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**FISCAL AND MONETARY POLICY NEXUS: REEXAMINING
THE EFFECT OF GOVERNMENT BORROWING ON INTEREST
RATES AND INTEREST SPREADS IN KENYA**



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MPPM 58411/17

**A RESEARCH DISSERTATION SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF PUBLIC POLICY AND MANAGEMENT AT
STRATHMORE UNIVERSITY**

**INSTITUTE OF PUBLIC POLICY AND GOVERNANCE
STRATHMORE UNIVERSITY BUSINESS SCHOOL
NAIROBI, KENYA**

SEPTEMBER 2021

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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Sharon Litunya Okwako

APPROVAL

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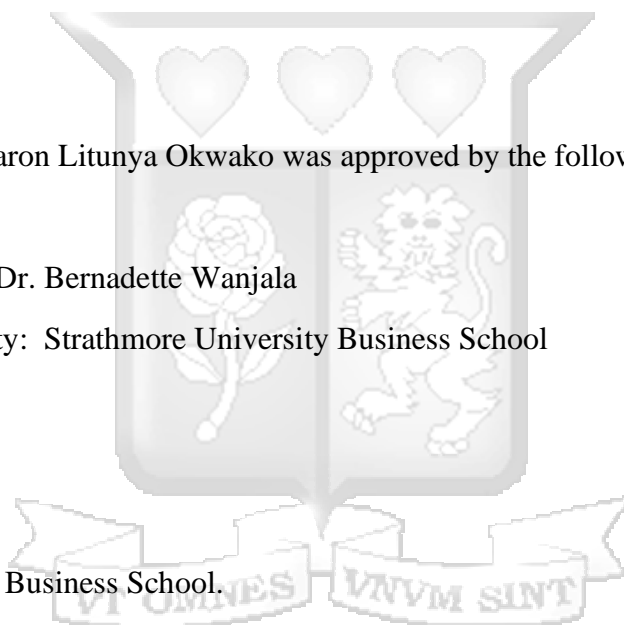
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ABSTRACT

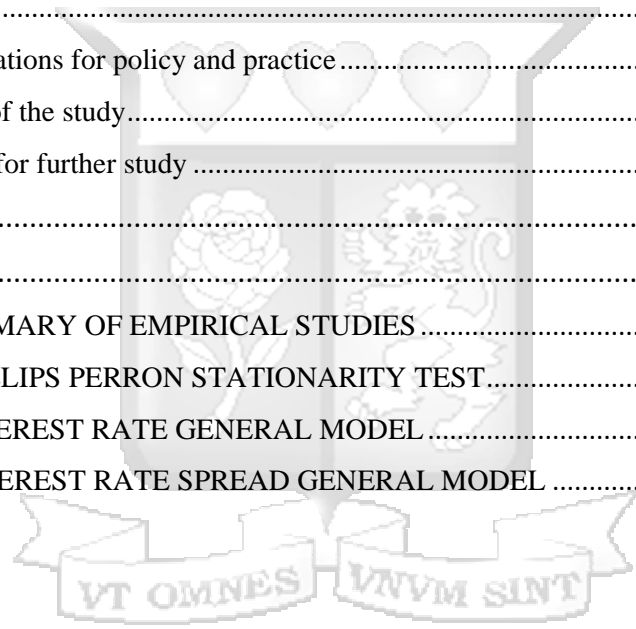
The Kenyan economy has experienced an increase in budget deficit and public debt since independence. In the recent past, the government has shifted its focus in financing its deficit from external funding sources to targeting the domestic financial markets. In light of this, this study sought to reexamine the effect of government domestic borrowing on interest rates and interest rate spread. There is limited research on the interactions between fiscal policy variables such as budget deficit and public debt and monetary variables such as interest rates and interest rate spreads. This study sought to fill this research gap. Secondary data from 1989 to 2018 was used for this study comprising of public domestic debt, net credit to government ratio, interest rate spread, interest rates, liquidity ratio, advance to deposit ratio, inflation and GDP growth rates. The study used Autoregressive Distributed Model (ARDL) to investigate the relationship between the dependent and independent variables. The findings indicate that in the long run, there is a negative and significant relationship between net credit to government ratio and interest rates and interest rate spreads. In the short run, net credit to government ratio was found to be positively and significantly related to interest rates while the relationship was negative and significant for interest rate spreads. Public domestic debt was found to be positively and significantly related to interest rate spreads in the short run. The implication of the findings is that public debt should be maintained at a reasonable level so that private sector growth is not hindered. Additionally, better coordination between fiscal policy authorities and monetary authorities is recommended.

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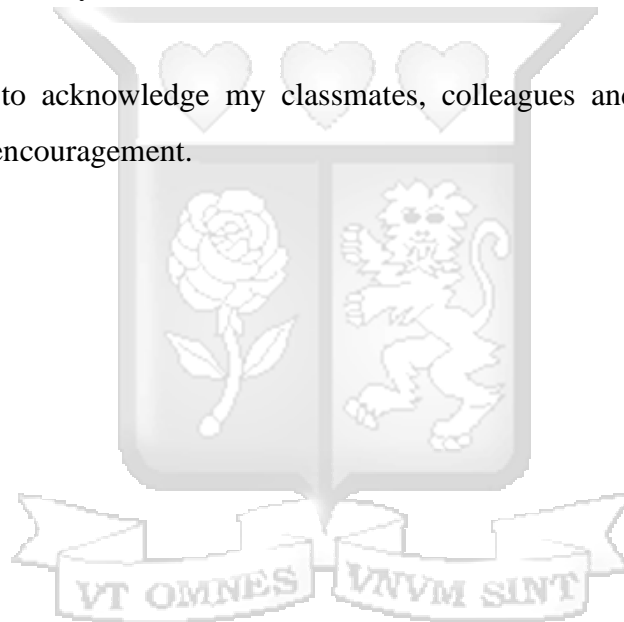
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1 CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter provides a background of the study, the research problem, the research objectives and research questions, scope of study and the significance of the study.

1.2 Background of the study

The role of banks in economic development and growth cannot be understated. These institutions play a vital role in the mobilization of savings and advancement of loans to borrowers. The difference charged between the savings rate and the lending rate is known as the interest rate spread. Interest rate spread reflect efficiency in the banking sector and status of financial sector (Tennat & Folawewo, 2009). Inefficiencies in the financial sectors are evidenced by high interest rate spread. High interest spreads are as result of high lending rates and low savings rates. The high lending rates discourage investments due to the high cost of credit while low savings rate discourage savings in an economy. This eventually hampers economic growth (Maende et al., 2018). Crowley (2007) also articulates that a large spread act as an impediment to the growth and progress of financial intermediation. Notwithstanding, from a bank's perspective, high lending rates or wide interest rate spread enables them to remain profitable in the context of high default rates, macroeconomic instability, high operational and regulatory costs (Mensah & Abor, 2012).

Fiscal policy is how a government uses its income and spending to influence the economy. When government's revenue source falls short of expenditure plans, the government experiences a budget deficit and can resort to public debt to finance the shortfall. There are several ways in which fiscal policy influence interest rates and subsequently interest rate spread. First, when governments turn to domestic market to finance its deficit, it results in increase in treasury bill rate which results in increase in lending rate. Conversely, when treasury bill rates decline, banks respond by reducing the saving rate but keep the lending rate high which results in an increase in interest rate spread (Ngugi, 2001). Second, expansionary fiscal policy results in increase in inflation which in turn pushes monetary authorities to tighten monetary policy causing banks to increase their lending rates eventually increasing interest rate

spread. Therefore, given this setting, Mujeri & Younus (2009) argue that the burden of reducing interest rate spread should not solely fall on monetary channels alone but should include a more synchronized use of fiscal policy.

1.2.1 Monetary Policy

Monetary policy can be viewed as actions taken by the Central Bank to influence economic growth by controlling money supply. The primary purpose of monetary policy is to sustain price stability by maintaining low and stable inflation. The Monetary Policy Committee (MPC) within Central Bank of Kenya is in charge of formulating monetary policy. One of the tools that Central Bank uses in influencing market changes and price stability is the Central Bank Rate (CBR). Any movements in the CBR reflect monetary policy pursued by CBK. The CBR is set according to the level of inflation in the economy. The MPC does not take into consideration the fiscal policy and its influence on interest rate. Changes in CBR affect changes in short term interest rates. The Kenya Bank's Reference Rate (KBRR) is the base rate for lending by bank which incorporates CBR and the 91-day Treasury Bill rates.

According to Keynes, interest rate can be defined as the compensation for parting with liquidity for a certain period. Keynes definition emphasizes more on the lending rate (Gylych, 2016). Another definition views interest rate as the return or opportunity cost for postponing current consumption into the future. Example of interest rates include saving rate, discount rate and lending rate. These interest rates can either be short term or long term. The various definition of interest rate can be summarized as the cost of credit or return for giving credit for borrowers and lenders respectively.

Interest rate spread can be described as the microstructure of the financial market and policy environment or simply the difference between the deposit rate and lending rate (Tarus & Manyala, 2018). The spread between saving and lending rates indicates financial performance and efficiency. Interest rate spread can be further classified as pure spread and actual spread. Pure spread is influenced by extent of bank characteristics, industry structure and interest rate variation on loans and deposits (Ho & Saunders, 1981). In other words, pure spread takes into account the influence of market structure on determination of interest rate spread (Brock & Suarez, 2000). Actual spread which also includes pure spread is influenced by conduct of monetary and fiscal policies.

1.2.2 Fiscal Policy

Fiscal policy is the way a government uses its income and spending to impact the economy. Budget deficit occurs when government's revenue is lower than its expenditure. Nyang'au & Orayo (2016) defines fiscal deficit as government spending exceeding its revenue; hence government brings more money into the economy than it gets by taxation. This results in increased business activity which brings enough revenue to cover the deficit. Ncanywa & Masoga (2018) define public debt as the money owned by the government from either foreign lenders or domestic lenders which increases with increase in fiscal deficit financing. Over the last few years, globally, public finance has been characterized by rising deficits and public debt.

