DRIVERS OF DOMESTIC GOVERNMENT BOND MARKET GROWTH IN SELECTED COUNTRIES IN EASTERN AND SOUTHERN AFRICA

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D58/CTY/PT/33537/2014

A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE AWARD OF THE DEGREE OF MASTER OF SCIENCE (IN FINANCE) OF KENYATTA UNIVERSITY

OCTOBER, 2018
DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION
I dedicate this work affectionately to my lovely wife, Priscillah Gathoni, children; Ms. Abigail Nduta and Mr. Ethan Thotho; my parents Mr. and Mrs. Dominic Gathiru Thotho; my brother and sister and colleagues and friends for their unrelenting inspiration, support and encouragement during the period of the study. They gave me the necessary drive and discipline to handle tasks with zeal and resolve. This thesis would not have been made possible without their love and support.
ACKNOWLEDGEMENTS

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Secondly, I am grateful to my wife Priscillah Gathoni for the supporting me throughout the study through running family affairs when I spent time to undertake this research. I pray that the Lord may reward her abundantly and grant us more years together. To my children, Abigail and Ethan, thank you for your patience when I was away most of the time studying. I pray that this thesis work will inspire, motivate and encourage you in your academic life.

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# OPERATIONAL DEFINITION OF TERMS

**Bond Market:** A financial market where securities such as bonds or notes are issued (primary market) or bought and sold (secondary market).

**Bond Market Growth:** Refers to the level of development of the bond market which was be measured as Government bond capitalization as a per cent of GDP.

**Economy Size:** Refers to the size of the economy of a country as measured by GDP at current prices.

**Financial Drivers:** Events or situations related to the financial and economic environment in households, countries or global scene. These included size of the banking sector and interest rate trend.

**Fiscal Balance:** Refers to the overall difference between government revenues and expenditure where a positive balance is a budget surplus, and a negative balance is a budget deficit. Fiscal balance was measured as proportion of government budget cash surplus/deficit to GDP.

**Interest Rate Trend:** Refers to the level of uncertainty or risk about changes and direction of changes in the value of a financial instrument. It is the movement of the interest rate during a specific period of time or at points in time.

**Liquid Market** This is a market with numerous buyers and sellers of securities thus many bid and ask offers, low spreads and low volatility and it is easy to execute a trade quickly, at a desirable price and low cost.

**Public Debt:** All outstanding financial liabilities of the Government arising from past borrowing which includes guaranteed bonds to state agencies. Public debt can be external if owed by a government to non-residents or domestic, if owed to residents or citizens.

**Public Debt Management:** The process of establishing and executing a strategy for managing Government bonds in order to raise the required funding levels, achieve its risk and cost objectives, and to meet any other sovereign bonds management goals such as developing and maintaining an efficient market for government securities.

**Eastern and Southern Africa (ESA):** It is the geographical area of the continent of Africa consisting of all countries that are located on the Eastern and Southern regions comprising of 21 countries (Appendix 1).
**Size of Banking Sector:**  Refers to the level of growth of the banking sector which was measured as banking sector credit as a ratio of GDP

**Structural Drivers:**  These are events or situations that related to the structural environment of the financial market within a country or across a region of countries or international scene. The structural variables that were assessed for effect on the growth of the domestic government bond market in this study were size of the economy and trade openness. Fiscal balance was used as a moderating variable.

**Trade Openness:**  Measure of openness of a country to international trade and was represented by a ratio to GDP of total exports of goods and services in this study.

**Volatility:**  Refers to the degree of variation of indicators such as bond prices, interest rates, and exchange rates. These parameters may be high during good times or low during bad times.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGFS</td>
<td>Committee on the Global Financial System</td>
</tr>
<tr>
<td>DSA</td>
<td>Debt Sustainability Analysis</td>
</tr>
<tr>
<td>EAC</td>
<td>Eastern Africa Community</td>
</tr>
<tr>
<td>EMH</td>
<td>Efficient Market Hypothesis</td>
</tr>
<tr>
<td>ESA</td>
<td>Eastern and Southern Africa</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GDP PPP</td>
<td>GDP Purchasing Power Parity</td>
</tr>
<tr>
<td>GGD</td>
<td>Global Goals for Development</td>
</tr>
<tr>
<td>HIPC</td>
<td>Heavily Indebted Poor Countries</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>KES</td>
<td>Kenya Shillings</td>
</tr>
<tr>
<td>MDRI</td>
<td>Multilateral Debt Relief Initiative</td>
</tr>
<tr>
<td>MTDS</td>
<td>Medium Term Debt Strategy</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Cooperation and Development</td>
</tr>
<tr>
<td>PDM</td>
<td>Public Debt Management</td>
</tr>
<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
</tr>
<tr>
<td>SSA</td>
<td>Sub-Saharan Africa</td>
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<td>WBG</td>
<td>World Bank Group</td>
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ABSTRACT

