vaca et al. (2020) on how public debt affects economic growth in Mexico with data spanning from 1994 to 2016, a dynamic model

demonstrated a concave relationship with debt to GDP ratio threshold of 27 percent of GDP beyond which gains in growth become less and less. Growth rates might reach close to 0 percent or even negative if the ratio of debt to GDP exceeds 55 percent. The non-linearity between external debt and growth is also confirmed by Smyth and Hsing (1995) and Cohen (1997). On the contrary, Schclarek (2004) studying the relationship between external debt and per capita income growth using panel data obtained from 59 emerging economies covering from 1970 to 2002, found no existence of an inverted U-shape relationship but found a negative and linear relationship between external debt and GDP per capita growth.

Literature contains very few studies on how public debt relates to economic growth in Malawi. Tchereni et al. (2013) assessed external debt and economic growth in Malawi from 1957 to 2003. The relationship though negative showed that external debt does not influence economic growth in Malawi. Our study intends to consider the gross public debt to analyze the effect of public debt on economic growth in Malawi while interrogating a possible human capital channel.

Lartey et al. (2018) used in their study data from 50 African countries covering period between 1980 and 2015 in order to evaluate the effect of public debt on economic growth using an ordinary least square estimation technique for a static panel regression model and the generalized method of moment estimation technique for a dynamic panel regression model. The empirical results from the two models suggested that public debt is growth dampening and also provided evidence of non-linearity in such a relationship.

The Sub-Saharan Africa, known for its unprecedented levels of debt in the recent decades has made the discussion of the impact of public debt on economic growth unavoidable and acutely important. Sanusi et al. (2019) explore this by examining the non-linear effects of public debt on economic growth in Southern African Development Community (SADC). In a panel structure, they used a non-linear autoregressive distributed lag model (NARDL). They found a long run twofold impact of public debt

on economic growth in SADC countries. They also found that public debt stimulates growth up to the level of 57 percent of GDP and beyond this level, any accumulation of more debt counters economic growth in SADC. In the short run however, the impact was negative, nonlinear and insignificant suggesting public debt does not have impact on economic growth.

Using data covering 40 years from 1970 to 2011, Checherita-Westphal and Rother (2012) studied the impact of national debt on GDP per capita growth in 12 euro area countries. They used the Two Stage Least Squares and General Method of Moments (GMM) estimation techniques. They established a concave relationship implying nonlinearity. The debt to GDP threshold was found at around 90-100 percent of GDP with a possibility of reaching 70 percent of GDP.

3.4 Contribution to literature

Summarizing the reviewed literature, it can be categorized into three parts. First, the literature on studies looking at public debt, human capital and economic growth at once. Second, literature on studies looking at the impact of human capital on economic growth. And third, literature on studies looking at the impact of public debt on economic growth. Some studies have been reviewed under the first class of literature and it has been observed that one study by Kgakge-Tabengwa (2014) pertains to the impact shocks to public debt on human capital and economic growth. The other two, Greiner (2008) and Greiner (2016) were theoretical studies.

The observations made under the second class of literature are that the studies generally find a human capital development to be positively related to economic growth. Further, the studies generally used education (primary, secondary and higher education enrollment rates) as a metric for human capital except studies by Kgakge-Tabengwa (2014) and Ogundari and Awokuse (2018) who use education and health to proxy human capital.

Lastly on the third class of literature, the theoretical literature tend to point to a negative relationship between public debt and economic growth Buchanan and Buchanan (1958) and Meade (1958), Modigliani, (1961). All empirical studies have generally found a negative and nonlinear relationship between public debt and economic growth except studies by Schclarek (2004) and Sanusi et al. (2019).

Most of the studies in the aforementioned classes of literature examined regions such as SADC, Euro area and African countries or a group of countries such as developing countries or developed countries. Vaca et al. (2020) and Tchereni et al. (2013) on the other hand, were country specific studies.

Having summarized the reviewed literature, the question of how this study contributes to literature still remains. Although previous studies recognize that public debt affects economic growth directly and indirectly, they only estimated the direct relationship. It is the view of this study, that such an approach underestimates the effect of public debt on economic growth. This is where the study comes in.

3.5 Summary

The chapter has presented a review of both theoretical and empirical literature on public debt, human capital development and economic growth. The theoretical literature presented four relationships: A postulated negative relationship between public debt and human capital development; interactions among public debt, human capital development and economic growth; a purported positive relationship between human capital development and economic growth; and a hypothesized negative relationship between public debt and economic growth. The empirical literature was reviewed into three relationships namely: a relationship among public debt, human capital development and economic growth; a relationship between human capital development and economic growth; and the relationship between public debt and economic growth. Lastly, the chapter has summarized the literature and presented how the study contributes to the existing literature.

CHAPTER 4

METHODOLOGY

4.1 Introduction

This chapter presents the methods used to achieve the stated study objectives. Section 4.2 provides the empirical frameworks of the estimated econometric models. Section 4.3 presents the sources of data used in the study. Time series properties of the variables are presented in section 4.4. Lastly, Section 4.5 summarises the chapter

4.2 Empirical model

In order to achieve the objectives of the study, we nest the conceptual framework in an ARDL model. The choice of the ARDL modelling framework is justified on three fronts: First, the order of integration of series were a combination of I(0) and I(1); second, to uncover the dynamic relationship between public debt and economic growth as postulated by theory; third, there is a possibility of a two way causality between economic growth and human capital development. We do not bother to determine the existence of such a relationship. This is because specifying an ARDL model where the regressors enter with lags mitigates any contemporaneous causation from the explained to the explanatory variables which might result in biasness of the estimates (Catão & Terrones, 2003). To capture both direct and indirect effects of public debt on economic growth, we estimate two models. The first model answers the first objective of assessing the effect of public debt on human capital development. The predicted human capital development from the first model is used in the second model. The second model is a growth model augmented with debt and predicted human capital development. The predicted human capital development captures the indirect effect of public debt on economic growth and answers the second objective of the study. Public debt in the second model captures the direct effect of debt on economic growth and therefore answers the third objective.

