THE IMPACT OF DOMESTIC DEBT ON PRIVATE INVESTMENT IN THE

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Ebrima GOMEZ

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THE IMPACT OF DOMESTIC DEBT ON PRIVATE INVESTMENT IN THE GAMBIA

Ebrima GOMEZ

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Department of Economics(English)
Supervisor: Assoc. Prof. Dr. Bilge Kağan ÖZDEMİR

Eskisehir
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<u>Committee Members</u>		<u>Signature</u>
Member (Supervisor)	: Assoc.Prof.Dr.B.Kağan ÖZDEMİR	
Member	: Assist.Prof.Dr.B.Tuğberk TOSUNOĞLU	
Member	: Assist.Prof.Dr.Hakan ACAROĞLU	

05/01/2018

Date

Prof.Dr.Emel SIKLAR

ABSTRACT

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Ebrima GOMEZ

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Recently, domestic borrowing has been a major source of deficit financing for many developing countries. Evidence suggests that this form of funding saves developing countries from currency risks as domestic debts are denominated in the local currency. However, it carries higher interest rates than external debts. Also, excessive domestic borrowing might crowd out private credit and investment. It is in this context that we seek to answer our main research questions. First, does domestic debt have a negative effect on private investment in the Gambia? Second, does interest rate have a crowding-out effect on private investment? To answer these research questions in an empirical way, we developed an investment model based on the neoclassical investment function and considered an annual time series data set from 1980 to 2013. To examine the nexus between our dependent variable, private investment, and the explanatory variables, we used an Autoregressive Distributed Lag (ARDL) model. Based on the bounds test result, a long run relationship exists between our variables. Furthermore, domestic debt was found to have a negative effect on private investment in the short run. On the hand, the real interest rates had a crowding-out effect on private investment in the long run but a positive effect in the short run. This study will be a guide for policymakers on formulating fiscal and monetary policies to curb the level of domestic borrowing to optimal or sustainable levels. It will also provide them will tools to enable the private sector which is a key pillar in any nation's economic growth and development.

Keywords: Private Investment, Domestic Debt, Real Interest Rate, Bounds Test, Cointegration

ÖZET

GAMBYA'DA İÇ BORCU ÖZEL YATIRIMA ÜZERİNDEKİ ETKİLERİ

Ebrima GOMEZ

İktisat (Ingilizce) Anabilim Dalı

Anadolu Üniversitesi, Sosyal Bilimler Enstitüsü, 05 Ocak, 2018

Danışman: Assoc. Prof. Dr. Bilge Kağan ÖZDEMİR

İç borçlanma birçok gelişmekte olan ülke için açık finansman kaynağı olmuştur. Kanıtlar, iç borçların yerel para birimi cinsinden oluşması nedeniyle gelişmekte olan ülkelerin para birimi riskini ortaya koymaktadır. Bununla birlikte, iç borçlanma dış borçlardan daha yüksek faiz oranlarına sahiptir. Ayrıca, aşırı iç borçlanma, özel kredi ve yatırımın kalabalığına düşebilir. Bu bağlamda ana araştırma sorularımızı cevaplamaya çalışıyoruz. İlk olarak, iç borç Gambiya'da özel yatırım üzerinde olumsuz bir etki yaratıyor mu? İkincisi, faiz oranı, özel yatırımlar üzerinde kalabalık bir etkiye sahip mi? Bu araştırma sorularını ampirik bir şekilde cevaplamak için, neoklasik yatırım fonksiyonuna dayanan bir yatırım modeli geliştirdik ve 1980-2013 yılları arasındaki yıllık zaman serisi verilerini değerlendirdik. Bağımlı değişken, özel yatırım ve açıklayıcı değişkenler arasındaki bağları incelemek için, Autoregressive Distributed Lag (ARDL) modeli kullandı. Sınırların test sonucuna dayanarak, değişkenlerimiz arasında uzun vadeli bir ilişki olduğuna dair kanıtlar vardı. Dahası, iç borç stokunun kısa vadede özel yatırımlar üzerinde olumsuz etkisi olduğu tespit edildi. Öte yandan, reel faiz oranları uzun vadede özel yatırımlar üzerinde kalabalık bir etkiye sahipken kısa vadede olumlu bir etki yarattı. Bu çalışma, iç borçlanmanın seviyesini optimum veya sürdürülebilir seviyelere çekebilmek için sürdürülebilir mali ve para politikaları oluşturma konusundaki karar vericiler için bir rehber olacaktır. Ayrıca, herhangi bir ülkenin ekonomik büyümesinde ve kalkınmasında kilit bir sütun olan özel sektörün etkinleştirilmesi için araçlar sağlayacaktır.

Anahtar Kelimeler: Özel Yatırım, İç Borç, Reel Faiz Oranı, Sınır Testi, Eşbütünleşme

ACKNOWLEDGEMENTS

STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with "scientific plagiarism detection program" used by Anadolu University, and that "it does not have any plagiarism" whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

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SYMBOLS AND ABBREVIATIONS

AIC   : Akaike information criterion

ADF   : Augmented Dickey-Fuller Test

ARDL   : Autoregressive Distributed Lags

BCPS   : Bank Credit to the Private Sector

CBG   : Central Bank of the Gambia

CIA   : Central Intelligence Agency

CUSUM   : Cumulative Sum Control Chart

CUSUMQ   : Cumulative Sum Square Control Chart

DD   : Domestic Debt

DSA   : Debt Sustainability Analyses

EC   : Error Correction

GDP   : Gross Domestic Product

GBOS   : The Gambia Bureau of Statistics

HIPC   : Heavily Indebted Poor Countries

I(n)   : Integrated at n Difference

IMF   : International Monetary Funds

PIV   : Private Investment

LICs   : Low Income Countries

MPC   : Monetary Policy Committee

REER   : Real Effective Exchange Rate

RINT   : Real Interest Rate

UNDP   : United Nation Development Policy

VECM   : Vector Error Correction Model

1.   **INTRODUCTION**
1.1.   **Background**

Past studies on government borrowing in Low-Income Countries (LICs) concentrated more on external debt. This is due to the unavailability of data and the historical dominance of external debt as a source of government borrowing for most of these countries (Panizza, 2008). It can also be as a result of the fact that external debt is seen as a source of additional resources for the country whilst domestic debt just moves resources within the country (Bua, Pradelli & Presbitero, 2014). Until recently, external debt has been the main component of public debt in the Gambia. The external debt stock rose to a level that the government could not settle. As a result, the International Monetary Fund (IMF) and the World Bank (WB) had to intervene. In 2007, to enable debt sustainability, the Gambia like many LICs were provided a debt relief by IMF and World Bank Debt Sustainability Analyses (DSAs) for Heavily Indebted Poor Countries (HIPC) and Multilateral Debt Relief Initiative (MDRI). The country saw its stock of external public debt reduced from USD $677 million as of end 2006 to USD $324 million at end 2007 (IMF, 2013).

After the recent financial crises in 2007-08, many LICs including the Gambia switched from external to domestic borrowing to finance budget deficits (Bua, Pradelli & Presbitero, 2014). This move sparked the interest from academician and policy makers to study the impacts that the accumulating domestic debt might have. In a report made by the Governor of the Central Bank of The Gambia (CBG), the current domestic debt as at the end of 2015 equals a 54.2 percent of GDP. The governor ascribed this to the widening of the budget deficit from the US $81.8 million dollars in 2014 to USD $115.2 million dollars in 2015 (CBG, 2016). The domestic debt of the Gambia maintained an increasing trend from the mid-2000s to date. Domestic debt stood at 31 percent of GDP in 2008, 28.3 percent of GDP in 2009, 27.4 percent of GDP in 2010, 29.2 percent of GDP in 2011, 30 percent of GDP in 2012 and 54.2 percent of GDP in 2015 (CBG,2015).

One of the reasons for the recent increase in domestic debt of the Gambia is the budget deficit. The IMF report on the Gambia in 2008 highlighted that the current account deficit of the Gambia is way above what economic fundamentals would predict.

From 1997 to 2003, the Gambia's current account deficit averaged 2.5 as a percent of GDP. However, from 2004 to 2007, the current account deficit increased to an average of 11 percent of GDP (Tsikata *et. al*, 2008).

The deficit on trade of goods and nonfactor service is another factor leading to the increase of the domestic debt to GDP ratio in the Gambia. The Gambia is an import oriented country. The hefty importation and small amount of exports have led to the goods account deficit widening from USD $89.38 million in 2012 to USD $131.3 million 2015 (CBG, 2016).

The recent large fiscal disparities as a result of policy slippages and financial difficulties in public enterprises is another cause of the increase domestic borrowing. The fiscal deficit increased from 4.4 percent of GDP in 2012 to 11 percent of GDP in 2014 and fell slightly to 9.6 percent of GDP in 2015 (UNDP, 2016).

The UNDP report (2016) stated that one of the reasons why the Gambia government rely heavily on the domestic financial commercial banks to finance its budget deficit is a result of the difficulties it faces in mobilizing external funds. This inability to access external funds has piled pressure on the Central Bank to continuously issue T-bills to cater for the deficit.

The main players in the domestic debt market are the commercial banks as mentioned earlier. Their assets are mainly in T-bills. The commercial banks stock of T-bills increased from GMD814.2 billion in the year 2000 to GMD2835.5 billion in 2008 (Tsikata *et. al* 2008). This rise in domestic bank holding of T-bills is worrying because according to Emran and Farazi (2008), when a government borrows US$1 from banks it crowds out private credit by up to 80 cents in the long run. This scarcity of funds for the private sector might lead to a fall in the accumulation of private capital. This is the reason why the IMF in their bid to enable economic growth policies does discourage governments from borrowing from the banking sector. To prevent the crowding out of private sector investment, IMF limits domestic finance to the public sector (IMF, 2005).

The 2011 Central Bank of the Gambia annual report highlighted that private sector credit has been falling over the years and this can be explained by the increasing size of the government which may crowd out private investment (CBG, 2011). In 2007, T-bills accounted for 85.75 percent of the domestic debt and 54.5 percent of these T-bills were

held by commercial banks (CBG, 2007). The private sector in developing countries especially the Gambia rely mainly on commercial banks' credit for a source of capital so an increasing government borrowing can limit the growth and development of private investment significantly.

On the backdrop of the continuous increase issuance of government securities in the domestic market and increase accumulation of domestic debt, it is imperative that an empirical study of the effects of domestic debt be examined. Some famous proponents of our topic are the Classical and Keynesian Economists. The Classical economists hold a reserved stance to government borrowing to finance deficits. Adam Smith in his book the Enquiry into the Wealth of Nations, 1776, condemned government intervention in the operation of the economy. He added that "the practice of funding deficit spending has gradually enfeebled every state which has adopted it" (Smith, 1776). The Classical Economists claim that government borrowing will lead to a shortage of fund for the private sector and this will lead to what is referred to as crowding-out effect on private investment. On the hand, David Ricardo in his equivalence theory stated that domestic borrowing does not have any effects on private investment. The opposite view is held by the Keynesian Economists. They believe that the economy is never at full employment level and the State can borrow funds to finance deficits. They claim that via the multiplier effect an increase in government spending will lead to an even greater increase in output (King'wara, 2014). Given the differences in views by the various economic schools, the only way to determine the effect of domestic debt on private investment in the Gambia is to empirically investigate it.

1.2.   Statement of Problem

The continuous increase in domestic debt may hamper the level of private investment growth in the Gambia. As Emran and Farazi (2008) stated, government borrowing from local banks reduces the amount of credit available to the private sector. The shortage of funds might lead to an increase in the cost of borrowing thereby discouraging investment. In addition to issues of high domestic debt, the Gambia suffers from the accessibility of funds and government intervention in the foreign exchange market. These issues are detrimental to business operations in the country as investors require a liquid and well-functioning financial market to operate (Brinded, 2016). Given the Gambia's struggle to reduce the youth unemployment rate which currently stands at

38 percent and also curb the poverty rate down from the current 48 percent according to torchon Gambia (2017), it is important to have a well-functioning private sector. That being the case, it calls for an empirical analysis of the possible impact the current domestic debt might have on private investment.

Researchers have studied private investment in developing countries in recent years but they mostly concentrate on the determinants of private investment (e.g., see Emran *et al.* (2002), Tariq and Saniya (2013), Acosta and Lazo (2004)). In some cases, the nexus between private investment and economic growth was investigated e.g. Forgha *et al.* (2014), Mustefa (2014) and Bal and Rath, (2014)). Studies by Akomolafe *et al.* (2015), Kamundia (2015), Narayan (2004) and Erenburg and Wohar (1995) looked at the link between private investment and public investment. Only a few, like King'wara (2014), Atukeren (2005) and Kamundia (2015) looked at the impact of domestic debt on private investment. To our knowledge, there has been no prior study on this topic on the Gambian economy. There is therefore a need to conduct an empirical analysis of the impact of domestic debt on private investment in the Gambia.

For these reasons, our study has the following merits. Policy makers will benefit from the findings of this paper in their quest to curb the ballooning domestic debt. In addition, domestic debt is new in the literature and there is no study on the Gambia, this study will be a source of literature for future researchers who are interesting in investigating problems related to debt.

1.3.   Objectives of the Study

The aim of our paper is to investigate the impact of domestic debt on private investment in the Gambia. We will consider the variable private investment as our dependent variable and domestic debt, real interest rate, GDP, real effective exchange rate and bank credit to the private sector as independent variables.

1.4.   Research Questions

The study aims to answer the following research questions:

1. Does domestic debt affect private investment?
2. Do the high-interest rate crowd out private investment?

1.5. Justification

This study is important due to the fact that it seeks to investigate the influence of domestic debt on private investment in the Gambia. Firstly, it is vital to conduct this study as policy makers should be informed of the nature of the effect of government borrowing from the local commercial banks on private investment in the country. If there is a crowding out effect, like the classical economists and some empirical studies claimed, then drastic steps should be taken to curb the increased use of this source of funding. Secondly, our results will provide vital suggestions on fiscal management. Given the new government's quest to creating jobs and alleviating poverty levels, private sector investment will be at the heart of achieving these goals and any other national development goals they might set. Thirdly, there is scarce empirical literature on the impact of domestic debt and most looked at the impact of domestic debt on economic growth and the impact of public investment on private investment. This paper is different as it provides new literature for future researchers on the impact of domestic debt on private investment. Finally, previous studies looked at domestic debt and its effects in developed and some developing countries but no specific study has ever been done specifically on the Gambian economy. So, this will be the first paper to empirically investigate the effect of domestic borrowing on private investment in the Gambia.

1.6. Scope and Limitations

Our study considered the impact of domestic debt on private investment in the Gambia over the period 1980-2013. The study couldn't include most recent years as data on most of them are not available. Also, the study relied fully on secondary data. This form of data might contain some errors that might affect the findings. A key limitation was unavailability of data on public investment. The data was not available online and neither the Ministry of Finance nor the Bureau of Statistics of the Gambia could provide it. The inability to measure the impact of this variable on private investment is a key limitation. The outcome of the model might have looked different if this variable was added.

1.7. Conceptual Framework

Private investment according to King'wara (2014) is the accumulation of capital goods over a period of times by firms. The World Bank defined private investment as

"the gross outlays by the private sector (including private non-profit agencies) on additions to its fixed domestic assets". The Cambridge Dictionary also defined it as "money invested by companies, financial organizations, or other investors, rather than by a government". Private investment is an investment made by private entrepreneurs whether of foreign or domestic origin (Majumder, 2007).

Panizza (2008) provided three definitions of domestic debt. First, domestic debt is debt issued in domestic currency. Second, domestic debt is owed by the government to residents of the country. Third, domestic debt can refer to debt issued internally and under the laws of the country. Ashadami (2006) defined Domestic government debt as debt instruments issued by the Federal government and denominated in the local currency. Bank credit to the private sector according to the World Bank refers to "financial resources provided to the private sector by financial corporations, such as loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment".

Real Interest Rate is defined by the World Bank as "the lending interest rate adjusted for inflation as measured by the GDP deflator".

GDP according to Meriam-Webster Dictionary is "the total value of the goods and services produced by the people of a nation during a year not including the value of income earned in foreign countries". The Cambridge dictionary also gave a similar definition stating that GDP is "the total value of goods and services produced by a country in one year".