Different countries in Eastern and Southern Africa (ESA) have experienced different levels of growth of their domestic Government bond markets due to various factors. This study aimed at evaluating the drivers of the growth of domestic government domestic bond markets in selected countries in Eastern and Southern Africa during the period 2003-2015. The main study problem is the inability of countries to sustainably fund their budgetary deficits from dependable and reliable local sources. Chances of African countries accessing concessional external financing from bilateral and multilateral lenders, or the international capital market have reduced due to shifting global priorities and debt crisis in the first world countries. Even countries that rely on commodity exports (such as oil and minerals) have experienced budgetary shocks due to volatility in the global commodities market. As such, the domestic government bond market is becoming more important as a homergrown and reliable source of government financing and for the development of the domestic capital market. This study assessed the drivers of the growth of the domestic government bond market in selected countries in Eastern and Southern Africa during the period 2003 to 2015. The specific objectives for the research were to assess the effect of size of the banking sector, interest rate trend, trade openness, size of the economy and fiscal balance (used as the moderating variable) on domestic government bond markets growth in selected countries in Eastern and Southern Africa. The study adopted the Functional Finance theory, Arbitrage Pricing theory, Interest Rate Structure theory and Liquidity Preference theory. The positivism research philosophy was used in this study because observations of variable trends were independent with no human interest; explanations demonstrated causality; generalization was through statistical probability; research progressed through hypotheses and deductions and concepts were operationalized for purpose of measurement. Descriptive research design was used and annual secondary data collected from the World Bank Development Indicators (WDI), OECD’s African Statistical Year book and International Financial Statistics by the IMF. A data collection schedule (MS Excel) was used as a tool to collect time series data for a period of 12 years from 2003 to 2015. The target population consisted of 21 countries in Eastern and Southern Africa from which five countries namely Kenya, Tanzania, Uganda, Zambia and Mozambique were chosen through purposive sampling. These countries are chosen because they have been implementing deliberate reforms to enhance the growth of their domestic government bond markets since 2000s, in addition to, data availability. Panel Ordinary Least Squares (POLS) was used to determine the effect of the independent variables on domestic government bond markets growth (measured as bond market capitalization) in selected countries in Eastern and Southern Africa and data was analyzed using E-views 8. Various diagnostic tests such as stationarity, normality, multicollinearity, and granger causality among others were undertaken. From the empirical results, banking sector size and size of the economy had positive and significant effect on the growth of the domestic Government bond market while openness of trade was negative and significant. The study provides pointers for priority areas in the development of the domestic government bond markets in Eastern and Southern Africa region, including initiatives to promote larger financial (banking) sector, stimulate economic growth to achieve larger economies and promote open trade but conscious of the effect of capital flight as a result of massive exit of foreign investors from the domestic market. This study contributed to filling knowledge gaps in determining the drivers of domestic government bond market growth in Eastern and Southern Africa during the period 2003 to 2015.
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

A financial market is a market where financial securities (such as equities, bonds, currencies and derivatives) are traded at prices that reflect supply and demand. The financial market consists of the capital market and the money market. A capital market is a market where long term securities such as stocks (shares) and bonds are traded while a money market is a market where short term instruments such as Treasury bills and commercial papers are traded (Mitchell and Pulvino, 2012). A bond market (also bonds or credit market) is a segment of the capital market where securities such as bonds and notes are issued (primary market) or bought and sold (secondary market). Government bond market is the market where Government bonds are issued and traded while corporate bond market is the market for bonds issued by corporate or private (non-government) entities (Marques & Gelos, 2016). Domestic government bond market refers to the market of bonds issued by the government and traded in the domestic market in local currency. External or international government bond market is the market where government issues bonds in the international market, often in foreign currency, also called Euro bonds (Loon and Zhang, 2016).

In recent years, most Governments in Africa have been faced with the need to bridge growing financing gap arising from increasing development expenditures compared to revenues, resulting in rising budgetary deficits (Fostel & Geanakoplos, 2010). This gap is financed by borrowing from the domestic financial markets, international lenders (bilateral or multilateral) or/and global financial markets. A growing domestic government bond market exhibits liquidity and efficiency, and helps the government to meet its financing needs at reasonable cost and risk (Bae & Kee-Hong, 2012). Liquidity refers to presence of numerous buyers and sellers of bonds thus have a variety of bid-ask quotes, low spreads and volatility and it is easy to execute trades with immediacy at market price (Kablan, 2010). Changes in supply and demand of securities have relatively small impact on market price of securities (Flood, Liechty & Piontek, 2015). Bond
market efficiency is the degree to which prices of bonds reflect all available and relevant public and private information. A liquid and efficient bond market exhibits among other features; fair pricing of bonds informed by market fundamentals, high liquidity, high demand and supply and competition, high number of local and foreign investors, diversified investors and securities, low return volatility, large market size, market depth with high cross-border integration, modern electronic trading platforms, many intermediaries, and pro-growth legal and regulatory framework (Dudley, 2015).

The growth of the domestic government bond market is an important milestone of every emerging economy around the world. Indeed, over the last 20 years or so, there has been an emergence of securities markets in developing countries and economies in transition around the world. The experience of the global financial crisis in 2008 placed a growing need for well-developed domestic bond markets (Bao, Jack, Pan, & Wang, 2011). The financial crisis largely reduced opportunities for countries to raise much needed finance from the global market. Thus enhancing the growth of the bond market has become a key growth target of emerging economies around the world.