Model 1: Human Capital Development

$$HDI_t = \beta_0 + \varphi ECT + \sum_{j=1}^{p} \lambda_j HDI_{t-j} + \sum_{i=0}^{q} \vartheta_i Eduexp_{t-i} + \sum_{i=0}^{k} \sigma_i Healthexp_{t-i} + \sum_{i=0}^{l} \alpha_i Debt_{t-i} + \eta_t \quad 4.1$$

Where HDI_t is Human Capital Index in year *t* whose computation is guided by Kgakge-Tabengwa (2014) as follows;

$$HDI_t = \gamma Health_t + (1-\gamma) Educ_t \; ; \; \gamma = 0.5$$

$$Health_t = (\frac{Life\ Expectancy}{60\ years}) \times 100$$

$$Educ_t = 0.1(primary) + 0.4(secondary) + 0.5(tertiary)$$

We believe that education and health are equally important in the development of human capital. Increased accumulation of knowledge over time improves efficiency in productivity. Equally, a healthy worker is seen as a productive worker. This justifies the equal weighting of the health indicator and the education indicator. With regards to the weighting of enrolments for primary, secondary and tertiary education, a sensitivity analysis conducted shows that the education indicator is almost insensitive to weighting. Therefore, the question of justification is rendered immaterial (See Tables 7.1-7.4 in Appendices 1A and 1B). However, the chosen ascending weighting from primary fits the data better and we speculate that it is not counter-intuitive.

β_0 = intercept; $ECT =$ error correction term; $Eduexp_t =$ government expenditure in education per capita in year *t;* $Healthexp_t =$ government expenditure in health per capita in year *t;* $Debt_t =$ Debt stock as a percentage of GDP in year *t;* $\eta_t =$ Error term.

Model 2: Growth Model

$$lnGDPC_t = \phi_0 + \beta T + \gamma ECT + \sum_{j=1}^{p} \lambda_j lnGDPC_{t-j} + \sum_{i=0}^{q} \delta_i' \Delta x_{t-i} + \mu_t \quad 4.12$$

Where $lnGDPC_t$ is the log of GDP per capita; ϕ_0 is an intercept; ECT is the error correction term; x_{t-i} is a vector of contemporaneous and lagged exogenous variables impacting on GDP per capita which include capital measured as gross capital formation as a percentage of GDP in year *t,* labour measured as log of the working age population (15-60 years of age) in year *t,* predicted HDI in year *t* from model 1 above and debt

measured as debt stock as a percentage of GDP in year *t*; while *T* is the trend term and μ_t is an uncorrelated error term. The terms β, γ, λ , and δ are slope parameters to be estimated.

4.3 Data Sources

The study used annual time series data for the period 1984 to 2019. The choice of the period of study was on account of availability of data particularly public debt series. The data from the Reserve Bank of Malawi (RBM) on public debt only dates back to 1984 in Malawi. In addition to RBM, the study uses data on GDP per capita, labour and capital from World Bank, data on education expenditure and health expenditure from Malawi Ministry of Finance and data on Human Capital Index from National Statistical Office (NSO).

4.4 Time Series Properties

The section provides a discussion of standard properties of time series data. The trend components in the series of the variables in the two models were removed in the estimation process by including trend terms as exogenous variables. For the second model, a quadratic term of the trend was included in addition to the trend term in order to capture the nonlinearity in the trend. The inclusion of the trend term in the estimation process removes the deterministic trend in all the series in the regression at once.

4.4.1 Stationarity Tests

In order to determine the orders of integration for the series under consideration, six different tests were conducted on all the series in the order of strength and exact order of presentation here. The tests conducted are the ERS Dickey-Fuller test with generalized least squares de-trending developed by Elliot, Rothenberg and Stock, J. (1996), the standard augmented Dickey - Fuller (ADF) test, the Phillips-Perron (PP) test, Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test, Zivot & Andrews test and the Clemente-Montanes-Reyes test. The ERS test, uses the generalised least squares (GLS) method to remove the intercept and/or trend terms from the series prior to

estimation of the unit root test equation. The test then substitutes the GLS de-trended series for the original series, and proceeds to estimate the DF/ADF tests. The test is called the Dickey-Fuller Test with GLS De-trending (DFGLS) or the ERS test. The ERS test is run first because it helps in determining optimal lags that are used in the subsequent stationarity tests, it suggests three options for selecting a suitable lag number: the Ng-Perron sequential t, the minimum Schwarz information criteria, and the Ng-Perron modified Akaike information criteria (MAIC). The MAIC is the most preferred because it is more recent and its advantages surpass the other two criteria for optimal choice of lags as supported by Monte Carlo experiments (Ng and Perron, 2001). There are two possible alternative hypotheses for the ERS test, the first is that the series is stationary around a linear trend; the other being that it is stationary without a linear time trend. The DFGLS test is executed by first computing the estimates of the intercept and trend through GLS in the first alternative hypothesis. The test equation for the ADF test is written as follows;

$$\Delta y_t = \alpha_1 + \alpha_2 t + \delta y_{t-1} + \sum_{j=1}^{m} \phi_j \, y_{t-1} + \eta_t \qquad 4.13$$

The hypothesis of a unit root is determined by the *tau*-statistic for the test of the null hypothesis $\delta = 1$, with proper critical values. The number of lagged difference terms was empirically determined so as to yield an error term that is serially independent using the Modified Akaike information criterion (MAIC). But the ADF and DF-GLS tests are known to be weak under serial correlation. In order to remedy problems with ADF and DF-GLS tests, Phillips and Perron (1988) proposed that the DF test should be used, but the tau-statistic should be modified using a non-parametric procedure. This is to make sure that the asymptotic distribution of the statistic is not affected by serial correlation. We therefore augmented the ADF and DF-GLS to come up with PP test. The aforementioned discussed tests that were conducted so far fall short on the fact that they fail to determine whether or not a series is trend stationary and also underperform under fractional stationary series. The KPSS test whose null hypothesis is trend

stationarity then was conducted to supplement the “unit root” tests to ensure that the series were not trend stationary. Again, since the “unit root” and “trend” stationarity tests discussed above do not account for the possibility of structural breaks, we augmented them with Zivot and Andrews (1992) and the Clemente-Montanes-Reyes test (1998) tests of stationarity which take such structural breaks into consideration.

4.4.2 Cointegration Test

In order to assess whether or not long run relationships exist in both the first and second models, the Bounds Test for cointegration was invoked. The ARDL bounds test method championed by Pesaran et al. (2001) was used. The approach is more advantageous than the classical cointegration tests. The first advantage is that it is used when the series are a combination of I(0) and I(1). The second advantage being that the approach through a simple linear transformation, allows for the derivation of the unrestricted error correction model (UECM) which harbours short and long run dynamics. The last advantage is that the approach delivers results that are consistent even for a small sample.