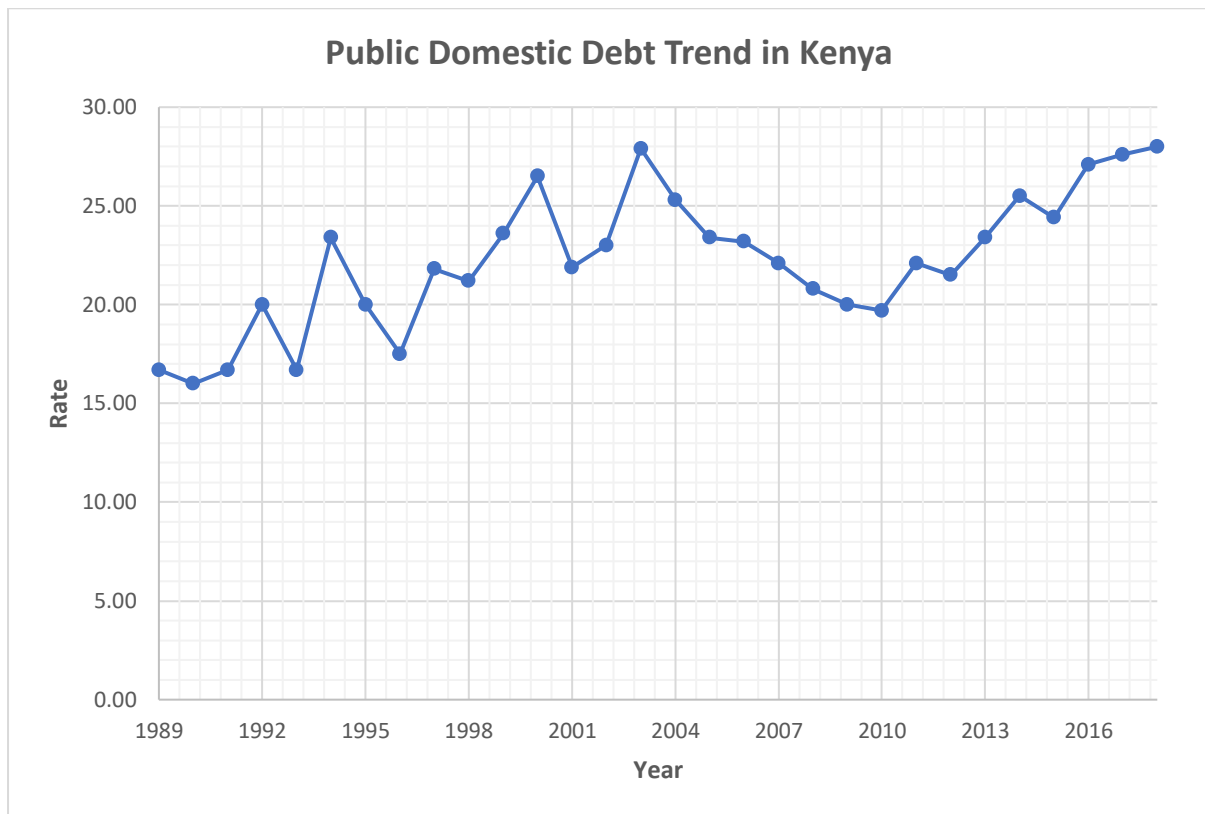
The relationship between budget deficits, public debt and interest rates is a complex one since countries finance their fiscal deficit in various ways. Those who finance their deficits through domestic debt increase the domestic real interest rates while markets that are integrated with world capital markets results in higher foreign debt. Dellerba & Sola (2013) find that an increase in the aggregate deficit results in increase in long-term interest rate more in small countries with low financial development, and macroeconomic or institutional weaknesses. The factors that determine whether fiscal debt or deficits have an influence on domestic interest rate are guided by how households and firms assess future tax obligations; the extent of openness of the economy; and the substitute between private and public goods. Fiscal policy may either be significantly influence (real) interest rate or be completely irrelevant depending on the aforementioned factors (Faini, Duranton, & Harald, 2006).

The general position regarding the relationship between fiscal debt and interest rate spread states that budget deficit and public debt are negatively related to interest rate spread. Researchers such as Jong (2018), Tennat & Folawewo (2009) and Obeng & Sakyi (2017) provide evidence that increase in deficits and higher government borrowing results in an increase in spreads. Poor financial intermediation resulting from bank concentrating on financing government securities among other factors is responsible for the wide bank spread (Kinyua, 2004). It follows that more emphasis should be put on controlling public debt and budget deficit for meaningful achievements in narrowing interest rate spread (Bosire et al., 2014).

1.2.3 Monetary and Fiscal Policy in Kenya

According to Gongera et al. (2013), the Kenyan government has experienced fiscal deficit since 1965 which is credited to government expenditure being greater than government revenue. This can be explained by poor economic performance that results in inadequate resources. High public debt and high interest rates have contributed to the poor economic performance. The several shocks that Kenya has experienced necessitated implementation of fiscal policy to counter these shocks. These shocks include the global oil crisis of 1973/1974, global financial crisis of 2008, post – election violence of 2007/2008 among others. The Government of Kenya responded to these shocks by implementing fiscal stimulus financed through government borrowing. Policies pursued by different political regimes can have an effect on budget deficit. Three major political changes have been identified. First, the new government ushered in 2002 pursued expansionary fiscal policy driven by increase in infrastructure development, provision of health care and universal primary education. Second, the 2013 general election ushered in two levels of government, national and county governments increasing government's expenditure (Mathu, Osoro, & Luvanda, 2018). Third, the jubilee government pursued policies that exerted pressure on the fiscal deficit emanating from increased security spending and new infrastructure development on Standard Gauge Railways (SGR), roads and energy (Mathu, Osoro, & Luvanda, 2018).

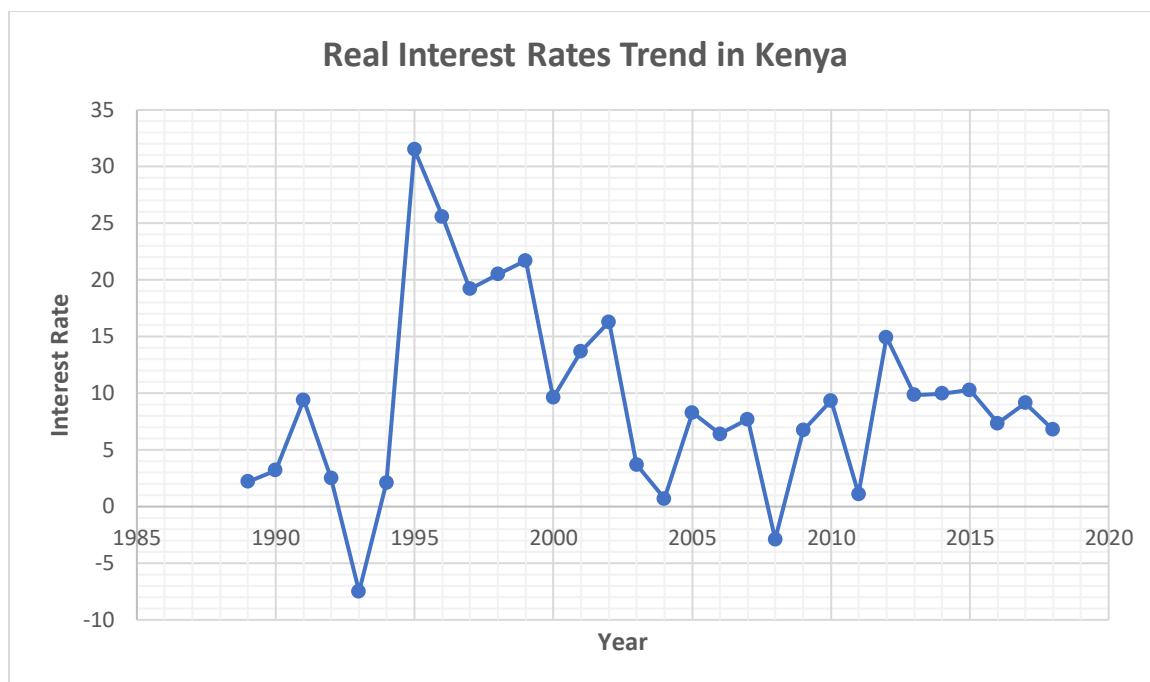
With respect to public debt, the size and structure of public debt in Kenya has increased and changed overtime (Makau, Ocharo, & Njuru, 2018). Public debt has fluctuated depending on the political, economic, environment and financial contexts. Events such as oil shock, political instability of 1982, economic uncertainty arising from 1992 and 2002 multiparty elections, Goldenberg scandal, implementation of Structural Adjustment Programmes (SAPs), global financial crisis and post-election violence increased public debt in the country. On the other hand, positive events such as the coffee boom of 1970s and implementation of Economic Recovery Strategy (ERS) for wealth creation (2003 – 2007) helped improve the country's debt position. External government debt has comprised the largest proportion of public debt in Kenya but from 2006 the portion of domestic debt started to increase. Figure 1.1 shows the general increase in public domestic trend. The government's medium-term debt management strategy of 2010 recommends a shift in its debt structure towards long term domestic debt. The aim is to reduce cost, minimize refinancing and foreign exchange risk and to promote domestic debt market and larger financial market.



Source: Kenya National Bureau of Statistics

Figure 1.1: Public Domestic Debt Trend in Kenya

Interest rates in Kenya were moderately stable before 1990s due to implementation of price controls and banking controls in the country. The 1992 multiparty elections led to interest rate fluctuations. In 1993, there was a sharp rise in interest rates which was coupled with soaring inflation. Figure 1.2 shows the general real interest rate trend in Kenya. The lending rate increased gradually from October 1993 to October 1994 averaging 30%. The average lending rate remained close to 30% through to 1999. Subsequently, the rates oscillated between 12 and 18 percent through 2011 which increased private sector credit, inclination for fiscal debt and economic growth (Parliamentary Budget Office, 2011). From 2012 to August 2016, the interest rate rose to range between 15 and 20 percent. This led the government to introduce interest rate caps that saw interest rates stabilizing to 14 percent.



Source: Kenya National Bureau of Statistics

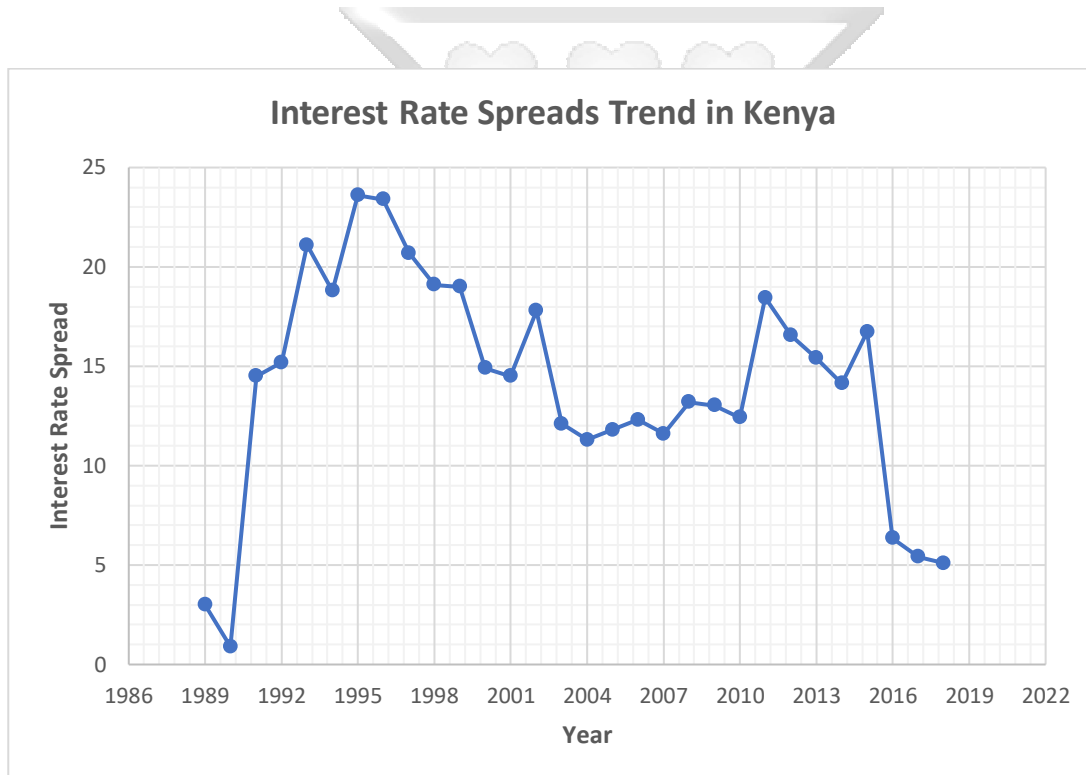
Figure 1.2: Real Interest Rates Trend in Kenya

With regards to interest rate spread, the economic environment and to a large extent the fiscal policy pursued by the government of Kenya has greatly influenced the magnitude of interest rate spread. At first, Central Bank of Kenya pursued a low interest rate policy with the aim of encouraging investment (Ngugi, 2001). This was achieved by setting minimum deposit rates and maximum lending rates for financial institutions (Central Bank of Kenya, 2018). The interest rates remained constant for two reasons. First, so as to boost investment as any changes in interest rates would create uncertainty and would negatively affect investment, and second, the good economic performance of the country sustained positive real interest rates. Subsequently, market shocks such as balance of payments crisis of 1971 – 1972, first oil crisis of 1974 and second oil crisis of late 1970s led Central Bank of Kenya to control inflation by reviewing interest rates. CBK actions helped to decrease interest rate spread as was the case in 1974 – 1979. Additionally, expansionary fiscal policy pursued by the government from the late 1970s to 1990s led to high inflation necessitating interest rate reviews.