Generally, a variety of factors determine the level of growth of the domestic government bond market including level of bank risk appetite, frequency and size of bond issuance, market structure, nature of securities being traded, structural changes in the markets such as regulatory constraints and tighter risk management, market cycles – normal times or periods of shocks (Hendershott, Terrence & Madhavan, 2015).

The growth of the government bond market is sometimes limited by the existence of large number of different outstanding securities from individual issuers, and institutional investors holding large size bonds to maturity without trading them, resulting in thin bond trading (IMF, 2012). The probability of matching buyers and sellers at a given time for a given bond is thus low and this increases illiquidity of the bond market. Market makers, typically banks and securities firms, however become useful in matching buyers and sellers and building market liquidity. The readiness of market makers to execute trades on an immediate basis facilitates price discovery and supports market growth. Market
makers are vital to smooth market functioning due to their willingness to absorb transitory imbalances in supply and demand (Fender & Lewrick, 2015).

A less developed government bond market is characterized by undesirable features such as low supply and demand for securities, few issuers of securities, few instruments with short maturities, volatility of returns and price, small market size, few deals and low turnover of trades (Brunnermeier, Markus & Lasse, 2010). In addition, such a market has pricing inefficiency and lacks a reliable yield curve. Further, market is shallow with high concentration, and has traditional or outdated trading infrastructures, limited international (cross-border) linkages, low number of investors with limited diversification (narrow investor base), few intermediaries and rigid legal and regulatory frameworks that do not encourage innovation and growth of vibrant capital market (Hu, Pan & Wang, 2012).

### 1.1.1 Domestic Government Bond Market Growth

The growth of the domestic government bond market refers to the level of development of the domestic government bond market. Countries that have succeeded in developing their domestic government bond markets have strategically managed their domestic marketable public debt which majorly comprises of Government bonds and promoted reforms for better market structure and infrastructure (Hendershott & Madhavan, 2015).

Failure to promote the growth of the domestic government bond market reduces chances of the Government relying on the domestic market to meet its financing needs. Most countries in Africa are experiencing increasing development financing needs (in addition to growing recurrent expenditure), as they seek to expand key economic sectors, social infrastructure and stimulate economic activity. For some countries which are currently exploring commodities such as oil and gas, initial costs are high calling for huge capital injection as they wait to reap economic benefits in future (Yibin, Phelps & Stotsky, 2013).

According to Marques and Gelos (2016), where the domestic market is underdeveloped, fiscal dependence becomes a norm where overreliance on unreliable external financing
sources reduces a country’s independence in the management of public finance and financing needs. Foreign sources of finance attach stringent conditions and unfavourable covenants affecting sovereignty of countries. There is a double mismatch risk, in terms of currency risk when value of foreign currency in which the bonds is denominated appreciates, and refinancing risk associated with the maturity of the loans. Short maturity loans are riskier to the borrowing government as obligations are due sooner than later. In an open economy, foreign financing sources increase vulnerability to external or global shocks significantly reducing country’s resilience (Foucault, Pagano & Roell, 2013).

In an underdeveloped domestic market, Government faces high cost and risk of public borrowing in the domestic market as investors demand price liquidity premium in their portfolios (Christensen and Gillan, 2016). In addition, issuance of long term bonds (preference of governments to reduce refinancing risk) becomes difficult because of low demand and uncertainty by investors. Short maturities of bonds increase refinancing risk to the issuer. A liquid bond market is competitive and offers lower prices for securities as determined by market fundamentals, creating investor confidence. This supports uptake of large volumes of long term bonds at lower cost and risk (Bessembinder et al., 2016).

There is overreliance on banking sector financing by Government and private sector where the domestic bond market is underdeveloped. Most commercial banks in Africa are affiliates of foreign parent banks thus exposing the financial sector to global market swings resulting from market sentiment and negative risk perception by foreign investors. In addition, financial crisis or bank failures may largely impact on government financing needs as banks’ financial capabilities are limited (Wong, Gilley & Gonzalez, 2015).

Finally, an underdeveloped domestic Government bond market results in lack of a benchmark for risk free investment and corporate market. Government bond investment is regarded as risk free and is the basis for which other products are priced with a premium for among others, liquidity and credit risk (Bao, Pan & Wang, 2011). The risk free rate in the Capital Asset Pricing Model (CAPM) is in most cases assumed to be the
Government bond yield. A well-developed Government bond market provides reliable tools such the yield curve and bond indices, for pricing financial market instruments and is an important prerequisite for the growth of corporate bonds market. Where the bond market is illiquid and inefficient, the benchmark for risk free pricing is unavailable, significantly hampering the growth of the capital market (Dick-Nielsen, Jens, Feldhutter & David, 2012).

To achieve development of local government bond markets, it is important that the Government promotes proper macroeconomic, financial and structural environment (Bank of International Settlements (BIS, 2015). This framework encourages market growth and liquidity through fair pricing of bonds informed by market fundamentals such as high demand-supply and competition for securities, high number of local and foreign investors, diversified investors and securities, low return volatility, large market size, market depth with high cross-border integration, modern electronic trading platforms, many intermediaries, and pro-growth legal and regulatory framework (Bhattacharyay, 2011). Factors that have been identified to contribute to the growth of the domestic bond market include among others level of economic development, the structure of the economy, strong investment environment, enhanced transparency and regulation, firm investor protection, large size of the banking sector, and regional approach to bond market development (Bae, Kee-Hong, 2012).