Exchange rate refers to the amount of a foreign currency per unit of domestic currency. The Cambridge dictionary defined exchange rate as "the rate at which the currency of one country would be changed for another if differences in prices and wages between the two countries are taken into account".

1.8. Definition of Variables

Private Investment: According to the World Bank indicators, "Private Investment (Constant LCU) covers gross outlays by the private sector (including private non-profit agencies) on additions to its fixed domestic assets".

Domestic Debt: The World Bank defined net domestic credit as "the sum of net claims on the central government and claims on other sectors of the domestic economy (IFS line 32). Data are in current local currency".

Real Interest Rates: Real interest rate (%) is defined by the IMF as "the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability".

GDP (constant LCU): The world bank defined GDP (constant LCU) as "the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency".

Real Effective Exchange Rate: Real effective exchange rate index (2010 = 100) is defined by the World Bank as "the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs".

Bank Credit to the private Sector: Bank Credit to Private Sector (% of GDP) is defined by the World Bank as "financial resources provided to the private sector by other depository corporations (deposit taking corporations except for central banks), such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises".

The structure of the thesis goes as follows. The second chapter will cover the theoretical background and literature review. In this chapter, we look at the theories and views of various economic schools and individual economists on investment and government domestic borrowing. In the same chapter, we will summarize relevant

empirical works by various researchers on our topic. To help understand our topic better, we will conduct an analysis of the Gambian economy. In this section, we will analyse key sectors of the economy, challenges the economy is facing and also monetary and fiscal policies that are currently been implemented by the government. Chapter three, methodology, covers the econometric techniques that will be used in analysing the econometric model. The Autoregressive Distributed lags (ARDL) approach is used to examine the dynamic relationship between our variables. The bounds test of the ARDL is implemented to examine cointegration between our variables. In Chapter 4, we analyse the findings from the dynamic model. Here we explain and interpret the results for the relationship between our independent variable and explanatory variables based on the ARDL estimations. In the final chapter, conclusion and policy recommendations, we summarize our findings and lay down key policy recommendations.

CHAPTER TWO

2. THEORETICAL BACKGROUND AND EMPIRICAL LITERATURE
2.1. Theoretical Literature

2.1.1. Introduction

High domestic debt can lead to an increase in interest rates. If a government relies on its domestic market for funds, this can lead to a shortage of funds. The shortage and high demand for funds will eventually cause the interest rates to increase (Engen & Hubbard, 2004). Since Interest rates are a key determinant of investment decisions, high-interest rates mean an increase in the cost of borrowing, this will discourage investment.

Another issue with domestic debt is its servicing. The debt is normally serviced using tax money. When domestic debt rises to a high level, people will start anticipating high taxes to be the aftermath. People's expectations of a higher tax burden tend to discourage investment (King'wara, 2014).

Finally, domestic debt cannot be defaulted on unlike external debt. This form of debt must be met because most of the creditors are commercial banks and default on the debt by the government can cause banking crises. Again, there is no debt relief on this debt. The IMF and other international bodies cannot provide a debt relief. Since this is the case, when domestic debt increases the default risk also increases in the financial sector. Therefore, commercial banks react by increasing the cost of borrowing (Panizza, 2008).

In this chapter, we will examine the theoretical and empirical literature on the research problem. We will end the chapter by critically examining the Gambian economy.

2.1.2. Origins of the theoretical framework

In this section, the thoughts of the various economic schools and proponents on domestic debt and private investment will be looked at. This is vital in making sense of the empirical literature to follow.

2.1.2.1.   *Classical economists view on government domestic borrowing*

On the topic of public borrowing, Classical Economists have taken a strong stance against it. They assert that government domestic borrowing should be kept as minimal as possible. They believe that government borrowing from the domestic market will drain most of the resources from the market leaving the private sector with limited funds. The impact the accumulation of funds by the government for itself and leaving the private sector with little funds may have on private investment is referred to as the crowding-out of private investment (King'wara 2014). Adam Smith like other classical economists was against the idea that government borrowing is not a problem for the society. He stated and I quote "it is the right hand which pays the left" (Smith, 1776). Mill's views differed slightly from that of Smith. He asserted that government expenditure on avenues that will yield benefits for the current and future generations should be encouraged. According to him there is no injustice in making the future generations pay for part of benefits they are enjoying (Holtfrerich, 2013).

2.1.2.2.   *Neoclassical investment theory on government borrowing*

The Neoclassical Investment theory asserts that private investment is affected by output and user cost of capital which is measured by interest rates (King'wara, 2014). Present output increase is seen as a sign of future economic growth and this expectation boost investment. On the other hand, interest rate has an inverse relationship with private investment. An increase in interest rates means a higher user cost of capital which will discourage private investment (king'wara, 2014). McConnell and Brue (2003) also contributed on the topic. They condemned domestic borrowing as a means of financing government expenditures. They stated the fiscal expansionary policies have greater effects if they are financed by money creation instead of borrowing.

2.1.2.3.   *The Keynesians view on government borrowing*

In contrast to the stance of the classical and neoclassical economists' view, Keynesians[1] were fully in support of government borrowing to finance deficits. Keynes see no harm in public borrowing and he based his argument on the multiplier effect. Based on the multiplier effect, a change in government expenditure will lead to a greater change in output (King'wara 2014). During periods of underemployment, an increasing

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[1] See Dwyer J. (2011) Keynes's economics and the question of public debt

in government borrowing is required to stimulate the economy. Public spending in infrastructure for example will stimulate private investment. Infrastructure is a catalyst to raising demand and profitability of private investment which will eventually lead to economic growth. Economic growth will also lead to increase consumption and savings eventually driving up economic activities. Unlike the Classical Economists who fully condemn government borrowing, the Keynesians considered allocating borrowed funds to productive ventures by the government. Olweny and Chiluwe (2012) dwelled on Barro (1997) explanation of Keynes's view on the multiplier effect saying that government expenditure provides a positive expectation for the investors. This expectation will motivate investors to invest and thereby leading to an increase in private investment. Furceri and Sousa (2011), also supported Keynes view on government borrowing. They stated that an increase in government spending will lead to an increase in employment and this trend will eventually lead to an increase in the expected returns on capital. The increase in returns on capital will trigger an increase in private investment. In support of Keynesian view on public debt, the German economist Lorenz Von Stein stated that a nation whose government doesn't participate in borrowing is equal to a nation that does not give importance to the future generation or it wants to put an excessive burden on the current generation (Holtfrerich, 2013).

2.1.2.5. Ricardian equivalence theorem

David Ricardo, the famous British Classical Economist, established the Ricardian Equivalence Theory in 1817. The theorem stood on the grounds that the world comprises of two periods; the present and the future. Also, that the capital markets operate perfectly. Another assumption is the government and households are forward-looking. The Ricardian Equivalence Theory which was further developed by Barro in 1979 states that consumers act based on future expectations and as a results government spending and ways of financing does not affect consumer consumption decision. Therefore, the means of finance has no effect on private investment. Barro (1979) explained that the trade-off between tax and debt to finance government investment will not have any impact on interest rates or private investment. For if the government chooses to finance deficits using bonds, forward-looking consumers will see this as a future increase in taxes since bonds are like loans and they will be paid in the future. So, consumer will decide to

consume less now and save more to cover the taxes. The effect is just the same as levying tax now. There will be no effect on aggregate demand or interest rate (Bernheim, 1987).

2.1.3. Conclusion

In this section, we looked at the thoughts of various schools of economics on domestic debt and its impacts on investment. Their views were found to be divergent. In the section to follow, we will take a look at empirical studies on our topic, their conclusion and recommendations.

2.2. Empirical Literature

2.2.1. Introduction

The literature on government expansionary fiscal policy financed by domestic borrowing and its impact on private investment is a new one but it has seen great attention in recent years. This is as a result of the increase government debt as a percent of GDP. The conclusions on the impact of domestic public debt on private investment by researchers are not unanimous. Some findings are in line with the Classical Economists view while others are in line with Keynesian Economists and some fall under the Ricardian Equivalence Theory. In this section, we take a look at relevant empirical work done on our research problem.

2.2.2. Impact of public domestic debt on private investment

Akomolafe *et. al* (2015) investigated the effect of public borrowing on private investment in Nigeria using Johansen Co-integration test and a Vector Error Correction model (VECM). They found out that domestic debt crowds out private investment in the short run and in the long run. However, external debt was found to have a crowding-in effect on private investment in the long run. Akomolafe added that government should strive to reduce her debt profile by improving its revenue base through diversification of the economy, and that any new borrowing is sensibly utilized for the purpose for which it was taken.

Olweny and Chiluwe (2012) analyzed the effects of monetary policies on private investment in Keyna from 1996 to 2009 using a Vector Error Correction Model. They stated that government borrowing from the domestic banks may lead to financial crises

in the credit market if there is limited liquidity in the financial market. The study found that government domestic borrowing crowds out private investment.

In another study, Kamundia (2015) examined the effect public debt on the level of private investment and economic growth in Kenya from 1980 to 2013. He employed Granger Causality and Ordinary Least Squares (OLS) estimation method. The study found that causality runs from public debt to private investment. Also, debt was detected to have a negative impact on private investment but a positive effect on economic growth.

King'wara (2014) investigated the impact of domestic public debt on private investment in Kenya from 1967 to 2007 using co-integration test. He found out that domestic debt affects private investment negatively. An increase in domestic debt crowds out private investment. He also found that interest rates affect private investment negatively. Output was found to have a positive effect on private investment. Based on this study, the author found out that public investment has not played a key role in complementing private investment in Kenya.

Asogwa and Okeke (2013) studied the crowding out effects of budget deficits on private investment in Nigeria using Ordinary Least Squares (OLS) and Granger Causality test. They found out that budget deficits and private investment granger cause each other. They concluded that budget deficits crowd out private investments. The study recommended that budget deficits be financed by printing money.

Nabende and Slater (2003) in their study concluded that the monetary policies employed does have a significant impact on private investment. Their paper found that output growth to have to crowd in private investment only in the short-run. In another study, Abdullatif (2006) investigated the relationship between public sector investment and private sector investment in a situation where the government finances its expenditures by selling bonds in a case of Japan. He found that financing deficits by issuing bonds do not crowd out private investment. He added that it might even have a crowd in effect. Therefore, he supported government increase issuance of bonds to both domestic and international market. The results also found that interest rates are not affected by increased government use of bonds to finance deficits. He stated that interest rates are not affected by government expenditure but only responds to interest rates

changes in the international financial markets as a result of globalization and financial markets integration.

Majumder (2007) investigated the crowding out effects of private investment in Bangladesh using co-integration and the Error Correction Model (ECM) to analyze an investment function comprising public borrowing, GDP and interest rate. The results show that public borrowing had a crowding-in effect on private investment. The author therefore suggests that as a way for better fiscal management and avoiding inflation, the government should rely on the domestic market for borrowing instead of accumulating external debt since domestic borrowing can finance deficits without affecting private investment.

Maana, Owino and Mutai (2008) examined the impacts of domestic debt on economic growth in Kenya from 1996 to 2007. They found that high domestic debt leads to high-interest payment and eventually becoming a burden on the national budget. However, as a result of the financial development in Kenya during the period under study, the increase domestic borrowing did not have any negative effects on the private investment.

2.2.3. Impact of GDP on private investment

Karagöz (2010) studied the determinants of private investment in Turkey using bounds test to ARDL approach to cointegration. He found out that GDP has a significant impact on private investment in Turkey. Abbas (2004) found similar results in a case of Iran.

Emerence and Bosco (2016) examined the GDP, interest rate, inflation and private investment in Rwanda from 1995 to 2007 using co-integration and Error Correction Model (ECM). They found out that GDP affects private investment both in the short run and in the long run.

Panizza and Presbitero (2014) investigated if there is any causality between economic growth and public debt in OECD countries. Their study found that public debt was negatively correlated with economic growth. However, after correcting for endogeneity, their results found no evidence that public debt had an effect on economic growth. The writer believes the negative correlation between debt and economic growth

is used by many to justify policies that assume public debt to be detrimental to economic growth. However, the authors warn that even though a negative effect between public debt and private investment was not found in their study, a high debt-to-GDP ratio with debt overhang may lead to distortionary effects in the economy.

Sothan (2017) studied the relationship between economic growth and the inflow of foreign investment in Cambodia from 1980 to 2014 using granger causality method. The study found a bi-directional causality between the variables. Causality runs from FDI to economic growth. However, there was no evidence of causality from economic growth to FDI. In another study, Mandishekwa (2014) examined the Causality between economic growth and investment in Zimbabwe. The empirical results found no evidence of causality between economic growth and investment and hence concluded that the two variables are independent of one another.

Samaké (2008) in his work on investment and growth dynamics investigated the impact of public and private investment on economic growth in Benin over the period 1965-2005 using a Vector Autoregressive (VAR) model. He found that private and public investment coupled with the availability of financial services affect economic growth significantly.

Jayachandran and Seilan (2010) on their paper on the nexus between trade, foreign direct investment (FDI) and economic growth in India from 1970-2007. They used the cointegration and Granger Causality method for empirical analysis. The study found that there is a long-run equilibrium relationship between the variables. Also, the Granger Causality test found that trade, FDI and economic growth all cause each other.

2.2.4. Impact of interest rate on private investment

Emerence and Bosco (2016) claimed that an increase in demand for credit from the private sector will lead to increase in private investment. They explained that the high demand for credit will lead to a rise in interest rates. Savers will be motivated to save more and therefore investors will have access to funds and eventually there will be an increase in investment.

Munir, Awan and Hussain (2010) in their paper on the long run relationship between private investment and Interest Rate found that interest rates affect private investment positively in the long run.

Demir and Sever (2008) examined the effect of public domestic borrowing on interest rate and inflation in Turkey from 1987-2007 using Johansen Co-integration and the Vector Error Correction model. They found that public domestic debt has a negative impact on interest rate and inflation rate. In addition, domestic debt causes interest rates and price levels to rise.

Misati and Nyamongo (2011) found that interest rates affect private investment negatively in Sub-Saharan Africa. He ascribed this crowding out effect to the large interest rate spreads in African economies. The same results were found by King'wara (2014) who also found interest rates to have a negative effect on private investment Kenya.

Hsu (1995) studied the effect of financing public investment issuing government bonds in Taiwan. They found that domestic borrowing crowds out private investment. The added to that financing government expenditures using debt will only lead to current account and fiscal deficits.

2.2.5. Impact of public investment on private investment

Coban and Tugcu (2015) looked at whether budget deficits crowd out or crowd-in private investment using a dynamic heterogeneous panel ARDL model for 28 countries for the period 2000-2012. They found that an expansionary fiscal policy positively affects private investment.

Also, Snyder (2011) investigated if federal budget deficits cause crowding out in the USA using Vector Error Correction Model (VECM). He found out that government spending has crowding in effects on private investment. He lamented these results meant national borrowing has negative impacts on investment but government spending crowds in investment as stated by the Keynesian multiplier effect.

Kuştepeli (2005) analyzed the effectiveness of fiscal policy in terms of crowding out or crowding in effects in Turkey using Johansen cointegration test. The results show

that government spending crowds in private investment whilst government deficits had a crowding out effect.

Majeed and Khan (2008) studied the relationship between private and public in Pakistan using a panel data for the period 1970-2006. They found that public investment crowds out private investment. They explained that government borrowing squeezes the private sector for credit and therefore affects it long term productivity.

Omojolaibi, Okenesi and Mesagan (2016) examined the relationship between fiscal policy and private investment in five West African countries from 1993 to 2014. Their results showed that government capital expenditure has significant crowding in effect on private investment.

Xu and Yan (2014) investigated if government investment crowd out private investment in China using structured Vector Autoregressive (sVAR) analysis. They divided government investment into investment in public goods and infrastructure and investment in private industry and commerce. They concluded that investment in public goods crowds in private investment whilst investment in private goods crowds out private investment. These means government investment in private goods does not complement private investment in China.

Motlaleng *et al.* (2011) examined budget deficit and government spending and found that budget deficit crowds out private investment whilst government spending crowds in private investment.

Mahmoudzadeh, Sadeghi and Sadeghi (2013) looked at the effect of fiscal spending on private investment both in developing and developed countries using a panel data for the time period 2000-2009. They found that government capital formation expenditure crowd in private investment in both developing and developed countries. However, the complementary effect was greater in developed countries. They also concluded that fiscal deficits had crowded in effect on private investment in developed countries but crowding out effect on private investment in developing countries. Though, the effects were minimal in both set of countries.