The most notable fluctuations in interest rates occurred in 1990s which was largely blamed on the interest rate liberalization. It was believed that the liberalization would improve financial sector performance. However, it led to high interest rate spread as shown in Figure 1.3. Interest rate liberalization happened during a period characterized by increasing inflationary pressure which was credited to expansionary fiscal policy measures. Interest rates increased further due

to government financing its budget deficit through domestic market. Bosire et al. (2014) attribute the wide interest bands post liberalization to declining financial intermediation. They go on to further contend that fiscal and monetary policies determined interest rates instead of market forces.

The persistent high interest rate spread in the country led policy makers to consider interest rate caps. Several attempts were made to introduce the caps but failed due strong arguments on free market (Central Bank of Kenya, 2018). Nonetheless, in September 2016, the government passed the Banking Amendment Act 2015 which provided for interest rate caps. Implementation of interest rate cap led to reduction of interest rate spread from 11.2% in August 2016 to 4.9% in August 2018.



Source: Kenya National Bureau of Statistics

Figure 1.3: Interest Rates Spreads Trend in Kenya

1.3 Research Problem

Monetary policy variables such as interest rate and interest rate spreads are critical variables capable of influencing and directing the growth pattern of a country’s economy. Low interest rate spreads should ideally stimulate private sector lending leading to economic growth. Fiscal

policy variables such as budget deficit and public debt indicate the health of an economy. While government borrowing may lead to increase aggregate demand and economic growth, at high levels it leads to crowding out. In the recent past, the Government of Kenya introduced interest rate caps so as to reduce interest rates spreads with the aim of increasing lending to the private sector. However, this objective was not met as banks resorted to government lending. Banks tightened their lending so as to price risk within the caps. Their portfolio moved from risky individuals and businesses to less risky clients such as the government. As a result, economic growth in the country was affected as individuals and businesses could not obtain the necessary funds they required to make investments and stimulate economic activity.

Academic opinion is divided with regards to effect of government borrowing on interest rates and spreads. Some theorists believe that government borrowing does not have an important influence on interest rates while others opine that government borrowing greatly influences interest rates and spreads. The results from empirical studies on the relationship between government borrowing and interest rate spreads is mixed. Some researchers find evidence that higher government borrowing leads to increase in spreads (Jong, 2018; Tennant and Folawewo, 2009; Kinyua, 2004 and Obeng and Sakyi, 2017) while other researchers find that public debt does not significantly influence interest rates (Simiyu, 2015). In addition, most researchers examine the impact of monetary policy on interest rates and spread. Monetary policy sometimes is ineffective in controlling interest rates (Ngugi, 2001). On the other hand, studies on fiscal policy variables and monetary policy variables use public debt and budget deficit without investigating specifically financing of deficit by borrowing from the domestic market. This research seeks to analyze the effects of domestic financing of public debt on interest rates and interest rate spreads.

1.4 Research Objectives

The main objective of this study is to examine the effect of government borrowing on interest rates and interest rates spreads in Kenya.

The specific objectives of this study are:

- a) To examine the effect of domestic government borrowing on interest rates
- b) To examine the effect of domestic government borrowing on interest rates spreads

1.5 Research Questions

- a) What is the effect of domestic government borrowing on interest rates?
- b) What is the effect of domestic government borrowing on interest rate spreads?

1.6 Scope of the study

This study investigated the effects of government borrowing on interest rates and spreads in Kenya. The period of study was between 1989 and 2018. The period was chosen so as to give insights into how changes in government borrowing have influenced interest rates and interest rate spreads. The data comprised the public domestic debt, net credit to government ratio, interest rate, interest rates spreads, inflation rate, GDP, liquidity ratio and advance to deposit ratio. Annual data was used in this study.

1.7 Significance of the study

This study will inform private sector in understanding the effect of fiscal policy actions in influencing interest rates and spreads and can therefore plan their financial and investment activities accordingly. The dissemination method would be through the Kenya Private Sector Alliance (KEPSA) where findings will be shared with them who would then play a critical role in disseminating the results to the wider private sector community.

This study will be useful for researchers by providing evidence on interaction of fiscal policy and interest rate and interest spread in the economy and can therefore provide valuable information to the public that will enable them to make informed decisions. The dissemination method would be publishing the results in academic journals that focus on the study area such as Journal of Finance and Economics.

The study is important to policy makers as they can use the results to guide them in recommending the right fiscal and monetary policy mix that would result in financial development and economic growth. The appropriate dissemination method would be through journals as well as international organizations such as International Monetary Fund (IMF).

This research will be useful to bankers as they can utilize the results to determine what changes they should make internally to mitigate against adverse impact of government borrowing on

private sector lending and saving (if any). The appropriate dissemination method would be through Kenya Bakers Association (KBA).



2 CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical and empirical literature on the nexus between monetary and fiscal policy. Section 2.2 articulates the theoretical literature as pertains to monetary and fiscal policy. Section 2.3 provides empirical evidence on monetary and fiscal policy. Section 2.4 articulates the research gap and concluding remarks. Section 2.5 provides the conceptual framework.

2.2 Theoretical Literature

2.2.1 Ricardian Equivalence Theorem

The Ricardian Equivalence Theorem was developed by David Ricardo. The theory holds that fiscal policy does not influence aggregate demand and subsequently national output. Government actions such as reducing taxes or increasing spending do not alter aggregate demand. Such actions by the government imply that government will incur debt in the future. Current tax reduction leads to growth in current private saving. A reduction in taxes today implies an upsurge in future taxes. Consumers would thus save the money so that they are able to pay back the government in the future. A rise in spending by government will be counterbalance by a reduction in spending by private sector (Abebrese & Pickson, 2018). The implication of Ricardian Equivalence Theorem is that if deficit does not have any bearing on national saving, subsequently it has no influence on interest rates, exchange rates or aggregate demand.

2.2.2 Keynes Liquidity Preference Theory of Interest Rate Determination

This theory was developed by John Keynes (1936). The theory analyses the behavior of interest rates as a response to changes in government expenditures and liquidity preference rather than changes in supply and demand for savings. Keynes postulated three reasons for holding money 1) transactions motive 2) precautionary motive and 3) Speculative motive. For transactions motive, people hold money as a medium of exchange for transactions purposes such as purchase of goods. Precautionary motive implies that people hold money to cater for emergencies such as job loss and sickness while speculative motive suggests that people hold

money as a stock of capital. He assumed that people tend to have two types of wealth: money and bond. Individuals holds money for present transactions and hold interest earning bonds. Interest rate is the opportunity cost of holding money. If interest rate is low, opportunity cost is low and individuals will hold more money. If the rate is high, the opportunity cost increases and people will hold more bonds. Consequently, money demand and interest rate are negatively related in this theory. The implication of this theory is that an increase in government deficit stimulates production and employment leading to increase in interest rates and crowding out of private sector.

2.3 Empirical Review

2.3.1 Fiscal policy and interest rates

Empirical studies on deficit and interest rates provide mixed evidence. Studies by Rani & Kumar (2017), Aisen & Hauner (2013), Wachtel & Young (1987) and Burney & Yasmeen (1986) link deficits to high interest rates. Rani & Kumar (2017) show that high deficit raises real interest rates. Aisen & Hauner (2013) provide evidence that budget deficits positively affects interest rates. They go on to state that the effect depends on the interaction of the variables and satisfaction of one of several conditions including high deficits predominantly domestic financed or relate with domestic debt. Wachtel & Young (1987) show that an announcement on anticipated fiscal deficit leads to interest rates rising. Burney & Yasmeen (1986) show that government deficit financed through the banking system results in nominal interest rates increasing.

On the other hand, Ahamad (1994), Burney & Yasmeen (1986), Das (2004) and Chakraborty (2002) have concluded that deficits and interest rates are not related. Ahamad (1994) find that budget deficit do not significantly influence nominal or real interest rates. Burney & Yasmeen (1986) find no connection between overall fiscal deficit and nominal interest rates. Das (2004) provide evidence that higher government budget deficit does not raise interest rates in India or other countries in the world. Chakraborty (2002) show that deficit does result in a rise in interest rate. On the contrary, high real interest rate leads to high deficit as high interest rate payments results in increase in debt.

Several studies have examined the interaction of fiscal policy and monetary policy in Kenya. These studies have either examined which policy between monetary and fiscal policy has an impact on interest rates or the effects of fiscal policy on monetary policy. Studies such as Mang'ang'a (2014) found that monetary policy has a greater impact on interest rates than fiscal policy. Simiyu (2015) investigated the effect of budget deficits and public debt on real interest rates in Kenya and found that these fiscal variables did not significantly influence interest rates. On the contrary, Sambiri et al. (2014) found the impact of budget deficit on interest rates to be positive and significant. Nyamongo (2015) found fiscal policy impacts monetary policy conduct and variables such as interest rates, interest rate spreads and exchange rates.

On determinants of interest rates, Konadu et al. (2012) find that budget deficit, overnight interest rates, expected inflation, GDP and foreign capital inflow significantly impact on long term interest rates in United States. Bikker & Gerristen (2018) provide evidence that market rate and inflation rate impacts interest rates positively while economic growth and concentration index has a negative impact on interest rates. They also find that bank size and bank risk are important determinants of interest rates. Tumwine et al. (2018) additionally includes operational efficiency and public sector borrowing as variables that negatively affect interest rates.

2.3.2 Fiscal policy and interest rate spread

Empirical studies on interactions between fiscal policy and monetary policy provide evidence that fiscal policy influences monetary policy specifically on interest rate spread (Karuhanga & Nyirakanani, 2015; Afful & Asiedu, 2013; Bredemeir et al., 2015 and Faini et al., 2006). For example, in Rwanda, Karuhanga & Nyirakanani (2015) in their analysis of influence of fiscal policy on monetary policy find that fiscal deficits have a significant influence on inflation but less impact on exchange rate and interest rate variation. Specifically, they find a negative relationship between government deficit and interest rate spread. The lending rate was found to be less reactive to debt financing of fiscal deficit compared to deposit rate which resulted in the interest rate spread to slowdown. In a similar study, Afful & Asiedu (2013) show that some fiscal variables have different effects on the interest rate spread. For example, crowding out and inflation broaden the spread while increase in central bank assets reduces it.