1.1.2 Drivers of Domestic Government Bond Market Growth
Drivers of domestic Government bond market growth were classified as financial and structural drivers. Financial drivers refer to events or situations related to the financial and economic environment in households, countries or global scene, which affect the growth of the domestic Government bond market (Fostel & Geanakoplos, 2010). In this study, financial variables studied included size of the banking sector and interest rate trend. Structural variables refer to events or situations related to the structure of households, countries or at global scene, which affect the growth of the domestic
Government bond market (Bae, 2012), which include trade openness and size of the economy. Fiscal balance was used as a moderating variable.

The size of the banking sector refers to the level of growth of the banking sector. Banking sector is the segment of the economy that holds financial assets on behalf of the investors, investing those financial assets to create wealth, and includes regulation of activities (Bhattacharyay, 2011). Banks may seek to place surplus funds in the domestic government bond markets but also, increased lending by banks may discourage the growth of the government bond market as these become competitors (Fender & Lewrick, 2015).

Size of the economy is the amount of production, distribution, or trade, and consumption of goods and services by different economic agents in a given geographical location (Bao, Pan, & Wang, 2011). Smaller economy countries are likely to under-developed domestic government bond markets as they tend to lack the efficiencies needed to deepen their bond markets (Marques & Gelos, 2016).

Trade openness refers to a measure of economic policies that restrict or encourage trade between one country and another. Less integrated countries with other countries’ economies would have more incentive to develop their domestic government bond market markets to meet their financing needs (Christensen & Gillan, 2016).

Interest rate trend refers to the level of uncertainty or risk about changes and direction of changes in the value of a financial instrument (Yibin, Phelps & Stotsky, 2013). For a risk-averse investor, the incentive to hold bonds is reduced when there is high interest rate volatility and vice versa (Bae, Kee-Hong, 2012).

Fiscal balance refers to the overall difference between government revenues and expenditure where a positive balance is a budget surplus, and a negative balance is a budget deficit (Feldhutter, 2012). Fiscal policy may affect the development of the
domestic government bond market through large or small supply of government bond in the market where large supply may crowd out the corporate debt market and lower bank lending while short supply may inhibit faster growth of the domestic government bond market (Yibin, Phelps & Stotsky, 2013).

Supporting deliberate measures to develop the domestic bonds market and the capital market in general is important to every Government that seeks to achieve fiscal independence (Fostel & Geanakoplos, 2010). A developed domestic government bond market is a key determinant of economic growth and development as it promotes a strong market oriented economy with robust financial system which is resistant to external shocks (Feldhutter, 2012). To develop the domestic bonds markets entails focusing on creating money market efficiency, diversifying investor base, activating the secondary markets, attaining reliable custodial and settlement systems as well as enhancing effective regulation. However, complexities of the market and amount of time required to implement such reforms are sometimes a hindrance to the attainment of market development goals for most countries (Hu et al., 2013).

1.1.3 Global Perspective of Domestic Government Bond Market Growth
An overview of Government Bond Market around the World in 2015 is shown in Table 1.1 which provides evidence of bond markets across different continents. Domestic government bond markets in terms of market capitalization as a share of GDP are higher in developed markets than in Sub-Saharan African (SSA) countries. Across all the continents, Africa ranks least in terms of growth of the domestic government bond market (Yibin, Phelps & Stotsky, 2013).

Average government bond market capitalization as a percent of GDP was 42.9 per cent in Asia, 41.1 per cent in Central Europe, 85.5 per cent in developed countries and 22.1 per cent in Latin America, compared to SSA’s 18.9 per cent with South Africa alone at 31.2 per cent. In terms of average percentage of government securities in total domestic debt, SSA scores highest at 81.8 per cent majorly consisting of short term Treasury bills and
not government bonds (Table 1.1), which implies high refinancing risk of domestic debt on the part of the government. Longer maturity of public debt is preferred to short maturity because it helps Governments to postpone repayment of the debt and concentrate on medium term development priorities (Feldhutter, 2012).

