THE IMPACT OF GOVERNMENT DOMESTIC BORROWING ON PRIVATE INVESTMENT IN MALAWI: RE-EXAMINING THE CROWDING OUT HYPOTHESIS

MASTER OF ARTS (ECONOMICS) THESIS

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UNIVERSITY OF MALAWI

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MASTER OF ARTS (ECONOMICS) THESIS

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Submitted to the Department of Economics, Faculty of Social Science in partial fulfilment of the requirements for a Master of Arts degree in Economics

University of Malawi

JANUARY 2022

DECLARATION

I declare that this is my original work and that it has not been presented for a degree at this or any other University. Work of others used in this study has been duly acknowledged. Any errors contained herein are entirely mine.

DAUCILOUS MATHEWS SADALA

_____

FULL LEGAL NAME

_____

Signature

_____

Date

CERTIFICATE OF APPROVAL

We declare that this thesis is from the student's own work and effort and where he has used other sources of information, it has been acknowledged. This thesis is submitted with our approval.

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First Supervisor

Signature: _____ Date: _____

Mr. Lucius Cassim (Lecturer)

Second Supervisor

DEDICATION

To my daughter, Immaculate. You challenge me a lot in every aspect. You are loved. All thanks to God for you. I dedicate all this work to you!

ACKNOWLEDGEMENTS

I am sincere grateful to God for my life, my family and the opportunity accorded to me to pursue this course. May your name be glorifed all the time.

I also wish to extend my sincere gratitude to everyone who in one way or another contributed to the successful completion of my studies. I am deeply indebted to my supervisors, Associate Professor Ronald Mangani and Mr. Lucius. Cassim for their guidance and assistance.

I am further grateful to my employer, the Reserve Bank of Malawi, for awarding me a scholarship opportunity to pursue this program.

Special thanks go to my wife, Patricia. Your support, understanding and endurance throughout this journey have been unparalleled!

ABSTRACT

There has been a persisitent increase in the stock of Malawi government's total public debt, rising from MK177.3 billion (28.6 % of nominal GDP) in 2007 to MK4,538.3 billion (69.7 percent of GDP) as at end of 2020. This raises concerns over both sustainability and possible crowding-out of the country's private investment given a corresponding rise in government domestic debt. Fear over a possible crowding-out effect of domestic financing has been one of the guiding factors in the formulation of the country's development strategies (such as the MGDS III, and the Malawi 2063). This paper sets out to investigate the extent to which this concern is justified in Malawi to promote evidence-based policy. The study also sets out to appreciate interest rates' responsiveness to government domestic borrowing in Malawi. Employing the 1975-2019 time series in an Auto-Regressive Distributed Lag framework, this paper establishes evidence of the quantity channel of the crowding-out effect. This finding suggests adherence to strict fiscal discipline to prevent stifling of private investment from government domestic borrowing. The paper, however, fails to gather evidence for the indirect channel of the crowding-out effect, a finding that is being attributed to the imperfect structure of the country's financial market, characterised by consumer (government) dominance.

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ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey Fuller
AIC	Akaike information criteria
ARDL	Autoregressive Distributed Lag
CPI	Consumer Price Index
CUSUM	Cumulative Sum
GDP	Gross Domestic Product
GNI	Gross National Income
GoM	Government of Malawi
IMF	International Monetary Fund
JB	Jarque-Bera
LM	Lagrange Multiplier
MGDS	Malawi Growth and Development Strategy
MIC	Middle-Income Country
MoF	Ministry of Finance
NSO	National Statistical Office
OLS	Ordinary Least Squares
RBM	Reserve Bank of Malawi
SSA	Sub-Saharan Africa
WB	World Bank Group
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.1 Background and Motivation

There is a long-standing debate on the efficacy of fiscal policy on economic growth, particularly through the impact that the policy would have on private investment. Two extremes have emerged from this debate.

On the one end of the continuum is the Keynesian trap proponents who believe that fiscal policy has significant multiplier effects on growth and employment due to prevailing unemployment which ensures that expansionary fiscal policy does not have undesirable effects on both investment and interest rates.

On the other end of the continuum is the full employment classical case under monetarism and rational expectations' proponents under which expansionary fiscal policy does not have any real effect on growth or employment, other than stifling the private sector through resource re-allocation. As Sen & Kaya (2014) notes, in, somewhat, the middle of the continuum is the Ricardian Equivalence proposition which asserts that the public sector and the private sector behave independent from each other. As such, an expansionary fiscal policy, such as that financed through public bond issuance does not result in alteration of either interest rates or private investment. The former extreme of the continuum leads to a crowding-in hypothesis while the latter condenses into the crowding-out hypothesis.

The Crowding-out hypothesis argues that government borrowing from the domestic financial markets reduces the availability of funds for private sector borrowing. This will, eventually, reduce private investment. As such, under this hypothesis, any increase in government borrowing from the domestic financial market results in a corresponding decrease in private investment.

There are two main strands of the crowding-out hypothesis. Real crowding out occurs when an increase in public domestic borrowing displaces private capital formation on a dollar-for-dollar basis. This is the direct crowding out. It involves a reduction of the physical resources available to the private sector because of resource re-allocation to the public sector Makuyana & Odhiambo (2014). The other form is the financial crowding-out, also called the indirect crowding-out. It refers to a phenomenon of partial loss of private capital formation due to the increase in the interest rates emanating from the pre-emption of real and financial resources by the government through bond-financing of its fiscal deficit Zeliko (2015). In practice, economies usually lie somewhere between the two extrema of full employment and depression. Resultantly, both effects would be experienced. The sum of these two opposing effects determines whether the policy will crowd in or crowd out private investment.

In practice, and across economies, the deficit-financing mechanism plays a crucial role on crowding-in or crowding out of private sector investment. Fiscal deficits may be financed through a primary issue, a tax increment, or a bond issuance. Either option has merits and demerits. For instance, while money printing may increase the supply of loanable funds Froyen (2013), lower interest rates and hence likely be favourable for private investment, the inflationary pressures it is associated with may not be favourable for investment, in general. Raising taxes as a second way of financing fiscal deficits reduces disposable income which may prove costly for private consumption, hence investment. The third option entails issuing public bonds from the domestic market.

The literature perspective considered this far suggests that whether the borrowing option enhances or impinges private investment, and indeed, whether it has no effect on investment, entirely depends on the economic situation with respect to both employment levels and rationality of the private agents. More explicitly, due to unemployment and the liquidity trap in the Keynesian framework, state borrowing will not reduce the amount of loanable funds nor raise interest rates significantly enough to

deter private sector investment: the associated increase in aggregate demand will promote growth, employment, and crowd in private investment. In contrast, under the classical case of full employment, characterised by low speculative money demand, government borrowing raises demand for loanable funds, and reduces amount of funds available for private investment, raising interest rates, and eventually, crowds out private investment. The neutral effect holds from the Ricardian Equivalence viewpoint.

Malawi government, just as other economies the world over, borrows both from international and domestic sources to finance fiscal deficits. Debt levels have been rising over the years. The country's total public debt stock has risen from MK177.3 billion (28.6 % of nominal GDP in 2007 (immediately after HIPC relief in 2006) to MK4,538.3 billion as at end 2020). The 2020 stock was at 69.7 percent of the country's GDP, with external debt accounting for 31.1 percent of Gross Domestic Product. This raises serious concerns on the sustainability of the country's debt stock considering that countries like Malawi are categorised as being incapable of sustaining any net present value of their external debt stock that is more than 30 percent of their GDP.

International measures have been set to avoid burdening nations with unsustainable debt. For instance, International Financial Institutions such as the World Bank and the IMF condition lending to countries on observance of the set thresholds, among other considerations.

The conditionality capped on external financing has forced many developing countries to resort to domestic financing. This has seen a rapid accumulation of central government domestic debt. For instance, between 2004 and 2019, the composition of Malawi government domestic debt in total public debt increased from 13.3 percent to 54.6 percent. This shows the growing importance of government domestic debt amidst challenges in obtaining foreign debt. Figure 1 below shows how domestic debt, relative to external debt, has recently evolved.

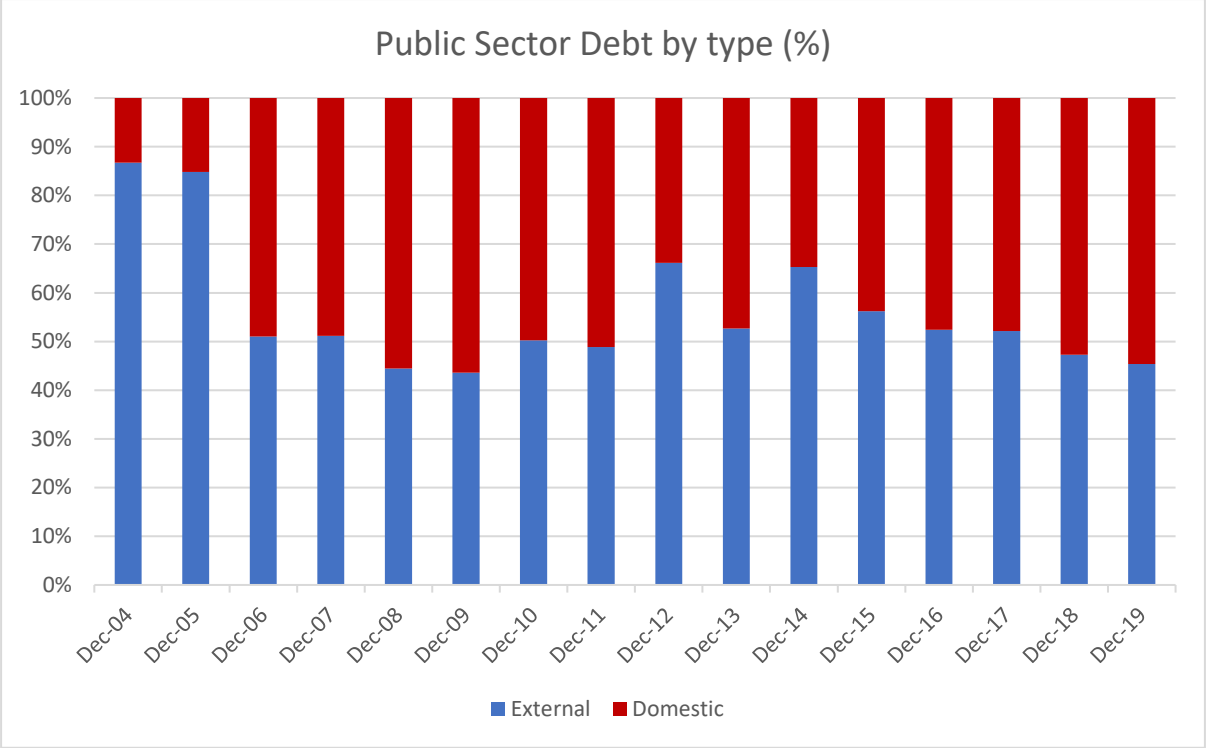

Figure 1: Composition of total public sector Debt

Source: RBM (2021)

As Figure 1 shows, there is a persistent increase in government dependence on domestic financing. It should be worth appreciating how local private investment is being affected by government's increasing dependence on domestic financing. Should there be worries of a possible crowding-out effect on private investment? does the crowding-out or its absence have any connections with investment sensitivity of interest rates, or interest rates' sensitivity of government borrowing, or does it occur simply because the private sector is being deprived of the resources being taken away by government?