Other empirical studies have investigated which policy between monetary and fiscal policy has a greater impact on interest rate spread. Studies such as Zoli (2005) and Baig et al. (2016) find that fiscal policy influences interest spread more than monetary policy. Zoli (2005) in her study on how fiscal policy affect monetary policy finds that fiscal actions have influenced movements in sovereign spread and exchange rates more than monetary policy. This is particular true in periods of high public debt which reduce the effectiveness of monetary policy. Baig et al. (2006) found similar results in their research which showed that during periods of high vulnerabilities, budget news has a greater impact on spreads and interest rates than monetary policy. Raj et al. (2011) also find that fiscal policy extensively impacts monetary policy. Fiscal deficit leads to decrease in savings and investment in economy and crowding out of private sector investment by government consumption.

Researchers have also examined the impact of fiscal policy on sovereign spreads. The findings from this research indicate that government debt is a significant determinant of spreads and its impact increases in countries with high levels of debt (Dell'Erba & Belhocine, 2013; Zigman & Cota, 2011; Nickel, Rother, & Rulke, 2009). Godl & Kleinert (2016) also found similar results that budget deficit forecasts influence government bond yield spreads in the Eurozone. Jong (2018) provides evidence that fiscal announcements such as those that hint to improvements in budget balance lower yield spreads in the Netherlands. Other researchers have investigated the link between fiscal policy and interest rate swap spreads and found that there is no significant influence of fiscal deficits on swap spreads (Heppke-Falk & Hufner, 2004).

In other studies, the relation between fiscal policy and monetary policy was found to be weak or non-existent. Andlib et al. (2012) show an insignificant relationship between fiscal and monetary policy variables though they affect each other. Their results showed no causality from fiscal to monetary variables. Vice versa is also true. They also showed a weak response of monetary shock to fiscal variables. Vice versa is also true. Karagoz & Keskin (2016) also find that fiscal policy has limited impact on macroeconomic variables including monetary variables such as interest rates.

Empirical evidence on fiscal dominance has been provided by Ng'ang'a et al. (2019) and Chuku (2010). Ng'ang'a et al. (2019) provide evidence that unsustainable fiscal period was more dominant compared to sustainable period in Kenya. Monetary policy responds to unsustainable fiscal policy sequentially by following restrictive policies implying a lagged

monetary policy effect. In a similar manner, Chuku (2010) provide results that indicate that fiscal and monetary policies have interacted in a counteractive manner. In some periods, no systematic form of interaction between policy variables was noted. The results implied the presence of fiscal supremacy in the interactions between monetary and fiscal policies in Nigeria. Fiscal authorities take the first step while monetary authorities follow. The author recommended that government should focus on monetary conduct before implementing any fiscal policy especially with regard to fiscal debt.

On the other hand, evidence on dominance of monetary policy has been provided in literature. Kuncoro & Sebayang (2013) find that monetary policy responds as anticipated to fiscal policy. The authors articulated that reaction points to fiscal sustainability in the long run. Fiscal policy slightly responds to monetary policy. Wesselbaum (2014) shows that depending on the dominant monetary policy system in place, monetary policy responds differently to government debt. He identified two regimes and categorized them as accommodative or easy and non-accommodative or tight monetary policy. He noted three main results for both easy and tight regimes. First, in the tight regime, changes in public debt does not result in changes in monetary policy while for easy regime, changes in public debt results in changes in monetary policy for instance monetary authorities reduce interest rate with increasing debt. Second, in tight regime, interest rate is determined by inflation rate and the relationship is negative while for easy regime, debt, output and inflation impact interest rates. Third, in tight regime, an increase in output reduces debt while for easy regime, there is a positive relationship between output and debt.

The relationship between fiscal policy and interest rate spread has also been examined under studies on determinants of interest rate spread. Obeng & Sakyi (2017) examined the macroeconomic factors of interest rate spread in Ghana and found that government budget deficit and government borrowing from commercial banks increase interest rate spread. Tennat & Folawewo (2009) also conducted a similar study in developing countries and found that crowding out by government due to their domestic borrowing results in interest rate spread widening.

There is a vast amount of literature on determinants of interest rate spread. Studies such as Peshev (2015) found that market concentration, loan to deposit ratio, inflation, lending rate and profit margins are determinants of interest rate spread . In Kenya, studies such as Maende et

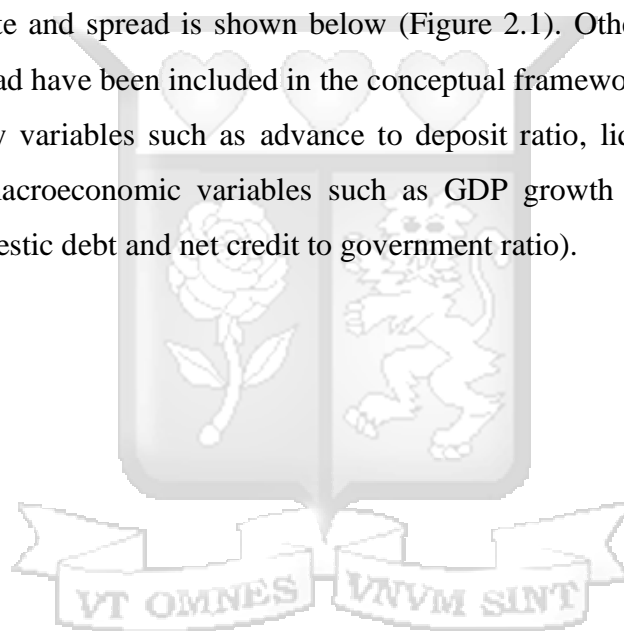
al. (2018) find that bank specific factors such as bank size, return on average assets, credit and liquidity risk and macroeconomic factors such as real GDP are significant towards determining interest rate spread. Also, Kiptui (2014) find that macroeconomic (GDP, inflation and exchange rate), bank specific (operation cost, bank's deposit, bank's liquidity and market concentration) and industry specific factors are important determinants of interest rate spread. Were & Wambua (2014) find that bank size, liquidity risk, operating costs and return on average assets greatly influences interest rate spreads. However, the impact of real economic growth and inflation was found to be insignificant. Studies on Sub-Saharan countries such as Tarus & Manyala (2018) provide evidence that bank specific (operating costs and bank concentration), macroeconomic (inflation) and institutional variables influence interest rate spread. Dwumfour (2019) investigated the determinants of interest rate spread for both developed and developing economies and found that bigger banks have less interest rate spread, low competition in the banking industry leads to high interest rate spread, lower operational efficiency leads to higher or lower interest rates spread subject to the region and market size and economic growth leads to lower interest rate spread.

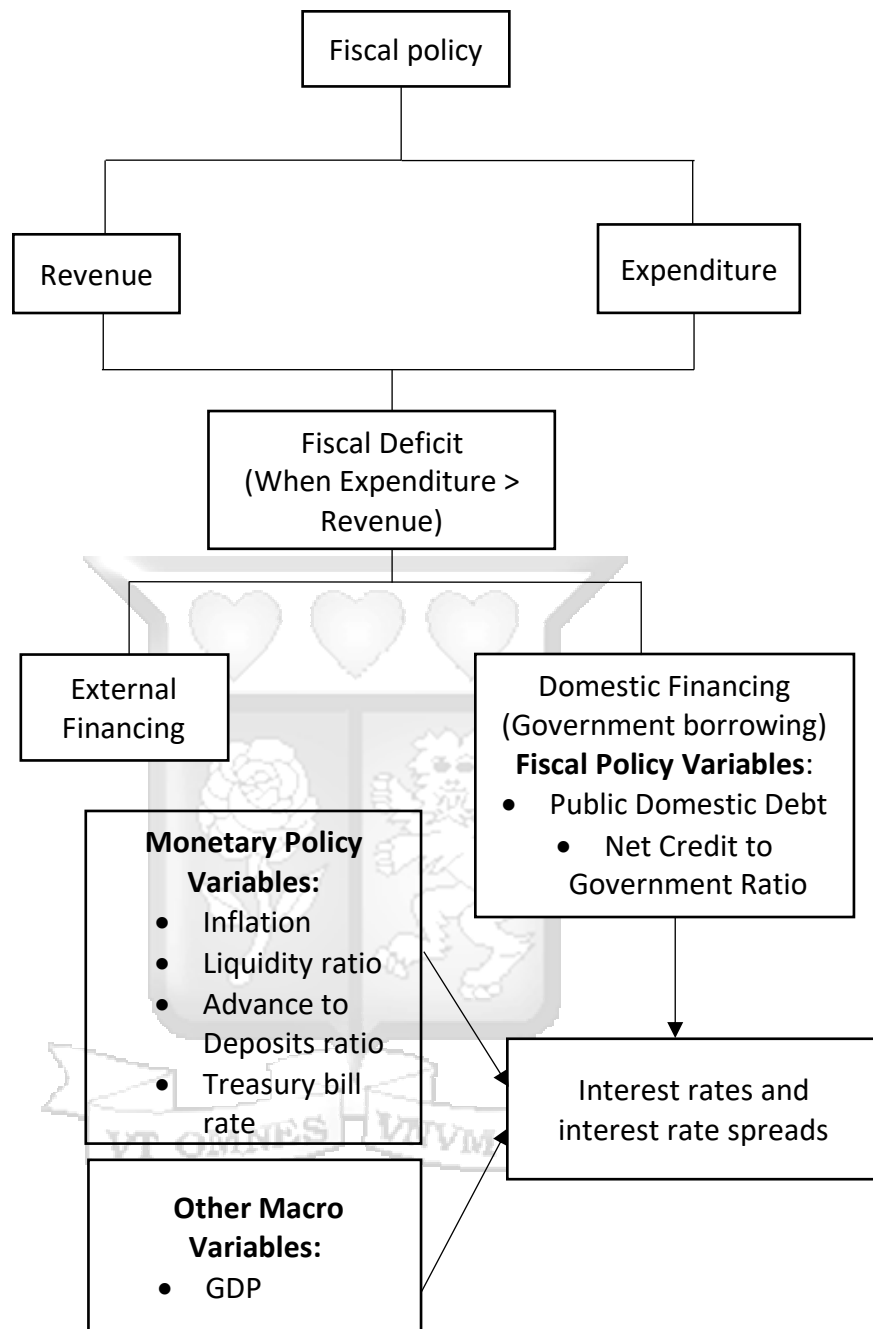
2.4 Research Gap and Summary of Literature Review

Research on the nexus between monetary policy and fiscal policy have yielded various results. Most of the empirical results suggest that higher fiscal deficit and higher government borrowing increases interest rate spread. Other studies find that fiscal policy influences spreads more than monetary policy. On the other hand, empirical evidence is provided that shows that monetary policy is more dominant and influences spreads more than fiscal policy. On the contrary, other studies show that the relation between fiscal policy and monetary policy is insignificant or non – existent. These studies have examined fiscal policy in general without investigating domestic financing of public debt. In light of the recent events of the government introducing interest rate caps, this research seeks to reexamine the effect of government borrowing on interest rates and interest rates spreads.