Table 1.1: Overview of Government Bond Market around the World in 2015

<table>
<thead>
<tr>
<th>Region</th>
<th>Country</th>
<th>Government Bond Market Capitalization (per cent of GDP)</th>
<th>Treasury Bills (per cent total domestic debt)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developing Countries and Emerging Markets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td>All</td>
<td>14.8</td>
<td>89.2</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>18.9</strong></td>
<td><strong>81.8</strong></td>
</tr>
<tr>
<td>South Africa (SA)</td>
<td></td>
<td>31.2</td>
<td>60.9</td>
</tr>
<tr>
<td>All excluding SA</td>
<td></td>
<td>14.2</td>
<td>91.8</td>
</tr>
<tr>
<td>Low income</td>
<td></td>
<td>15.3</td>
<td>93.3</td>
</tr>
<tr>
<td>Middle income</td>
<td></td>
<td>15.1</td>
<td>81.2</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>42.9</strong></td>
<td><strong>59.8</strong></td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>27.3</td>
<td>54.5</td>
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<tr>
<td></td>
<td>Hong Kong</td>
<td>35.9</td>
<td>72.2</td>
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<td></td>
<td>Malaysia</td>
<td>57.3</td>
<td>50.2</td>
</tr>
<tr>
<td></td>
<td>South Korea</td>
<td>43.8</td>
<td>42.4</td>
</tr>
<tr>
<td></td>
<td>Thailand</td>
<td>50.5</td>
<td>79.7</td>
</tr>
<tr>
<td>Latin America</td>
<td><strong>Average</strong></td>
<td><strong>22.1</strong></td>
<td><strong>61.9</strong></td>
</tr>
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<td></td>
<td>Argentina</td>
<td>13.3</td>
<td>83.7</td>
</tr>
<tr>
<td></td>
<td>Brazil</td>
<td>39.4</td>
<td>63.4</td>
</tr>
<tr>
<td></td>
<td>Chile</td>
<td>13.1</td>
<td>43.5</td>
</tr>
<tr>
<td></td>
<td>Mexico</td>
<td>22.6</td>
<td>56.9</td>
</tr>
<tr>
<td>Central Europe</td>
<td><strong>Average</strong></td>
<td><strong>41.1</strong></td>
<td><strong>84.2</strong></td>
</tr>
<tr>
<td></td>
<td>Czech Republic</td>
<td>23.3</td>
<td>67.5</td>
</tr>
<tr>
<td></td>
<td>Hungary</td>
<td>57.3</td>
<td>89.1</td>
</tr>
<tr>
<td></td>
<td>Poland</td>
<td>42.6</td>
<td>95.9</td>
</tr>
<tr>
<td>Developed Countries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td><strong>Average</strong></td>
<td><strong>85.5</strong></td>
<td><strong>57.6</strong></td>
</tr>
<tr>
<td></td>
<td>Australia</td>
<td>27.4</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Canada</td>
<td>63.2</td>
<td>70.5</td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>205.4</td>
<td>84.5</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>75.7</td>
<td>43.4</td>
</tr>
<tr>
<td></td>
<td>Europe</td>
<td>55.8</td>
<td>54.6</td>
</tr>
</tbody>
</table>

Source: Yibin, Phelps and Stotsky (2013)

According to Figures 1.1 and 1.2, the size of domestic government bond markets varies across countries and regions around the world. Domestic government securities market as
a per cent of GDP is highest in North America which implies that they have the largest bond market, followed by East Asia. North America’s government bond market accounts for 60.58 per cent of GDP in 2015, down from 71 per cent in 2011, after growing steadily from 49.80 per cent from the year 2000. East Asia’s bond market grew from 26.21 per cent of GDP in 2000, begun to pick up in 2009 at 40.29 per cent rising to highest level of 46.86 per cent in 2015. Some individual countries within these continents have more developed domestic government bond markets than developed countries like the United States. Size of domestic government bond market in Sub-Sahara Africa (mainly South Africa) grew from 34.93 per cent in 2000 to 34.59 in 2004, then begun to slow down to lowest level of 19.21 per cent in 2008, then picked up to 38.50 per cent in 2014 and 35.02 per cent in 2015 (World Bank, 2015).

Figure 1.1: Domestic Government Bond Markets around the World

1.1.4 Overview of Domestic Government Bond Market Growth in Eastern and Southern Africa

Most countries in SSA have resorted to mobilization of domestic resources as an alternative source of financing and to reduce increased external debt (Thupayagale, 2015). Before the global financial crisis in 2008, most SSA countries would access easy external financing from donors in form of multilateral and bilateral loans and grants that were secured on concessional terms. Donor funding after 2008 has dwindled and SSA countries are reverting to fiscal financing from domestic sources (Getter, 2012). Even more, the growing need to bridge fiscal gaps as well as increase financing in developmental and structural investments has necessitated SSA governments to promote development of bond markets in their countries although most markets still remain shallow, illiquid and inefficient, with the exception of South Africa (IMF, 2012).

For a long time now in SSA, there has been overreliance on commercial banks for funding and these banks have mostly been subsidiaries of foreign banks which implies that financial sector in SSA is exposed to swings in global market sentiment as well as negative risk perception by foreign investors (Vayanos, Dimitri & JiangWang, 2012). With liquid bond markets, there will be improved financial intermediation which will in turn boost the channeling of funds into the domestic market to finance development (Trebbi &
Xiao, 2016). Domestic bond markets provide alternative sources of financing with enhanced capital allocation by directing savings towards high return assets, contributing to the growth of country’s financial system and facilitating risk management by distributing risk among different groups of investors (Dudley, 2015).

Figure 1.1 shows the trend of domestic Government bonds as a percent of GDP in selected countries in Africa. South Africa has had the highest levels of domestic government bonds amongst the countries shown here, rising to 38.18 per cent of GDP by 2012 from 33.58 percent in 2003 after dipping slightly to 25.89 per cent in 2009. Mozambique recorded the lowest levels of domestic government bonds at 4.52 percent of GDP in 2012 after rising from 1.52 per cent in 2009 to 6.11 per cent in 2011. These trends indicate that most countries in SSA have had small domestic government bond markets compared to countries like South Africa and Kenya in Figure 1.1. Further, most of the domestic government bond markets have not been growing over the years, except South Africa, but have either declined or remained unchanged in terms of size to GDP (OECD, 2015).