Bende-Nabende and Slater (2003) found out that public investment is a crowding out factor to private investment in Association of Southeast Asian Nations (ASEAN) in the short run.

In another study, Nazmi and Ramirez (1997) studied public and private investment and economic growth in Mexico. They concluded that whereas public investment has a positive impact on economic growth, there was a significant crowding out effect on private investment.

Afonso and Jalles (2011) looked at the linkages between investment and fiscal policies in 95 countries during the time period 1970-2008. They found that total government expenditure and public investment crowds in private investment. However, government consumption spending had a negative effect on private investment. Interest payment had a negative effect on both public and private investment whilst government spending on health play a complementary role in enhancing private investment in emerging economies.

Şen and Kaya (2014) in their study examined the effect of government spending on private investment in Turkey from 1975 to 2011 to see if there exist any crowding out or crowding in effects. They found that government current transfer spending, government current spending and government interest spending had a crowd out effect on private investment. However, government capital spending was found to crowd in private investment within the time under study.

Ditimi and Matthew (2015) studied the relationship between public and private investment. They found no long run relationship between them.

2.2.6. Impact of exchange rate on private investment

Soleymani and Akbari (2011) examined links between exchange rate uncertainty and domestic investment in sub-Saharan Africa from 1975 to 2006 using fixed effect panel data approach. They found that exchange rate uncertainty is negatively related to investment.

Serven (2002) empirically studied the impact of real exchange rate volatility on private investment in developing countries using a panel data from 1970 to 1995. The

study found that in all the overall sample, the exchange rate had a highly significant negative effect on private investment in developing countries. They added that the degree of openness and financial development affects the way investment reacts to exchange uncertainties. High openness and weak financial development will be followed by the significant negative relationship between exchange rate and investment. However, high financial development coupled with low openness may bring about a significant positive impact of exchange rate on private investment.

Kandil, Berument and Dincer (2007) in their study found out that high fluctuation of real effective exchange rate around its anticipated value will affect growth, private consumption and private investment negatively.

Caglayan and Torres (2011) looked at the effects of exchange rate behavior on fixed capital investment in Mexican manufacturing sector over 1994-2002. They found out that currency depreciation affects fixed private investment positively via exports and negatively via imports. The impact of exchange rates changes is greater in export-oriented sectors. Also, the non-durable goods sector tend to be sensitive to exchange rate volatility.

Okorie (2013) examined the nexus between private investment and exchange rate in Nigerian. The results of the Error Correction model in the study found that private investment is positively affected by the exchange rate. The same results were found by Oriavwote and Oyovwi (2013) on their study on private investment behavior in Nigeria.

Harchaoui, Tarkhani and Yuen (2005) studied the effect of exchange rate on investment in Canada using industry level data for 22 Canadian manufacturing industries for the period 1981-1997. The study found no evidence that exchange rate affects investment during the time under study. However, when they looked at the impacts in terms of volatility, they found that exchange rate depreciation with low volatility has a positive effect on investment. On the other hand, depreciation with high volatility has a negative effect on investment.

2.2.7. Impact of bank credit to the private sector on private investment

Financial institutions play a key role in enhancing the movement of funds from savers to investors. In fact, amongst the main function of banks is to link savers and

borrowers. In this section, we will examine empirical literature on the nexus between bank credit to private sector and private investment.

Ugwu, Okoh and Mbah (2017) examined the relationship between bank credit and private investment in Nigeria from 1980 to 2014 using Ordinary Least Square (OLS) regression method and granger causality technique. The study found a bidirectional causality between the variables. Also, bank credit was found to affect private investment positively.

Munir, Awan and Hussain (2010) investigated the short run and long run relationship between bank credit to the private sector and private investment in Pakistan from 1973 to 2007. Using an ARDL bounds test approach, they found that bank credit to the private sector is positively related to private investment in the long run.

Okorie (2013) studied the impact of private sector credit on private investment in Nigeria using an Error Correction Model (ECM). He found that private sector credit positively affects investment. In fact, a 10 percent increase in private sector credit leads to 6 percent increase in private investment. Also, Majeed and Khan (2008) in their study found that the volume of bank credit to the private sector affects private investment positively in Pakistan.

Misati and Nyamongo (2011) investigated the link between private investment and financial development in Saharan African for the period 1991-2004. They found that credit to the private sector positively affects private investment. In another study, Spatafora and Luca (2012) studied the relationship between capital flow, financial development and domestic investment in developing countries for the period 2001-2007. They found that private capital inflows and domestic credit both have positive effects on private investment.

Forgha, Sama and Aquilas (2016) examined the effects of financial intermediation on private investment in Cameroon from 1975 to 2014 using a vector Autoregression (VAR) approach. The study found that financial intermediation doesn't have an effect on investment in Cameroon during the time under study.

2.2.8. Conclusion

After a thorough study of the literature, we have found that empirical studies, just like the classical, neoclassical and Keynesian Economists, have not reached the same conclusion on the impact of domestic debt on private investment. Some studies found a crowding-out effect while some concluded on a crowding in effect between the government borrowing and private investment. Given the differing conclusions, we will conduct an empirical analysis to study the case of the Gambia.

2.3.   Economic Outlook of the Gambia

2.3.1. Introduction

The Gambia is located in the western part of Africa. It is surrounded on all fronts by neighboring Senegal except for the 60-km border on the Atlantic Ocean. The Gambia is the smallest country in the mainland of Africa with a total area of 11,300 sq. km of which 10,120 sq. km is land and the remaining is 1,180 sq. km is water (CIA Factbook, 2016). The Gambia is endowed with arable land, coastal marine, wetland habitats and varieties of species enabling the country to attract tourists from all over the world. Also, due to its strategic location at the mouth of the Atlantic Ocean and the river Gambia running across the country, it has cemented its position as a center for trade in the region.

The main natural resources in the Gambia are fish, silica sand, titanium, tin and zircon. The Gambia has a tropical climate with hot weather during rainy seasons between June and November while the dry seasons are characterized by cooler weather from November to May (CIA Factbook, 2016)

According to the World Bank, the Gambia has a population of 2 million with a 2.8% population growth rate for the past decade. The country has a population density of 177 people per square kilometer making it the most densely populated country in the Africa. It has about 57 percent of its population living in the urban area raising concerns about urbanization as there are too many people to occupy the poorly planned urban area.

2.3.2. The Gambian economy

The Gambian economy relies mainly on agriculture, remittances and tourism. Manufacturing activities exist but in small scale entailing the processing of peanuts, fish

and hides. Due to its location, the Gambia served as a regional entrepot, using the long-stretched River Gambia as a transportation link to the neighborhood. The exports of the country entail 80 percent re-exports (Stephenson, 2007). In this form of trade, goods are imported into the Gambia and later transported to Senegal and other neighboring countries. These activities generated significant revenue for the country as imported goods meant for re-exports were charged import duties. However, the recent tensions with neighboring Senegal, negotiation of trade agreements within the region and improved ports and customs operations in Senegal and other countries has negatively affected the re-exports (Stephenson (2007).

Agriculture is one of the most important sectors of the Gambian economy with 75 percent of the population depending on this sector for their livelihood. Also, it contributes to 20 percent of the country's Gross Domestic Product (GDP). Agriculture takes the form of subsistence farming. As a result, the sector has not been able to reach its potential with half of the arable land left uncultivated (CIA Factbook, 2016). Groundnut used to be one of the traditional pillars of the Gambian economy. It used to be the mainly cultivated and exported product. However, in recent year the sector has encountered domestic and international challenges plus the failed attempt to privatize the sector in the mid-1990s has led to a drop in its exports (Stephenson, 2007).

The GDP breakdown by sector in 2016 according to the CIA world factbook stated that agriculture contributes 21.4%, industry brings in 15.6% and the service sector contributes 63% of GDP. The agricultural sector employs 31 percent of the labor force in activities like farming, husbandry and fisheries. The service sector is dominated by tourism which is the main source of foreign exchange and also the biggest employer. Tourism provides employment for people in hotels, airport, and the service infrastructure. It also provides revenue for workers in the independent indigenous enterprise in handicrafts, entertainment and transport (Farver, 1984). According to the world travel and tourism report 2014 a case of the Gambia, in 2013 tourism provided 125,500 jobs accounting for 18.7 percent of total employment. However, the number of jobs fell to 12,400 in 2014 due to the outbreak of Ebola but it is expected to rise to 144,000 jobs in 2024. This clearly shows that the services sector especially tourism is by far the driving factor for economic growth in the Gambia (Turner, 2014).

The Gambia has faced challenges in realizing sustainable development. According to the Balance of Payment Technical Committee (BOPTC) report 2001, some of the causes of the struggles the economy is facing is a result of limited finance and high population growth. The GDP growth from 1994-2000 averaged 2.6 percent while the population growth rate was 4.2 percent. So, to enhance economy growth, domestic investment and savings has to increase. However, investment and savings in the Gambia are relatively low and therefore there is a need for an inflow of private capital to cover for the savings-investment gap to maintain sustainable development.

The country has limited natural resources and the agricultural base is small, so it depends mainly on remittances from Gambians working abroad and tourism. Remittance inflows into the country account for approximately 20 percent of the GDP (CIA Factbook, 2016).

Recently, Tourism and Agriculture which can be considered the backbone of the Gambian economy have been negatively affected by external shocks and poor and late rainfall. In 2014, the outbreak of the Ebola virus in the sub-region affected tourism negatively cutting the revenue generated from tourism by half. In the same year, the country experienced poor downpour of rains leading to a decline in output growth from -1.8 percent in 2013 to -7.2 percent in 2014. These two unfortunate events led to a contraction of the country's GDP growth from 5.6 percent in 2013 to 0.9 percent in 2014 (UNDP, 2016).

The economy seems to have recovered in 2015 with the Central Bank of the Gambia Monetary Policy Committee reporting in June 2016 that the economy attained a 4.7 percent growth in 2015 in contrast to the 0.9 growth realized in 2014. This is a result of the recovery from the poor rainy season and the effects of the Ebola outbreak in the region. Agriculture recovered from a -7.1 percent to a 7 percent growth in 2014 (CBG MPC, June 2016).

2.4. Macroeconomic Policies

2.4.1. Fiscal policy

The Ebola outbreak in 2014 led to a fall in revenues from tourism by more than 50 percent. This affected the balance of payment by about US$40 million which equals 5

percent of GDP. As tourism is the main sources of foreign reserves, total reserves to cover for imports fell drastically as a result of the poor performance of the sector in 2014. To make things worse, in May 2015, the ex-president imposed a restriction on foreign exchange causing commercial banks to experience a decline in foreign reserves. These events forced the Central Bank of the Gambia (CBG) to commit to a debt swaps of US$40 million with commercial banks in 2015 (UNDP, 2016).

Table 2.1. *Public Finances as a percentage of GDP*

	2007	2012	2013	2014	2015	2016	2017
Total Revenue Grants	**18.4**	**25.4**	**18.5**	**21.9**	**23.1**	**23.5**	**23.3**
Tax Revenue	15.2	14.5	14.2	16.1	17.0	17.9	17.4
Grants	1.0	9.0	2.2	3.2	3.5	3.0	3.3
Total Expenditure and net lending	**18.3**	**29.8**	**27.1**	**32.9**	**32.7**	**32.8**	**29.3**
Current Expenditure	13.0	17.4	20.0	23.6	23.1	23.1	18.9
Excluding Interest	8.9	13.7	15.9	15.6	14.5	14.0	13.5
Wages and Salaries	3.4	6.2	5.8	5.6	5.1	4.7	4.4
Interest	4.1	3.7	4.0	8.0	8.6	9.2	5.4
Capital expenditure	4.9	12.4	7.1	9.3	9.6	9.7	10.5
Primary balance	4.2	-0.7	-4.5	-3.0	-1.0	-0.1	-0.7
Overall balance	**0.1**	**-4.4**	**-8.6**	**-11.0**	**-9.6**	**-9.3**	**-6**

Source: *UNDP country report, 2016*

Table 2.1 shows a breakdown of public finances in percentages of GDP from 2007 to 2017. The figures for 2016 and 2017 are estimations and projections respectively.

The Gambia, a country without significant natural resources, relies mainly on taxation as a source of revenue. In 2004, in a bid to enhance the tax collection and compliance to tax payment and management of revenue, the Gambia Revenue Authority was established. Again, as a way of increase the tax based and revenue from the tax, the

country introduced the Value-Added Tax (VAT) in January 2013. This resulted in an increase in domestic revenue by 18.4 percent in 2014. From the Table 2.1, you can see an increase in tax revenue as a percentage of GDP from 14.2 percent in 2013 to 16.1 percent in 2014 to 17 percent in 2015 and is estimated to reach to 17.9 in 2016. In 2015, tax revenue was D5.1 billion a 25.6 percent increase from the previous year (CBG, Monetary Committee Report, November 2015). Grants are another vital source of revenue but the tax is the main source for the government.

Total expenditure and net lending increased by 22.4 percent in 2014. Interest payment has had an unprecedented increase in recent years. As a percentage of GDP, interest payments have increased from 4 percent in 2013 to 8 percent in 2014 and is expected to increase to 8.6 percent in 2015 and projected to reach 9.2 percent by 2016. Interest rates increased by 60 percent in 2014 (UNDP, 2016). Wages and salaries and other charges increased by 11.5 percent and 4.5 percent while capital expenditure decreased by 2.6 percent in 2014 (UNDP, 2016).

It is clear that most of the spending is in current expenditures. According to the Organization for Economic Cooperation and Development (OECD), current expenditures are expenditures on goods and services consumed within a year and needs to be provided in recurrent basis. Examples of this form of expenditure are final consumption expenditure, property income paid, subsidies and other current transfers like social security, social assistance, pensions and other welfare benefits. Current expenditure as a percentage of GDP increased from 13.0 in 2007 to 23.1 in 2015. This is a clear manifest that a huge proportion of the national budget goes to expenditures that do not lead to wealth creation.

The Gambian economy has been characterized by huge fiscal imbalances. This according to UNDP 2016 report is a result of the consistent policy slippages and financial constraints in public enterprises. In 2012, revenues constituted 25.4 percent of GDP whilst total expenditure and lending was 29.8 percent of GDP. This difference came with a deficit of -4.4 percent. In 2014, revenues as a percentage of GDP fell to 21.9 percent whilst total expenditure and lending increased to 32.9 percent in 2014. This huge difference in government spending and revenues pushed the deficits to 11 percent of GDP in 2014. The deficit is expected to be at 9.6 percent in 2015 and projected to reduce to 9.3 in 2016 (UNDP, 2016).

The fact that the government is always on running a fiscal deficit is a cause for concern. There is a need to keep the expenditures in line with budgeted amounts and to the means of the country so as to minimize the deficit. The deficit is a huge burden on the Gambian economy as it is financed by domestic sources mainly in the form of the Central Bank selling treasury bills. These securities are mainly held by the commercial banks with 50 percent of their assets constituting T-bills (UNDP, 2016). Given the shallow banking sector, relying on it to finance deficits coupled with the unclear financial ability of the government to pay back the debts, has led to increasing interest rates on the T-bills over the years reaching 21.9 percent on the one-year T-bills in 2015 (UNDP, 2016).

Table 2.2. *Current Account Balance (as a Percentage of GDP Current Prices)*

	2007	2012	2013	2014	2015	2016 p
Trade balance	-21.5	**-22.1**	**-19.1**	**-28.6**	**-24.5**	**-23.0**
Exports of goods	11.4	13.8	14.7	15.0	14.4	12.6
Imports of goods	32.9	35.9	33.8	43.6	38.9	35.7
Services	8.3	8.6	7.4	4.5	1.1	4.7
Factor income	-5.9	-3.2	-2.5	-2.9	-4.0	-3.6
Current transfers	9.0	8.7	4.0	9.2	7.5	6.9
Current account balance	-10.0	-8.0	-10.2	-17.7	-20.0	-15.0

Source: *UNDP country report, 2016*

2.4.2. Monetary policy

By monetary policy, we are referring to the actions that the Central Bank of the Gambia undertakes to influence the amount of money and credit in the Gambian Economy. The main aim of any monetary policy is price stability as controlling inflation is core to economic stability and growth.