As Makuyana & Odhiambo (2019) notes, at a simple glance, the trends in private investment and central government domestic borrowing could give a rough clue on the crowding out effect. However, any such observation cannot be definite enough. As Figure 2 below depicts, a virtual inspection of the trends does not show a consistent relationship between the two. This casts doubt on the extent to which the crowding-out effect could be applicable in Malawi, and further, raises questions on the stability of the relationship between the two, over time.

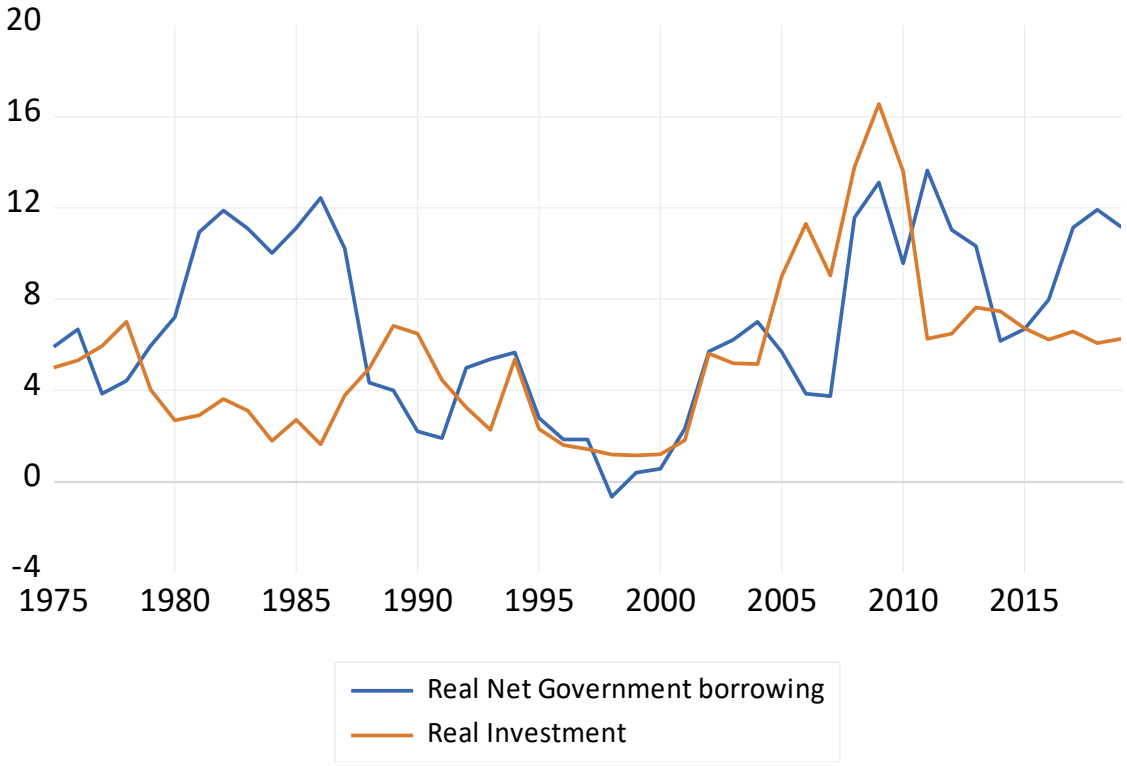

Figure 2: Government Net Domestic Borrowing and Private Investment (as a % of GDP)

Source: WDI (2021)

A quick glance at Figure 2 above reveals lack of tangible and consistent evidence in support of the crowding-out hypothesis over the review period. For instance, while growth in net government debt seems to have occurred at the expense of private investment between 1977 and 1986, and between 1991 and 1992, the rest of the sample period either indicates no discernible relationship between the two variables, or indeed, shows that the two variables moved in the same direction. This would cast doubt on the phenomenon in Malawi. However, a proper empirical investigation would provide a definite verdict. One might also want to appreciate the likely channel through which the crowding-out effect manifests itself in Malawi: direct or indirect? In establishing the indirect channel, they would have to establish the extent to which interest rates are responsive to government domestic borrowing on the one hand, and the sensitivity of private investment to interest rates, on the other hand.

1.2 Research Problem

The increasing reliance of the government's domestic financing of fiscal deficits raises fears over a likely crowding-out effect of the country's private investment. Identified

as the engine of economic growth by the country's development strategies such as the Malawi Growth and Development Strategy III, any impediments to the flourishing of the private sector must be identified and ironed out to avoid their undesirable effect. This justifies rising interest in investigating the crowding-out hypothesis.

There have been several studies on the subject both in Malawi and elsewhere (Fayed (2013); Khan & Gill (2009); Lidiema (2018) Mbulawa (2015), and Mwakalila (2020)). The findings have not been consistent across economies and space. There have been at least four studies on this subject in Malawi. A study by Wella (2018) examined the impact of government's domestic borrowing on private sector credit while threes other studies investigated the crowding-out effect of public investment, or of public spending.

None of the previous studies examined the relationship between net government domestic borrowing and private investment. Despite lack of explicit empirical evidence supporting how government domestic borrowing negatively affects private investment in Malawi, the crowding-out hypothesis forms a critical argument in most government policy papers. For instance, MGDS III identifies crowding-out as a potential threat to private investment in Malawi GOM (2018), and IMF's supported programs limit domestic financing of the public sector based on the crowding-out hypothesis Martijn et al. (2006), and Emran & Farazi (2009).

Realising the short-fall in empirical evidence from Malawi, this paper seeks to use government net domestic borrowing and private investment to investigate the crowding-out hypothesis in Malawi. The paper also investigates the indirect channel of the crowding-out hypothesis, and further investigates if the level of domestic financial markets development affect interest rates' responsiveness.

1.3 Research Objectives

The principal objective of this study is to assess the validity of the crowding-out hypothesis in Malawi. In unveiling this, the study sets out to explore the following specific objectives:

I. to investigate if net government domestic debt affects private investment.
II. to investigate if net government domestic debt affects domestic interest rates.
III. to investigate if private investment varies with interest rates.

A definite stand on these objectives sheds light on the extent to which the crowding-out hypothesis holds in Malawi.

1.4 Hypothesis

Along with the stated research objectives, this paper seeks to test the following hypotheses:

I. Net government domestic debt does not affect private investment in Malawi.
II. Net government domestic debt does not affect interest rates in Malawi.
III. Interest rates do not affect private investment in Malawi.

1.5 Contribution to Literature

As stated before, there have been at least four studies on the crowding-out hypothesis in Malawi. This study intends to re-examine the hypothesis in the country. The paper adopts a different approach from that used by Makuyana & Odhiambo (2014) and Maganga & Abdi (2012) in that it proposes to use government net domestic borrowing and private investment as opposed to using public investment for government borrowing as employed in those two papers. Certain components of public investment such as domestic debt, and grants may have conflicting effects on private investment. This can potentially inhibit the possible crowding out effect associated with government domestic borrowing.

Further, this study also differs from the approach by Wella (2018) in that it intends to use private investment, and not private sector credit in the examination of the crowding-out hypothesis. Employing the 1975-2019 data, the current study finds a correlation of 0.22 between private investment and private sector credit in Malawi. This correlation is not strong enough to comfortably relate any observed relationship involving private sector credit to private investment. Further, it still should be understood that any observed relationship between government borrowing and private credit cannot provide a holistic insight into the relationship between private investment and government borrowing because private sector credit could be sourced for various causes, and not just for capital formation purposes, and further because investment can be financed through several means, including borrowing, new capital injections and retained earnings. As such, changes and developments in private sector credit may not

adequately reflect changes in private investment, and vice versa. This implies that a relationship between government borrowing, and private investment cannot be confidently inferred from any observed relationship between government borrowing and private sector credit.

If anything, this paper notes, private sector credit should simply be regarded as one of the determinants of private investment. Indeed, private sector credit has been used as an explanatory variable in some studies on the crowding-out hypothesis in Malawi such as in studies by Maganga & Abdi (2012) and Makuyana & Odhiambo (2019). In fact, Makuyana & Odhiambo (2019) uses private sector credit as a control variable for financial market development in the investment function. The current study also includes some financial market variable to control for the influence of financial market development, particularly in the interest rate model. This is acknowledged by Wella (2018), and has also been used in several other studies on the subject.

1.6 Organisation of the Study

The study has been organised as follows: Chapter 1 sets out the introduction to the study. Chapter 2 provides a background overview on the Malawian economy. Literature review and conceptual framework is given in chapter 3 whereas chapter 4 outlines the methodology and data sources. Empirical results and analysis are presented in chapter 5. Lastly, chapter 6 carries conclusion, policy recommendation, and area for further research.

CHAPTER TWO

BACKGROUND

2.1 Chapter overview

This section highlights the context of the economy in which this study is conducted. This is to contextualise and understand the study outcomes within the confinement of the macro-economic conditions relating to policy, demographic structures, and endowment.