**Figure 1.3: Domestic Government bonds (Per cent of GDP)**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>4.40</td>
<td>5.87</td>
<td>6.63</td>
<td>5.84</td>
<td>8.63</td>
<td>16.53</td>
<td>18.74</td>
<td>8.83</td>
<td>7.37</td>
<td>7.78</td>
</tr>
<tr>
<td>Kenya</td>
<td>25.34</td>
<td>24.04</td>
<td>22.29</td>
<td>22.05</td>
<td>22.07</td>
<td>20.43</td>
<td>21.91</td>
<td>25.89</td>
<td>25.27</td>
<td>24.71</td>
</tr>
<tr>
<td>Mozambique</td>
<td>4.21</td>
<td>2.01</td>
<td>3.58</td>
<td>2.88</td>
<td>2.34</td>
<td>1.78</td>
<td>1.52</td>
<td>5.99</td>
<td>6.01</td>
<td>4.52</td>
</tr>
<tr>
<td>South Africa</td>
<td>33.58</td>
<td>33.76</td>
<td>33.25</td>
<td>31.46</td>
<td>28.73</td>
<td>26.18</td>
<td>25.81</td>
<td>31.86</td>
<td>34.40</td>
<td>38.18</td>
</tr>
<tr>
<td>Tanzania</td>
<td>10.72</td>
<td>10.69</td>
<td>15.13</td>
<td>14.28</td>
<td>15.01</td>
<td>10.63</td>
<td>8.04</td>
<td>10.36</td>
<td>9.13</td>
<td>10.36</td>
</tr>
<tr>
<td>Uganda</td>
<td>9.55</td>
<td>9.60</td>
<td>10.75</td>
<td>10.70</td>
<td>13.15</td>
<td>11.16</td>
<td>8.61</td>
<td>9.79</td>
<td>11.17</td>
<td>13.03</td>
</tr>
</tbody>
</table>

Source: OECD, 2015
As shown in Table 1.2 in nominal terms, Kenya recorded the highest Central Government debt (majorly Treasury bonds) of US$ 20,207 million in 2015 compared to Zambia whose debt at US$ 6,044 million, Tanzania at US$2,932, Uganda at US$5,883 and Mozambique at US$ 5,628. Kenya’s government bond debt has marginally but constantly been increasing over the years with a slowdown in 2008 when it fell to US$ 11,054 million from previous year’s US$ 12,588 million. In terms of government bonds as a proportion of GDP in 2015, Kenya recorded highest stock at 46.7 per cent followed by Mozambique and Uganda at 40.2 per cent and 32.2 per cent respectively. In the period 2003-2012 on average, Mozambique had the highest central government debt compared to GDP at 54.5 per cent with Zambia and Kenya following closely at 50.5 per cent and 49.5 per cent respectively (Table 1.2).

<table>
<thead>
<tr>
<th>Country</th>
<th>Domestic Debt</th>
<th>Domestic Marketable Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>20,207</td>
<td>10,694</td>
</tr>
<tr>
<td></td>
<td>46.7</td>
<td>24.7</td>
</tr>
<tr>
<td>Mozambique</td>
<td>5,628</td>
<td>633</td>
</tr>
<tr>
<td></td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Tanzania</td>
<td>2,932</td>
<td>2,932</td>
</tr>
<tr>
<td></td>
<td>10.4</td>
<td>10.4</td>
</tr>
<tr>
<td>Uganda</td>
<td>5,883</td>
<td>2,377</td>
</tr>
<tr>
<td></td>
<td>32.2</td>
<td>13.0</td>
</tr>
<tr>
<td>Zambia</td>
<td>6,044</td>
<td>2,782</td>
</tr>
<tr>
<td></td>
<td>29.6</td>
<td>13.6</td>
</tr>
</tbody>
</table>


Comparing the amount of central government debt of sampled countries for this study, Kenya dominated the pack with the highest proportion of 70.64 per cent in 2015. Tanzania had the lowest share of the sample debt at 8.14 per cent. On average, the share of each country’s domestic debt in the total sample debt was 50.65 per cent, 18.10 per cent, 8.14 per cent, 17.95 per cent and 17.50 per cent for Kenya, Mozambique, Tanzania, Uganda and Zambia respectively (OECD, 2015).

In terms of average maturity of government bonds in 2015, Kenya recorded the longest maturity of 5.3 years compared to Zambia’s 5 years, Tanzania’s 3.1 years and Uganda’s
1.6 years. In terms of residency of investors of government bonds, Kenya had the highest amount of local currency bonds owned by residents at US$ 10, 557 million in 2015, bonds owned by non-residents at US$ 137 million. Tanzania’s US$ 2, 932 million was owned by residents only (OECD, 2015).

1.2 Statement of the Problem

According to Yibin, Phelps & Stotsky (2013), domestic government bond markets in Sub-Saharan Africa (SSA) have been at the nascent stage of growth for a long time. Average government bond market capitalization as a percent of GDP in 2015 was 42.9 per cent in Asia, 41.1 per cent in Central Europe, 85.5 per cent in developed countries and 22.1 per cent in Latin America, compared to SSA’s 18.9 per cent. These statistics show that the domestic government bond market in SSA has been underdeveloped for a long time and there is need to focus on measures to enhance the growth of this market.