The Central Bank of the Gambia (CBG) like any other central bank has a mantle to keep prices stable. Some of the monetary policy tools available at its disposal are the Open Market Operations (OPO) which entail the buying and selling of government

instruments, interest rates, policy rate and reserve requirement. All these tools are meant to directly or indirectly influence money supply in the economy in other to keep inflation in check.

Price stability is a challenge to any economy and the Gambia is no exception. Inflation in the Gambia is measured by using the consumer price index. Over the years, the Central Bank of the Gambia has been able to keep inflation rate in between 6.5 and 7.5 percent (UNDP, 2016). However, prices volatility has been a challenge. Looking at the past years to date, this volatility can be visible.

2.5. Analysis of Major Economic Variables of the Gambian Economy

2.5.1. Gross Domestic Product (GDP)

According to the International Monetary Fund Gross Domestic Product "measures the monetary value of final goods and services—that is, those that are bought by the final user—produced in a country in a given period of time". The GDP of the Gambia is highly volatile. This is a result of the sensitivity of the economy to internal and external shocks. The most notable internal shocks are tourism and agriculture which are considered amongst the most important sectors of the Gambian economy. External shocks such as financial crises also impact on the country's economy. The Gambian economy averaged 4.3 percent economy growth from 1968 to 2015. The highest economic growth the Gambia economy has ever realized was 12.39 percent and that was in 1975. The lowest growth was -4.3 in 2011 due to severe droughts leading to a failure in the agricultural sector which is regarded as the backbone of the country's economy.

According to the Central Bank of the Gambia in 2007 the Gambia realized 6.3 percent economic growth. This was a result of the performance in the agriculture and service sectors. However, in 2008 economic growth dropped to 6.1 percent as a result of the global financial crises and recession which affected the global economy. The crises affected the country in form of a fall in inflow of remittance, foreign direct investment and a reduction in the number of tourists. The effect of the crises lasted till 2009. In 2009 economic growth was 5 percent owing to the agricultural output was good as a result of the good rains. In 2010, economic growth became more robust recording a 5.5 percent growth even though the global economy was yet to recover from the effects of the

financial crises. The Ebola outbreak in the neighboring countries coupled with poor rains in 2014 led affected tourism and agricultural output negatively leading to contraction of growth to 0.9 percent in 2014. The economy recovered from the shocks in 2015 and GDP recovered with a 4.7 percent growth. The Graph 2.1 shows the outlook of GDP of the Gambia from 1980-2013.

Graph 2.1. *Gross Domestic Product (GDP Million USD)*

GDP
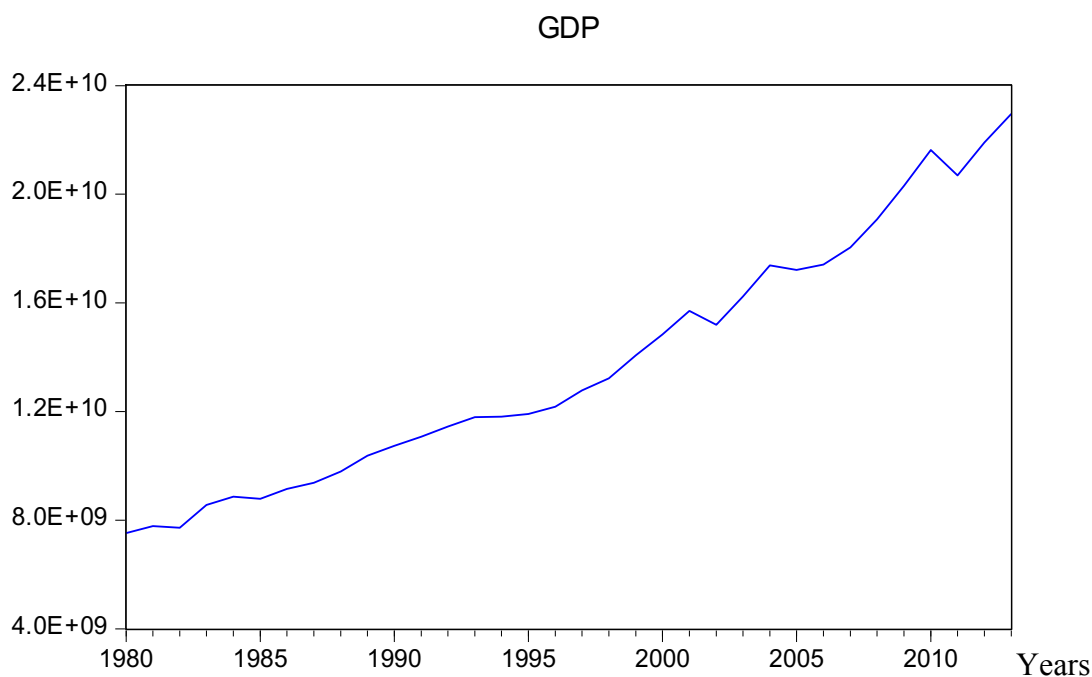
Source. *World Bank online database and author's computation[2]*

2.5.2. Private investment

The Cambridge dictionary defined private investment as "money invested by companies, financial organizations, or other investors, rather than by a government". Over the years, the government of the Gambia has implemented vital macroeconomic policies to enable the development of the private sector. From the Graph 2.2, we can see that this move has led to an inflow of foreign capital and also the improvement in domestic investment. From 1980 to 1985, private investment was relative low. However, the period from 1986 to 1996 saw a significant accumulation of private capital. This could be a result of the Economic Recovery Program (ERP) implement policy reforms and increase government's role in supporting the private sector development. The trend

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[2] *The graph was plotted by the author with the aid of EViews 9.*

changes between the years 2009 to 2010 when there was a fall in private investment. This could be ascribed to the spillovers of the global financial crises. In 2011, the markets recovered and there was a boost in private investment. The recent trend has not been promising as private capital accumulation has been falling and this may be a result of the shortage of credit from commercial banks as a result of the huge government domestic borrowing. The Graph 2.2 is an illustration of the pattern of private investment in the Gambia from 1980 to 2013.

Graph 2.2. *Private Investment (Million LCU)*

LPIV
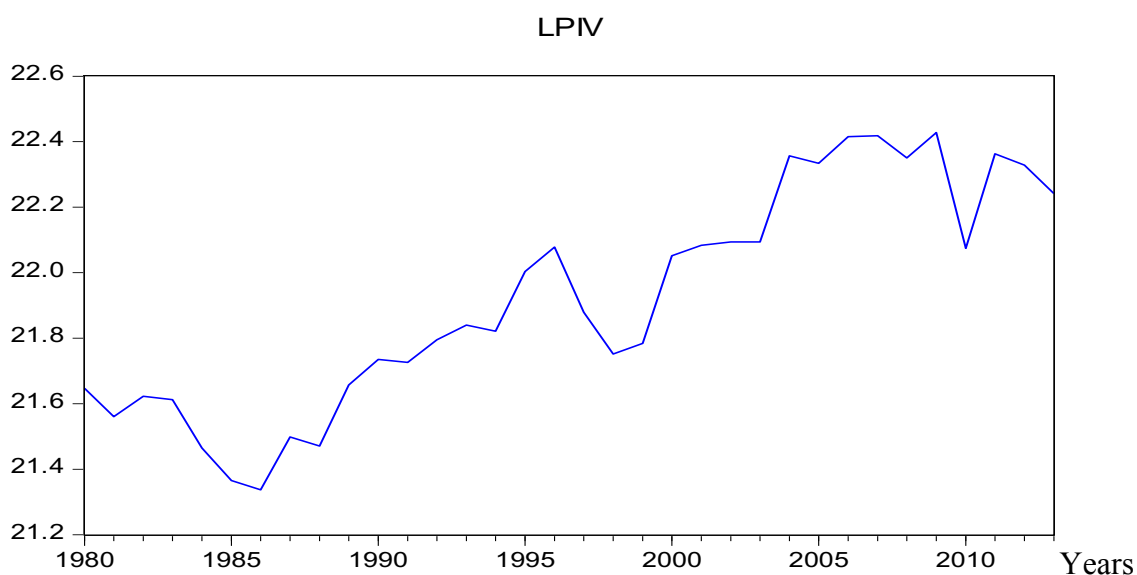
2.5.3. Domestic Debt

The stock of domestic debt in the Gambia was relative low from 1980 to 2000. The increase started around the year 2000 and by the year 2007 the figure started ballooning. After the debt relief in 2006 coupled with the financial crises in 2008, the Gambia has seen its stock of external reduced by half whilst the domestic debt reached a record level.

After debt relief program, the Gambia switched from external to domestic debt as a means of deficit financing. This according to the UNDP report (2016) is a result of the country's difficulties in access external funds. Also, the global financial crises in 2008 played a role

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[3] *The graph was plotted by the author with the aid of EViews 9.*

as the inflow of remittance and foreign aid which constitute a significant proportion of income for the economy fell drastically.

A comparison of the Graph 2.3 and Graph 2.5 will show you that as the external debt fell the domestic debt ballooned. The stock of domestic debt according to the Central Bank of the Gambia increased from GMD 5.17 billion in November 2007 to a staggering GMD 25.1 billion in June 2016. This is worrying as 61.4 percent of the stock of domestic debt is outstanding.

This increase in the stock of domestic debt is a result of the CBG continuous sale of T-bills to finance the huge deficit. With the weak financial position of the government leading to the accumulation of outstanding debt, additional issuance of government securities could only be possible at high-interest rates. This pushed interest rates to 23 percent. The returns on the 91-day T-bill increased from 10.99 percent in 2008 to 17.15 percent in 2016. Also, the returns for the 182 day T-bills rose to 17.83 in 2016 from 13.43 percent in 2008. The same pattern applies to the 365 day T-bills whose returns increased from 14.23 percent in 2008 to 21.85 in 2016. This increase in returns on the government securities means a huge proportion the government revenues goes to paying for the domestic debt (CBG,2016).

Graph 2.3. *Domestic Debt (Million LCU)*
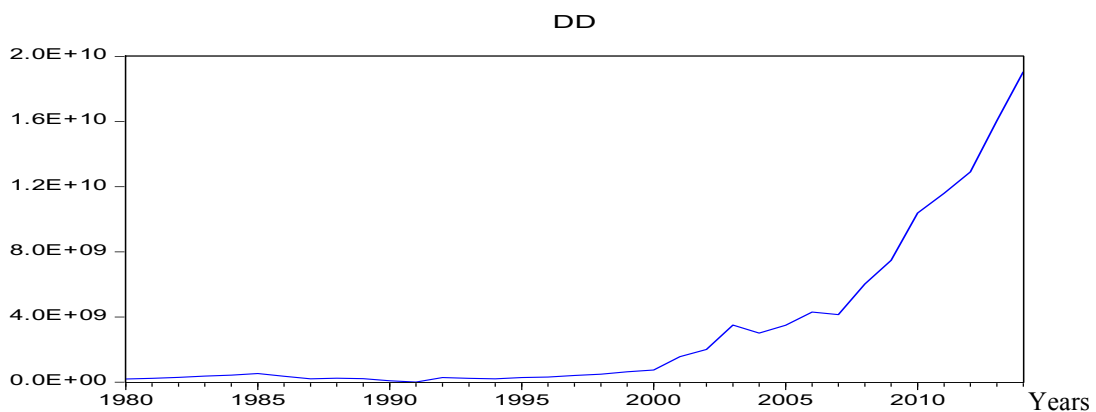
Source. *International Monetary Fund database and author's computation [4]*

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[4] *The graph was plotted by the author with the aid of EViews 9*

2.5.4. Real interest rates

The World Bank refers to real interest rates as the lending interest rate adjusted for inflation as measured by the GDP deflator. In the Gambia, the interest rates are set by the Central Bank monetary policy committee in their policy meetings. According to the IMF, interest rates in the Gambia have averaged 19.5 percent over the last 15 years. The highest it has ever been is 34 percent in 2003 and the lowest is -45.95 percent in 1991. The current real interest rate is 23 percent. According to an article by the global economy (2014) on the IMF ranking of real interest rates in 2014 the Gambia has the 4th highest real interest rates in the world.

Graph 2.4. *Real Interest Rates (%)*
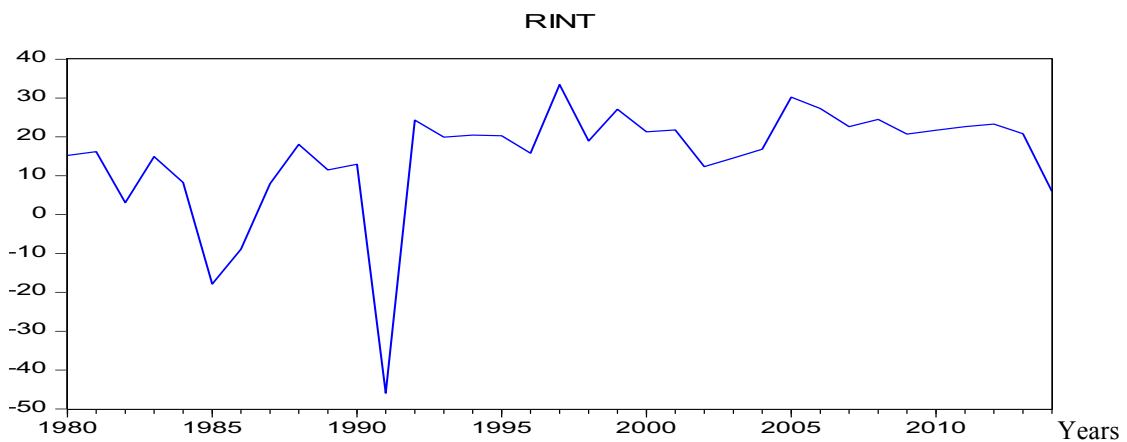
Source. *International Monetary Fund Database and author's computation* [5]

2.5.5. External debt (External debt stocks, total (DOD, current US$)

External debt stock according to the World Bank is that part of the total debt in a country that is owed to creditors outside the country. This form of debt has been a key source of finance for the Gambia in the past. The accumulation of foreign debt has been increasing from the 80s until 2006 when the debt stock reached unsustainable levels as can be seen from the Graph 4 below. In 2006, the Gambia benefitted for the debt relief program courtesy of the IMF sustainable debt initiative for heavily indebted poor countries. The country had its stock of external reduced significantly. As can be seen from

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[5] *The graph was plotted by the author with the aid of EViews 9*

the graph below, there was a plummet in the graph from 2006 to 2007 marking the IMF debt relief program.

Graph 2.5: *External Debt(LCU)*

EXD
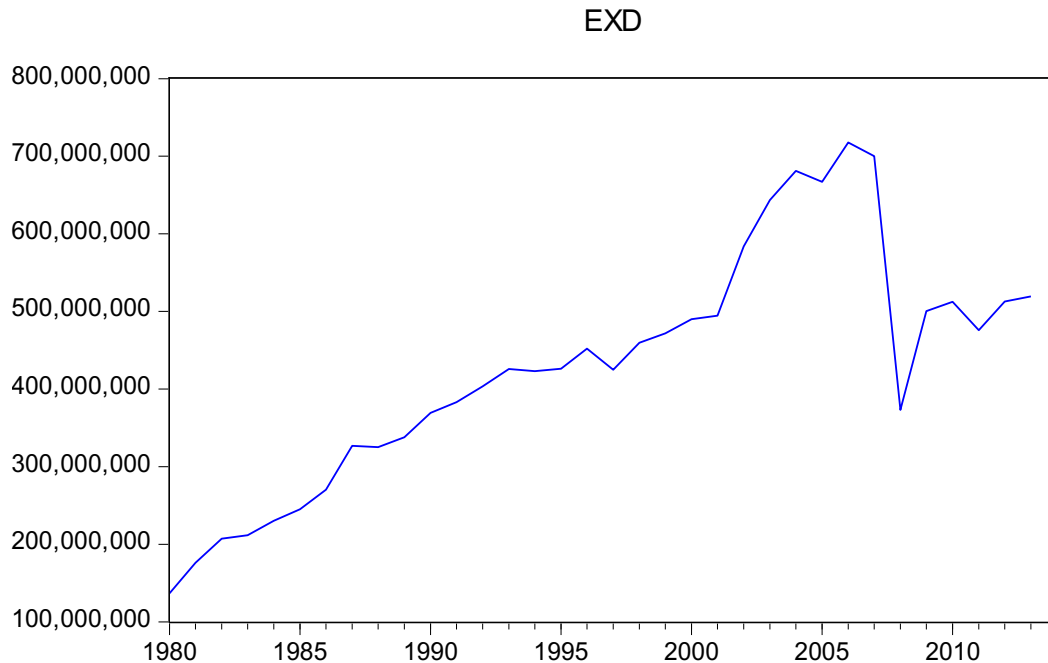
Source. *World Bank Online database and author's computation[6].*

2.5.6. Bank credit to private sector (domestic credit to private sector by banks as percentage of GDP)

The world bank defined domestic credit to the private sector by banks as "financial resources provided to the private sector by banks, through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment". The Banking industry in the Gambia improved substantively over the years. In 1998, there were only 5 registered banks in the country. Currently, there are 14 banks registered by the Central Bank of the Gambia. This has led to an increase in financial intermediation in the country. Currency demand decline from 6.6 percent in 1988 to 6.2 percent in 1997. However, the increase in the number of commercial banks operating in the country has not reflected on the credit availability for the private sector. In 1984, credit to the private sector was 40 percent and in 1997 it fell to 9.2 percent. The trend has not changed ever since (IMF, 1999).