2.5 Conceptual Framework

Literature reveals various transmission mechanism between fiscal policy and monetary policy. One such mechanism is through inter-temporal budget constraint of government on monetary policy. Government budget actions have an influence on monetary policy variables such as interest rates and interest rate spreads. The two key fiscal policy instruments that the government can use to influence the economy are revenue and expenditure. When government's revenue falls short of expenditure, the government runs a fiscal deficit. The government can either choose to finance this deficit through external or domestic financing. If it chooses to finance the deficit domestically this will influence interest rates which is a monetary policy instrument and interest rate spreads. The conceptual framework for fiscal policy and interest rate and spread is shown below (Figure 2.1). Other variables that affect interest rates and spread have been included in the conceptual framework. These variables are other monetary policy variables such as advance to deposit ratio, liquidity ratio, inflation, treasury bill rate, macroeconomic variables such as GDP growth rate and fiscal policy variables (Public domestic debt and net credit to government ratio).





Source: Author

Figure 2.1: Conceptual Framework

3 CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section focuses on the research methodology that was used in carrying out the study. It covers the research design, data collection methods, data analysis approaches, research quality and ethical issues considered.

3.2 Research Design

Cooper and Schindler (2014) define research design as the blueprint for data collection, measurement and analysis with the aim of answering the research questions. Descriptive research design is concerned with understanding the accurate profile of events, persons or situations (Saunders et al., 2016). The main objective of this research is to investigate the effects of government borrowing on interest rate and spread. Descriptive research design was adopted to gain an accurate picture of the interactions of the variables.

3.3 Data collection methods

Secondary data was collected for this study. Quantitative data was mainly collected from Economic Survey by Kenya National Bureau of Statistics and was compared against other sources such as World Bank and Central Bank data. The study period was for 30 years from 1989 to 2018. This period was chosen because of changes in government policies that had significant impact on the variables under study. The study variables included public domestic debt as a percentage of total debt, net credit to government ratio, interest rates, interest rates spread, gross domestic product, inflation, liquidity ratio and advance/deposit ratio. Table 3.1 provides a summary of the variables, their measurement and source of data.

Table 3.1: Description of variables

Variable	Measure	Source
Interest Rate (IR)	Lending Rate	Kenya National Bureau of Statistics (KNBS)
Interest rate spread (<i>IRS</i>)	Lending interest rate minus deposit interest rate	Kenya National Bureau of Statistics (KNBS)
Public debt (<i>PDT</i>)	Government domestic borrowing as a percentage of total debt	Kenya National Bureau of Statistics (KNBS)
Net Credit to Government Ratio (NCGR)	Total credit to government as percentage of total domestic credit	Kenya National Bureau of Statistics (KNBS)
Inflation (<i>INF</i>)	Changes in consumer price index	Kenya National Bureau of Statistics (KNBS)
Real Gross Domestic Product (<i>GDP</i>)	Real GDP Growth Rates	Kenya National Bureau of Statistics (KNBS)
Liquidity Ratio (LR)	Average liquid assets as a percentage of deposit liabilities.	Kenya National Bureau of Statistics (KNBS)
Advance to Deposit Ratio (ADR)	Loans as a percentage to deposits.	Kenya National Bureau of Statistics (KNBS)
Treasury Bill Rate (<i>TBILL</i>)	91-Day Treasury Bill	Kenya National Bureau of Statistics (KNBS)

3.4 Data analysis

The data was analyzed using descriptive statistics and Autoregressive Distributed Lag (ARDL) model. The dependent variables were interest rate spread and interest rates while the independent variables were liquidity ratio, inflation, advance to deposit ratio, net credit to government to total domestic credit, public domestic debt as a percentage of total debt, GDP growth rates and advance to deposit ratio.

3.4.1 Model Specification

The study used an ARDL to examine the effects of fiscal policy on interest rate spread and interest rates in Kenya. The models are given below:

$$IRS = \beta_0 + \beta_1PDT + \beta_2INF + \beta_3GDP + \beta_4LR + \beta_5ADR + \beta_6TBILL + \beta_7NCGR + \varepsilon_t$$

$$IR = \beta_0 + \beta_1PDT + \beta_2INF + \beta_3GDP + \beta_4LR + \beta_5ADR + \beta_6TBILL + \beta_7NCGR + \varepsilon_t$$

β_0 captures all explanatory variables that affect interest rate spread but are not included in the model. β_1, β_2 are coefficients of the variables while ε_t captures error term in the model.

Description of variables

Interest rate spread (IRS): is the difference between average real lending rate and average deposit rate for commercial banks.

Interest rate (IR): cost of credit or return for giving credit to borrowers and lenders. Interest rate is measured as the average real lending rate of commercial banks.

Public debt (PDT): is defined as the money owned by the government from either foreign lenders or from domestic lenders. This was measured as ratio of net credit to government to total domestic credit and public domestic borrowing as a percentage of total debt.

Inflation (INF): This is described as sustained increase in price level. High inflation leads to high interest rates and spread so as to compensate banks for the decrease in real value of interest rates and spreads. Inflation is measured as changes in consumer price index.

Gross Domestic Product (GDP): is defined as measure of value of goods and services produced by a country. Increase in gross domestic product is expected to either increase interest rate spread or reduce. High economic activity results in high demand for loans increasing interest rates and interest rate spread. On the other hand, high economic activity leads to profitable firms which reduce rate of default and increase deposit reducing interest rates and interest rate spread (Were & Wambua, 2014). Real GDP growth rates was used in this study.

Liquidity Ratio (LR): Liquidity is defined as the ability of a commercial bank to pay debt when they fall due. Liquidity ratio is measured as the average liquid assets as a percentage of deposit liabilities. High liquidity is associated with lower interest rates and spreads.

Advance to Deposit Ratio (ADR): This measures loans as a percentage to deposits. A high ratio implies bank may not be able to cover unforeseen funding needs. High ratio reduces interest rates and interest rate spread.

Treasury Bill Rate (TBILL): The treasury bill rate represents monetary policy and increase in this rate is expected to increase interest rate and interest rate spread.

3.4.1.1 Unit Root Test

Unit root tests were carried out to find out if the time series variable is non – stationary. A stationary time series is characterized by constant statistical properties, such as mean and variance, over time. The presence of a unit root indicates non – stationarity of the time series. The study used the Philips-Perron unit root test. The null hypothesis is the series has a unit root.

$$\Delta y_t = \alpha + \beta_t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} \dots + \delta_{p-1} \Delta y_{t-p+1} + \epsilon_t$$

If the time series is not integrated, the past values of the series y_{t-1} will not provide relevant information in forecasting the change in y_t . In such a situation, the $y = 0$ null hypothesis is not rejected.

The variables failed to be stationary at the same level and thus Autoregressive Distributed Lag Model (ARDL) was used for analysis as recommend by Pesaran et al. (2001).

3.5 Research quality

Research quality deals with the reliability and validity of research instruments. Reliability deals with the accuracy and dependability of a measurement (Cooper and Schindler, 2014). Reliability of the research procedures will be enhanced by using standardized method for analyzing the variables. Validity refers to the appropriateness of measures used, accuracy of results and generalizability of findings (Cooper and Schindler, 2014). Internal validity is about the capacity of the research tool to measure what it is supposed to measure. Internal validity was enhanced by using experts to give feedback on the study. External validity is concerned with the generalizability of findings (Saunders et al., 2016). External validity was enhanced by the use of real data on the macroeconomic variables.

3.6 Ethical considerations

Secondary quantitative data was used for this study. The research study was submitted to the Strathmore University Institutional Review Board (IRB) for research ethics approval. Subsequently, the study was submitted to National Commission for Science, Technology and Innovation (NACOSTI) for approval.



4 CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter presents data analysis, findings and interpretations. Data has been analyzed using descriptive statistics, unit root test and Autoregressive Distributed Lag (ARDL) model.

4.2 Descriptive Statistics

Table 4.1 illustrates descriptive statistics for the variables used in the study. The table provides the minimum, maximum, mean, median and standard deviation for the dependent and independent variables.

Table 4.1: Descriptive Statistics

	IR	IRS	ADR	LR	NCGR	PDT	GDP	INF	TBILL
Mean	9.315	14.080	79.633	41.673	25.677	22.233	3.650	11.523	1.657
Median	8.720	14.500	81.000	42.650	24.750	22.100	4.350	9.600	1.945
Maximum	31.500	23.600	90.000	53.000	40.657	28.000	7.100	46.000	20.100
Minimum	-7.5	0.900	61.000	22.000	16.405	16.000	-0.1	1.600	-10.9
Std. Dev.	8.419	5.678	6.657	7.040	5.942	3.458	2.104	9.129	7.338
Skewness	0.635	-0.521	-0.977	-1.073	0.861	-0.091	-0.290	2.157	0.489
Kurtosis	3.460	2.868	4.033	4.018	3.107	2.255	1.823	8.221	3.330
Jarque-Bera	2.283	1.381	6.103	7.054	3.719	0.735	2.151	57.342	1.330
Probability	0.319	0.501	0.0473	0.029	0.156	0.692	0.341	0.000	0.514
Sum	279.440	422.410	2389.000	1250.200	770.315	667.000	109.500	345.700	49.700
Sum Sq. Dev.	2055.657	934.871	1285.327	1436.919	1023.971	346.787	128.375	2416.854	1561.589
Observations	30	30	30	30	30	30	30	30	30

Source: Author's computations

Where IR is Interest Rates, IRS is Interest Rate Spread, ADR is Advances to Deposit Ratio, LR is Liquidity Ratio, NCGR is Net Credit to Government Ratio, PDT is Public Domestic Debt, GDP is Gross Domestic Product Growth Rate, INF is Inflation and TBILL is Treasury Bill Rate

For all the variables, the mean and median values fall within the minimum and maximum values suggesting a good consistency level. The kurtosis of six of the variables exceeds 3 meaning that the series are leptokurtic (peaked) relative to the normal. The probability of the Jarque Bera statistic exceeds 5% value is evident for six of the variables meaning the null

hypothesis of normal distribution cannot be rejected. However, for three variables that is Advance to Deposit Ratio (ADR), Liquidity Ratio (LR) and Inflation (INF), the probability of Jarque-Bera statistic is below 5% meaning the null hypothesis of normal distribution is rejected.

4.3 Unit Root/Stationarity Test

In this study, the Phillips Perron (PP) unit root tests were employed to test for the time series properties of model variables. The results showed that all variables except Liquidity Ratio (LR) are non-stationary at level form using 5% significance value and become stationary at 1st difference (Appendix II). Given that the series were integrated of different orders, the study used the Autoregressive Distributed Lag (ARDL) model as per Pesaran & Shin (1999) and Pesaran et al. (2001) to estimate the long run and short run equation.

4.4 Interest Rate Model

The long run estimations for the Interest Rate model were carried out using the Autoregressive Distributed Lag (ARDL) model with each independent variable being lagged once.