The trend of domestic Government bonds as a percent of GDP in selected countries in Eastern and Southern Africa region in Figure 1.1. above shows most countries in this region had small domestic government bond markets compared to countries like South Africa and Kenya, and that there has been a slow growth of the domestic government bond markets over the years in most countries, except South Africa. Although the study by Yibin, Phelps & Stotsky (2013) confirmed the growing importance of developing the domestic government bond markets in SSA, it did not focus on specific financial and structural drivers of government domestic bond market growth.

Ngugi and Agoti (2010) noted that majority of government bond markets in Africa are in their infant stage of development offering minimal alternative source of financing for Governments. They observed that highly liquid, efficient and less volatile market is preferred more as it facilitates greater participation by firms and investors, and that a key prerequisite for the development of corporate bonds market is the growth of the domestic government bond market. Their study concentrated on Kenya only and did not focus on specific financial and structural drivers of government domestic bond market growth.

According to Flood, Liechty & Piontek (2015), an under-developed domestic government bond market is illiquid and inefficient resulting in among others unmet financing needs of
Governments, weak fiscal independence compromising a country’s sovereignty, high cost and risk of lending and borrowing in the domestic market, overreliance on banking sector financing and lack of a benchmark for risk free investment.

Skeel (2010) and Thakor (2012) study showed that most studies in SSA have concentrated on the banking sector and stock markets with little focus on the domestic bond market. They also stated that most countries in Africa have been relying heavily on external financing mainly concessional loans and grants for funding capital spending and government deficits, with just a few countries having limited access to global capital markets. As African governments have been facing widening fiscal deficits and increasing infrastructure development budgets, fiscal challenges in the western world have been increasing significantly leading to reduced donor flows to Africa (World Bank Publications, 2012).

Developing the domestic government bond market is becoming a matter of priority for African governments to meet critical financing needs. Different research work by Kablan (2010) and Beck et al. (2011) observed that there was little attention on the development of the domestic Government bond markets in Africa with no deliberate reforms to foster its growth. Thupayagale (2015) studied the information efficiency in the 10-year Kenya government bond and observed that there has been little research focus on the growth of the domestic government bond market in Africa and around the world, with numerous studies concentrated on global equity markets with focus on assessment of weak form market efficiency. Thupayagale (2015) did not study specific financial and structural drivers of government domestic bond market growth.

Few studies on domestic government bond markets have been done for the Eastern and Southern Africa region. For instance, Bhattacharyay (2011) and Bae and Kee-Hong (2012) studied government and corporate bond markets in Asia. Most studies (including those done for Africa) focused on different measures of domestic government market growth such as bond market liquidity, for instance, Flood, Liechty & Piontek, (2015) and methodological approaches such as ordinary simple regression by Bhattacharyay (2011)
and Bae and Kee-Hong (2012) and descriptive analysis by Ngugi and Afande (2015). This study focuses on the domestic government bond market in Eastern and Southern Africa and makes use more rigorous panel Ordinary Least Squares (OLS) analysis.

It is important to determine important drivers of the growth of domestic government bond market as a key source of financing for governments and to promote development of the capital market. This study contributes to filling the research gaps in determining relevant drivers of domestic government bond market growth in five countries in Eastern and Southern Africa during the period from 2003 to 2015.

1.3 Objectives of the Study

1.3.1. General Objective

This study sought to assess the drivers of domestic government bond markets growth in selected Eastern and Southern countries in Africa.

1.3.2. Specific Objectives

i. To determine the impact of size of banking sector on domestic government bond market growth in Eastern and Southern Africa.

ii. To evaluate the effect of interest rate trend on domestic government bond market growth in Eastern and Southern Africa.

iii. To establish the effect of trade openness on domestic government bond market growth in Eastern and Southern Africa.

iv. To determine the size of the economy on domestic government bond market growth in Eastern and Southern Africa.

v. To evaluate the moderating effect of fiscal balance on the relationship between drivers and domestic government bond market growth in Eastern and Southern Africa.
1.4 Research Hypothesis

The following null hypotheses were tested:

H₀₁: Size of banking sector does not have significant effect on the growth of domestic government bond market in Eastern and Southern Africa.

H₀₂: Interest rate trend does not have significant effect on the growth of domestic government bond market in Eastern and Southern Africa.

H₀₃: Trade openness does not have significant effect on the growth of the domestic government bond market in Eastern and Southern Africa.

H₀₄: Size of the economy does not have significant effect on the growth of the domestic government bond market in Eastern and Southern Africa.

H₀₅: Fiscal balance does not have significant moderating effect on the relationship between drivers and domestic government bond market growth in Eastern and Southern Africa.