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[6] *The graph was plotted by the author with the aid of EViews 9*

From 1998 to date, there has been an increase in commercial bank holdings of government securities. The net domestic assets of commercial banks comprise 50 percent in T-bills and CBG-bills (IMF, 1999). The motive to hold these securities stemmed from the high-interest rates on them. This act by commercial banks has greatly affected lending to the private sector. Graph 2.6 is an illustration of the pattern of bank credit to the private sector over the years 1980-2013. From the Graph 2.6, it can be seen that in the 80s even though the number of commercial banks present in the country was few, the credit to the private sector was high. After the increase in the number of banks, there was a fall in the credit to the private sector. This actually rings a bell on the reason why these banks decided to operate in the country. Up until recently the majority of the operations of the banks have been on government securities and you see that the slight increase in credit to the private sector is still yet to reach the levels attained in the 80s.

Graph 2.6. *Bank Credit to the Private Sector (% of GDP*
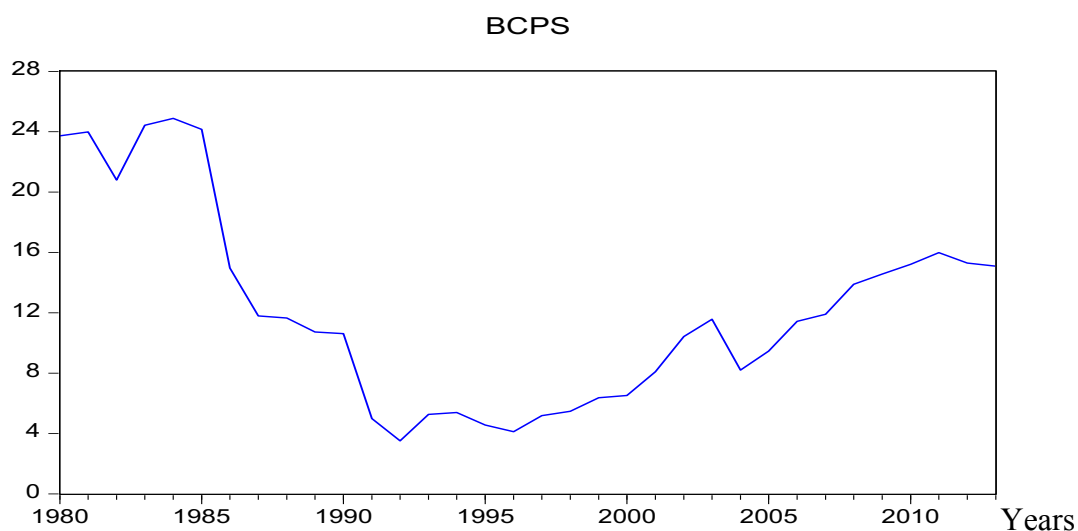
Source. *International Monetary Fund Database and author's computation* [7]

2.5.7. Real effective exchange rate (LCU per US$, period average)

Exchange rate refers to the amount of foreign currency per unit of the domestic currency. The World Bank defined the real effective exchange rate as "the nominal effective exchange rate divided by a price deflator or index of costs". The exchange rate

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[7] *The graph was plotted by the author with the aid of EViews 9*

system in the Gambia has gone through a transformation from independence in 1965 to date. After independence, the country maintained the Bretton woods fixed exchange rate system in which the GMD 5 was pegged to GB£1Pound Sterling. This exchange rates system was used until 1986 after which the Structural Adjustment Policy was enforced and the exchange system was changed from fixed to float. The floating exchange rate system means the government allows the market forces to determine the price of the local currency, the Dalasi. In 2003, as a result of the huge volatility of the Dalasi the country changed to a managed floating exchange rate system. The value of the Dalasi relative to US Dollar, Pound Sterling and Euro is mostly a depreciation. The Graph below shows varying states of the dalasi. The value of the Dalasi after Structural Adjustment Program (SAP) was stable with relative depreciation against the major currencies. The trend from 2001 to 2003 showed an appreciation of the Dalasi and a depreciation from 2004 to 2008 and then an appreciation. However, it should be noted that the index used to calculate the value of the Dalasi against the major currencies can be the reason that the Dalasi exhibits an appreciation whilst in reality it is not the case.

Graph 2.7. *Real Effective Exchange Rate (%)*
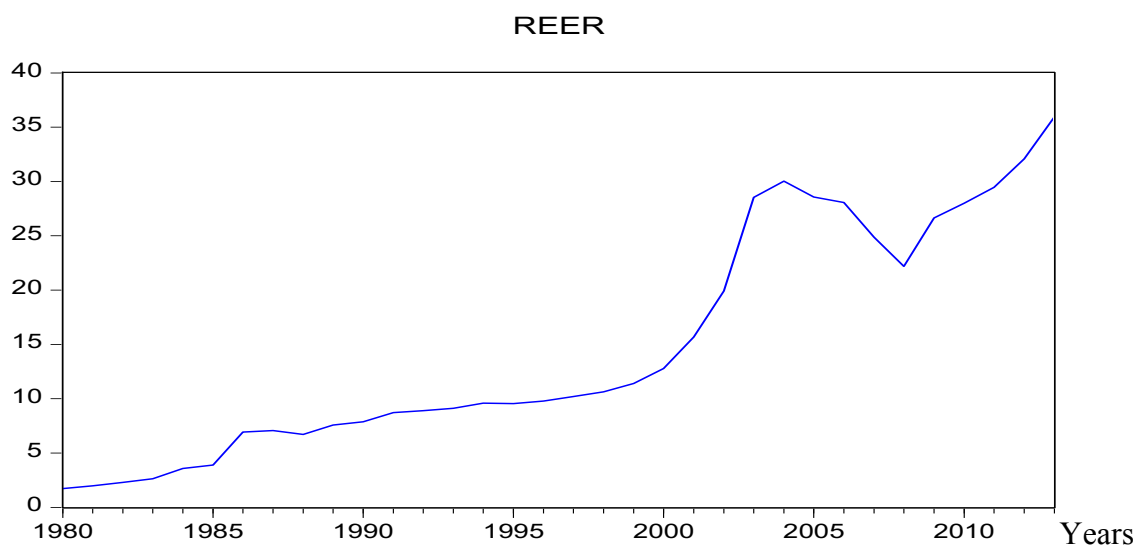
Source. *International Monetary Fund Database and author's computation[8]*

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[8] *The graph was plotted by the author with the aid of EViews 9*

2.5.8. Conclusion

This section covered key issues in The Gambian economy. First, an overview of the country and the economy was looked at. Second, the fiscal and monetary policies were examined. Finally, the movement of key major economic variables like GDP, private investment, domestic debt, real interest rate, bank credit to private sector and real effective exchange over the period 1980-2013 was examined. The section to follow will look at the methodology for our empirical analysis.

CHAPTER THREE

3.   METHODOLOGY
3.1.   Introduction

In this section, we will look at the stationarity and integration levels of our series to make sure we do not violate the assumptions of ARDL bounds testing. Then we will move on theoretical procedures from forming our simple private investment econometrics model to transforming it to an ARDL model to capture the long run and short run dynamics.

3.2.   Stationarity and Non-Stationarity

In an econometric study, stationarity is an important issue to consider. It is vital to verify if a time series is stationary or not. Non-stationary series refers to series with a unit root or a break. On the other hand, series without a unit root are considered to be stationary.

Unit Root testing is vital for estimation of time series econometric models as using non-stationary series for estimation can give results that are spurious or referred to a spurious regression with a coefficient of R^2, F-statistics, t-statistics etc. that seem significant but inaccurate. This can result in serious errors if such misleading results are used for policy formulation or forecasting.

When series are non-stationary, their mean, variance, covariance and autocorrelation functions change with time and therefore affecting the series over the long run. These characteristics of non-stationary series go against the assumption of OLS that states that series have a constant mean and variance.

In econometrics, series are normally tested for stationarity at the level and if there exist a unit root, the first difference is taken. Most series are stationary after taking the first difference. However, for our study we want to investigate the long run relationship between our variables so taking the difference of the series will lead to the loss of their long run properties rendering long run comparison impossible. We will employ Unit Root testing for the purpose of using an ARDL model.

3.2.1. Unit root testing

3.2.1.1.   The Augmented Dickey-Fuller (ADF) (1981) tests for unit root

One of the most commonly used unit root testing technique by researchers is the Augmented Dickey-Fuller (ADF) test. The three equations below are examined when testing for stationarity using the ADF test method.   The equation 1.1 is an equation without a trend or intercept. The equation 1.2 has an intercept (drift) but no trend. While, the equation 1.3 has a trend and intercept. Therefore, when examining a variable, we look at its stationarity whilst also examining the existence of an intercept, trend or their absence. In some cases, we will have to employ the breakpoint unit root test method. This method is used when we suspect the existence of a break at a specific point in the series by examining their graphs.

$$\Delta Y_t = \gamma Y_{t-1} + \sum_{i=1}^{k}(\delta_i \Delta Y_{t-i}) + \varepsilon_t \qquad\qquad 1.1$$

$$\Delta Y_t = \alpha o + \gamma Y_{t-1} + \sum_{i=1}^{k}(\delta_i \Delta Y_{t-i}) + \varepsilon_t \qquad\qquad 1.2$$

$$\Delta Y_t = \alpha o + \gamma Y_{t-1} + \alpha_2 t + \sum_{i=1}^{k}(\delta_i \Delta Y_{t-i}) + \varepsilon_t \qquad\qquad 1.3$$

In the above equations 1.1, 1.2 and 1.3, ε_t is the pure white noise term. $\sum_{i=1}^{k}(\delta_i \Delta Y_{t-i})$ represents the lag changes. It is the only difference between the Dickey Fuller (DF) and Augmented Dickey Fuller (ADF). The ADF test adds lag difference of the explained variable to control for possible autocorrelation in the error terms. The number of lags to be included are determined empirically based on the information/statistical criteria such as minimum Akaike Information Criterion (AIC), Schwartz Information Criterion (SIC), the t-statistics or the p-value. αo is the intercept or drift term whilst the T represents the trend. For our ADF test, γ from the three equations above will be examined where $\gamma = \rho - 1$. So, we formulate a null hypothesis.

$$H_0 : \gamma = 0$$

tested against the alternative

$$H_1 : \gamma < 0$$

The null hypothesis of the ADF test implies that our series is non-stationary whilst the alternative means series are stationary. If we reject the null hypothesis, it means that there is no unit root. However, if we fail to reject the null hypothesis then our series are non-stationary or the series contain a unit root.

Numerous unit roots test techniques are available for stationarity testing. Some of them are Durbin-Watson (DW) test, Dickey-Fuller test (1979) (DF), Augmented Dickey-Fuller (1981) (ADF) test, Philip-Perron (1988) (PP) test etc. However, for our paper we will employ the ADF test. This method is considered superior to many other unit root tests methods as it has the attribute of taking care of possible autocorrelation problems by adding lagged difference of the explained variables. The PP is also another popularly used unit root testing technique. It also solves autocorrelation issues in the error term. However, the ADF is the most popular and widely used technique.

3.3. Autoregressive Distributed Lag Model (ARDL) Approach to Cointegration Testing or Bounds Test Cointegration Testing Approach

ARDL models are econometric models that capture both lags of the dependent and explanatory variables as regressors in a single model (Green, 2003). These models are not new in econometric estimations as they have been in use for estimation for years. However, via the work of Pesaran and Shin (1998) and Pesaran *et al*. (2001), that the ARDL cointegration technique has gained huge prominence and favored by many for estimation of cointegration relationships. The method has certain qualities that make researchers favor it for estimation.

The ARDL model can be used with a mix of both *I(0)* and *I(1)* series thereby saving researchers the problems of studying data with different integration level. Apart from that, the ARDL model involves one single equation making it easy to analyze the relationship between variables. It has the ability to distinguish between explanatory and explained variables in a single equation. Also, as variables enter the model, they can take varying lag lengths (Nkoro and Uko, 2016).

In addition, the ARDL short run adjustment can be derived from the Error Correction Model (ECM). This is done from a simple linear transformation by integrating

the short run movement and the long run equilibrium without affecting the long run property of the series (Nkoro and Uko, 2016).

3.3.1. Requirements for using an ARDL model

The Autoregressive Distributed Lag (ARDL) model provides a unique solution that not many models in econometrics do. The ARDL model works with variables of different cointegration levels. Whether our variables are integrated of order *I(0)* or *I(1)* or we have a combination of both, we can use the ARDL model for estimation. Therefore, we are not required to test for unit root prior to performing the bound cointegration testing. However, ARDL does not work well when series are of the order *I(2)*. So, we require unit root testing to verify the integration level of the series so as to confirm the non-existence of an *I(2)* variable.

Again, if using the F-statistics we conclude we have one long run relationship and the sample is relatively small, the ARDL error correction term provides better relations. On the other hand, if the F-statistics concludes that multiple long-run exists then the ARDL cannot be used. The Johensen and Juselius (1990) should be employed instead (Nkoro and Uko, 2016).

3.4. Econometric Model Specification

An ARDL model is a dynamic model which uses lags of the explained and explanatory variables to estimate the short-run effects as well as the long-run equilibrium relationship between the variables using one single equation.

For our empirical study, we developed an ARDL model based on a modified neoclassical investment function to examine the dynamic relationship between the explained variable private investment and explanatory variables:

$$PIV = f(GDP, DD, RINT, BCPS, REER) \qquad 1.4$$

From the investment function above, PIV presents private investment, DD represents Domestic debt, GDP represents the Gross Domestic Product, RINT represents real interest rate, BCPS represents bank credit to private sector and REER represents real effective exchange rate.

The choice of the model and variables was motivated by previous studies on the topic by Adofu and Abula (2010) who studied domestic debt and the Nigerian Economy and King'wara (2014) who studied the impact of domestic public debt on private investment in Kenya. In their papers, they constructed an investment model with GDP growth, interest rates and domestic debt as the explanatory variables.

3.4.1. Econometric model

Estimated Equation

The model 1.5 is simply constructed to capture the nexus between private investment and variables that impact on it.

$$lnPIV_t = \beta_0 + \beta_1 lnDD_t + \beta_2 lnGDP_t + \beta_3 RINT_t + \beta_4 BCPS_t + \beta_5\ REER_t +$$
$$\epsilon_t \hspace{10cm} 1.5$$

To study the short run and long run relationship between our variables, the equation 1.5 is transformed into an Error Correction Model form of the ARDL model. This is represented by equation 1.6 below.

$$\Delta lnPIV_t$$
$$= \beta_0 + \sum_{i=1}^{n1} \beta_{1i}\, \Delta lnPIV_{t-i}\ + \sum_{i=0}^{n2} \beta_{2i}\, \Delta lnDD_{t-i} + \sum_{i=0}^{n3} \beta_{3i}\, \Delta lnGDP_{t-i}$$
$$+ \sum_{i=0}^{n4} \beta_{4i}\, \Delta RINT_{t-i}\ \ + \sum_{i=0}^{n5} \beta_{5i}\, \Delta BCPS_{t-i} + \sum_{i=0}^{n6} \beta_{6i}\, \Delta REER_{t-1} + \delta_7 piv_{t-1} + \delta_8 dd_{t-1}$$
$$+ \delta_9 gdp_{t-1} + \delta_{10} rint_{t-1} + \delta_{11} bcps_{t-1} + \delta_{12} reer_{t-1}$$
$$+ u_t \hspace{10cm} 1.6$$

3.5. ARDL Bounds Test Approach to Cointegration

One of the main reasons for using the ARDL model estimation technique is to employ the bounds test. It helps in examining the long run relationship between our variables. The bound test by Pesaran and Shin (1999) is employed to test for co-integration in an ARDL model.