2.2 Overview of the economy

The Malawi economy is largely agri-based with most of the farmers involved in subsistence rain-fed agriculture. The agriculture sector contributes around 30 percent to the country's Gross Domestic Product. The sector is a major export earner, contributing up to 90 percent of the country's total export earnings. In 2019, the sector brought 74.1 percent of total exports. Tobacco is the main export crop with its export value ranging between 40 and 70 percent of the country's total exports. In 2019, tobacco raked in 46.2 percent of the economy's total export value. Over the years, the share of tobacco in total export earnings has reduced significantly largely owing to reduced demand for the commodity following the global anti-smoking campaign. The country is one of the least developed countries in the world. According to the World Bank, the country's per capita income remained low at US$411.6 in 2019.

2.3 Private Investment in Malawi

Investment dynamics in Malawi have been dictated by various policy regimes that have characterised the country from independence. Having seen the backwardness in infrastructure development from the colonial masters, the immediate post-colonial rule set in place policies aimed at improving infrastructure development. For the first 15 years after independence, government pursued strong market-intervention policies, Makuyana & Odhiambo (2014). The objective was to accelerate growth whose benefits were envisaged to trickle down to the poor majority who had been marginalized during the colonial rule. Pryor (1990) reports that this resulted in a massive expansion of public investment that accounted for about two thirds of gross investment during the period.

Government effort to promote public investment was facilitated and reinforced by the creation of state-owned enterprises across key economic sectors. The creation of these enterprises resulted in the build-up of public and quasi-public bodies that invested, managed, or supported a broad spectrum of economic activities in agriculture, industry, commerce, and finance. As Ng'oma (2010) reports, these companies dominated all economic activities and virtually displaced the private sector in Malawi. The Malawi Development Corporation (MDC), the Agricultural Development and Marketing Corporation (ADMARC) and Press Corporation Limited (PCL) were the three major enterprises established or supported by the state that dominated economic activity and took a leading role in promoting public investment.

The Agricultural Development and Marketing Corporation was established in 1971 to market agricultural produce and inputs, and to spearhead the development of the smallholder agricultural sector through marketing activities and investments in agro-industry enterprises. Apart from agricultural marketing activities, ADMARC also invested in other enterprises. By the mid-1980s, ADMARC had equity investments in thirty-four commercial enterprises and owned several farms. Laws and regulations were put in place restricting entry and participation of private players in agriculture, and in retail trading in some selected areas. One such law is the directive that government made in the 1970's removing all Asian traders from the rural areas to urban and peri-urban centers. This paved the way for the expansion of Peoples' Trading Centre retail shops owned by PCL Stambuli (2002). This, and many other state interventions made

ADMARC and other state supported corporations, such as MDC and PCL enjoy a monopoly in the restricted activities at the expense of private sector investment.

Malawi Development Corporation was established to provide long-term financing for investment in projects undertaken through acquisition of shares from foreign enterprises or completely new investments in industry. Some of the investments that MDC made included the Portland Cement of Malawi, investment in the Commercial Bank of Malawi, Cold Storage Company, and the Plastic Products Limited.

According to Stambuli (2002), Malawi government embraced privatisation in 1987 under the Industrial Trade Policy Adjustment Credit (ITPAC) following the forces that had started as early as 1984. While there were several reasons for this, one driving force was the observed inefficiency in state owned enterprises which saw many of the enterprises making losses, in the process exerting fiscal pressure on central government. For instance, in 1984, government issued bonds purely for bad debts of PCL to Commercial Bank of Malawi amounting to $39 million. Further, in 2002, government assumed control over ADMARCC's four largest loss-making subsidiaries, in preparation for public sale. The deregulation and liberalisation promoted through privatisation and other means has allowed entry and greater participation of private stakeholders in the country's economic activities, ranging from banking, insurance, retail trading and agricultural marketing, hence, most likely, promoting and enhancing expansion of private investment.

The private and public investment statistics observed prior to liberalisation shows that state dominance in economic activities overshadowed private sector investment. For instance, private investment, as a percentage of GDP, averaged 7.4 percent between 1970 and 1979 while public investment averaged 14.8 percent of GDP during the same period. Similarly, during the 1980-89 period, public investment overshadowed private investment by averaging 8.6 percent of GDP while private investment averaged 5.5 percent of GDP during the same period Lesotho (2006). Makuyana & Odhiambo (2014) concludes that the period saw state dominance crowding out private investment, which was reinforced by such interventions as rationing of bank credit, as well as the enactment of various Acts that made it virtually impossible to set up private investments. There were also laws enacted to priotise public sector lending such as credit rationing and interest rate ceilings Kaluwa et al. (1992).

Figure 3 below shows that annual growth in real private investment in Malawi has been volatile. It experienced some contraction during some years in the sample. There were frequent and more contractions prior to liberalisation. This could possibly be attributed to the restrictive policies that promoted public investment at the expense of private investment.

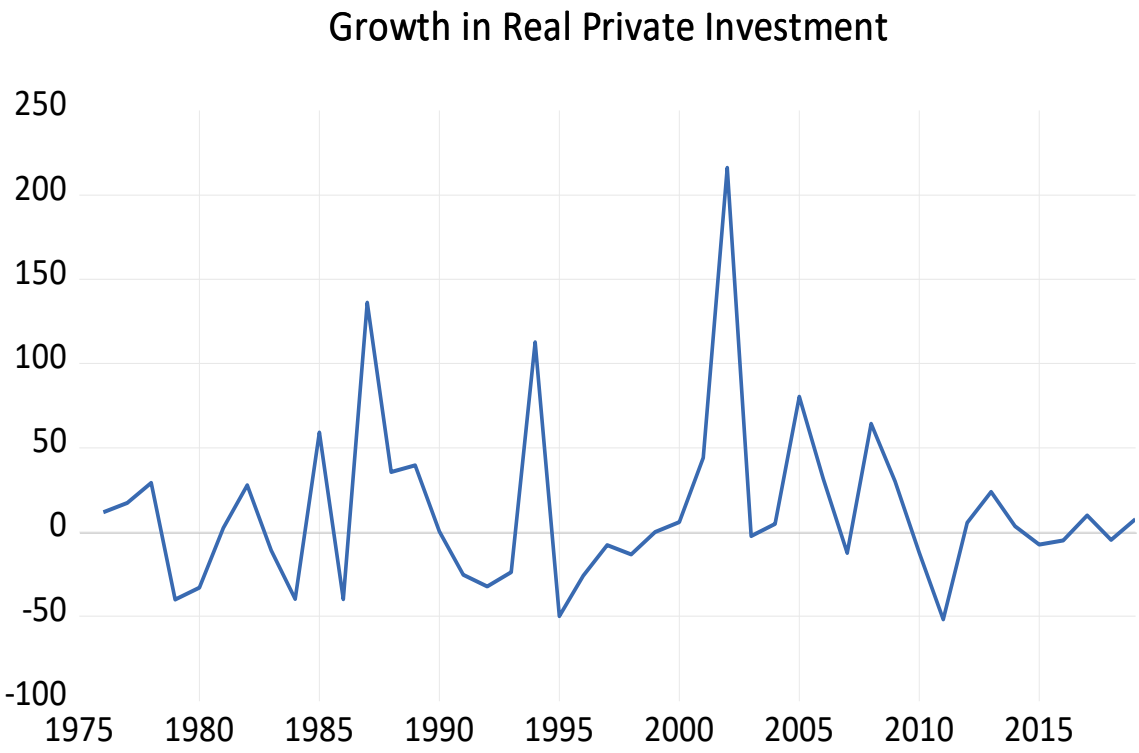

Figure 3: Trends in Private Investment in Malawi (Growth rates)

Source: WDI (2021)

2.4 Financial sector development

The country's financial sector remains underdeveloped, characterised by low financial inclusion. As such, deposit mobilisation is still below potential. MGDS III recognises that this has resulted in a wide Savings-Investment gap, and a huge demand and supply imbalance for long-term securities as most of the savings are short-term. This has meant that much of the lending to government from the sector is through short-term securities. As government provides a guaranteed clientele, extension of long-term borrowing from both banks and other financial institutions, which would have been crucial for private

sector investment, has been scanty. This has negatively affected the private investment's financing prospects.

The underdeveloped financial market has also resulted in low competition among market players. The banking sector lacks competition. According to the 2019 Financial Stability Report, the two biggest banks in Malawi controlled at least 46 percent of the sector's total assets and deposits as at end of 2019 RBM (2020). This has potential to keep lending rates high, which has been a concern over the years. There are also arguments that the high interest rates are on account of low deposit mobilisation which could be exacerbated by high demand on account of government borrowing, to a large extent. High interest rates in the economy have also been blamed on high inflation in which financial institutions have tried to achieve positive real returns on their portfolios.

The economy has been characterised by high inflation rates, averaging 18.6 percent over the 1975-2019 sample period. This has potential to create uncertainty in the investment environment, in the process, affecting proper investment planning. Financial institutions set lending rates above inflation rates to keep positive real margins. As such, persistently high inflation rates in the country have, likely, exerted pressure on interest rates. As Figure 4 shows, prior to the liberalisation forces in the 80's, real interest rates were generally lower than they have been, post-liberalisation. In some cases, they could be negative. This is also observed by Kaluwa et al. (1992). Unfortunately, this could not have much impact on private investment due to credit rationing regime of the period in favour of public investment. Financial liberalisation meant that much as credit would be availed to the private sector, that would be at a higher price to keep positive real returns, during high inflation periods. Private investment has, thus, suffered from both high lending rates and high uncertainty on account of persistently high inflation.