4.4.3 Diagnostic Tests

In order to verify the appropriateness of the models, diagnostic tests were conducted. The Durbinalt test for serial correlation was conducted for both models. It performs Durbin’s alternative test for serial correlation in the error term and has the null hypothesis of no serial correlation. This test still performs even when not all the independent variables are strictly exogenous as opposed to the Durbin-Watson test. In addition to the Durbinalt test, the Breusch–Godfrey test for higher-order serial correlation with the null hypothesis of no serial autocorrelation was conducted. For the existence of autoregressive conditional heteroskedasticity, the Engle’s Lagrange multiplier (LM) test was performed for the two models and its null hypothesis is no conditional heteroskedasticity. The Breusch-Pagan test for heteroskedasticity was also conducted and has the null hypothesis of constant variance. The White’s test for heteroskedasticity is another test for heteroskedasticity that was used. The Breusch-

Pagan test is a default test for linear forms of heteroskedasticity and has the following weaknesses: the test only works well for linear forms of heteroskedasticity; it does not work when no constant is included and underperforms when errors are not normally distributed. The White's general test is a special case of Breusch-Pagan used for such cases (Williams, 2020). It has the null hypothesis of homoskedasticity. The variance inflation factor (VIF) was used to test for multicollinearity in order to measure how much the estimated regression coefficient increases if predictors are correlated.

4.5 Summary

The chapter has presented and discussed the data sources for the variables in the study. It has provided the empirical models employed. In a nutshell, two ARDL models were run for the first and second models.

In the first model, the aim was to capture the impact of public debt on human capital development by looking at how the public debt coefficient impacts HDI. After estimation, predicted HDI was obtained from the first model to be included in the second model. The inclusion of the predicted HDI obtained from the first model was intended to capture the indirect impact of public debt on economic growth via human capital development. The predicted HDI is understood to be the HDI that is affected by public debt.

CHAPTER 5

ESTIMATION AND DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the empirical findings of the analysis of Public debt, Human Capital and Economic Growth in Malawi. Section 5.2 presents the descriptive statistics and discusses only those statistics of variables of interest. Time series properties are presented and discussed in Section 5.3 with subsections 5.3.1 presenting and discussing stationarity tests. Estimation results of models 1 and 2 are presented and discussed in Section 5.4 as well as their associated diagnostic tests. Section 5.5 provides the summary of the chapter.

5.2 Descriptive Statistics

In the Table 5. 1 below are the summary statistics of series considered in the study from the sample data for the period 1984 to 2019.

Table 5. 1: Descriptive statistics

	Obs	Mean	Sd	Min.	Max
Per capita GDP	36	60240.56	88489.34	245.15	306990.3
Debt % of GDP	36	94.86	62.64	25.10	323.27
Capital	36	16.41	4.91	10.78	29.10
Labour	36	6273512.61	1770374.21	3537137	1.00e+07
Edu Exp	36	1527.67	2197.99	8.09	8496.42
Health Exp	36	1163.34	1648.97	2.96	5533.20
HDI	36	47.44	6.06	42.44	59.56
N	36				

On average, the GDP per capita from 1984 to 2019 was about 60, 240.56 Malawi Kwacha for an ordinary individual. This is equivalent to 75.57 US dollars and GDP per capita ranged from 245.15 to 306, 990.30 Malawi Kwacha. It is also revealed that public debt as a percentage of GDP in the period under consideration ranged from 25.1 percent of GDP to 323.3 percent of GDP and on average Government borrowed 94.9 percent of its Gross Domestic Product.

The lowest ever recorded was in 2006, possibly because of the debt relief that took place the same year. The maximum debt as a percentage of GDP ever reached was in the year 1994. We speculate that the referendum in 1993 and the subsequent campaign costs of first multiparty elections were the causes. On average, expenditures per capita in education and health are worrisomely low recording 1, 527.67 Malawi Kwacha and 1, 163.34 Malawi Kwacha, respectively thus less than 2 US dollars was spent by Government per individual on education and health. The human capital index captures the quantity of human capital that a child born in the current period is expected to accumulate by the age of 18, when the risks of poor health and poor education that exist in child's country are considered (World Bank, 2020). On average human capital index in the period under study was 47.4 percent, this indicated that the earnings potential of a child born between 1984 and 2019 was 47.4 percent of what they could have been with education and health at their full potential.

5.3 Time series properties results

This section presents and discusses stationarity results and cointegration results.

5.3.1 Stationarity results

Table 5. 2: Stationarity Test Results

Variable	DFGLS Cv1: -3.770 Cv2: -3.386 Cv3: -3.049	ADF Cv1: -2.453 Cv2: -1.696 Cv3: -1.309	PPerron Cv1: -17.880 Cv2: -12.820 Cv3: -10.400	KPSS Cv1: 0.216 Cv2: 0.176 Cv3: 0.146	Zandrews Cv1: -5.57 Cv2: -5.08 Cv3: -4.82	Clemao2 Cv1: Cv2: -5.490 Cv3:	Result
GDPperCapita	Level: -1.855	Level: -0.915	Level: -0.290	Level: .3	Level: -3.992	Level: -2.066	I(0)
Public Debt	Level: -1.966 1st Diff: -3.692	Level: -1.160 1st Diff: -3.581	Level: -13.472 1st Diff: -41.067	Level: .155 1st Diff: .0963	Level: -5.123 1st Diff: -9.468	Level: -6.758 1st Diff: -6.503	I(1)
Capital	Level: -3.037	Level: -2.209	Level: -14.140	Level: .0928	Level: -4.283	Level: -1.218	I(0)
Labour	Level: -0.411	Level: 1.127	Level: -0.339	Level: .147	Level: -5.775	Level: -2.905	I(0)
HDI	Level: -1.011	Level: 2.746	Level: 1.416	Level: .18	Level: -5.592	Level: -2.220	I(0)

Education expend	Level: -1.678	Level: -1.111	Level: -0.657	Level: .237	Level: -2.649	Level: -3.054	I(0)
Health expend	Level: -1.246 1st Diff: -4.038	Level: -1.135 1st Diff: -3.582	Level: -0.737 1st Diff: -41.077	Level: .309 1st Diff: .0989	Level: -3.836 1st Diff: -8.433	Level: -3.263 1st Diff: -7.886	I(0)

Note: DF-GLS is a modified Dickey-Fuller t test for unit root with series transformed by generalized least squares which also gives the optimal lag length; ADF is the Augmented Dickey-Fuller test for unit root; PPerron is the Phillip-Perron test for unit root; KPSS is the Kwiatkowski, Phillips, Schmidt, and Shin test for trend stationarity; Zandrews is the Zivot-Andrews test for unit root with structural breaks; Clemalao2 is the Clemente-Montanes-Reyes test for unit root with two structural breaks. The power of the tests increases from the left to the right of the Table. Where different tests give different results, the result of the most powerful test is adopted and when KPSS result is trend stationarity, the result I(0) is adopted unequivocally.