From the equation 1.6, the coefficients $\delta_7, \delta_8, \delta_9, \delta_{10}, \delta_{11}, \delta_{12}$ represents the long run relationship in the model. To perform the bounds test on the equation 1.6 given the long-run coefficients, the F-statistics will be used to test the following hypothesis:

$H_0: \delta_7 = \delta_8 = \delta_9 = \delta_{10} = \delta_{11} = \delta_{12} = 0$ Null hypothesis of no co-integration against the alternative

$H_1: \delta_7 \neq \delta_8 \neq \delta_9 \neq \delta_{10} \neq \delta_{11} \neq \delta_{12} \neq 0$ existence of a co-integration.

The result of bounds test provides a joint F-statistic, lower bound critical values and upper bound critical values. To test the hypotheses above, we examine the calculated F-statistics against the critical values. If the computed F-statistics is greater that the upper bound critical value, we reject the null hypothesis H_0 and conclude that our variables are co-integrated. However, if the F-statistic falls below the lower bound critical values we cannot reject the null hypothesis H_0. That will mean there is no long run relationship between our variables.

After confirming the existence of a long-run relationship between our variables from the bounds test, we can then move on to estimating the long and short-run coefficients. To this end, equation 1.4 is transformed to capture the short-run dynamics as can be seen in the equation 1.7.

3.6. Short run dynamics based on the Error Correction Model

From the equation 1.4, we derive an Error Correction Model to help us measure the short run impacts of the private investment model.

$$\Delta lnPIV_t = \alpha_0 + \sum_{i=1}^{m1} \partial i\, \Delta lnPIV_{t-i} + \sum_{i=0}^{m2} \delta_i\, \Delta lnDD_{t-i}$$

$$+ \sum_{i=0}^{m3} \theta_i\, \Delta lnGDP_{t-i} \qquad + \sum_{i=0}^{m4} \tau_i\, \Delta RINT_{t-i} + \sum_{i=0}^{m5} \gamma_i\, \Delta BCPS_{t-i}$$

$$+ \sum_{i=0}^{m6} \emptyset_i\, \Delta REER_{t-1} + \lambda EC_{t-1}$$

$$+ \mu_t \qquad\qquad\qquad 1.7$$

The equation above represents the short run dynamics of ARDL error correction form. The lags of our explained and explanatory variables are captured.

3.7.   Error Correction Term

After establishing the long-run relationship between our variables, we move on to test for the short-run dynamics as in equation 1.7. The short run dynamic is adjusted to capture a one period lag of the error correction term. The Error Correction term EC_{t-1} is the speed of adjustment parameter which explains the rate at which our variables return to their long run equilibrium after an exogenous shock. A negative Error Correction term signifies effective feedback. That is there is a quick convergence to the long run equilibrium after a disequilibrium or shock. A positive Error Correction term means a slower feedback or divergence from the long run equilibrium after a shock. If the Error Correction terms is zero, then there is no adjustment.

3.8.   Diagnostic Tests

In our study, we performed two types of diagnostic tests to examine our model. They are stability tests and residual diagnostic tests. The stability test looks at the misspecification and structural break issues in the model. On the other hand, the residual tests examine if the residuals of our model are serially independent, do not suffer from heteroscedasticity or non-normality issues.

The Table 3.1 shows a summary of the tests types, name, hypothesis and their accompanying decision criteria

 Table 3.1. *Diagnostic and Stability tests*

Test	Test Name	Hypothesis	Decision Criteria Based on P-Value
Normality	Jarque-Bera (J-B)	H0: The residuals are normally distributed H1: The residuals are not normally distributed	If the P-value is less than 5% we reject the null hypothesis and accept our alternative hypothesis vice versa
Serial Correlation	Breusch-Pagan Godfrey LM	H0: No serial correlation H1: Presence of serial Correlation	If the P-value of the LM statistics is less than 5% we reject H0 and accept the alternative hypothesis and vice versa.
Heteroscedasticity	Breusch-Pagan Godfrey	H0: Homoscedasticity H1: Heteroscedasticity	If the probability of the LM is less than 5%, we reject the null hypothesis and conclude there is Heteroscedasticity and vice versa
Misspecification	Ramsey RESET	H0: Correct Specification H1: Misspecification	If the F-statistics is less than 5% we reject the null hypothesis and accept the alternativ hypothesis and vice versa.
CUSUM and CUSUMQ	Stability	H0: No structural Breaks H1: Structural Breaks	If the blue line crosses the two red lines on either side of the graph we conclude there is a structural break

Note: *The table has been prepared by the author*

3.9. Data, Sample Size and Definition of Variables

The study relied on secondary sources for data collection. Data was collected from the World Bank online database and the International Monetary Fund database. The series

are in annual frequency starting from 1980 to 2013. The Table 3.2 shows the name of the variables, how they are represented in the estimated model and the source.

Table 3.2. *Name of Variables and data Sources*

Name of Variable	Sign in the Model	Source of Data
Private Investment (Constant LCU)	logPIV	World Bank national accounts data
GDP (constant LCU)	logGDP	World Bank National Accounts Data
Domestic Debt (current LCU)	logDD	International Monetary Funds database
Real interest rate (%)	RINT	International Monetary Fund Database
Bank Credit to Private Sector (% of GDP)	BCPS	International Monetary Fund Database
Real effective exchange rate index (2010 = 100)	REER	International Monetary Fund Database

Note: *Table prepared by author*

3.10.   Theoretical Expectations

Domestic Debt

The liquidity position of the economy will determine the sign of the coefficient of domestic debt. If there is a shallow financial market and the government borrows heavily from the local banks to finance its budget, then there will be limited funds for the private sector. In this case, the coefficient of domestic debt will be negative. However, if the financial system is developed and borrowing does not lead to a shortage of funds for the private sector then we might have a positive coefficient. Again, the way the borrowed funds are utilized matters. If the funds borrowed are invested in the form of capital expenditure, this can complement private investment. If the funds are used for recurrent expenditures then the opposite holds.

Interest Rate

Interest rates are inversely related to investment. An increase in interest rates means a high cost of capital. Therefore, when they increase the cost of borrowing increases and this discourages investment. This is what is referred to as the crowding-out effect on private investment. So, theoretical we might expect the coefficient of interest rate to be negative. However, if interest rate motivates savers to save more, we might have a positive coefficient.

Bank Credit to the Private Sector

Bank credit is one of the main sources of funds for private investors in the Gambia. An increase in bank credit to the private sector will lead to an increase private investment. However, in a case where the government attracts all the funds from the banks leaving little or none for the private sector we will expect a crowding out effect on private investment. From theory, we expect a positive or negative sign for the coefficient of bank credit to private sector.

Gross Domestic Product (GDP)

An economy with a high GDP growth attracts investors as they foresee an increase prosperity or output to larger consumption and increase saving. This will mean availability of funds for investment purpose. We expect the coefficient of GDP to be positive.

Real Exchange Rates

The expected movements in the exchange rate is an important element in investment decision making. When there is too much uncertainty it makes making investment decision harder. If the exchange rate is highly volatile we would expect it to have a negative effect on private investment and vice versa. As Harchaoui, Tarkhani and Yuen (2005) and Oliveira (2014) stated, the lower the volatility in the exchange rate, the higher the investment. However, depending on which investor we are referring to. If we consider a foreign investor using the Euro. If he invests in the GMD and the Euro appreciates to a Dalasi depreciation of 5 percent, his returns would increase by 5 percent. A depreciation of the dalasi will lead to an increase in returns from the foreign investor's

point and the vice versa for the local investor. We expect a negative or positive coefficient depending on the volatility of the Gambian Dalasi.

3.11. Conclusion

In this chapter, we laid the econometric procedures and methods to follow in other to study our research problem empirically. The chapter starts by deriving a basic private investment function. It was transformed into a dynamic model from which the short run and long run estimations will be made. Diagnostic tests which are necessary for the validity and reliability of our estimated model were listed. To follow will be the empirical results and the analysis.

CHAPTER FOUR

4. EMPIRICAL RESULTS AND ANALYSIS
4.1. Introduction

This chapter will look at the empirical results of our ARDL model. Cointegration level of our variables will be examined first. After that, the long run and short run estimations based on bounds test and Error Correction model will be examined. Diagnostic tests will also be looked at to make sure our model is consistent and our estimations can be relied upon.

4.2. Empirical Results

4.2.1. Unit Root Test (ADF) results

Prior to the estimation of our econometric model it is vital for us to examine the series for a unit root, structural breaks and other issues that can be found in time series data. This will help us in deciding which econometric estimation technique is most suitable.

The Augmented Dickey-Fuller unit root test is used to examine the stationarity and other properties of our variables. The test is implemented on equation 1.1, 1.2 and 1.3 to test for the integration level of our series. The results are summarized in Table 4.1.

Table 4.1. *Unit Root Test Results*

Variables	Model (1) No Constant & No trend	Model (2) Constant and No trend	Model (3) Constant and Trend	Oder of Integration
ADF Unit Root on the level series				
LPIV	0.752744	-1.070271	0.1198	
LDD	0.495441	-2.415559	-3.902751**[b]	I(0)
LGDP	1.0000	-0.088326	-3.912043**[b]	I(0)
RINT		-9.744529***c	-9.197323***	I(0)
REER	1.308894	-0.038031	-2.552908	
BCPS	-1.405060	-4.295368***	-1.184550	
ADF Unit Root on the first differenced series				
LPINV	-6.630396***	-6.728205***	-6.598101	I(1)
LDD	-8.766796***	-8.702585***	-8.606676***	

LGDP	-3.393086***	-6.717572***c	-6.609967***	
RINT		-8.923430***	-9.197323***	
REER	-2.926482***	-3.454875***	-3.522346**	I(1)
BCPS	-4.578018***	-1.251813	-5.044812***	I(1)

Source. *Author's computation*

Note: *From author's estimation with data sample 1980-2013. *** represents significance at 1% while ** is significance at 5%. *is significance at 10% the letter c represents the intercept or drift and b signifies the presence of a trend.*

The results from the ADF test found that the series are integrated of different orders. The variables LDD, LGDP and RINT are integrated of order *I(0)*. That is, they are stationary at their levels. On the other hand, LPIV, REER and BCPS are integrated of the *I(1)*-that is-first difference had to be taken for them to be stationary.

After observing the graphs of all the variables, the presence of a break in 1986 was detected for the variable real interest rate (RINT). Therefore, the Unit Root Breakpoint test method was used to test for its stationarity. The break dummy was found to be significant proving the presence of the break. The variable was found to be stationary at the level.

After confirming the order of integration of our variables, we confirmed that no variable is integrated of the order *I(2)*. Also, we have a mix of *I(0)* and *I(1)*. Therefore, since we want to examine the short run and long run relationship between our variables an ARDL model will be the appropriate model for our study. We therefore move on to estimate an ARDL model.

The Estimated ARDL (2,3,4,3,4,4) model

 Table 4.2. *ARDL Model*

Dependent Variable: LPIV				
Method: ARDL				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (4 lags, automatic): LDD LGDP RINT BCPS REER				
Number of models evaluated: 6250				
Selected Model: ARDL(2, 3, 4, 3, 4, 4)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*

LPIV(-1)	0.214735	0.331753	0.647273	0.5527
LPIV(-2)	-0.650447	0.291820	-2.228930	0.0897
LDD	-0.102375	0.070598	-1.450127	0.2206
LDD(-1)	0.012459	0.053653	0.232214	0.8278
LDD(-2)	0.158532	0.067435	2.350885	0.0784
LDD(-3)	0.212226	0.107600	1.972355	0.1198
LGDP	-2.099826	1.525227	-1.376730	0.2406
LGDP(-1)	3.701549	1.738961	2.128598	0.1004
LGDP(-2)	-3.537185	1.511602	-2.340024	0.0794
LGDP(-3)	5.596648	3.229982	1.732718	0.1582
LGDP(-4)	-2.771388	2.854087	-0.971024	0.3865
RINT	0.007319	0.006887	1.062721	0.3478
RINT(-1)	-0.011807	0.009089	-1.298932	0.2638
RINT(-2)	-0.033648	0.013429	-2.505601	0.0664
RINT(-3)	-0.027691	0.015467	-1.790347	0.1479
BCPS	0.058305	0.036027	1.618372	0.1809
BCPS(-1)	0.054125	0.036178	1.496069	0.2090
BCPS(-2)	0.005140	0.045094	0.113980	0.9147
BCPS(-3)	-0.117696	0.050849	-2.314609	0.0816
BCPS(-4)	-0.064351	0.033919	-1.897198	0.1307
REER	-0.008757	0.024472	-0.357834	0.7386
REER(-1)	-0.068957	0.038459	-1.793013	0.1474
REER(-2)	0.044746	0.036832	1.214858	0.2912
REER(-3)	0.031747	0.036432	0.871407	0.4327
REER(-4)	-0.014859	0.023259	-0.638852	0.5577
C	7.262635	23.50065	0.309040	0.7727

R-squared	0.985517	Mean dependent var	21.96135
Adjusted R-squared	0.895001	S.D. dependent var	0.338872
S.E. of regression	0.109807	Akaike info criterion	-1.861762
Sum squared resid	0.048230	Schwarz criterion	-0.647391
Log likelihood	53.92643	Hannan-Quinn criteria	-1.473274
F-statistic	10.88772	Durbin-Watson stat	2.259709
Prob(F-statistic)	0.015840		
*Note: p-values and any subsequent tests do not account for model selection			

Source: *Author's estimation*

Model Selection Criterion

As can be seen from the estimated ARDL model in Table 4.2, a total of 6250 models were evaluated and the ARDL (2, 3, 4, 3, 4, 4) was chosen. It is imperative that we examine how well other models performs in terms of minimizing the AIC. This procedure is important as it will help us use a model with Gaussian error terms. That is, error terms without non-normality, autocorrelation or heteroscedasticity problems. The main selection criterions used are Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion (HQC). The results can be found in Graph 4.1.

Graph 4.1. *Criteria Graph*

Akaike Information Criteria (top 20 models)
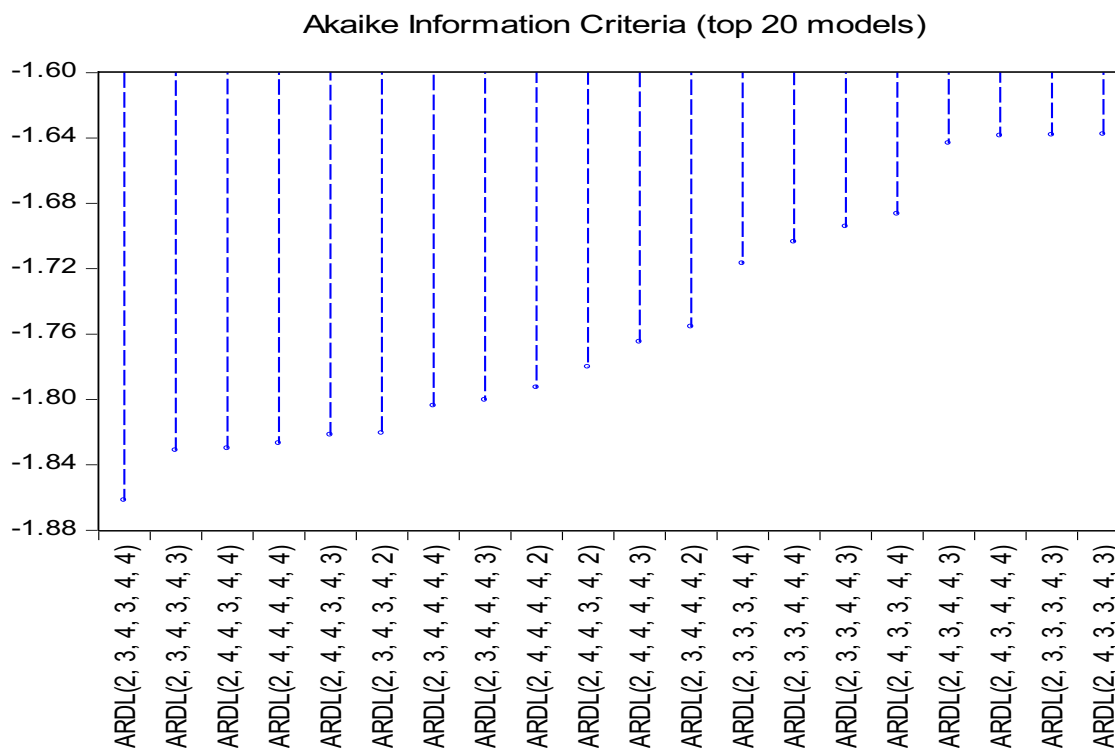
Source: *Author's computation from the estimated ARDL (2, 3, 4, 3, 4, 4)*

4.2.2. Co-integration result, short run and long run impacts

4.2.2.1.   *Co-integration test based on ARDL bounds test approach*

One of the main aims of an ARDL model estimation technique is to test for a long run relationship between variables using the bounds test. The bounds test approach to cointegration examines the existence of a long-run relationship between our series. From our ARDL (2, 3, 4, 3, 4, 4) model, we run the bound test based on the equation 1.6. The bounds test framework involves comparison of the generated F-statistics and the critical values.