Long Run Equation

$$IR = 17.956 + 0.216*ADR(-1) - 0.654*GDP(-1) - 0.539*INF(-1) - 0.448*NCGR - 0.402*PDT + 0.634*TBILL$$

Table 4.2: Interest Rate Final Long Run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.956	10.947	1.640	0.121
ADR	-0.171	0.173	-0.986	0.339
ADR(-1)	0.216	0.163	1.325	0.204
GDP	0.326	0.396	0.822	0.423
GDP(-1)	-0.654	0.401	-1.628	0.123
INF	-0.539	0.131	-4.100	0.001
INF(-1)	0.449	0.111	4.041	0.001
NCGR	-0.448	0.160	-2.797	0.013
NCGR(-1)	0.446	0.147	3.036	0.008
PDT	-0.402	0.247	-1.630	0.123
PDT(-1)	-0.128	0.278	-0.460	0.651
TBILL	0.634	0.097	6.561	0.000
TBILL(-1)	0.406	0.099	4.103	0.001
R-squared	0.951651	Mean dependent var		9.56
Adjusted R-squared	0.915389	S.D. dependent var		8.458498
S.E. of regression	2.460407	Akaike info criterion		4.940375
Sum squared resid	96.85763	Schwarz criterion		5.553301
Log likelihood	-58.63544	Hannan-Quinn criter.		5.132336
F-statistic	26.24382	Durbin-Watson stat		2.468372
Prob(F-statistic)	0			

The results show a significant negative long run relationship between interest rates and Inflation (INF) and Net Credit to Government Ratio (NCGR) as displayed in Table 4.2. This shows that an increase in inflation and net credit to government ratio will lead to a decrease in interest rates. While this contradicts theory, Wesselbaum (2014) argues that an increase in debt to government can lead to reduction in interest rates in an accommodative regime. An accommodative regime is where monetary authorities decrease interest rates in an effort to boost private sector development. Specifically, a one percent increase in net credit to government is linked to a decrease in interest rates by 0.448 percent. The results contradict the findings of Wachtel & Young (1987) and Burney & Yasmeen (1986) who show that an increase in government borrowing leads to increase in interest rates. With regards to inflation, the results shows that an increase in inflation leads to reduction in interest rates by 0.539 percent. These results are similar to the findings by Afful & Asiedu (2013), Manganga (2011) and Rani &

Kumari (2011) but contradicts theoretical assertions that an increase in inflation should lead to an increase in interest rates to counter the effects of the increased inflation. According to Mundell-Tobin effect, increase in inflation results in increase in nominal interest rate but decreases real interest rate. On the other hand, treasury bill has a positive significant relationship with interest rates and is consistent with theoretical assertions that increase in treasury bill rates leads to an increase in interest rates.

The residuals generated from the long run equation were tested for unit root to establish whether there was long run cointegrating relationship. The residuals were found to be stationary with a PP test statistic of -7.6045 (against a critical value of -3.5806 at 5% significance) as shown in Table 4.3 indicating existence of long run cointegration relationship between interest rates and its determinants.

Table 4.3: Unit Root Test for Residuals from Interest Rate Model Long Run Equation

Trend and Intercept				
Significance level	PP Test	Prob.	Critical Values	
1%	-7.604	0.1112	-4.324	
5%			-3.581	
10%			-3.225	

The short run equation was obtained after differencing the variables with a unit root and using the variable without unit root in level form. Dummy variables were included in order to model structural break. The 2000 dummy captures the changes in the interest rate behavior as a result of adoption of Basel standards on capital adequacy by Central Bank of Kenya that led to the introduction of capital adequacy ratios for core capital and total capital to risk weighted assets for banks. The final short run equation was obtained after dropping non – significant variables, variables with a probability greater than 0.5, to make it parsimonious. The results shows that the model explains about 98.5% of the variation in interest rates (IR). The speed of adjustment from the short run to the long run is about 132% which implies that on average, it takes about 9 months for a shock in interest rate to recede and therefore return to the equilibrium level.

Short Run Equation

$$IR = 5.809 + 0.252*ADR(-1) - 0.568*GDP(-1) - 0.497*INF(-1) + 0.443*NCGR + 0.261*PDT + 0.720*TBILL - 0.135LR(-1)$$

Table 4.4: Interest Rate Final Short Run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.809	3.504	1.658	0.121
D(ADR)	-0.120	0.097	-1.238	0.238
D(ADR(-1))	0.252	0.098	2.573	0.023
D(GDP)	0.246	0.227	1.085	0.298
D(GDP(-1))	-0.568	0.332	-1.712	0.111
D(INF)	-0.497	0.085	-5.820	0.000
D(INF(-1))	0.409	0.070	5.856	0.000
D(NCGR)	-0.174	0.126	-1.383	0.190
D(NCGR(-1))	0.443	0.108	4.110	0.001
D(PDT(-1))	0.261	0.149	1.749	0.104
D(TBILL)	0.720	0.067	10.698	0.000
D(TBILL(-1))	0.500	0.079	6.361	0.000
LR(-1)	-0.135	0.083	-1.618	0.130
RESID01(-1)	-1.322	0.178	-7.438	0.000
D2000	-5.300	1.855	-2.857	0.014
R-squared	0.985172	Mean dependent var		0.128571
Adjusted R-squared	0.969204	S.D. dependent var		8.89698
S.E. of regression	1.561316	Akaike info criterion		4.033109
Sum squared resid	31.6902	Schwarz criterion		4.74679
Log likelihood	-41.46352	Hannan-Quinn criter.		4.251288
F-statistic	61.69521	Durbin-Watson stat		1.851836
Prob(F-statistic)	0			

The final short run model for the interest rate is presented in Table 4.4. The results shows that net credit to government is positively and significantly related to interest rates. The results show that a one percent increase in first lag of the first difference of net credit to government is linked to an increase of 0.4434 percent in interest rates. The results supports the findings of Rani & Kumar (2017) and Aisen & Hauner (2017) who show that high government borrowing results in increase in interest rates. Public domestic borrowing has a positive effect on interest rates but is not significant. A one percent increase in the first lag of the first difference of the variable leads to increase in interest rates by 0.261 percent. Other variables that are significant include advances to deposit Ratio, inflation and treasury bill. The F-statistic value is 61.7 and Prob is 0.0 implying that the joint contribution of the variables significantly predict interest rates. The R squared is 98.51% showing that independent variables explain the dependent

variables. The Durbin Watson statistic is 1.85 which is close to 2.0 indicating no autocorrelation exists in the model.

4.5 Interest Rate Spread Model

The long run estimations for the Interest Rate Spread model were carried out using the Autoregressive Distributed Lag (ARDL) model with each independent variable being lagged once.

Long Run Equation

$$\text{IRS} = 60.366 - 0.507*\text{ADR}(-1) - 1.349*\text{GDP}(-1) + 0.302*\text{INF}(-1) - 0.738*\text{NCGR} - 0.466*\text{PDT} + 0.318*\text{TBILL}(-1)$$

Table 4.5: Interest Rate Spread Final Long Run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	60.366	12.431	4.856	0.000
ADR	0.120	0.197	0.610	0.550
ADR(-1)	-0.507	0.185	-2.735	0.015
GDP	-0.122	0.450	-0.271	0.790
GDP(-1)	-1.348	0.456	-2.959	0.009
INF	0.302	0.149	2.026	0.060
INF(-1)	0.027	0.126	0.211	0.836
NCGR	-0.738	0.182	-4.056	0.001
NCGR(-1)	0.350	0.167	2.097	0.052
PDT	-0.466	0.280	-1.663	0.116
PDT(-1)	0.254	0.315	0.807	0.431
TBILL	0.283	0.110	2.576	0.020
TBILL(-1)	0.318	0.112	2.831	0.012
R-squared	0.8454	Mean dependent var		14.46241
Adjusted R-squared	0.729449	S.D. dependent var		5.371431
S.E. of regression	2.793922	Akaike info criterion		5.194615
Sum squared resid	124.896	Schwarz criterion		5.80754
Log likelihood	-62.32191	Hannan-Quinn criter.		5.386575
F-statistic	7.291053	Durbin-Watson stat		1.977552
Prob(F-statistic)	0.000201			

The results show a significant negative long run relationship between interest rate spreads and Advances to Deposits Ratio (ADR), Gross Domestic Product growth(GDP), Net Credit to Government Ratio (NCGR) and Public Domestic Debt (PDT) as shown in Table 4.5. This means that an increase in in Advances to Deposits Ratio, Gross Domestic Product growth, net credit to government ratio and public domestic debt leads to a decrease in interest rates. Specifically, a one percent increase in net credit to government and public debt is linked to a decrease in interest rate spread by 0.738 and 0.466 percent respectively. This results are similar to the findings of Karuhanga & Nyirakanani (2015) who find a negative relationship between government debt and interest rate spread. On the other hand, inflation (INF) and treasury bill (TBILL) have a positive relationship with interest rates.

The residuals generated from the long run equation were tested for unit root to establish whether there was long run cointegrating relationship. The residuals were found to be stationary with a PP test statistic of -5.823 (against a critical value of -3.581 at 1% significance) as shown in Table 4.6 indicating existence of long run cointegration relationship between interest rate spreads and its determinants. The Durbin Watson statistic is 1.98 which is close to 2.0 indicating no autocorrelation exists in the model.

Table 4.6: Unit Root Test for Residuals from Interest Rate Spread Model Long Run Equation

Trend and Intercept			
Significance level	PP Test	Prob.	Critical Values
1%	-5.823	0	-4.324
5%			-3.581
10%			-3.225

The short run equation was obtained after differencing the variables with a unit root and using the variable in level form for those without unit root. Dummy variables were included in order to model structural break. The 2000 and 2015 dummy variables captures changes in government policy. For example, in 2015, exchange rate depreciation, demand pressures and persistent global foreign exchange volatility led to rising inflation expectations which led the Central Bank of Kenya to raise the Central Bank Rate to 8.5% and 11.5% in June and July

2015 respectively. This increase resulted in volatility in Treasury bill and interbank interest and eventually increase in lending and deposit rates (Central Bank of Kenya, 2016).

The results shows that the model explains about 92.3% of the variation in interest rates (IRS). The 2000 dummy captures the adoption of Basel standards on capital adequacy by Central Bank of Kenya that led to the introduction of capital adequacy ratios for core capital and total capital to risk weighted assets for banks. The speed of adjustment from the short run to the long run is about 114% which implies that on average, it takes about 10 months for a shock in interest rate spread to recede and therefore return to the equilibrium level.

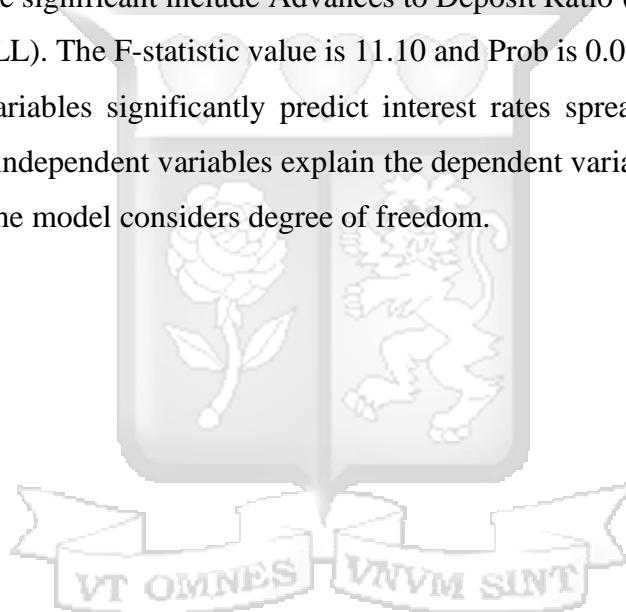
Short Run Equation

$$\text{IRS} = 3.419 - 0.436*\text{ADR}(-1) - 0.761*\text{GDP}(-1) + 0.235*\text{INF}(-1) - 0.587*\text{NCGR} + 0.447*\text{PDT} + 0.350*\text{TBILL}(-1)$$