Definitions:

Cv1= Critical value at 1 percent significance level; Cv2= Critical value at 5 percent significance level; Cv3= Critical values at 10 percent significance level.

I(0) means the series were stationary in levels; and I(1) means the series were stationary after first differencing.

The results presented in Table 5. 2 revealed that some variables were stationary in levels while others were stationary after differencing once. On one hand, only Public debt was nonstationary in levels and stationarity was achieved after first differencing implying the series were integrated of order 1 thus *I* (1). On the other hand, GDP per capita, Capital, Labour, Education expenditure per capita, Health expenditure per capita and Human Development index were stationary in levels. This finding triggers the use of the ARDL econometric models for both model 1 and model 2 as well as a search for a long-run relationship amongst the series in both models.

5.3.2 Cointegration test results

Table 5. 3: Bounds Test results for model 1 and model 2

Model 1			
F-statistic	F= 11.49		
	10 percent	5 percent	1 percent
Critical Values: [I_1]	4.35	4.89	5.61
[I_0]	3.23	3.69	4.29
Model 2			
F-statistic	F= 6.17		
	10 percent	5 percent	1 percent
Critical Values: [I_1]	3.48	3.90	4.44
[I_0]	2.26	2.62	3.07

As mentioned before in section 4.5.2, the Bounds Test for cointegration is a test to determine if there is a long run relationship among variables. The null hypothesis is '*there is no cointegration'* which means no long run relationship among variables. The decision rules are first case; to fail to reject the null hypothesis if F-statistic is less than

the critical value for I(0), second case; to reject if the null hypothesis if F-statistic is more than the critical value for I(1) and third case; inconclusive if the F-statistic is between critical values for I(0) and I(1). Here, we fall in the second case for both models as the F-Statistic is greater than critical values for I(1) at all levels of significance. We therefore reject the null hypothesis meaning that there is a long run relationship among variables in both models.

5.4 Estimation Results

The section presents diagnostic test results and discusses model estimates. Table 5.5 contains the long run results for both the first and second models while Table 5.6 presents the short run results for the two models.

5.4.1 Diagnostic test results

The results of the different diagnostic tests on Model 1 and Model 2 to verify the appropriateness of the specified models are given in the Table 5.4 below.

Table 5. 4: Diagnostic test results

Model 1			
Test	Prob > chi2	Null Hypothesis	Decision
durbinalt	0.1579	No serial correlation	Fail to reject the null
bgodfrey	0.9220	No serial correlation	Fail to reject the null
archlm	0.7631	No ARCH effects	Fail to reject the null
hettest	0.8243	No unconditional heteroskedasticity	Fail to reject the null
Model 2			
durbinalt	0.8741	No serial correlation	Fail to reject the null
bgodfrey	0.9744	No serial correlation	Fail to reject the null
archlm	0.2208	No ARCH effects	Fail to reject the null
imtest	0.4167	No heteroskedasticity	Fail to reject the null

The diagnostic test results in the table above show that the two models are econometrically good. The decision rule for all the diagnostic tests above is to reject the null hypothesis if the p-value is greater than the test statistic. We reject the null hypotheses in all the diagnostics in Table 5.4.

Serial Correlation: It refers to correlation between a series of observations ordered in time or space which happens when the error term in one period is correlated with the error term in the next period. Autocorrelation leads to downward biased standard errors, and inefficient estimators. Our result by the (Breusch–Godfrey) Durbinalt test shows that there is no (high order) serial correlation in both models. This implies that the individual observations' deviations from their expected values are uncorrelated.

Heteroskedasticity: This concept is based on that traditional econometric model should have a constant one period-forecast variance thus unconditional heteroskedasticity and is tested by the Breusch-Pagan test (hettest) or White's test (imtest). However, as argued by Engle (1982), the assumption of a constant one period-forecast variance, was rather improbable because sometimes, the variance of a times series data may have an autoregressive component which makes the variance volatile across space. This calls for testing autoregressive conditional form of heteroscedasticity (ARCH). The presence of ARCH effects would mean inefficient estimates and, in our case, there is no conditional or unconditional heteroscedasticity meaning efficient estimates.

Multicollinearity: The average Variance Inflation Factor (VIF) was 39.49 indicating high case of multicollinearity. Considering that the models we ran are ARDL models, this was expected. After all the models contain lagged terms. As remedy, guided by Gujarati (2009) we chose to do nothing on the basis that: It does not affect the "Best Linear Unbiasedness" (otherwise called BLUE) property within the Gaus-Markov theorem environment.

Normality: Given that the sample of the study is more than 30, we assume a normal probability distribution of variables by invoking Lindeberg Central Limit Theorem. The theorem says that the distribution of a sample variable approximates a normal

distribution as the sample size becomes larger, assuming that all samples are identical in size.

Stability Test: The CUSUM stability test for the model reveals that there is parameter constancy across the across the sample (See Figure 5.1 below).

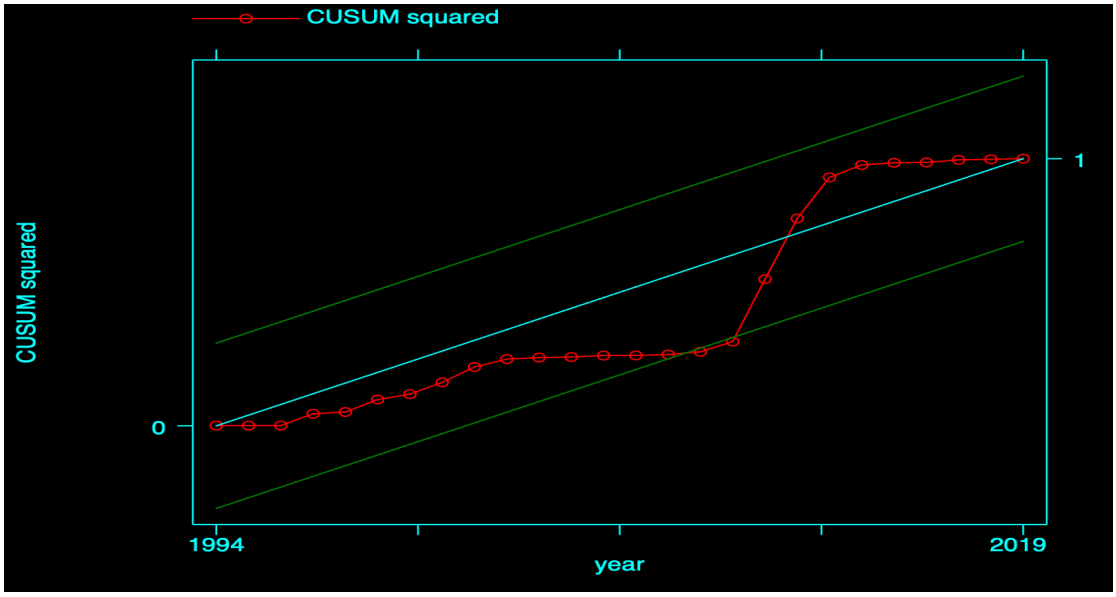

Figure 5. 2: CUSUM Stability test for the Growth Model

5.4.2 Long run estimation results

The table below presents long run estimation results for the first model and the second model.