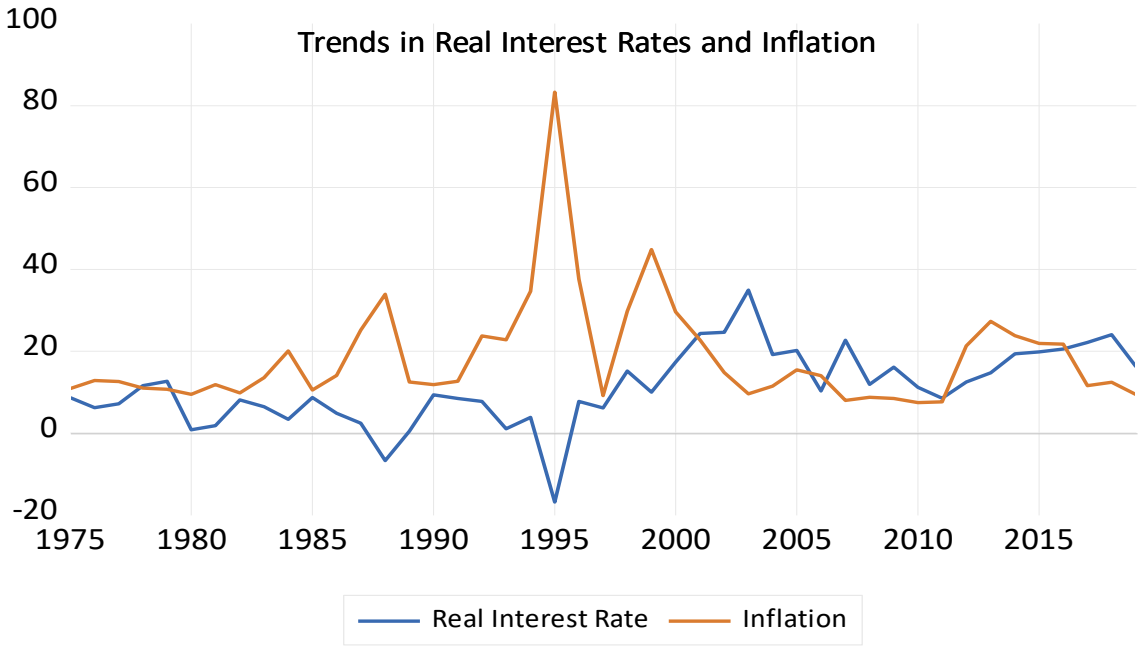

Figure 4: Inflation and real interest rates

Data source: NSO & RBM (2021)

2.5 Government Domestic Debt

Prior to the Highly Indebted Poor Countries' debt relief initiative in 2006, many developing countries, including Malawi, were faced with higher levels of external debt than domestic debt levels. Largely, this was due to less strict measures that were put on external financing GoM (2018). However, the strict adherence to the subsequent debt sustainability thresholds that evolved following the debt relief initiative meant that most developing countries began experiencing difficulties in accessing external financing. Governments resorted to domestic financing for their respective deficits. As such, the domestic market has provided an alternative and competitive source of government financing. Consequently, domestic debt has steadily risen, such as (for the case of Malawi) rising from 10.2 percent of GDP in 2001, to 17.9 percent of GDP in 2006, and finally, to 38.6 percent of GDP as at the end of 2020.

Unlike external borrowing, which in most cases carters for development expenditure GoM (2018), domestic borrowing finances both recurrent and capital expenditures. The Malawi Growth and Development Strategy III reports that government domestic borrowing for capital expenditure took a sharp downward turn in 2001 following a cancellation of direct budget support by the country's donors over financial mismanagement concerns. The cancellation created a cash flow problem which

worsened the need for increased government borrowing to meet the recurrent expenditure gap, in the process, reducing resources available for capital expenditure. As such, from 2001 onwards, domestic borrowing has been financing recurrent transactions more than it has financed capital expenditure. Despite lack of consensus, there is some evidence in support of the crowding-in effect of public investment in Malawi which suggests that more often than not, borrowing for development expenditure could be more beneficial to private investment as it has crowding-in effect on private investment (studies by Makuyana and Odhiambo (2014, 2019) and a study by Maganga and Abdi (2012)). This might imply that the rising role of domestic borrowing in financing recurrent expenditure could have the opposing effect on private investment.

The country's banking and non-banking sectors have been the major sources of government's domestic financing. The banking system, includes commercial and investment banks, whereas the non-banking system includes pension funds, insurance companies Froyen (2013), among others.

The banking system has been a major source of government domestic borrowing in Malawi. Prior to financial liberalisation, credit rationing ensured priority financing to pre-identified state organisations and sectors. The period between 1965 and the mid 80's was characterised by a belief in the infrastructural hypothesis Makuyana & Odhiambo (2019). This formed the basis for massive state borrowing to build the country's infrastructure. Government intensified resource mobilisation for development expenditure. Makuyana & Odhiambo (2014) reports that credit rationing ensured that a greater proportion of bank credit be held by the public sector as much borrowing was done by or on behalf of parastatals, such as the Agricultural Development and Marketing Corporation (ADMARC), Malawi Development Corporation and Press Corporation Limited. In addition, these enterprises' controlling interest in the banking system gave them an upper hand in credit access during the time.

The adoption of the 2010 Pension Act has further helped to facilitate the accumulation of pension funds, which has in the process, expanded the resource envelope for financing opportunities in the country from the non-banking sector. Unfortunately, arising at a time with competing demand for government domestic borrowing to finance recurrent transactions, the pension sector's growing importance in financing the fiscal

deficits has meant that the availed extra resource envelope continues to fall in the hands of the public sector, perhaps, at the expense of private investment. Nevertheless, there is hope for private investment given the growth in pension funds realised so far which has implied that more resources are being availed for investment, and that there could be reduced pressure on the banking sector and enable it free up some resources for private investment.

Figure 5 below shows the rising role of the non-banking sector in domestic financing. As the figure shows, generally, government domestic borrowing from the non-banking sector has increased from just about 22.1 percent of total government domestic debt in 2010 to about 45.6 percent of total government domestic debt at the end of 2020.

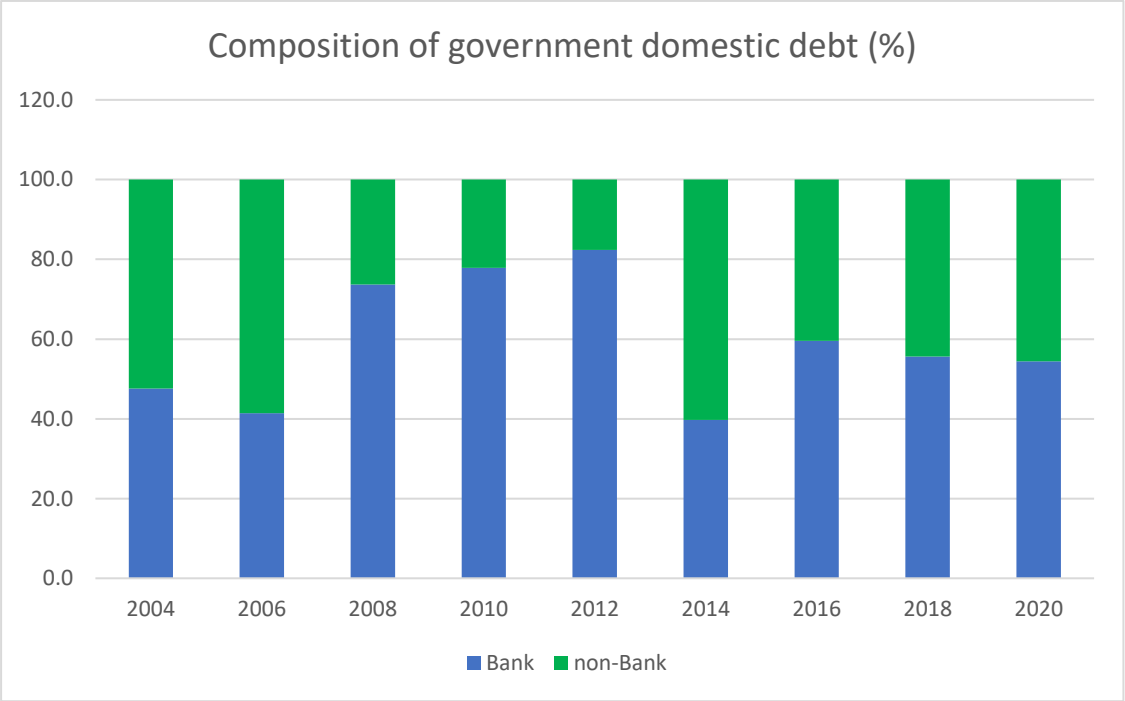

Figure 5: Composition of Government domestic debt

Data Source: MoF & RBM (2021)

CHAPTER THREE

LITERATURE REVIEW

3.1 Chapter Overview

This chapter outlies the theoretical aspect of the crowding-out hypothesis. It also provides a theoretical framework that establishes the basis on which the models adopted in the succeeding chapter are built. The chapter concludes with a section on lessons and gaps from the literature (empirical) considered. This again, further provides basis for the modification to the models as used in the various studies reviewed.

3.2 Theoretical Literature

The background overview points to a possibility that the not-so satisfactory performance in private investment in Malawi may have been due to the crowding-out effect from government domestic borrowing. This is portrayed to have occurred through two possible channels. First, the quantity channel in which state borrowing, partly supported by credit rationing during the financial control period, deprived the private sector of resources as they went into public investment. Second, through the interest rate channel where the liberalisation period has been accompanied by continued government domestic borrowing, possibly, exerting upward pressure on interest rates. Government borrowing further reduced the supply of loanable funds towards private investment, while high interest rates worsened the situation by making most investment projects less profitable. The eventual result must have been crowding out of private investment.

The controversy in modern macroeconomics on the crowding-out hypothesis emanates from the disagreements about how financial markets would react to more government borrowing Emran and Farazi (2009). The popular discussion surrounding the crowding-

out hypothesis is based on the banks' balance sheets. If government borrows one more dollar from the banks, the banks are left with one dollar less for the private sector.

Commercial banks respond to a higher government borrowing by adjusting their loan portfolio optimally given the risk-return characteristics of their different assets and liabilities Al-Majali (2018). The Ricardian Equivalence theorem may not hold, especially in the context of developing countries Emran & Farazi (2009). The net effect on private investment depends on the bank's response to the risk disposition and the subsequent portfolio adjustment.

There are some banks which would rather lend to the "risk-free" borrower (government), instead of having to conduct due diligence assessment of the risky private sector borrower. The higher the credit demand from the risk-free borrower, the less the probability that a "risky" borrower will access credit at "competitive" rates. As a result, commercial banks' access to "safe" government assets could discourage the banks from lending to risky private sector or stifle their incentives to seek out new profitable lending opportunities for private investment Emran & Farazi (2009). The eventual result is that the more a given economy is populated with such "lazy" banks, the greater the likelihood and degree of the crowding-out effect.

Alternatively, the commercial banks' portfolio review necessitated by the concentration of the risk-free assets can free-up resources by reducing the banks' need for excess reserves. This could be because of a strong risk-diversification effect Fayed (2013). The presence of risk-free creditors allows banks to expand credit because the "safe" government assets in the banks' portfolio allows the banks to bear more risk on the assurance of some minimum return from the risk-free client, government. The expansion would have a positive externality on private investment.