Table 4.7: Interest Rate Spread Final Short Run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.419	3.869	0.884	0.393
D(ADR)	-0.098	0.113	-0.865	0.403
D(ADR(-1))	-0.436	0.093	-4.699	0.000
D(GDP)	-0.432	0.237	-1.822	0.092
D(GDP(-1))	-0.761	0.366	-2.078	0.058
D(INF)	0.235	0.090	2.599	0.022
D(NCGR)	-0.587	0.147	-3.986	0.002
D(NCGR(-1))	0.478	0.113	4.239	0.001
D(PDT(-1))	0.447	0.165	2.709	0.018
D(TBILL)	0.350	0.068	5.137	0.000
D(TBILL(-1))	0.345	0.075	4.608	0.001
LR(-1)	-0.084	0.092	-0.919	0.375
RESID01(-1)	-1.148	0.173	-6.629	0.000
D2015	6.523	2.005	3.254	0.006
D2000	-4.932	2.038	-2.420	0.031
R-squared	0.922778	Mean dependent var		0.15
Adjusted R-squared	0.839617	S.D. dependent var		4.220832
S.E. of regression	1.690354	Akaike info criterion		4.191927
Sum squared resid	37.14487	Schwarz criterion		4.905608
Log likelihood	-43.68697	Hannan-Quinn criter.		4.410106
F-statistic	11.09619	Durbin-Watson stat		1.021971
Prob(F-statistic)	0.000049			

The final short run interest rate spread model is presented in Table 4.7. The results shows that the difference of the net credit to government is negatively and significantly related to interest rate spreads. A 1 percent increase in first difference of net credit to government will decrease interest rate spreads by 0.587 per cent. The results contradicts the findings of Jong (2018) and Tennat & Folawewo (2009) that higher government borrowing leads to significant increase in spreads. Public domestic borrowing is positively and significantly related to interest rate spreads. A one percent increase in first lag of the first difference of the variable will lead to 0.44 percent increase in interest rate spreads. The results are similar to the findings by Obeng & Sakyi (2017) who found that higher government borrowing results in increase in spreads. Other variables that are significant include Advances to Deposit Ratio (ADR), inflation (INF) and treasury bill (TBILL). The F-statistic value is 11.10 and Prob is 0.0 implying that the joint contribution of the variables significantly predict interest rates spreads. The R squared is 92.28% showing that independent variables explain the dependent variables. The Adjusted R-squared is 83.96% if the model considers degree of freedom.



5 CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter articulates the discussion, conclusion and recommendations. The section is aligned to specific study objectives. It also describes limitations of the study and suggests further areas of research.

5.2 Discussion

This research paper examined the empirical analysis of relationship between government domestic borrowing and interest rates and interest rate spreads in Kenya from 1989 to 2018 using Autoregressive Distributed (ARDL) model. Other related variables namely advance to deposit ratio, liquidity ratio, inflation, Gross Domestic Product (GDP) and Treasury Bill (T-bill) were included to assist in modelling.

The results show that in the long run, net credit to government ratio affects interest rates negatively and significantly while the relationship is positive and significant in the short run. In the long run, a one percent increase in net credit to government ratio will lead to a decrease in interest rates by 0.448 percent while in short run, a one percent increase in net credit to government ratio is linked to an increase of 0.4434 percent in interest rates. The implications of these findings is that in the short run an increase in net credit to government ratio will lead to an increase in interest rates resulting in crowding out of private sector investment and hampering economic growth. This is consistent with theory and findings by Raj et al. (2011), Tennant & Folawewo (2009), Wachtel & Young (1987) and Burney & Yasmeen (1986) who show that an increase in government borrowing leads to an increase in interest rates. In the long run, an increase in net credit to government ratio leads to a reduction in interest rates indicating an accommodative monetary policy consistent with the findings by Wesselbaum (2014) who shows that an increase in government debt will lead to reduction in interest rates further boosting real economic activity. Andrieu et al. (2013) provide evidence that the accommodative monetary policy pursued by the Kenyan Government has played an important role in decreasing interest rates. The negative relationship implies that monetary authorities pursue accommodative monetary policy to counter the effects of high debt in the long run. The

Central Bank of Kenya justified the implementation of accommodative monetary policy in its 2010 Monetary Policy Statement by stating that growth in money supply was adopted to support economic growth through expansion of credit to private sector. This was the main monetary policy regime adopted for a long period of time.

With regards to interest rate spread, in both the long run and short run, net credit to government ratio negatively and significantly affects interest rate spread. A one percent increase in net credit to government is linked to a decrease in interest rate spread by 0.738 percent in the long run and 0.587 percent in the short run. The Ricardian equivalence can be said to apply to the Kenyan case in the long run whereby government borrowing from the domestic market does not lead to a significant increase in interest rates. It is expected that people increase their savings in anticipation of higher taxation rates in the future for repaying increased government debt. The results are similar to the findings of Karuhanga & Nyirakanani (2015) who found a negative relationship between fiscal deficit and interest rate spread. The decrease in interest rate spread implies an accommodative monetary policy which seeks to promote private sector development in the context of increasing government debt as discussed above. Public domestic debt positively and significantly affects interest rate spreads in the short run. A one percent increase in public debt will lead to an increase in interest rate spread by 0.44 percent. These results are similar to the findings by Obeng & Sakyri (2017) who found that an increase in government borrowing results in increase in spreads. The increase in interest rate spread implies that it will lead to crowding out of private sector consistent with theory.

5.3 Conclusion

This paper examined the effects of fiscal policy variables (net credit to government ratio and public domestic debt as a percentage of total debt) on monetary policy variables (interest rates and interest rate spreads) using annual data from 1989 to 2018 employing Autoregressive Distributed Model (ARDL). The results show that the fiscal policy variables are significant variables in explaining changes in the monetary policy variables. In the short run, increase in net credit to government and public domestic debt leads to increase in interest rates and interest rate spreads implying crowding out of private sector investment. However, in the long run, increase in net credit to government ratio and public domestic debt leads to decrease in interest rates and interest rate spreads implying the adoption of accommodative monetary policy regime

where monetary authorities decrease interest rates in an effort to boost private sector development eventually leading to economic growth.

5.4 Recommendations for policy and practice

The study results indicate that domestic borrowing by government significantly impacts the behavior of interest rates and interest rate spreads in Kenya in the short run. It is therefore important for government to implement appropriate monetary and fiscal policy that will encourage private sector development and stimulate economic growth.

The evidence of positive relationship between net credit to government ratio and interest rates, and between public domestic debt and interest rate spread implies that government should adopt debt policies that does not hamper private sector development. Government should look to other forms of financing such as public private partnerships, privatization and sale of state corporations.

5.5 Limitations of the study

The study relied on quantitative secondary data. Secondary data may fail to capture factors that explain why the results are the way they are, and it is not possible to fully interrogate the relationship between fiscal policy and monetary policy variables. Additionally, data collected was for industry level and not individual bank level. The results therefore cannot be applied to individual banks.

5.6 Suggestions for further study

This study examined the effects of government domestic borrowing on interest rates and interest rate spread and found evidence of both negative and positive relationship in the long and short run. This study recommends the use of mixed methods of data collection such as primary data from decision makers to fully understand the effect of fiscal policy on interest rates and interest rate spreads. The use of panel data that is specific to banks is also suggested to understand the effects of fiscal policy on different bank tiers. The study can also be expanded to examine other countries which have different levels of government borrowing and investigate what impact these have on interest rates and interest rate spreads. A different methodology such as variance decomposition and impulse response is recommended for

examining the extent of the influence of various variables on interest rates and interest rate spread and how shock in one variable affects the other respectively.



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APPENDICES

APPENDIX I: SUMMARY OF EMPIRICAL STUDIES

Fiscal Policy and Interest Rates

Authors	Objective	Country/Region	Methodology	Variables	Findings	Research Gap
Rani & Kumar (2017)	To examine the effect of government deficit on interest rates in India	India	Autoregressive Distributed Lag (ARDL) model and Error Correction Model	Real interest rate, fiscal deficit as percentage of GDP, inflation and money supply as percentage of GDP.	High government deficit results in increase in interest rates in India	The study did not consider financing of fiscal deficit by domestic borrowing which the current study investigates.
Burney & Yasmeen (1986)	To investigate the relationship between government budget deficits and interest rates	Pakistan	Ordinary Least Squares (OLS) Methods	Overall government budget deficit, public domestic borrowing, public domestic	No relationship between government deficit and interest rates but deficit finance through domestic	The country under investigation was Pakistan. The current

				borrowing from banks	borrowing from banking system results in increase in nominal interest rates	study looks at Kenya.
Das (2004)	To examine the effect of government deficit on interest rates	India and other countries in the world	Regression model	Fiscal Deficit – GDP ratio, interest rates,	High government deficit is not associated with high interest rates.	The study did not incorporate financing of fiscal deficit by domestic borrowing which current study considers
Chakraborty (2002)	To investigate the influence of fiscal deficit on interest rate in a financially deregulated regime	India	Vector Autoregressive Model	Government deficit and real interest rates	Government deficit does not result in rise in interest rate. Interest rate(real) causes government deficit through high interest rates that result in high	The study did not consider financing of fiscal deficit by domestic borrowing which current study considers

					interest payments and resultant debt-deficit spiral.	
Sambiri et al. (2014)	To examine factors influencing lending interest rates and its influence on economic growth in Kenya	Kenya	Multivariate regression model	Lending interest rates, government fiscal deficit and international interest rates	Government deficit and international interest rates positively and significantly influences interest rates	The study did not consider financing of fiscal deficit by domestic borrowing which current study considers
Mang'ang'a (2014)	To study the influence of monetary and fiscal policy on interest rates in Kenya	Kenya	Regression model	Interest rates, Central Bank Rate, Central Bank Cash Reserve Ratio, incremental public debt as a percentage of national expenditure,	Monetary policy has a greater impact on interest rates compared to fiscal policy	The study examined the total public debt without looking at public domestic debt which is one of the variables for this study

				inflation rates, exchange rates		
Simiyu (2015)	To investigate the effects of budget deficits and public debt on real interest rates	Kenya	Linear model	Real interest, growth in budget deficit, growth in public debt, inflation rate and GDP growth	Budget deficit and public debt are not significant determinants of interest rates	The study did not consider financing of fiscal deficit by domestic borrowing which current study considers

Fiscal Policy and Interest Rate Spread

Authors	Objectives	Country/Region	Methodology	Variables	Findings	Research Gap
Karuhanga & Nyirakanani (2015)	To investigate the influence of fiscal policy on monetary policy	Rwanda	The study used Structural Vector Autoregressive (SVAR) models	Budget deficit to GDP ratio, domestic and foreign financing of deficit to GDP, inflation,	The results conclude that fiscal deficits have a significant influence on inflation but less	The study was done for Rwanda. A Kenyan study is needed.

				depreciation in nominal exchange rate, exchange rate and interest rate spread	impact on interest rate changes.	
Afful & Asiedu (2015)	To examine the effect of fiscal policy and stock market activity on the lending-deposit rate spread in Sub-Saharan countries	Sub-Saharan African Countries: Botswana, Ghana, Mauritius and South Africa	The paper uses a regression model with a vector or fiscal and stock market variables	Central bank assets as a percentage of GDP, degree of crowding out, stock market dummy, lending-deposit spread, exports as a percentage of GDP, final consumption expenditure as a percentage of GDP, inflation, stock market capitalization as a	The findings illustrate that some fiscal variables have different effects on the spread. For example, crowding out and inflation increase the spread while increase in central bank assets decreases it.	The variables and methodology used in the study differ from the current study.