Table 5. 5: Normalized Long run estimation results

	HDI	lnGDPperCapita
Speed of Adjustment	-0.098 ***	-0.645***
EduExp	0.830	
HealthExp	-1.126	
Debt	-0.060***	
Capital		0.009
Labour		0.202***
Debt		-0.003***
PredictedHDI		-0.643***
r2_a	0.971	0.786
N	32	32

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In model 1, the speed of adjustment was -0.098 and significant which conforms to expectations since the speed of adjustment is expected to be negative. This means that there is convergence between short run and long run. Specifically, any divergence from the equilibrium is corrected by 9.8 percent per year as we are moving from the short run to the long run. Public debt slows down human capital development. On average, a percentage increase in debt leads to a 0.06 percentage decrease in human capital development in the long run.

In model 2, the speed of adjustment was -0.645 and significant, also conforming to expectations and hence convergence between short run and long run. Specifically, any disturbance in the dependent variable is corrected by 64.5 percent each year as we are moving from the short run to the long run. Debt was statistically significant and that it dampens economic growth in the long run. Precisely, a percentage increase in debt leads to a 0.003 percentage decline in economic growth on average in the long run. However, this is economically insignificant.

According to neoclassical sense, growth models tend to display a negative relationship between public debt and economic growth. Elmendorf & Mankiw's (1998) conventional view of debt; Krugman's (1988) debt overhang; and Samuelson's (1958) overlapping generations model argue for a negative relationship between debt and economic growth. This finding counters this economic theory. Empirically, this is also in contradiction to what previous studies have found, for instance studies by (Sanusi et al, 2019, Lartey et al 2018, Chicherita-Westphal & Rother, 2012, Modigliani, 1961) as they found a significant negative relationship between public debt and economic growth. However, the result agrees with Tchereni (2013) who also found an insignificant relationship between foreign debt and economic growth in Malawi. We speculate that this result can be explained in two ways: first, interest rates in Malawi do not respond to government borrowing and as such it does not directly affect private investment which is linked to growth; second, households or SMEs in Malawi do not use the formal financial sector (through which government borrowing would actually have growth effects on the economy by direct or indirect crowding out) as source funds. As a source of funds, village banks take up 42.1 percent, relatives and friends take 27.8 percent, loan sharks taking 9 percent and banks (representing the formal financial sector) at 1.5 percent (NSO, 2020).

We find predicted HDI to be significant and growth dampening in the long run. The predicted HDI measures the impact of public debt through the channel of human capital development on economic growth. And the fact that predicted HDI is statistically significant confirms the channel of human capital development through which public debt affects economic growth. Thus, public debt dampens economic growth indirectly through human capital development. In the long run, a percentage increase in public debt via human capital development leads to a 0.65 percentage decrease in per capita GDP.

5.4.3 Short run estimation results

The table below presents the estimation results from model 1 and 2 in the short run.

Table 5. 6: Short run estimation results

	HDI	lnGDPperCapita
HDI	0.516***	
D.EduExp	0.082	
D.HealthExp	-0.111	
D.Debt	-0.001**	
LD.Debt	-0.004***	
L2D.Debt	-0.002***	
L3D.Debt	-0.002***	
Trend	-0.061**	
_cons	-0.001***	
D.Capital		0.002
D.Labour		3.545**
LD.Labour		-0.706
L2D.Labour		-1.925
L3D.Labour		5.230
D.Debt		-0.002***
D.PredictedHDI		-0.435***
trend		0.383***
Trendsq		-0.002***
_cons		76.416
r2_a	0.971	0.786
N	32	32

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Model 1 in the short run, debt negatively influences human capital development. This finding confirms what Tabengwa (2014) found that a rise in public debt reduces human capital development. It also confirms what Modigliani (1961) claimed that debt tends to burden the next generations because it lowers the stock of capital. In Model 2, public debt reduces economic growth. Specifically, a percentage increase in public debt results in a 0.002 percentage decline in per capita GDP on average all else being equal in the short run. It is noteworthy that the public debt estimates for both the short run and long run are not economically significant. In other words, the magnitude of the estimates is too small to matter. To illustrate, 1 percent increase in debt given average GDP in the sample period is 9.87 billion Malawi Kwacha and this directly reduces the average per capita GDP by 120.48 Malawi Kwacha which means an increase in debt by 1 billion Malawi Kwacha will reduce average per capita GDP by 12.20 Malawi

Kwacha[4]. This is negligible or insignificant economically. In the short run, a percentage increase in public debt via human capital development results in a 0.43 percentage decrease in per capita GDP on average ceteris paribus. Development economics literature reveals human capital to be crucial in driving economic growth (Romer, 1986; Mankiw et al., 1992; Bils & Klenow 2000; Abbas & Nasir 2001, Agiomirgianakis, 2002; Barro and Sala-i-Martin, 2004; Gyimah-Brempong & Wilson, 2004; Hanushek & Woessmann, 2008; Hartwig, 2010; Ali et al, 2012; Qadri & Waheed, 2014; Ogundari & Awokuse, 2018) and as established in the results from Model 1, public debt negatively impacts human capital development. The findings on the impact of predicted human capital development on economic growth confirm empirical literature that human capital is crucial for economic growth indirectly.

It is traditional with ARDL models to report short run estimation results with joint significance because of multicollinearity issues. Table 5. 7 reports the joint significance short run results for model 1 and model 2.