The theoretical background to the crowding-out hypothesis suggests that the effect can be moderated through fiscal multiplier effects when state borrowing for recurrent transactions helps to boost aggregate demand for the private sector. A similar argument can be made for state borrowing towards public investment, such as in utility, health, education, power, transport, and communication. This is expected to have a positive effect on private investment Al-Majali (2018). The accelerator effect would be most applicable in conditions of unused industrial capacity, such as during recessions or depressions.

However, the crowding-out effect would be most catastrophic if the economy was already operating at potential output. Then, state domestic borrowing would be inflationary, and result in eventual higher money demand. Since the economy is at full capacity, there is no room for the accelerator effect. More directly, if the economy stays at full employment, any increase in government domestic borrowing will shift resources away from the private sector. This phenomenon is sometimes called “real” crowding-out. This suggests that interest rates and inflation are intertwined. Indeed, Lucas & Sargent (1981) posit that the effect of state borrowing on prices should be understood in terms of its effect on money creation. There have been mixed results on fiscal dominance in Malawi, however, just as there have been mixed results on money and prices; (Mangani (2011, 2020); and Chiumia & Malikane (2015).

3.3 Empirical Literature

On the empirical front, there have been studies conducted on the crowding-out hypothesis for both developed and developing countries, including Malawi.

In a study aimed at investigating the effect of net government domestic borrowing on private sector credit in Jordan, Al-Majali (2018) used a Vector Error Correction Model to investigate the relationship. The study established evidence of the crowding-out hypothesis. Specifically, the study concluded that government borrowing from the domestic banks leads to a more than one to one crowding out of private credit.

In another study, Fayed (2013) used a Vector Error Correction Model approach to investigate the quantity channel of the crowding-out effect in Egypt. The study did not find evidence of the crowding-out effect. Instead, the study revealed that government domestic borrowing had a crowding-in effect on private sector credit.

A study by Thilanka & Ranjith (2018) examined the impact of public debt on private investment in Sri Lanka using a Vector Error Correction Model. They found that public borrowing crowds in private investment in Sri Lanka.

Khan & Gill (2009) investigated the crowding-out effect of public borrowing in Pakistan. Employing a Vector Error Correction Model on a 34-year time series, the study failed to corroborate the crowding-out effects. The study also observed that the sample period was characterised by market imperfections, and high liquidity conditions.

In the SADC region, Mbulawa (2015) used annual panel data for eleven SADC countries (including Malawi) to establish the determinants of credit to the private sector, and the possibility of a crowding-out effect of public debt. The study did not establish any evidence of the crowding-out effect of government domestic borrowing.

Using the Autoregressive Distributed Lag technique, Lidiema (2018) investigated the effects of government borrowing on private investment in Kenya. The study revealed that there was a strong and diminishing crowding-out effect on private investment in Kenya.

Another study by Mwakalila (2020) analysed the impact of government expenditure and domestic borrowing on private sector credit in Tanzania using the Autoregressive Distributed Lag Model. The study found that government expenditure and domestic borrowing crowded-out private sector credit through the positive impact that both variables have on lending rates.

Makuyana & Odhiambo (2019) conducted a study to examine the crowding-out/in effect of public investment on private investment in Malawi. The study established that public investment crowds-in private investment. This finding differs from another study that the same authors conducted in 2014 in which they reported that because of a centralised economic management system, the rapid expansion of public investment between 1966 and 1980 crowded-out private investment in Malawi Makuyana & Odhiambo (2014).

Maganga & Abdi (2012) conducted a study on an empirical test of the macroeconomic variables that can potentially affect private investment decisions in Malawi from a short and long run perspective. The study found evidence of a crowding-out effect of public investment.

In investigating the impact of government domestic borrowing on private sector credit in Malawi, Wella (2018) did not find evidence of a crowding-out. However, the study did not include financial market variables to control for the influence from financial market innovations on interest rate responsiveness. According to Wella (2018), the omission or inclusion of such variables can potentially change the outcome.

3.4 Conceptual Framework

This section outlines the theoretical background on the determinants of investment, and interest rates. This theoretical framework forms the basis for model selection and choice of variables of interest.

3.4.1 The Neoclassical Theory of Investment Demand

Spending on investment is an important component of aggregate spending in an economy. Investment can take several forms, including fixed capital formation for production of goods, infrastructure investment for production of services and inventory investment, among others. Investment decisions are two-staged. The first stage involves firms' determination of desired capital stock levels. The second stage involves deciding on how much change in investment (to the existing stock) will be required to attain that optimal stock.

The Neoclassical model of investment is cast in the neoclassical environment characterised by perfect competition, in which firms seek to maximise profit at each point in time with infinite time horizon as price-takers in both the factor and product markets Jorgenson (1963). Total revenue (TR) is the market value of the Cobb-Douglas production function (F(k, l)) with constant returns to scale, and diminishing marginal returns to capital (K) and labour (L), which can be expressed as:

$$TR_t = P_t Y_t = P_t F(K_t, L_{t)} = P_t K_t^{\alpha} L_t^{1-\alpha} \qquad 3.01,$$

$$\text{in which, } F_k, F_L > 0;\ F_{kk}, F_{LL} < 0$$

Total costs faced by an individual firm include rental cost of investment goods, adjustment costs and the wage bill. Rental cost (rc) includes all cost incurred in using the investment equipment, ranging from opportunity cost (foregone interest income in purchasing equipment), capital consumption, and capital gain or loss on the capital equipment, such that a capital gain will reduce the rental cost, and varies inversely with the price level.

$$rc = \frac{P^I}{P}(\mathrm{r}+\delta) \qquad 3.02$$

in which P^I is price of equipment, P is the price level, r is the real interest rate, and δ is the rate of depreciation of the capital equipment.

The Adjustment costs are associated with installation of new equipment and training of personnel in running and managing the new equipment. These are specified to be proportional to the price of the equipment, $a(l_t)$, and the marginal adjustment cost is $a'(l_t)$. Hence total cost, TC is a sum of these two cost components, and the wage bill, W_t.

Hence Adjustment cost = $RA_t = \{P_t^I + a'(l_t)\}(\mathrm{r} + \delta)$ 3.03,

$$ra_t = P_t^{-1}\{P_t^I + a'(l_t)\}(\mathrm{r} + \delta) \quad 3.04,$$ (in real terms)

The firm's profit, π_t, will be the difference between TR and TC, as:

$$\pi_t = TR_t - TC_t = P_t K_t^{\alpha} L_t^{1-\alpha} - \{P^I I_t + a'(l_t) + W_t\} \quad 3.05$$

Defining q_t as a measure of the marginal gain in total profit per unit increase in the capital stock at time, t, and taking first order conditions of equation 3.05 to maximise profits, we have the following identities:

$$P_t MPL_t = VMPL_t = W_t \quad 3.06$$

$$P_t MPK_t = VMPK_t = (1 + r)q_{t-1} - (1 - \delta)q_t \quad 3.07$$

$$a'(l_t) + P^I = q_t \quad 3.08$$

The foregoing theoretical framework suggests that in making decisions about a profit maximising capital stock, among other considerations, firms consider income (total revenue), real interest rates, prices of their goods and services, depreciation, and input cost. A similar conclusion is made from the q-theory and investment dynamics advanced by James Tobin, and by Tobin and William Brainard Yoshikawa (1980). This informs the basic formulation of investment function adopted in this study.

3.4.2 The Theory of Interest Rate Determination

It is generally theorised that increases in government borrowing results in an upward movement in interest rates. However, the empirical support for this proposition has been weak at best. Much of the debate on the relationship concerns the crowding-out question Hoelscher (1986).

The theory of interest rate determination traces its origin from the classical economic theories. In the classical system, consumption, investment, and government determine movements in the interest rate. The equilibrium interest rate is the rate at which the amount of funds individuals desire to lend out just equals the amount others desire to borrow. In the loanable funds market, this entails the interest rate that equates the supply and demand for loanable funds.

Money market equilibrium implies that real money supply equals real money demand. The money supply is assumed to be policy determined, hence exogenous.

$$m_t^S = \frac{M_t^S}{P_t} = lnM_t^d = \ln\left[\frac{M_t^d}{P_t}\right] = \sigma_0 + \sigma_1 lny_t - \sigma_2 i_t \qquad 3.09$$

$$i_t = \frac{\sigma_0}{\sigma_2} + \frac{\sigma_1}{\sigma_2} lny_t - ln\frac{M_t^d}{P_t} \qquad 3.10$$

i_t is real interest rate; M_t^S is nominal money supply; M_t^d is nominal money demand, y_t is real GDP' and P_t is the price level.

The rate of interest measures the return to holding bonds and, equivalently, the cost of borrowing. The interest rate depends on determinants of bond supply (borrowing) and bond demand (lending) Froyen (2013). Other factors might include foreign real interest rates, exchange rate, credit availability, and fiscal deficits Asamoah & Adu (2016).

3.5 Lessons, gaps, and critique of the current literature

One of the important lessons drawn from the reviewed literature is that the state of development of the domestic financial market influences the indirect channel of the crowding out hypothesis. The structure of the financial market could play a major role in determining interest rates' responsiveness, and hence the extent to which the indirect channel of the crowding-out effect could be prevalent in a particular economy. However, most of the reported studies on the subject (including those conducted for Malawi) did not empirically investigate interest rates' responsiveness to government borrowing as they focused on the quantity channel of the crowding-out hypothesis.

Considering that we are in a free market system, the quantity channel may not be holistic enough to explain the crowding-out effect. If interest rates were not determined by the free market, (as was the case during the financial repression period) credit availability would be more important in understanding the effects of government borrowing on private investment Fayed (2013). For the case of Malawi, this factor could

partly account for the observed weak correlation between private sector credit and private investment, which implies that a relationship between private investment and government borrowing cannot be inferred from any observed relationship between private sector credit and government borrowing, for instance. It would thus be more insightful to empirically investigate both channels at play.

It is for these observations that, different from the approach employed in the other studies reviewed, this study further investigates the indirect channel by investigating the extent to which interest rates respond to government domestic borrowing. This study also uses the financial development index to control for financial innovation in interest rates' determination.