The null hypothesis of our bounds test as stated previously is that there exists no long run relationship between our variables and it is tested against the existence of a long-run relationship. From the bound test results in Table 4.3, we have an F-statistics of 3.937982. Comparing that to the critical values, we can reject the null hypothesis of no long-run relationship as the F-statistics value exceeds the 2.5% critical value for the upper bound. We conclude that there exists a long run relationship between our variables.

Table 4.3. *ARDL Bounds Test*

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ARDL Bounds Test Results		
Test Statistic	Value	k
F-statistic	3.937982	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: *Author's estimations.*

Note: *The results are from the ARDL (2, 3, 4, 3, 4, 4) model*

4.2.2.2. Long-run impact

After confirming the long run relationship between our variables, we proceed on to estimate the long run coefficients. Based on the equation 1.6 we estimated this relationship. The results are summarized in Table 4.4.

Table 4.4. *Long Run Coefficient Estimation of ARDL (2, 3, 4, 3, 4, 4)*

Dependent Variable: LPIV				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDD	0.195611	0.123217	1.587528	0.1876
LGDP	0.619762	0.640101	0.968224	0.3878
RINT	-0.045849	0.027329	-1.677676	0.0687*
BCPS	-0.044910	0.019862	-2.261087	0.0866*
REER	-0.011200	0.029405	-0.380890	0.7226
C	5.058559	15.637073	0.323498	0.7625

Source: *Author's computation*

Note: * *means significance at 10 percent level. The results are from the ARDL (2, 3, 4, 3, 4, 4) model.*

The results from table 4.4 show that domestic debt has a positive relationship with private investment in the long run. However, the probability of its coefficient is not significant at 10 percent level of significance. Therefore, we fail to reject the null hypothesis of no long run relationship.

Gross Domestic product was also found to have a positive long-run relationship with private investment. However, the probability is not significant at the 5 percent level. So, we fail to reject the null hypothesis of no long-run relationship.

Real interest rate was found to have a negative long run relationship with private investment. The results show that a 1 percent increase in real interest rates will lead to a 4 percent decrease in private investment. The coefficient of the real interest rates was found to be significant at the 10 percent level of significance. Most importance, the negative effect of interest rate signifies the crowding out effects on private investment as a result of increase interest rates.

Bank credit to private sector (BCPS) has a negative and significant impact on private investment in the long run. The coefficient is (-0.044910). This explains the reduction of private investment as a result of the fall in bank credit to the sector as a result of the increased commercial bank lending to the government in the form of T-bills and other government securities.

Real effective exchange rate (REER) had a negative effect on private investment in the long run. A 1 percent increase in the real effective exchange rate will lead to an 11 percent decrease in private investment. However, the P-value of real exchange rate is not significant at the 5 percent level. Therefore, we don't reject the null hypothesis and conclude that real effective exchange rate does not affect private investment in the long run.

4.2.2.3. Short run impact based on ARDL vector error correction model

Based on equation 1.7, we estimated the short run impact of our explanatory variables using the ARDL Vector Error Correction Model (VECM) Approach. The results are summarized in table 4.5.

Table 4.5. *ARDL Short Run Relationship Estimation*

Dependent Variable: LPIV				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPIV(-1))	0.650447	0.152699	4.259674	0.0131
D(LDD)	-0.102375	0.023280	-4.397596	0.0117
D(LDD(-1))	-0.370758	0.046762	-7.928657	0.0014
D(LDD(-2))	-0.212226	0.032233	-6.584085	0.0028
D(LGDP)	-2.099826	0.555388	-3.780828	0.0194
D(LGDP(-1))	0.711924	0.468131	1.520778	0.2030
D(LGDP(-2))	-2.825261	0.548577	-5.150159	0.0067
D(LGDP(-3))	2.771388	0.575836	4.812808	0.0086
D(RINT)	0.007319	0.002944	2.485896	0.0678
D(RINT(-1))	0.061339	0.007660	8.007340	0.0013
D(RINT(-2))	0.027691	0.004329	6.397203	0.0031
D(BCPS)	0.058305	0.014292	4.079501	0.0151
D(BCPS(-1))	0.176908	0.024017	7.365987	0.0018
D(BCPS(-2))	0.182047	0.022181	8.207241	0.0012
D(BCPS(-3))	0.064351	0.013475	4.775564	0.0088
D(REER)	-0.008757	0.009628	-0.909499	0.4145
D(REER(-1))	-0.061634	0.010452	-5.896552	0.0041
D(REER(-2))	-0.016888	0.010899	-1.549503	0.1962
D(REER(-3))	0.014859	0.009198	1.615530	0.1815
CointEq(-1)	-0.357012	0.182461	-7.868588	0.0014
Cointeq = LPIV - (0.1956*LDD + 0.6198*LGDP -0.0458*RINT -0.0449 *BCPS -0.0112*REER + 5.0586)				

Source: *Author's Computation*

Note: *Based on author's estimation. The results are from the estimated ARDL (2, 3, 4, 3, 4, 4) model.*

The results from Table 4.5 show that previous period private investment has a positive effect on current private investment. The effect is positive (0.650447) and is statistically significant at the 5 percent level. A 1 % increase in private investment in the previous period will lead to a 65 percent increase in private investment in the current period or short run.

It can also be seen that domestic debt (DD) had a negative effect on private investment in the short run not only in the current period but in the past three periods. The effect is strong and statistically significant for all the three periods. A 1 % increase in domestic debt, will lead to a 10%, 37% and 21% decrease in private investment in the current, first lag and second lag respectively in the short run.

Gross Domestic Product (GDP) has a negative and statistically significant effect on private investment in the current and two periods back. The first lag was found to be statistically insignificant. However, in the effect in the third lag was positive (2.771388) and statistically significant. The effect of GDP on private investment is relatively weak.

Real interest rates (RINT) was found to have a positive effect on private investment. The effect is not strong in the current period as the current lag is not significant at the 5 percent level but significant only at the 10 percent. However, the preceding two legs were found to have positive coefficients and statistically significant p-values.

Bank credit to the private sector (BCPS) had a positive effect on private investment in the short run. The short run relationship is strong as all the p-values of the three-period lags were statistically significant even at 1 percent level. When commercial banks increase credit to the private investment by 1% private investment increases by 6%, 18%, 18% and 6% in the first lag, second lag, third lag and first lags respectively.

The real effective exchange rate (REER) had a negative effect on private investment in the short run. The current period had no statistically effect however the second lag was negative and statistically significant. The short run relationship between real exchange rate and private investment exist but it is weak with the effect fluctuating with different lags.

Interpreting the Error Correction Term (EC$_{t-1}$)

We have seen from the bound test results that there exists a long run relationship between our variables. The error correction term will be used to examine the speed of recovery of variables back to their long-run equilibrium after there is a shock. The error correction term (EC_{t-1}) is generated from the ARDL model by considering the cointegration and long-run coefficients. A negative error correction term coefficient means there is a quick return to long-run equilibrium after there is a shock. However, when we have a positive error correction term it means our variables do not return to their long-run state or it takes a long time before converging to their long-run equilibrium.

From the Table 4.5, we have an EC term coefficient of (-0.357012). The ECT is negative and its P-value is significant. This proves the existence of a cointegrating relationship between our variables. There is a quick recovery to the long run equilibrium after a shock. From the ECT, we can say after exogenous shock disturbs the equilibrium condition, 35 percent of the correction is completed in the first period.

4.2.3. Diagnostic tests

Estimates are only good enough if they are reliable and stable. To ensure that our empirical results from the ARDL model estimations can be relied upon, we conduct various diagnostic tests. The results of these tests will be presented in this section.

Table 4.6. *Breusch-Godfrey Serial Correlation LM Test*

F-statistic	1.414461	Prob.	0.4142
Obs*R-squared	17.57486	Prob.	0.0905

Note: *author's estimation from the results of the ARDL (2, 3, 4, 3, 4, 4) model*

From Table 4.6, the p-values of the Breusch-Godfrey Serial Correlation LM test are above 5 percent. The Probability of the F-statistics is (0.4142) whilst the Obs*R-squared p-value is 0.0905. We can therefore conclude that our estimated model does not suffer from serial correlations as expected of any good model.

Table 4.7. *Heteroskedasticity Test: Breusch-Pagan-Godfrey*

F-statistic	0.393651	Prob.	0.9351

Obs*R-squared	21.33028	Prob.	0.6741

Table 11 shows a summary of Breusch-Pagan-Godfrey heteroscedasticity test. The Probabilities of the F-statistics (0.9351) and the Obs*R-squared (0.6741) are both greater than 0.05. We can conclude that the model does not suffer from heteroscedasticity problems.

Jarque-Bera

The figure 4.1 shows the Jarque-Bera normality test results. From the results, the Jarque-Bera P-value (0.972995) is greater than 0.05. Based on this, we accept the null hypothesis and conclude that our residuals of our model are normally distributed.

Figure 4.1. *Normality Test Result*

Series: Residuals	
Sample 1984 2013	
Observations 30	
Mean	-2.43e-15
Median	-0.002522
Maximum	0.095114
Minimum	-0.094961
Std. Dev.	0.040781
Skewness	0.073604
Kurtosis	3.148769
Jarque-Bera	0.054753
Probability	0.972995
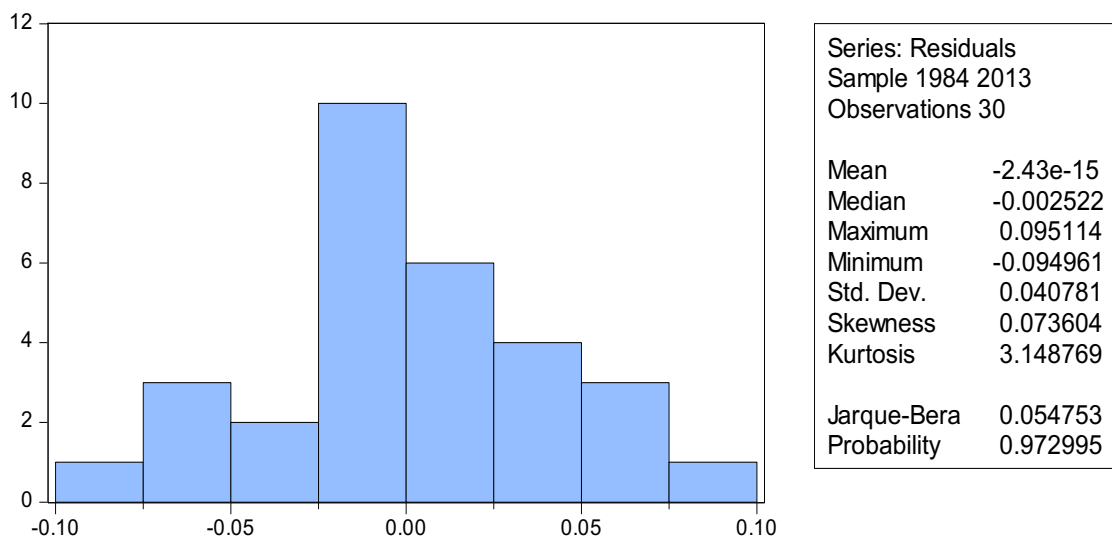
Source: *Author's computation*

Note: *Author's estimation from the results of the ARDL (2, 3, 4, 3, 4, 4) model*

Table 4.8. *Ramsey RESET test for model specification*

Ramsey RESET Test For Model Specification

	Value	Df	Probability
t-statistic	0.461534	3	0.6758

F-statistic		0.213013	(1, 3)		0.6758	

Note*: Author's estimation from the results of the ARDL (2, 3, 4, 3, 4, 4) model*

From table 4.8, we see from the model specification test results show that the probability of the F-statistics (0.6758) is greater than 0.05. We therefore accept the null hypothesis and which means our model is correctly specified.

Q-statistic probabilities

For our ARDL to provide consistent estimates, it is vital that our errors are serially independent. The ARDL model takes a lag of the dependent variable as part of the explanatory variables making it even more vital to study autocorrelation issues. The Q-statistics test is used to examine if our model does not suffer from autocorrelation. The results of the test are found in Table 4.9.

Table 4.9. *Q-statistic Probabilities*

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. *| . |	. *| . |	1	-0.135	-0.135	0.6049	0.437
**| . |	**| . |	2	-0.450	-0.477	7.5503	0.123
. | . |	. *| . |	3	0.015	-0.184	7.5582	0.156
. |* . |	. *| . |	4	0.196	-0.076	8.9788	0.162
. | . |	. *| . |	5	-0.047	-0.113	9.0627	0.107
. *| . |	. *| . |	6	-0.166	-0.178	10.162	0.118
. |* . |	. |* . |	7	0.169	0.075	11.355	0.124
. | . |	. *| . |	8	0.030	-0.068	11.394	0.180
. *| . |	. | . |	9	-0.118	-0.034	12.032	0.212
. | . |	. *| . |	10	-0.046	-0.079	12.133	0.276
. | . |	. *| . |	11	0.064	-0.070	12.341	0.339
. | . |	. *| . |	12	-0.033	-0.153	12.398	0.414
.**| . |	.**| . |	13	-0.207	-0.343	14.810	0.319

. |* .		. *| .		14	0.163	-0.132	16.395	0.290
. |* .		.	.		15	0.210	-0.051	19.209	0.204
. *| .		. *| .		16	-0.133	-0.116	20.427	0.202

*Probabilities may not be valid for this equation specification.

From the Table 4.9 Q-statistics test results, the P-values show no evidence of autocorrelation. Therefore, we conclude that our model's residuals are serially independent and our model does not suffer from autocorrelation.

Model Stability Tests

CUSUM TEST

The CUSUM test is another test commonly used for testing model stability. The CUSUM test results come in the form of a graph with two red lines on either side of a blue one. If the blue line crosses the red ones then we know that we have an issue with our model. There might be a structural break or our model is not stable.

For our ARDL equation 1.6 and 1.7, we use the CUSUM and CUSUMQ to examine their stability both in the short run and in the long run. The results can be seen in Figure 4.2 and Figure 4.3.

From Figure 4.2 and 4.3, we found no evidence of a structural break in our model and at 5 % level of significance, we can strongly state that our model is stable and the estimated results are reliable and valid.