[4] In the calculations, the units are in Malawi Kwacha;
Average GDP in the period: 987,435,677,533.33
1 percent increase in debt as a percentage of GDP= 0.01 x 987,435,677,533.33= 9,874,356,775.33
Direct debt coefficient is 0.002 and average per capita GDP is 60,240.56: 0.002 x 60,240.56= 120.48

Table 5. 7: Short run joint significance test

Model 1: Joint effects on Human Capital Development			
Effect	**Null Hypothesis**	**F statistic**	**P value**
Edu Expenditure	$\vartheta_0 = 0$	0.79	0.3855
Health Expenditure	$\sigma_0 = 0$	0.76	0.3935
Public Debt	$\alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = 0$	6.57	0.0014
Model 2: Joint effects on Economic Growth			
Capital	$\delta_0 = 0$	0.13	0.7265
Labour	$\pi_0 = \pi_0 = \pi_0 = \pi_0 = 0$	0.72	0.5904
DirectDebt	$\theta_0 = 0$	8.09	0.0104
Hdi(IndirectDebt)	$\varphi_0 = 0$	15.09	0.0010

5.5 Summary

The chapter has presented the findings of the study. We have seen from the first model that public debt impacts human capital development negatively both in the short run and the long run. We have also seen from the second model that public debt has a direct negative impact on economic growth in both the short run and long run. However, the direct impact of public debt on economic growth though statistically significant is not economically significant. Further, using the predicted human capital index from the first model we find evidence of indirect effect of public debt on economic growth. We therefore confirm the existence of a channel of human capital development to be the only channel through which public debt affects economic growth in Malawi.

CHAPTER 6

SUMMARY, POLICY IMPLICATIONS AND CONCLUSION

6.1 Introduction

This chapter gives the summary of the whole study and the conclusion. Section 6.2 summarizes the study. Section 6.3 provides the implications and policy recommendations of the study. The limitations of the study as well as possible areas for future research are outlined in Section 6.4. Lastly, section 6.5 gives the conclusion of the study.

6.2 Summary

The main aim of the study was to analyze public debt, human capital and economic growth in Malawi. The study had three objectives, first to assess the impact of public debt on human capital development, second to investigate the indirect effects of public debt on economic growth via human capital development and third to examine the direct impact of public debt on economic growth. Time series data from 1984 to 2019 for Malawi was used to conduct the study. The choice of the period was on account of data availability.

An ARDL model was employed for both models estimated in the study in order to achieve the objectives of the study. It was found that public debt was statistically significant and negatively affects economic growth in both the short run and the long run although the effect may not be economically significant. Human capital development was found to be significantly and negatively affected by public debt both in the short run and the long run. The study found existence of a channel of human capital development through which public debt affects economic growth.

6.3 Study implications and policy recommendations

The finding that public debt has indirect negative short run and long run effects on economic growth via human capital development implies that public debt consumes resources that would be used for human capital development. And since human capital development is key to sustainable economic growth, high levels of debt that take away resources from human capital development sectors dampens economic growth. Human capital development is very important because it increases productivity in an economy through knowledge acquisition and healthy working force.

It has also been found that the direct effect of public debt on economic growth both in the short run and long run though statistically significant may not be economically significant. This means that other channels but human capital development through which public debt affects economic growth should not be a source of concern. The findings have shown that public debt dampens economic growth via resource diversion from productive sectors that are responsible for growth.

The result that public debt has a negative impact on human capital development both in the short run and long run is of great importance. It implies that high debt reduces resources that would be available for human capital development which is more important because the development of human capital will result in the long term sustained growth that is required by developing countries.

It is recommended that government borrowing be checked in two ways. First, the levels of public debt have got to be checked through fiscal discipline which reduces budget deficits. This will reduce resource diversion from productive sectors responsible for human capital development such as education and health. Second, contracted public debt should be spent on productive projects and social spending such as investment in education and health. These productive sectors will ensure high productivity in the economy. It is imperative to set funds aside specifically for purposes of developing human capital in developing countries such as Malawi since human capital is crucial in improving labour effectiveness, productivity and growth. This would eventually set in motion a guarantee that certain objectives and targets of the SDGs and indeed vision 2063 are realized.

6.4 Limitations of the study and suggestions for future research

The study did not assess the impact of debt servicing because of data availability issues. There are economic presuppositions that achieving SDGs is more difficult for countries because high debt and debt service diverts resources from spending on vital activities such as poverty reduction and from public investment on sectors such as education and health (Patillo et al., 2004). Further, repackaged debt overhang hypothesis by (Pattillo et al., 2002; Chowdhury, 2004) argues that a high current debt may severely obstruct the ability to service debt in the future because it might come with different disincentive effects to invest and adjust in the economy, leading to intense negative effect on future economic growth. This justifies looking into debt servicing as an area to be considered for future research. Therefore, given data availability, further studies should assess the impact of debt servicing on economic growth.

6.5 Conclusion

We conclude that there exists a channel of human capital development in Malawi through which public debt affects economic growth both in the short run and long run. We also find that public debt has a direct negative impact on economic growth both in the short run and long run. However, the direct impact is not economically significant. We also find that public debt has a negative impact on human capital development in Malawi. This means that high debt levels affect the available resources for human capital development. Compared to direct effects of public debt on economic growth, the channel has a greater impact. This calls for attention from governments to reduce public debt and utilize the borrowed funds in productive sectors.

REFERENCES

Abbas, Q., & Nasir, Z. M. (2001). Endogenous Growth and Human Capital: A Comparative Study of Pakistan and Sri Lanka [with Comments]. *The Pakistan Development Review*, *40*(4), 987–1007.

Agiomirgianakis, G., Asteriou, D., & Monastiriotis, V. (2002). Human capital and economic growth revisited: A dynamic panel data study. *International Advances in Economic Research*, *8*(3), 177–187. https://doi.org/10.1007/BF02297955

Ali, S., Sharif Chaudhry, I., & Farooq, F. (2012). Human Capital Formation and Economic Growth in Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, *32*(1), 229-240.

Bahal, G., Raissi, M., & Tulin, V. (2018). Crowding-out or crowding-in? Public and private investment in India. *World Development*, *109*, 323–333.

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.

Bank, A. D. (2019, April 1). *Malawi Economic Outlook* [Text]. African Development Bank - Building Today, a Better Africa Tomorrow; African Development Bank Group. https://www.afdb.org/en/countries/southern-africa/malawi/malawi-economic-outlook

Bank (2020). *Enhancing Human Capital in Malawi: The Role of Maternal and Child Health and Nutrition Services*. World Bank. Retrieved from https://elibrary.worldbank.org/doi/abs/10.1596/35089

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, *70*(5, Part 2), 9–49.

Bils, M., & Klenow, P. J. (2000). Does schooling cause growth? *American Economic Review*, *90*(5), 1160–1183.

Blanchard, O. J. (1985). Debt, deficits, and finite horizons. *Journal of Political Economy*, *93*(2), 223–247.

Bloom, D. E., Sachs, J. D., Collier, P., & Udry, C. (1998). Geography, demography, and economic growth in Africa. *Brookings Papers on Economic Activity*, *1998*(2), 207–295.