				percentage of GDP, stock market ratio and trend		
Zoli (2005)	To study the effects of fiscal policy on monetary policy in emerging economies	Emerging economies: Argentina, Brazil, Chile, Colombia, Mexico, Poland, South Africa, Thailand	The paper uses VAR methodology to test for fiscal dominance and uses an event study to assess the influence of fiscal policy on country premium, sovereign spread and exchange rates.	Public sector liabilities, real primary balance, policy rate, inflation rate, exchange rate, output gap and expected inflation deviation	The study concluded that fiscal actions have influenced movements in sovereign spread and exchange rates more than monetary policy.	The variables and methodology used in the study differ from the current study.
Baig et al. (2006)	To investigate the relationship between fiscal and monetary policy in emerging economies	Emerging economies: Brazil, Poland, and Turkey	The study uses a regression model to investigate the interaction	Inflation, interest rates, debt to GDP, external debt to GDP.	The results show that during periods of high vulnerabilities, government budget news has a greater	The study examined external debt and did not include domestic debt.

					influence on country spreads and interest rates than monetary policy.	
Andlib et al. (2012)	To test the empirical evidence of fiscal and monetary coordination in Pakistan.	Pakistan	The study uses a VAR model	Interest rate and fiscal surplus ratio.	The result show an insignificant relationship between fiscal and monetary policy variables. They find show no causality from fiscal to monetary variables. Vice versa is also true.	The variables and methodology used in the study differ from current study.
Kuncoro & Sebayang (2013)	To examine the relationship between monetary and fiscal policies	Indonesia	The study uses a regression model	Inflation rate, output gap, debt to GDP ratio among others	The results show that monetary policy responds to fiscal policy as anticipated and the reaction is marginally. Monetary policy is	The study did not consider public domestic debt.

					the leading policy in Indonesia.	
Wesselbaum (2014)	To investigate relationship between monetary and fiscal policy in New Zealand	New Zealand	The study uses a Markov-switching model to demonstrate regime changes	Interest rate, government debt, output, inflation	The results show that tight monetary policy period, changes in government debt does not lead to changes in monetary policy while for easy regime, monetary authority decreases interest rate with increasing debt.	The study considered total government debt without differentiating between external and domestic debt.
Ng'ang'a et al. (2019)	To explore the coordination of fiscal and monetary policy in Kenya.	Kenya	The study uses Markov-Switching model to determine fiscal and monetary policy regimes and self-exciting models to	GDP growth, fiscal balance/GDP, inflation, total debt/GDP, exchange rate, real interest rate and GDP	The results show that unsustainable fiscal period was more dominant compared to sustainable period in Kenya. Monetary	The study considered total debt without analyzing impact of domestic debt.

			check on monetary and fiscal policy reaction function	gap/government expenditure gap.	policy responds to unsustainable fiscal policy sequentially by following restrictive policies implying a lagged monetary policy effect.	
Chuku (2010)	To assess the nature of fiscal and monetary policies in Nigeria	Nigeria	The study uses vector autoregressive (VAR) model and Markov-Switching model to estimate the time-varying parameter of the relationship.	Fiscal variables: fiscal balance (surplus or deficit of government finances) and government liabilities (outstanding debt)	The result imply fiscal policy is more dominant than monetary policy. Fiscal policy is implemented first while monetary policy is reactive.	The study did not examine public domestic debt.
Karagoz & Keskin (2016)	To investigate the effect of fiscal policy on macroeconomic variables	Turkey	The study uses Bayesian vector autoregression	Public revenues, non – interest public spending, external debt,	The results show that fiscal policy has little impact on interest rate,	The study did not consider public domestic debt.

			(BVAR) technique.	GDP, inflation, indicator for stock market, interest rate	external debt, GDP, stock market index and inflation.	
Bredemeir et al. (2015)	To study the relationship between fiscal policy, interest rate spreads, and the zero-lower bound	US	The study uses a VAR model	GDP, primary deficit, government spending and money market spread.	The result shows that interest rate spread increases with government expenditures	The study did not consider domestic financing of primary deficit.
Faini et al. (2016)	To analyze the impact of fiscal policy on interest rate spread and interest rates	Europe (Belgium, Austria, Spain, France, Finland, Portugal, Italy, Ireland, Netherlands)	Simple regression model	Real interest rates, gross debt as ratio to GDP, budget surplus	The findings illustrate that expansionary fiscal policy has marginal effects on country spreads and greater impact on interest rates level. Additionally, government debt stock level and	The study did not consider public domestic debt as one of the variables.

					dynamics has a strong influence on spreads.	
Nyamongo (2015)	To examine the influence of fiscal policy on monetary policy in Kenya	Kenya	Gap model	Total output, non-agricultural output, non – agriculture output, real interest rates, real exchange rates,	The findings illustrate that fiscal policy has an impact on monetary policy conduct and the key variables in monetary transmission such as exchange rates, interest rates and interest rates spreads	The study did not examine the influence of public domestic debt on monetary policy.
Dell'Erba & Belhocine (2013)	To examine the influence of debt sustainability and the level of debt on emerging market spreads	26 emerging economies such as Egypt, Chile, Brazil, Bulgaria, China, Argentina etc.	Regression model	Sovereign spreads, total debt to GDP, CPI Inflation, external reserves to GDP, current account to GDP,	The findings indicate that debt sustainability is an key factor of spreads. Spreads become twice sensitive to debt	The study did not consider domestic public debt as a variable.

				and real GDP growth.	when public debt increases above 45% of GDP.	
Tennat & Folawewo (2009)	To investigate the determinants (macroeconomic and market) of interest rate spreads in low- and middle-income countries	Asia (Philippines, Sri Lanka etc.), Latin America and Caribbean (Dominica, Bolivia, Guyana etc.), Sub-Saharan Africa (Kenya, Uganda, Tanzania etc.)	Regression model	Interest rate spreads, inflation, exchange rate volatility, government borrowing, discount rate, treasury bill rate, GDP	Economies of scale, bank development, GDP, treasury bill rate, exchange rate volatility and inflation variables are statistically insignificant in determining interest rate spread while changes in reserve ratio, public sector crowding out, discount rate significantly influences spreads.	

<p>Obeng & Sakyi (2017)</p>	<p>To examine the macroeconomic determinants of interest rate spreads in Ghana</p>	<p>Ghana</p>	<p>Linear model</p>	<p>Exchange rate volatility, fiscal deficit, economic growth, public sector borrowing, institutional quality, lending interest rate volatility, monetary policy rate,</p>	<p>Public sector borrowing, fiscal deficit, exchange rate volatility and economic growth increase interest rate spread while institutional quality, lending interest rate variation and monetary policy rate decrease interest rate spreads in the long run and short run respectively.</p>	
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APPENDIX II: PHILLIPS PERRON STATIONARITY TEST

Variable	Level				1st Difference			
	Significance level	Trend and Intercept		Critical Values	Significance level	Trend and Intercept		Critical Values
		PP Test	Prob.			PP Test	Prob.	
IR	1%	-3.204321	0.1033	-4.309824	1%	-9.162512	0.0000	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728	10%			-3.225334
IRS	1%	-2.775686	0.2167	-4.309824	1%	-6.785592	0.0000	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728	10%			-3.225334
ADR	1%	-2.590218	0.2869	-4.309824	1%	-4.768932	0.0036	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728	10%			-3.225334
LR	1%	-4.046580	0.0182	-4.309824	1%	-9.723068	0.0000	-4.323979
	5%			-3.574244**	5%			-3.580622
	10%			-3.221728*	10%			-3.225334
NCGR	1%	-2.715590	0.2380	-4.309824	1%	-11.77545	0.0000	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728	10%			-3.225334
PDD	1%	-3.116977	0.1213	-4.309824	1%	-8.102712	0.0000	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728	10%			-3.225334
GDP	1%	-3.130270	0.1184	-4.309824	1%	-6.257690	0.0001	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728	10%			-3.225334
INF	1%	-3.224019	0.0996	-4.309824	1%	-7.278156	0.0000	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728*	10%			-3.225334
TBILL	1%	-3.528665	0.0549	-4.309824	1%	-11.48623	0.0000	-4.323979
	5%			-3.574244	5%			-3.580622
	10%			-3.221728*	10%			-3.225334

**Sig 0.05, *Sig 0.01

APPENDIX III: INTEREST RATE GENERAL MODEL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.735	4.814	1.399	0.189
D(ADR)	-0.126	0.135	-0.933	0.371
D(ADR(-1))	0.234	0.111	2.111	0.059
D(GDP)	0.289	0.258	1.123	0.285
D(GDP(-1))	-0.591	0.372	-1.589	0.140
D(INF)	-0.494	0.094	-5.256	0.000
D(INF(-1))	0.408	0.076	5.368	0.000
D(NCGR)	-0.157	0.158	-0.994	0.342
D(NCGR(-1))	0.421	0.143	2.942	0.013
D(PDT)	-0.042	0.213	-0.198	0.847
D(PDT(-1))	0.262	0.189	1.382	0.194
D(TBILL)	0.715	0.076	9.429	0.000
D(TBILL(-1))	0.505	0.086	5.887	0.000
LR	-0.051	0.152	-0.338	0.742
LR(-1)	-0.104	0.121	-0.864	0.406
RESID01(-1)	-1.278	0.213	-6.012	0.000
D2000	-5.117	2.031	-2.519	0.029
R-squared	0.985537	Mean dependent var		0.128571
Adjusted R-squared	0.964499	S.D. dependent var		8.89698
S.E. of regression	1.67635	Akaike info criterion		4.151091
Sum squared resid	30.91164	Schwarz criterion		4.95993
Log likelihood	-41.11528	Hannan-Quinn criter.		4.398361
F-statistic	46.84598	Durbin-Watson stat		1.966195
Prob(F-statistic)	0			

APPENDIX IV: INTEREST RATE SPREAD GENERAL MODEL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.475	6.626	0.675	0.515
D(ADR)	-0.094	0.157	-0.598	0.563
D(ADR(-1))	-0.437	0.129	-3.386	0.007
D(GDP)	-0.389	0.304	-1.280	0.229
D(GDP(-1))	-0.761	0.426	-1.787	0.104
D(INF)	0.249	0.106	2.350	0.041
D(INF(-1))	0.027	0.086	0.319	0.756
D(NCGR)	-0.558	0.215	-2.596	0.027
D(NCGR(-1))	0.478	0.173	2.773	0.020
D(PDT)	-0.081	0.253	-0.319	0.756
D(PDT(-1))	0.437	0.217	2.008	0.072
D(TBILL)	0.356	0.087	4.102	0.002
D(TBILL(-1))	0.363	0.098	3.723	0.004
LR	-0.049	0.203	-0.240	0.815
LR(-1)	-0.058	0.138	-0.423	0.682
RESID01(-1)	-1.057	0.294	-3.601	0.005
D2015	6.284	2.344	2.681	0.023
D2000	-4.634	2.465	-1.880	0.090
R-squared	0.92497	Mean dependent var		0.15
Adjusted R-squared	0.79742	S.D. dependent var		4.220832
S.E. of regression	1.899752	Akaike info criterion		4.377418
Sum squared resid	36.09056	Schwarz criterion		5.233835
Log likelihood	-43.28385	Hannan-Quinn criter.		4.639233
F-statistic	7.251788	Durbin-Watson stat		0.920943
Prob(F-statistic)	0.001493			