CHAPTER FOUR

METHODOLOGY

4.1 Chapter overview

This chapter specifies the model, outlies diagnostic tests, describes the variables, and data sources.

4.2 Model specification

From both the theoretical literature review and the conceptual framework presented in Section 3.2 and 3.4.1, there seem to be consensus that investment is influenced by both income (GDP) and interest rates. Inflation has also been identified as one other determinant of investment. Inspired by Thilanka & Ranjith (2018), the basic model specification relating private investment, and a set of exogenous variables is given by equation 4.01 below. Further still, theory and the conceptual framework as presented in Section 3.4.2, and with inspiration from Asamoah & Adu (2016), this study also estimates equation 4.02 to assess the impact of government domestic borrowing on interest rates. As captured in the preceding chapter, particularly Section 3.2, money supply is a key determinant of interest rates. Government domestic borrowing is a key variable in the interest rate determination under the current study. Considering the likely multicollinearity between money supply and government domestic borrowing in Malawi, money supply has been dropped as a regressor in equation 4.02. As suggested by Wella (2018), and as has been used in other empirical work such as by Asamoah & Adu (2016) and Fayed (2013), a control variable for financial markets' development has been incorporated in equation 4.02 in interest rate determination.

$$\Delta Invst_t = \beta_0 + \sum_{i=1}^{n} \beta_i \, \Delta Invst_{t-i} + \sum_{i=0}^{n} \theta_i \, \Delta borr_{t-i} + \sum_{i=1}^{n} \theta_{i+1} borr_{t-i} + \sum_{i=0}^{n} \gamma_i \, \Delta Infl_{t-i} + \sum_{i=1}^{n} \gamma_{i+1} Infl_{t-i} + \sum_{i=0}^{n} \delta_i \, \Delta Int_{t-i} + \sum_{i=1}^{n} \delta_{i+1} Int_{t-i} + \sum_{i=0}^{n} \alpha_i \, \Delta GDP_{t-i} + \sum_{i=1}^{n} \alpha_{i+1} GDP_{t-i} + + \beta_1 Invst_{t-1} + v_t$$

4.01

$$\Delta Int_t = \sigma_0 + \sum_{i=1}^{n} \sigma_i \, \Delta Int_{t-i} + \sum_{i=0}^{n} \varphi_i \, \Delta borr_{t-i} + \sum_{i=1}^{n} \varphi_{i+1} borr_{t-i} + \sum_{i=0}^{n} \pi_i \, \Delta Infl_{t-i} + \sum_{i=1}^{n} \pi_{i+1} Infl_{t-i} + \sum_{i=0}^{n} \rho_i \, \Delta FDI_{t-i} + \sum_{i=1}^{n} \rho_{i+1} FDI_{t-i} + \sum_{i=0}^{n} \omega_i \, \Delta GDP_{t-i} + \sum_{i=1}^{n} \omega_{i+1} GDP_{t-i} + + \sigma_1 YInvst_{t-1} + \mu_t$$

4.02

Δ indicates change (delta) in a variable, **Invst** is real private investment, **borr** is real government's net domestic borrowing, **Infl** is inflation rate, **Int** is real interest rate, **GDP** is real GDP. **FDI** is the Financial Development Index, and t is time variable in years. There are several measures for financial markets development. This study uses private sector credit as a percentage of GDP as a measure of financial market development. $\boldsymbol{\upsilon}$ and $\boldsymbol{\mu}$ are error terms. GDP, Investment, and government net domestic borrowing are in Malawi kwacha, expressed in 2010 constant prices.

Equation 4.01 is assessing both the direct and the indirect channels, while equation 4.02 further validates the indirect channel. Of prime interest to the current study are the signs and significance (both statistical and economic) of the coefficients of **borr**, and **Int**: θ_i and δ_i , respectively in equation 4.01. In equation 4.02, the coefficient of **borr**, φ_i, is of primary importance to the current study.

There is crowding-out effect if θ_i, from 4.01 is negative and significant. This also implies presence of the quantity channel. The indirect channel is operational and unambiguous if δ_i is negative and significant, and φ_i is positive and significant.

In a financial system dominated by the risk diversification effect, $|\theta_i| < 1$ when $\theta_i < 0$; and in an extreme case, it can be positive. If the banks' behaviour is better characterized by the "lazy bank" view, then $|\theta_i| > 1$ with $\theta_i < 0$. An exceptional case is possible where both effects cancel each other out and have $\theta_i \approx -1$.

4.3 Diagnostic Tests

4.3.1 Unit root test

To avoid spurious regression, and to determine the appropriate form of models for estimation, unit root tests for the relevant series must be conducted using various test methodologies.

A stochastic process is stationary or covariance stationary if its mean and variance are constant over time such that the value of the covariance between any two periods depends only on the lag length between the two periods and, not necessarily, on the actual time at which the covariance is computed Gujarati (2003). Statistically, a stationary process fluctuates around a constant long-run mean and, also, the effects of shocks dissipate over time. Alternatively, if the series features a unit root, then it has no tendency to return to a long-run deterministic path and more importantly, a current shock to the series produces permanent effect on the long-run level of the series.

The sample period for the current study has been characterised by several regime changes: liberalisation, foreign exchange regimes, and donor freeze. These changes might have had some impact on the behaviour of the variables of interest in the current study, or on the likely relationships between them. Cognizance of these possible structural breaks, ordinary tests for unit root such as Phillip Perron and Augmented Dickey Fuller may not be effective. This study uses the Zivot and Andrews (1992) test to complement the ADF and KPSS stationarity test results.

The ADF test constructs a parametric correction for higher-order correlation by assuming that the series follows an AR(k) process and adding lagged difference terms of the dependent variable to the right-hand side of the test regression:

$$\Delta Y_t = C + \alpha Y_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad 4.03$$

$$\Delta Y_t = C + \alpha Y_{t-1} + \beta t + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad 4.04$$

Equation 4.03 tests for the null hypothesis that the series has a unit root against a mean-stationary alternative hypothesis while equation 4.04 tests the null that the time series has a unit root against a trend-stationary alternative hypothesis Sen (2003). In either case, the null hypothesis is that α is zero.

One shortfall with the ADF test is that it does not accommodate a possibility of a structural break. The power to reject a unit root decreases when the stationary alternative is not false and a structural break is ignored Perron (1997). As such, Perron proposed a unit root test that recognises the presence of a structural break. Perron's test is, however, discredited in that it assumes that the break point is known to the researcher, which may not be so in several instances. Instead, Zivot & Andrews (1992) proposes another unit root test which recognises the presence of a structural break but that which is dependent on the data algorithms to determine the break point.

Zivot and Andrews procedure uses three models to test for a unit root. One model accommodates a one-time change in the level of the series. The second model allows for a one-time change in the slope of the trend function, and the last model combines one-time changes in the level and the slope of the trend function of the series. To test for a unit root against the alternative of a one-time structural break, Zivot and Andrews use the following regression equations corresponding to the stated three models:

$$\Delta Y_t = C + \alpha Y_{t-1} + \beta t + \gamma DU_t + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad 4.05$$

$$\Delta Y_t = C + \alpha Y_{t-1} + \beta t + \theta DT_t + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad 4.06$$

$$\Delta Y_t = C + \alpha Y_{t-1} + \beta t + \theta DT_t + \gamma DU_t + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad 4.07$$

With a null hypothesis that α is zero in either case, DU is a dummy variable for a mean shift occurring at each possible break-date while DT is corresponding trend shift variable. The null implies that the series contains a unit root with a drift that excludes any structural break, while the alternative hypothesis $\alpha<0$ implies that the series is a trend-stationary process with a one-time break occurring at an unknown point in time Zivot & Andrews (1992).

4.3.2 Test for serial correlation

Serial correlation refers to correlation between members of series of observations ordered in time or space. This occurs when the error term in one period is correlated with the error term in the next period. It is a common problem in time series data. Non-autocorrelation does not imply that the individual observations are uncorrelated. Rather, it implies that the individual observations' deviations from their expected values are uncorrelated. Autocorrelation leads to downward biased standard errors, and inefficient estimators. The Breusch Godfrey LM correlation test is used to test for absence of serial correlation.

4.3.3 Autoregressive Conditional Heteroscedasticity (ARCH) Test

This is a concept developed by Engle (1982) who observed that traditional econometric models assume a constant one period-forecast variance, an assumption, he argued, was rather implausible considering that under certain circumstances, the variance of a time series data may have an autoregressive component which makes the variance volatile across space. Following this work, much test for heteroscedasticity in time series studies focuses on this form of heteroscedasticity. The general assumption is that the model has constant variance in that it does not have ARCH effects. Presence of ARCH effects can make the estimates inefficient. The test for ARCH effects was originally devised by Engle (1982) and is similar to the Lagrange Multiplier (LM) test for autocorrelation.

4.3.4 Cointegration test

Economic theory suggests that certain groups or pairs of variables are linked by a long run relationship. The long run equilibrium relationship is referred to as cointegration. Cointegration implies that the variables may drift away from each other in the short run but may not divert from each other in the long run. If a linear combination of nonstationary series is found to be stationary, the combination is called cointegrating vector/ cointegration, and the series are said to be cointegrated, and have a long-run relationship. If such series have a unit root, their short-run relationship (regression) is not spurious. On the other hand, a regression analysis of non-cointegrated series is

meaningless. It is, therefore, critical to test for cointegration to determine appropriate model forms and run away from spurious regressions.

This study conducts a cointegration test of the variables to determine the appropriate model and identify if there are both short-run and long-run relationships between the variables of interest. Several tests for cointegration complement each other in the current study, ranging from the bounds test (using the Kripfganz and Schneider (2018) critical values) to the sign and significance of the speed of adjustment coefficients in both models.

4.5 Data sources

The study uses annual data from 1975 to 2019. The choice of the sample period has been dictated by data availability. The data has been sourced from the Reserve Bank of Malawi, Ministry of Finance, and the World Bank. The summary of the data sources is as below.