Figure 4.2. *CUSUM TEST*
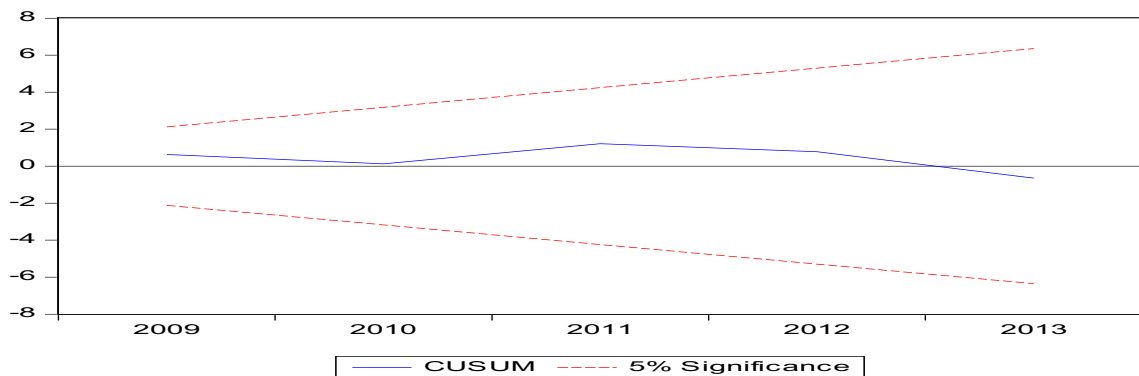
Figure 4.3. *CUSUM of Squares*
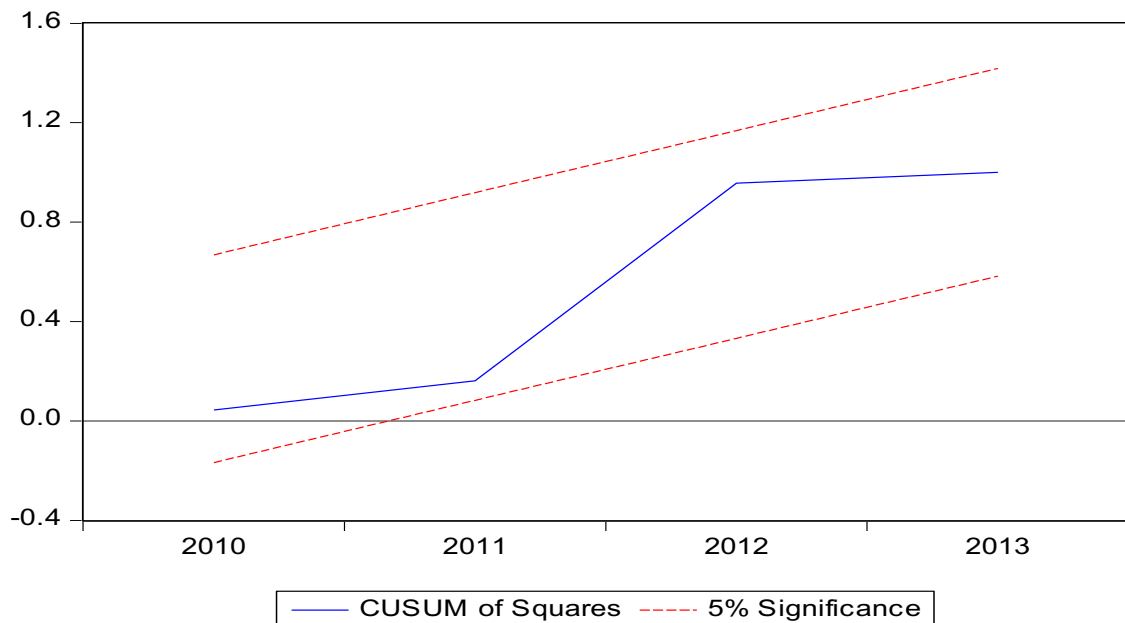
4.3.   Conclusion

In this chapter, we followed the standard econometric data analysis method to examine our private investment function. The integration level of our variables was looked at to make sure we don't have variables of *I(2)* since we are using an ARDL model. The ARDL model was estimated and the bounds test for cointegration was performed. The variables were cointegrated in the long run. The short run and long run coefficients were then estimated. This was followed by diagnostic tests for normality and stability. The results showed that the estimated model and results are correct and reliable.

CHAPTER FIVE

5.   CONCLUSION AND POLICY RECOMMENDATIONS
5.1.   Introduction

In the previous chapters the impact of domestic debt on private investment was examined. The long run and short run nexus were studied using an ARDL model. In this chapter, a summary of the empirical results and possible policy recommendations will be covered.

The main aim of this paper is to investigate the impact of domestic borrowing on private investment in the Gambia from 1980 to 2013. The study considered the effects both in the short run and in the long run. A dynamic model of private investment based on the neoclassical investment model was used to empirically examine the research questions. The econometric model included private investment as a function of domestic debt, real interest rates, GDP, bank credit to the private sector and real effective exchange rates.

5.2.   Summary of the Findings

The ARDL model technique was used to investigate our problem. Applying the bounds test to our model, the statistical inferences showed that there exists a long run relationship between our variables.

The findings showed that domestic debt affects private investment negatively in the short run but not in the long run. The negative effect of domestic debt on private investment is in line with the classical economists' view. Also, Kamunda (2015) and King'wara(2015) found similar results in their study. The crowding out effect of domestic debt on private investment is a result of the fact that commercial banks are motivated to investment in government securities which have lower risks and higher returns compared to extending loans to the private sector. The Central Bank monetary committee highlighted the shortage of funds to the private sector due to the heavy domestic borrowing. However, the trend keeps increasing due to huge government expenditures leading to huge deficits.

The results showed that Gross Domestic Product affects private investment negatively in the short run but the impact in the long run is not statistically significant. It is not surprising that we have a negative short-run effect because the GDP of the Gambia over the years has been highly volatile with internal shocks from agriculture and tourism as a result of poor rains and ebola virus in the region affecting economic growth adversely. Low output signals low economic performance to prospective investors.

Empirical evidence showed that real interest rates affect private investment positively in the short run and negatively in the long run. The continuous government borrowing from banks coupled with the huge outstanding debt on the T-bills plus the shortage of funds have pushed interest rate at business killing rates. The local banks are willing to lend to the government but at very high-interest rates. This increase in interest rates affects the private sector negatively as the high-interest rates imply a high cost of capital. This is what is referred to as crowding out of private investment. This evidence is in line with previous studies by Emerence and Slater (2016) who said increase interest rates might increase savings and therefore lending to the private sector and eventually increase investment in the short run. King'wara (2015) and Nabenda and Slater (2003) also found similar evidence of the crowding out effect of interest rates on private investment in the long run.

The bank credit to the private sector is found to have a positive and negative effect on private investment in the short run and long run respectively. This is another evidence of crowding out of private investment. Even though over the years the number of banks in the Gambia has increased, the credit to the private sector has been moderate.

The real effective exchange rate has a negative effect on private investment in the short run. The impact in the long run was not statistically significant. The exchange rate of the Dalasi is highly volatile. Also, compared to all major currencies the value of the Dalasi is low. The negative effect the real exchange rate has on private investment is not surprising as the value of a country's currency can be used to measure its economy's strength and the Gambia's Dalasi has not been doing quite well. Similar to our results, Harchaoui, Tarkhani and Yuen (2005) and Kandil, Berument and Dincer (2007) in their studies found that high volatility in exchange rates has a negative effect on private investment.

5.3.   Policy Recommendations

The domestic debt level in the Gambia has been well discussed recently and this motivated the empirical examination of the problem. Based on the empirical findings, the study made the following recommendations.

First and foremost, the prime task of the government is to settle the currently outstanding stock of domestic debt. After doing this, there will be room for conducting proper monetary policy. One way that the government can cut on its stock of domestic debt is using external debt to pay for the outstanding domestic stock of domestic debt. Another way is by setting up donor funds which will be used to pay for the domestic debt.

Second, the government of the Gambia should revive its lost revenue base and also try to create new avenues for raising funds to finance deficits instead of relying heavily on domestic borrowing. With the new government in place, funds from donors and external debt will go a long way in helping the economy regain its strength. The privatization of Agricultural sector will also be a good move in helping the economy reduce its trade deficit through increased exports. The government can create avenues to motivate investors to come and invest in agriculture given the fertile lands. This will not only create jobs and output in the agricultural sector but it will allow for the export of agricultural products.

Third, one of the reasons for the increase domestic debt in the Gambia according to the UNDP (2016) report is a result of macroeconomic policy slippages. The lack of commitment to policies has led to the government spending far more than budgeted for. Therefore, at the core of controlling the ballooning domestic debt is macroeconomic policy discipline and commitment to the national budget.

Fourth, the study recommends the establishment of a Debt Management Department for the Gambia government. This office will be in charge of setting limits to the domestic debt levels. Also, they will be in charge of overseeing the utilization of borrowed funds. This way, the borrowed funds will be put to use in the right way and for the right purpose.

Fifth, we also recommend that borrowed funds be used to finance capital expenditures. The breakdown of government spending according to the UNDP (2016) shows that enormous portion of government spending goes to recurrent expenditure and just a small amount is invested into capital expenditure. For the domestic debt to complement the private sector development, the government most invest in infrastructure and other capital expenditures.

Sixth, the study also recommends for the government to create and trade in securities with a longer maturity. Although this will require macroeconomic stability and also low inflation rates.

Seventh, we also suggest for the CBG to consider expanding its investor base for the domestic debt markets. They should encourage foreign investors and non-commercial banks such as private individuals to invest in the domestic debt market. At least, this will reduce the concentration of the local commercial banks on the debt market. It will also increase competition in local debt market which is likely to reduce the cost of borrowing. By expanding the investor base on the debt market, the private sector won't be squeezed for credit.

Finally, to be able to formulate proper debt sustainability policies there ought to be ready and update data on the debt structure. The stock of domestic debt, maturity, currency and type of holders should be known. However, until now, the data on domestic debt is one of the most challenging things to access. The Gambia Bureau of Statistics (GBOS) and the Central bank of Gambia (CBG) should work together towards providing data on debt and other related variables.

5.4.   General Conclusion

Evidence showed that domestic debt has a crowding-out effect on private investment in the Gambia. In the short run, it reduces private investment directly. However, in the long run it affects private investment indirectly through high-interest rates. The interest rate has been found to crowd out private investment in the long run.

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APPENDICES

A.1.

ARDL Estimated Model
Dependent Variable: LPIV
Method: ARDL
Date: 04/11/17   Time: 00:35
Sample (adjusted): 1984 2013
Included observations: 30 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LDD LGDP RINT BCPS REER

Fixed regressors: C
Number of models evaluated: 6250
Selected Model: ARDL(2, 3, 4, 3, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LPIV(-1)	0.214735	0.331753	0.647273	0.5527
LPIV(-2)	-0.650447	0.291820	-2.228930	0.0897
LDD	-0.102375	0.070598	-1.450127	0.2206
LDD(-1)	0.012459	0.053653	0.232214	0.8278
LDD(-2)	0.158532	0.067435	2.350885	0.0784
LDD(-3)	0.212226	0.107600	1.972355	0.1198
LGDP	-2.099826	1.525227	-1.376730	0.2406
LGDP(-1)	3.701549	1.738961	2.128598	0.1004
LGDP(-2)	-3.537185	1.511602	-2.340024	0.0794
LGDP(-3)	5.596648	3.229982	1.732718	0.1582
LGDP(-4)	-2.771388	2.854087	-0.971024	0.3865
RINT	0.007319	0.006887	1.062721	0.3478
RINT(-1)	-0.011807	0.009089	-1.298932	0.2638
RINT(-2)	-0.033648	0.013429	-2.505601	0.0664
RINT(-3)	-0.027691	0.015467	-1.790347	0.1479
BCPS	0.058305	0.036027	1.618372	0.1809
BCPS(-1)	0.054125	0.036178	1.496069	0.2090
BCPS(-2)	0.005140	0.045094	0.113980	0.9147
BCPS(-3)	-0.117696	0.050849	-2.314609	0.0816
BCPS(-4)	-0.064351	0.033919	-1.897198	0.1307
REER	-0.008757	0.024472	-0.357834	0.7386
REER(-1)	-0.068957	0.038459	-1.793013	0.1474
REER(-2)	0.044746	0.036832	1.214858	0.2912
REER(-3)	0.031747	0.036432	0.871407	0.4327
REER(-4)	-0.014859	0.023259	-0.638852	0.5577
C	7.262635	23.50065	0.309040	0.7727

R-squared	0.985517	Mean dependent var	21.96135
Adjusted R-squared	0.895001	S.D. dependent var	0.338872

S.E. of regression	0.109807	Akaike info criterion	-1.861762
Sum squared resid	0.048230	Schwarz criterion	-0.647391
Log likelihood	53.92643	Hannan-Quinn criter.	-1.473274
F-statistic	10.88772	Durbin-Watson stat	2.259709
Prob(F-statistic)	0.015840		

*Note: p-values and any subsequent tests do not account for model selection.

A2: ARDL Bounds Test

ARDL Bounds Test
Date: 04/11/17   Time: 00:41
Sample: 1984 2013
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	3.937982	5

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

A4: Short run dynamics Estimates
ARDL Cointegrating And Long Run Form
Dependent Variable: LPIV
Selected Model: ARDL(2, 3, 4, 3, 4, 4)
Date: 04/11/17   Time: 00:46
Sample: 1980 2013
Included observations: 30

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPIV(-1))	0.650447	0.152699	4.259674	0.0131
D(LDD)	-0.102375	0.023280	-4.397596	0.0117

D(LDD(-1))	-0.370758	0.046762	-7.928657	0.0014
D(LDD(-2))	-0.212226	0.032233	-6.584085	0.0028
D(LGDP)	-2.099826	0.555388	-3.780828	0.0194
D(LGDP(-1))	0.711924	0.468131	1.520778	0.2030
D(LGDP(-2))	-2.825261	0.548577	-5.150159	0.0067
D(LGDP(-3))	2.771388	0.575836	4.812808	0.0086
D(RINT)	0.007319	0.002944	2.485896	0.0678
D(RINT(-1))	0.061339	0.007660	8.007340	0.0013
D(RINT(-2))	0.027691	0.004329	6.397203	0.0031
D(BCPS)	0.058305	0.014292	4.079501	0.0151
D(BCPS(-1))	0.176908	0.024017	7.365987	0.0018
D(BCPS(-2))	0.182047	0.022181	8.207241	0.0012
D(BCPS(-3))	0.064351	0.013475	4.775564	0.0088
D(REER)	-0.008757	0.009628	-0.909499	0.4145
D(REER(-1))	-0.061634	0.010452	-5.896552	0.0041
D(REER(-2))	-0.016888	0.010899	-1.549503	0.1962
D(REER(-3))	0.014859	0.009198	1.615530	0.1815
CointEq(-1)	-0.357012	0.182461	-7.868588	0.0014

Cointeq = LPIV - (0.1956*LDD + 0.6198*LGDP -0.0458*RINT -0.0449
*BCPS -0.0112*REER + 5.0586)

A4.Long Run Coefficient
Estimates
Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDD	0.195611	0.123217	1.587528	0.1876
LGDP	0.619762	0.640101	0.968224	0.3878
RINT	-0.045849	0.027329	-1.677676	0.0687
BCPS	-0.044910	0.019862	-2.261087	0.0866
REER	-0.011200	0.029405	-0.380890	0.7226
C	5.058559	15.637073	0.323498	0.7625

A5: Q-statistic probabilities for Autocorrelation
Date: 04/11/17   Time: 01:03
Sample: 1980 2013
Included observations: 30
Q-statistic probabilities adjusted for 2 dynamic regressors

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*

			AC	PAC	Q-Stat	Prob
.*| .		.*| .		1	-0.135	-0.135	0.6049	0.437
**| .		**| .		2	-0.450	-0.477	7.5503	0.123
.	.		.*| .		3	0.015	-0.184	7.5582	0.156
. |* .		.*| .		4	0.196	-0.076	8.9788	0.162
.	.		.*| .		5	-0.047	-0.113	9.0627	0.107
.*| .		.*| .		6	-0.166	-0.178	10.162	0.118
. |* .		. |* .		7	0.169	0.075	11.355	0.124
.	.		.*| .		8	0.030	-0.068	11.394	0.180
.*| .		.	.		9	-0.118	-0.034	12.032	0.212
.	.		.*| .		10	-0.046	-0.079	12.133	0.276
.	.		.*| .		11	0.064	-0.070	12.341	0.339
.	.		.*| .		12	-0.033	-0.153	12.398	0.414
.**| .		.**| .		13	-0.207	-0.343	14.810	0.319
. |* .		.*| .		14	0.163	-0.132	16.395	0.290
. |* .		.	.		15	0.210	-0.051	19.209	0.204
.*| .		.*| .		16	-0.133	-0.116	20.427	0.202

*Probabilities may not be valid for this equation specification.