Buchanan, J. M., & Buchanan, J. M. (1958). *Public principles of public debt: A defense and restatement* (Vol. 2). RD Irwin Homewood, IL.

Burhanudin, M. D. A., Muda, R., Nathan, S. B. S., & Arshad, R. (2017). Real effects of government debt on sustainable economic growth in Malaysia. *Journal of International Studies*, *10*(3), 161-172.

Catao, L., & Terrones, M. E. (2003). Fiscal Deficits and inflation. u: IMF Working Papers.

Checherita-Westphal, C., & Rother, P. (2012). The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. *European Economic Review*, *56*(7), 1392–1405. https://doi.org/10.1016/j.euroecorev.2012.06.007

Chouraqui, J.-C., Jones, B., & Montador, R. B. (1986). Public debt in a medium-term perspective. *OECD Economic Studies*, *7*, 103–139.

Chowdhury, A. R. (2004). External debt, growth and the HIPC initiative: Is the country choice too narrow? In *Debt relief for poor countries* (pp. 158–180). Springer.

Chudik, A., Mohaddes, K., Pesaran, M. H., & Raissi, M. (2017). Is there a debt-threshold effect on output growth? *Review of Economics and Statistics*, *99*(1), 135–150.

Clements, B., Bhattacharya, R., & Nguyen, T. Q. (2003). *External debt, public investment, and growth in low-income countries*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=880959

Cohen, D. (1993). Growth and external debt. *CEPR Discussion Papers*, *778*. CEPR.

Cohen, D. (1997). *Growth and external debt: A new perspective on the African and Latin American tragedies* (Vol. 9715). Citeseer.

Collin, M., & Weil, D. (2018). *The Effect of Increasing Human Capital Investment on Economic Growth and Poverty: A Simulation Exercise*. 30. World Bank.

De Vita, G., Trachanas, E., & Luo, Y. (2018). Revisiting the bi-directional causality between debt and growth: Evidence from linear and nonlinear tests. *Journal of International Money and Finance*, *83*, 55–74.

Diamond, P. A. (1965). National debt in a neoclassical growth model. *The American Economic Review*, *55*(5), 1126–1150.

Ecker, O., & Qaim, M. (2011). Analyzing Nutritional Impacts of Policies: An Empirical Study for Malawi. *World Development*, *39*(3), 412–428. https://doi.org/10.1016/j.worlddev.2010.08.002

Elmendorf, D. W., & Mankiw, N. G. (1999). Government debt. *Handbook of Macroeconomics*, *1*, (14), 1615–1669.

Ewaida, H. Y. (2017). *The impact of Sovereign debt on growth: An empirical study on GIIPS versus JUUSD countries*. Retrieved from https://www.um.edu.mt/library/oar/handle/123456789/29260.

Fund, I. M. (2008). Malawi: Debt Sustainability Analysis 2007 Update Under the Framework for Low Income Countries. *IMF Staff Country Reports*, *2008*(003). https://doi.org/10.5089/9781451828184.002.A002

Gong, G., Greiner, A., & Semmler, W. (2004). Endogenous growth: Estimating the Romer model for the US and Germany. *Oxford Bulletin of Economics and Statistics*, *66*(2), 147–164.

Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (international edition). New York*: McGraw-Hills Inc*.

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.

Greiner, A. (2008). Human capital formation, public debt and economic growth. *Journal of Macroeconomics*, *30*(1), 415–427. https://doi.org/10.1016/j.jmacro.2006.08.003

Greiner, A. (2016). Human capital formation and public debt: Growth and welfare effects of three different deficit policies. *Journal of Economic Policy Reform*, *19*(4), 369–385.

Gyimah-Brempong, K., & Wilson, M. (2004). Health human capital and economic growth in Sub-Saharan African and OECD countries. *The Quarterly Review of Economics and Finance*, *44*(2), 296–320.

Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature*, *46*(3), 607–668.

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

IDA & IMF. (2012). *Second Malawi Growth and Development Strategy (MGDS II) 2011-2016 Joint Staff Advisory Note*. 305. IMF.

I. M. F. (2017). *Ninth review under the extended credit facility arrangement and request for waivers for nonobservance of performance criteria—debt sustainability analysis*. 18. IMF.

IMF Staff Country Reports Volume 2017 Issue 183: Malawi: Ninth Review Under the Extended Credit Facility Arrangement and Request for Waivers for Nonobservance of Performance Criteria-Press Release; Staff Report; and Statement by the Executive Director for Malawi (2017). (n.d.). Imfsg. Retrieved 27 August 2021, from https://www.elibrary.imf.org/view/journals/002/2017/183/002.2017.issue-183-en.xml

J Barro, R., & Sala-i-Martin, X. (2004). *Economic growth second edition*. Retrieved from https://observatorio.dadep.gov.co/sites/default/files/documentos/li12_economic_growth.pdf

Kgakge-Tabengwa, G. G. (2014). Impact of shocks to public debt and government expenditure on human capital and growth in developing countries. *Journal of Economics and Behavioral Studies*, *6*(1), 44–67.

Kim, E., Ha, Y., & Kim, S. (2017). Public debt, corruption and sustainable economic growth. *Sustainability*, *9*(3), 433.

Krugman, P. (1988). Financing vs. Forgiving a debt overhang. *Journal of Development Economics*, *29*(3), 253–268.

Lartey, E. Y., Musah, A., Okyere, B., & Yusif, N. (2018). Public debt and economic growth: Evidence from Africa. *International Journal of Economics and Financial Issues*, *8*(6), 35-48.

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, *107*(2), 407–437.

Matthews, A. (2003). *WTO Agreement on Agriculture: The Implementation Experience - Developing Country Case Studies*. WTO.

Meade, J. E. (1958). Is the national debt a burden? *Oxford Economic Papers*, *10*(2), 163–183.

Milanzi, S. A. & Mongale, I.P. (2018). Human Capital Investment's Contribution Towards Economic Growth in Malawi. *The 3rd Annual International Conference on Public Administration and Development Alternatives*, 04 - 06 July 2018, Stellenbosch University, Saldahna Bay, South Africa.

Modigliani, F. (1961). Long-run implications of alternative fiscal policies and the burden of the national debt. *The Economic Journal*, *71*(284), 730–755.

MoF, M. of F. (2021). *Malawi Budget Statements*. Malawi, Ministry of Finance. https://www.finance.gov.mw/index.php/our-documents/budget-statements

MoF, (Ministry of Finance). (2020). *Malawi Ministry of Finance Annual Economic Reports*. https://www.finance.gov.mw/index.php/our-documents/annual-economic-reports

Ng, S., & Perron, P. (2001). Lag length selection and the construction of unit root tests with good size and power. *Econometrica*, *69*(6), 1519–1554.