Table 1: Data Sources

Series	**Source**
GDP	World Bank
Exchange Rate	World Bank
Interest rate	Reserve Bank of Malawi
Inflation	World Bank
CPI	World Bank
Money Supply (Broad money)	Reserve Bank of Malawi
Net Domestic Government Borrowing	Reserve Bank of Malawi/ Ministry of Finance
Private investment	World Bank
Private sector Credit	World Bank

CHAPTER FIVE

EMPIRICAL RESULTS AND ANALYSIS

5.1 Chapter Overview

This section presents the findings and discussion from the study. Summary statistics of the variables used in both models are presented in Section 5.2. Section 5.3 presents results of the unit root tests conducted to determine the order of integration and guide on the most applicable methodology. Model diagnostics, to shed light on the reliability of the results, are presented and discussed in Section 5.4. Finally, Section 5.5 contains model results and analysis.

5.2 Descriptive statistics

Table 2 below provides a summary of the variables used in the study.

Table 2: Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
GDP	45	693,123	344288.6	297,994.6	1,467,859
Investment	45	42,713.0	40767.1	6,778.584	162,290.8
Inflation	45	18.6	13.4	7.411591	83.3
Interest rate	45	9.6	11.0	-29.22136	35.0
Borrowing	45	51,535.4	47951.7	-4,266.321	167,647.2
Fdi	45	7	4	2	15

5.3 Unit Root Test Results

As Table 3 below shows, to account for structural breaks, the Zivot and Andrews test was employed in the stationarity test. This was used to complement the ADF and KPSS tests. The results show that no series has been found to be trend stationary. All variables, except for real interest rates, are integrated of order one while real interest rates series is stationary in levels.

Table 3: Unit Root Test Results

	ADF (-2.9297)	KPSS (0.463)	Zivot-Andrews (-4.8)	**Order of Integration**
GDP	2.2076	0.5861	-2.236	**I(1)**
D(GDP)	-1.3073	0.2839**	-7.84**	
D2(GDP)	-13.0848**			
T(GDP)	0.2085		-2.236	
Invst	-0.7954	0.6068	-4.082	**I(1)**
D(Invst)	-5.4247**	0.1445**	-8.132**	
T(Invst)	-1.9539		-4.082	
Infl	-2.2885	0.1547**	-3.671	**I(1)**
D(Infl)	-7.0328**		-9.472**	
T(Infl)	-2.2245		-3.671	
Inte	-0.2746	0.6077	-8.071**	**I(0)**
D(Inte)	-12.4093**	0.403**		
T(Inte)	-6.9715**		-8.071**	
Borr	-0.4489	0.5861	-4.297	**I(1)**
D(Borr)	-6.2979**	0.2839**	-6.535**	

T(Borr)	-1.6382		-4.297	
Fdi	-1.4869	0.2166**	-3.529	**I(1)**
D(fdi)	-3.0682**		-5.855**	
T(fdi)	-1.2182		-3.529	

*Significant at 10%, ** significant at 5%, *** significant at 1%.

Based on these results, and guided by Pesaran et al (2001), the study resolved to employ the Autoregressive Distributed Lag Model.

5.4 Model Diagnostics

Several post-mortem checks have been conducted to ascertain the robustness and reliability of the estimation results. This subsection reports on some of the test results conducted.

5.4.1 Normality test

One of the assumptions of the Classical Linear Regression model is that the error terms are normally distributed. Violation of this assumption implies that inference and hypothesis testing cannot be reliable. Table 4 below presents the Jackie Bera normality test results. The results show that in both models the normality assumption hypothesis cannot be rejected.

Table 4: Normality Test Results

Model 4.01		**Model 4.02**	
Jarque-Bera statistic	0.592541	Jarque-Bera statistic	0.295684
P-Value	0.743586	P-Value	0.862567

5.4.2 Autocorrelation

The Breusch-Godfrey LM test for autocorrelation results for both models as presented in Table 5 below show that neither model suffers from serial correlation.

Table 5: ARCH Effects and Autocorrelation Test Results

Model 4.01		**Model 4.02**	
Breusch-Godfrey LM chi2	0.222	Breusch-Godfrey LM chi2	1.460
P-Value	0.6375	P-Value	0.2269
archlm chi2(1)	0.27	archlm chi2(1)	2.348
P-value	0.6031	P-value	0.1254

5.4.3 ARCH Effects

Table 5 above also presents the ARCH effects test results for models 4.01 and 4.02. The results show that the null hypothesis of no ARCH effects (constant variance) cannot be rejected in both models.

5.4.4 Stability tests

The CUSUM tests for model stability in both models show that there is parameter constancy across the sample space. The test results are as shown in Figure 6 and Figure 7 below.

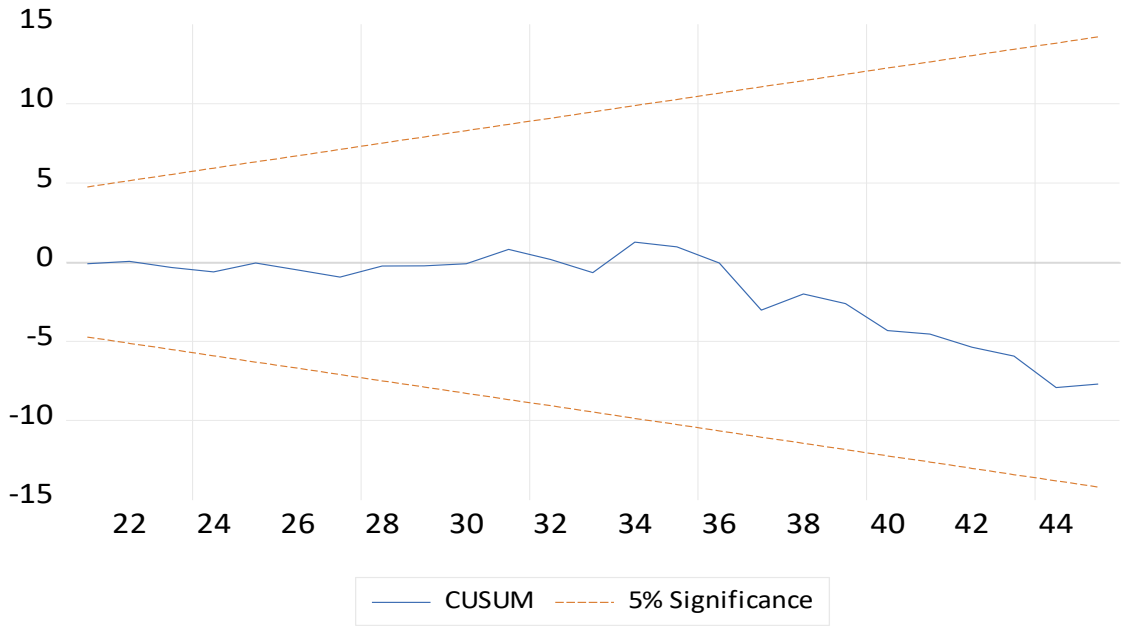

Figure 6: CUSUM stability test of the Investment Model

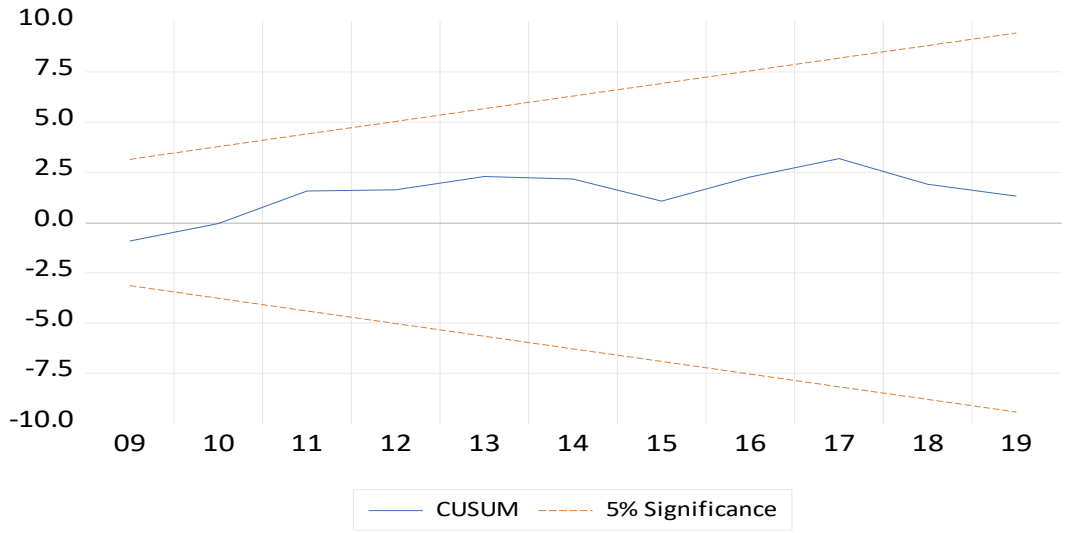

Figure 7: CUSUM stability test of the Interest rate Model

5.5 The ARDL Model and Results

Following the outcome of the unit root tests given in section 5.3, the appropriate model to use is the Autoregressive Distributed Lag (ARDL).

Various functional forms were experimented in the estimation of the adopted ARDL model. These have been expressing real investment and real net government domestic

borrowing as percentages of GDP, using logarithmic transformation for GDP, investment, and net government domestic borrowing, and using growth rates for GDP, investment, and net government domestic borrowing. After all this experimentation, the paper has settled for estimating the models in absolute values of the variables as reported in section 4.2, on account of overall model significance, and individual parameter significance, and on account of the respective models' goodness of fit.

5.5.1 Short-run effects

The short run effects of models 4.01 and 4.02 are presented in Table 6 below. Results from model 4.01 indicate that in the short run, real interest rates have a significant negative influence on real private investment. Further, the joint significance test for a group of coefficients for net government borrowing variables (as presented in the last row of Table 6) shows that the null hypothesis that government net domestic borrowing does not affect investment is rejected, and hence conclude that government net domestic borrowing does affect investment. This provides evidence of the direct channel of the short-run crowding-out effect in Malawi.

For model 4.02, government borrowing is found to have a statistically significant effect on real interest rates. However, it is of a wrong algebraic sign, lacking a theoretical backing. From the economic significance viewpoint, it might as well be considered that these results show that government domestic borrowing does not have a significant impact on interest rates. As such, largely on the basis of economic significance, it is safe to conclude that the outcome fails to establish evidence that real net government domestic borrowing influences real interest rates in the short run. This casts doubt on the relevance of the indirect channel of the crowding-out hypothesis in Malawi.