NSO, M. (2018). *National Statistics Office Statistical Yearbook*. http://www.nsomalawi.mw/index.php?option=com_content&view=article&id=41&Itemid=95

NSO, M. (2020). *National Statistical Office Publications*. NSO. http://www.nsomalawi.mw/index.php?option=com_content&view=article&id=3&Itemid=40

Ogundari, K., & Awokuse, T. (2018). Human capital contribution to economic growth in Sub-Saharan Africa: Does health status matter more than education? *Economic Analysis and Policy*, *58*, 131–140.

Omankhanlen, A. E., Ogaga-Oghene, J., Obarisiagbon, 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), 01–132.

Pattillo, C. A., Poirson, H., & Ricci, L. A. (2002). *External debt and growth* (No. 2002-2069). *International Monetary Fund*.

Pattillo, C. A., Poirson, H., & Ricci, L. A. (2004). *What are the channels through which external debt affects growth? https://dx.doi.org/10.2139/ssrn.878838*.

Pauw, K., Dorosh, P., & Mazunda, J. (2013). *Exchange rate policy and devaluation in Malawi* (IFPRI Discussion Paper No. 1253). International Food Policy Research Institute (IFPRI). https://econpapers.repec.org/paper/fprifprid/1253.htm

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.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75*(2), 335–346.

Qadri, F. S., & Waheed, A. (2014). Human capital and economic growth: A macroeconomic model for Pakistan. *Economic Modelling*, *42*, 66–76.

RBM. (2021). *Monetary Policy—Reserve Bank of Malawi*. https://www.rbm.mw/MonetaryPolicy/

Rengin, A. K. (2012). The relationship between health expenditures and economic growth: Turkish case. *International Journal of Business Management & Economic Research*, *3*(1), 404–409.

Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, *94*(5), 1002–1037.

Sanusi, K. A., Hassan, A. S., & Meyer, D. F. (2019). Non-linear Effects of Public Debt on Economic Growth in Southern Africa Development Community (SADC) Countries. *International Journal of Economics & Management*, *13*(1), 193-202.

Schclarek, A. (2004). *Debt and economic growth in developing and industrial countries, mime*. Department of Economics.

Shahor, T. (2018). The impact of public debt on economic growth in the Israeli economy. *Israel Affairs*, *24*(2), 254–264.

Shkolnyk, I., & Koilo, V. (2018). The relationship between external debt and economic growth: Empirical evidence from Ukraine and other emerging economies. *Investment Management and Financial Innovations*, *15*(1), 387-400.

Smyth, D. J., & Hsing, Y. (1995). In search of an optimal debt ratio for economic growth. *Contemporary Economic Policy*, *13*(4), 51–59.

Snieška, V., & Burkšaitienė, D. (2018). Panel data analysis of public and private debt and house price influence on GDP in the European Union countries. *Inžinerinė Ekonomika*, *29*(2), 197–204.

Tchereni, B. H. M., Sekhampu, T. J., & Ndovi, R. F. (2013). The impact of foreign debt on economic growth in Malawi. *African Development Review*, *25*(1), 85–90.

UNDP. (2015). *sustainable development goals pdf—Google Search*. https://www.google.com/search?q=sustainable+development+goals+pdf&rlz=1C5CHFA_enMW885MW885&oq=sus&aqs=chrome.3.69i59j0i512j69i57j0i20i263i512j0i512j69i60l3.3196j0j9&sourceid=chrome&ie=UTF-8

Vaca, J., Vaca Medina, G., & Mora Pérez, C. O. (2020). The impact of public debt on economic growth: An empirical study of Mexico (1994–2016). *CEPAL Review, 168,* 167-180.

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.

WHO Commission & WHO. (2001). Macroeconomics and health: Investing in health for economic development: Executive summary / report of the Commission on Macroeconomics and Health. *Macroéconomie et santé : investir dans la santé pour le développement économique : résumé d' orientation du rapport*. WHO IRIS. https://apps.who.int/iris/handle/10665/42463

Williams, B. (2020). Nonparametric identification of discrete choice models with lagged dependent variables. *Journal of Econometrics*, *215*(1), 286–304.

APPENDICES

SENSITIVITY ANALYSIS RESULTS

APPENDIX 1 A: Equal weighted enrolment results

Table 7. 1: Long run equal weighted enrolment results

	HDI	lnGDPperCapita
Speed of Adjustment	-0.088***	-0.664***
L.EduExp	0.428	
L.HealthExp	-0.786	
L.Debt	-0.054***	
L.Capital		0.007
L.LnLabour		0.204***
L.Debt		-0.003***
L.PredictedHDI		-0.616***
r2_a	0.982	0.858
N	32	32

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7. 2: Short run equal weighted enrolment results

	HDI	lnGDPperCapita
LD.HDI	0.623***	
D.EduExp	0.038	
D.HealthExp	-0.069	
D.Debt	-0.001**	
LD.Debt	-0.003***	
L2D.Debt	-0.002***	
L3D.Debt	-0.002***	
Trend	-0.054**	
_cons	3.972***	
D.Capital		0.002
D.LnLabour		12.827**
LD.LnLabour		-2.445
L2D.LnLabour		-2.993
L3D.LnLabour		1.119
D. Debt		-0.002***
D.PredictedHDI		-0.409***
trend		0.318***
trendsq		-0.004***
r2_a	0.982	0.858
N	32	32

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

APPENDIX 1 B: Descending weighted enrolment results

Table 7. 3: Long run descending weighted enrolment results

	HDI	lnGDPperCapita
Speed of Adjustment	-0.082***	-0.675***
L.EduExp	0.075	
L.HealthExp	-0.438	
L.Debt	-0.050***	
L.Capital		0.007
L.LnLabour		0.204***
L.Debt		-0.003***
L.PredictedHDI		-0.600***
r2_a	0.987	0.856
N	32	32

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7. 4: Short run descending weighted enrolment results

	HDI	lnGDPperCapita
LD.HDI	0.682***	
D.EduExp	0.006	
D.HealthExp	-0.036	
D.Debt	-0.001**	
LD.Debt	-0.003***	
L2D.Debt	-0.002***	
L3D.Debt	-0.001***	
Trend	-0.050***	
_cons	3.716***	
D.Capital		0.002
D.LnLabour		12.886**
LD.LnLabour		-2.373
L2D.LnLabour		-2.923
L3D.LnLabour		0.871
D.Debt		-0.002**
D.PredictedHDI		-0.405***
trend		0.321***
trendsq		-0.004***
r2_a	0.987	0.856
N	32	32

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$