Table 6: Short-Run Estimation Results

Variable	Model 4.01	Model 4.02
Constant	9691.925	6.8178
LD.Investment	0.5137**	-
L2D.Investment	-0.3719**	-
D1.GDP	0.2328**	0.0000**

LD.GDP	0.4158**	-
D1.Inflation	-230.6	-0.2777**
LD.Inflation	1142.1**	-
L2D.Inflation	678.6**	-
L3D.Inflation	455.5**	-
D1.Interest	-797.0**	-
D1.Borrowing	-0.1188	-0.0001**
LD.Borrowing	0.4708**	
Fdi	-	-40.9866
D1. Borrowing =LD. Borrowing =0 (F-statistic) P-Value (F-Statistic)	6.79** 0.0044	

*Significant at 10%,** significant at 5%, *** significant at 10%.

5.5.2 Cointegration Analysis (Bounds Test)

A Pesaran, Shin, and Smith (2001) bounds test for cointegration analysis has been conducted to ascertain the existence of a long run relationship, and hence the reliability of the long run coefficients obtained from the estimation of the ARDL framework employed.

The results of the test are presented in Table 7 below.

Table 7: Kripfganz and Schneider (2018) critical values and approximate p-values

	Model 4.01							
	10%		**5%**		**1%**		**P-Value**	
	I(0)	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**
F	2.576	3.961	3.145	4.736	4.526	6.598	0.005	0.035
T	-2.464	-3.579	-2.835	-4.014	-3.594	-4.901	0.006	0.067
	Model 4.02							
	10%		**5%**		**1%**		**P-Value**	
	I(0)	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**
F	2.657	3.848	3.211	4.547	4.515	6.177	0.000	0.000
T	-2.56	-3.668	-2.905	-4.069	-3.607	-4.872	0.000	0.000

With a computed F-statistic of 5.144, and a computed t-statistic of -3.832 from model 4.01, and an F-statistic of 15.601, and a t-statistic of -8.704 from model 4.02, the results show that in both models, the null hypothesis of no levels relationship is rejected at 5 percent level of significance. The variables in both models are, therefore, cointegrated. The long run coefficients from the corresponding ARDL forms are, thus, meaningful. Further to the bounds test results, the coefficients for the speed of adjustment in both models are negative and significant, pointing to a possible long-run convergence in the variables, hence providing further support for presence of cointegration.

5.5.3 Long-run effects

The bounds test conducted above confirms presence of long run relationship in the variables. As such, the long run forms of the ARDL formulation are estimated. Table 8 presents long run coefficients from models 4.01 and 4.02.

Table 8: Long-Run Estimation Results

Variable	Model 4.01	Model 4.02
Speed of adjustment		
Investment (-1)	-0.6897**	-
Interest (-1)	-	-1.3258**
GDP (-1)	0.1473**	-0.0000**
Inflation (-1)	-2625.8**	-0.4611**
Interest (-1)	-1155.5**	-
Borrowing (-1)	-0.724**	-0.0001**
fdi (-1)	-	-30.9148

*Significant at 10%, ** significant at 5%, *** significant at 1%.

The test results show that in the long term, real private investment is influenced by both real interest rates and real net government domestic borrowing. Impliedly, government domestic borrowing rises at the expense of private investment, and higher interest rates impinge private sector investment.

Specifically, the results show that a one percentage point increase in real interest rates reduces real private investment by about MK1.2 billion. Further, a MK1.0 million increase in real net government domestic borrowing reduces real private investment by about MK724,000. This indicates that there is a partial crowding out effect of government domestic borrowing as the reduction in private investment is less than the increase in government domestic borrowing. This could be indicative of the dominance of a strong risk diversification effect in the country's banking system in which a high concentration of government securities (assumed risk-free) in the banking system's assets frees up some resources (such as from excess reserves) for other clients, including private investors. Stated differently, this finding points to a possibility that the uptake of government securities by the domestic financial institutions, particularly by the country's banking system, for instance, reduces the need for excess reserves, and

is associated with a strong risk diversification effect. This would explain the partial crowding-out established.

The finding on the effect of government borrowing on private investment supports the quantity channel of the crowding-out hypothesis in Malawi. Consequently, with the study findings, the null hypotheses that government borrowing, and that interest rates do not affect investment in Malawi are rejected. The study, therefore, has established evidence of the (direct) crowding out effect in Malawi.

In general, this finding is consistent with Makuyana & Odhiambo (2014) who established evidence of the crowding out effect in Malawi, especially between 1964 and 1980. The study findings are also consistent with Maganga & Abdi (2012) in finding evidence of the crowding out effect in Malawi. However, these results are not in agreement with Makuyana & Odhiambo (2019), and Wella (2018) who failed to establish evidence of the crowding out effect in Malawi from their respective studies. As stated before, the current study has used government domestic borrowing and private investment as opposed to using public investment for government domestic borrowing or using private sector credit for private investment as was used in the other studies before. It is, therefore, possible that the inconsistency in the findings is on account of the methodological differences.

In model 4.02, the results show that government domestic borrowing has negative impact on real interest rates. This finding is contrary to the theoretical disposition. One would expect to have a positive relationship between the two. Much as the coefficient is statistically significant, it is economically insignificant. It is safe to regard this outcome as implying interest rate non-responsiveness to government borrowing, particularly with emphasis on economic significance. With this finding, the null hypothesis that government borrowing does not affect interest rates in Malawi cannot be rejected. As such, the finding fails to substantiate the indirect channel of the crowding out effect in Malawi.

One may speculate that the non-responsiveness of interest rates to government domestic borrowing is on account of the structure of the country's financial market. There is a possibility that being a significant player on the domestic financial market, government is not a price-taker. Instead, it enjoys monopsony. Indeed, this can be supported by the observation that government securities in Malawi are usually oversubscribed, hence

likely to have a dampening effect on interest rates. With such excess supply, there is little upward pressure on interest rates irrespective of the level of financing sought. Possibly, the excess supply of funds associated with the borrowing demands from government could be responsible for the observed downward pressure on interest rates. What this further implies is that in scramble for government securities, subscribers lower their expected yields to increase their chances of success (non-rejection). This would explain the puzzle on the observed statistical (negative) relationship between government domestic borrowing and interest rates, otherwise expected to be positive and significant.

CHAPTER SIX

CONCLUSION AND POLICY RECOMMENDATIONS

6.1 Chapter Overview

This study aimed at re-examining the crowding-out hypothesis in Malawi. The overall objective has been to investigate if government borrowing from the domestic financial market crowds out private investment. This chapter summarises the main study findings and suggests policy recommendations based on the findings. The chapter concludes with a suggestion on future research areas.

6.2 Conclusion

The study has employed the ARDL technique upon satisfaction of the basic requirements, such as that the series used be a mixture of I(0) and I(1) processes. The determination of the orders of integration was done and confirmed by appropriate tests that take into consideration the potential impact of structural breaks on the behaviour of economic variables.

Both short run and long run results have shown that government domestic borrowing and interest rates reduce real private investment in Malawi. This has implied the existence of the crowding-out effect, particularly through the quantity channel. As such, this study has rejected the first and third null hypotheses, and concluded that government borrowing, just as interest rates, affect private investment in Malawi.

The study also sought to investigate the indirect channel of the crowding-out effect in Malawi by estimating the interest rate model.

Results from this model have shown that, statistically, there is a significant negative relationship between interest rates and government domestic borrowing in Malawi both in the short run and in the long run. The finding is counter-intuitive in that theory predicts a positive relationship. The study speculates that the negative relationship could have more to do with the market structure than the actual relationship between these variables. It has been hypothesised that excess supply of loanable funds for government securities as government intends to borrow from the market could be responsible for the dampening effect on interest rates.

More importantly, the coefficients on government borrowing in the interest rate model have been found to be economically insignificant though statistically significant. The economic insignificance of the coefficients of net government domestic borrowing on interest rates has led to the failure to reject the second null hypothesis and conclude that government borrowing from the domestic financial market does not affect interest rates in Malawi. This has informed the verdict that the indirect channel of the crowding-out effect is non-existent in Malawi on account of interest rate insensitivity to government domestic borrowing.

In a nutshell, this paper has, therefore, found evidence of only the direct channel of the crowding-out effect in Malawi, but has failed to substantiate the indirect channel of the crowding-out hypothesis in Malawi.

6.3 Policy Recommendation

The study has found evidence that government borrowing impedes real private investment in the country. It has also established evidence that high interest rates stifle private investment in Malawi, both in the short run and in the long run. However, the study has failed to link high interest rates to increased government borrowing from the domestic financial markets.

These findings provide an insightful input into policy formulation in the country. It provides a call for fiscal prudence if government's goal of achieving private sector led growth as contained in both the Malawi Growth and Development Strategy III and the Malawi 2063 is to be attained. If the country's development strategies continue to identify the private sector as an engine of economic growth, relevant effort to identify and uproot impediments to the sector's growth need to be applied to ensure that the

sector thrives. Fiscal discipline will help to moderate the need for government borrowing, and hence support private investment, in the process.

The finding on the impact of interest rates on private investment calls policy action to keep low interest rates in the country. One way to achieve this is by promoting financial market development, such as through increasing number of market players and financial instruments, among other innovations. This will enhance competition and help keep low and competitive interest rates to boost private investment.

The paper attributes the non-responsiveness of interest rates to government borrowing to the underdeveloped financial markets in Malawi. Investing in the domestic financial markets development could also go a long way to address this challenge, and perhaps, help pave way for a more reliable re-examination of the extent to which interest rates adjust with government borrowing from the domestic market.

6.4 Further areas of Research

One of the findings in this study has been that government domestic borrowing negatively affects real interest rates in Malawi. This finding is counter-intuitive in that a positive relationship between the two variables is expected as government borrowing represents demand for loanable funds.

This paper speculates that this finding could be attributed to excess supply of funds for government securities whenever government intends to borrow from the domestic financial market, compounded by the shallow domestic financial market. This is a strong supposition and requires empirical investigation other than mere speculation. However, such an elaborate investigation is beyond the scope of the current study.

As such, future studies may consider exploring the extent to which real interest rates respond to supply of loanable funds for government securities. Alternatively, the studies may explore the impact of government conduct and dominance on financial markets' responsiveness in Malawi. Findings from the suggested areas will help to complement the findings from this study and enhance the literature for both academic and policy purposes.

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