1.5 Significance of the Study

The financial sector (including financial markets) is the engine oil of every economy around the world (Wong, Gilley & Gonzalez, 2015). At national level, this study is relevant to countries’ medium-long term development goals such as Kenya’s economic development blue print ‘Vision 2030’. The economic pillar of Vision 2030 promotes financial sector development and prudent public finance management to support economic growth. Governments are critical in supporting the growth of the domestic capital market through prudent monetary and fiscal (public finance) management policies (World Bank Publications, 2012). On fiscal policy, most SSA countries conduct Public Debt Sustainability Analysis (DSA) and manage their public debt under the Medium Term Debt Strategy (MTDS) framework (IMF, 2014). In addition to providing insights on the drivers of domestic government bond market growth, this study was meant to inform policy makers and stakeholders in public financial management circles and the financial sector on the effectiveness of PDM reforms that are in place and perhaps provide impetus for enhanced implementation of pending reforms to achieve positive outcomes. The study also targeted at offering useful lessons for other countries in Africa.
Different stakeholders stand to gain from a developed domestic government bond market. The Government as the issuer of securities benefits from the bond market as a reliable financing source to meet budgetary deficits and support economic growth. The Government enhances its fiscal independence and country sovereignty as cost and risk of domestic market financing reduced (IMF, 2014). As government bond market provides benchmark for risk free investment, the corporate sector and the market at large benefits from increased investment options and diversified instruments, better pricing mechanism and financial intermediation (Kablan, 2010). The market also benefits from reduced reliance on banking sector financing as corporate institutions issue bonds instruments to raise capital for their projects backed by their balance sheets. Countries benefit from enhanced economic growth resulting from liquid and efficient bond market as it supports financial sector growth which is the engine of the economy (Loon & Zhang, 2016).

1.6 Scope of the Study

The scope of this thesis is to determine the effect of the financial and structural drivers of the growth of domestic government bond markets in Kenya, Tanzania, Uganda, Zambia and Mozambique during the period 2003-2015. Various financial and structural drivers of government bond market growth was studied. The study concentrated on domestic Government bond markets because there is little data available on the corporate bond markets in Africa. Before 1996, 33 countries in Sub-Saharan Africa (SSA) were categorized as heavily indebted poor countries (HIPC). The Multilateral Debt Relief Initiative (MDRI) together with bilateral debt cancellation arrangements which begun in 1996 improved external debt situation resulting in significant reduction in external debt among most countries. To further reduce external indebtedness, most countries resorted to domestic financing by putting deliberate measures to develop their local government debt markets. The five countries chosen from 21 countries (Appendix 1) in Eastern and Southern Africa begun to implement key reforms to strengthen the growth of their domestic Government bond markets in the year 2000 and continued to do so during the period covered by this study (2003 – 2015). These reforms include prudent PDM, sustained issuance of Government bonds, promoting growth of the financial sector
through proper legal and regulatory frameworks and proper market institutions, and fostering existence of a favorable macroeconomic environment.

Other market reforms involve development of benchmark government bonds, adoption of digital platforms such as electronic auctions and Automated Trading System (ATS) and modernization of Central Securities Depositories (CSDs) through dematerialization of securities among others. In addition to deliberate initiatives to develop the bond market, these countries have adequate data on the variables to be considered in this study. The period of this study from the year 2003 to 2015 is the reform period during which the implementation of initiatives to develop the domestic government bond markets has been active, with data updates for most variables in this study available up to 2015.

1.7 Limitations of the Study
The five countries identified for this study were purposively chosen because in addition to data availability, these countries begun reforms to strengthen the growth of their domestic Government bond markets since 2000 and continued to do so during the period covered by this study. Other countries in Eastern and Southern Africa were not studied because of lack of comparable data across countries. Lack of data on the corporate bonds market limited the study to the assessment of domestic government bond markets. There is generally lack of centralized database on the area of bonds or bond markets particularly on corporate bonds. Due to data availability limitations and to mitigate negative findings, this study did not include the corporate bond market and only focused on the domestic government bond market in Eastern and Southern African countries which had implemented or were in the process of implementing reforms to strengthen the growth of their domestic Government bond markets.

1.8 Organization of the Study
This thesis is structured as follows: the foregoing Chapter One provides the background, research objectives, study significance, scope, and limitations. Chapter Two presents a literature review on drivers of domestic government bond market growth as well as a
conceptual framework, Chapter Three presents the study methodology, Chapter Four presents the Research Findings and Discussions while Chapter Five presents the Summary and Recommendations of the study.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction
Literature review is an examination of research work by other researchers, scholars and academicians which provides the scholarly background needed for the subject under study. The main aim of literature review is to determine what has been done already related to the research problem being studied. This chapter adopts a theoretical and empirical review approach, beginning with the theories guiding this study and proceeds to discuss empirical research in terms of financial and structural effects of bond market growth. A summary of the literature review and the conceptual framework are presented at the end of this chapter.

2.2 Theoretical Literature Review
The development of the domestic government market is important because it ensures liquidity in the market which sustains financial system equilibrium within an economy (Vayanos & Wang, 2012). Financial system equilibrium through the debt market entails firms’ financing choices, factors influencing these choices and the effect of choices on the rest of the economy (Bao, Pan & Wang, 2011). In determining the financial and structural drivers of domestic government bond market growth, this study combines six theories namely; functional finance theory, efficient market hypothesis theory, interest rate structure theory, liquidity preference theory, expectations hypothesis theory and comparative advantage theory.

2.2.1 Functional Finance Theory
Lerner (1937) proposed the functional finance theory asserts that in order to meet its explicit goals including ensuring economic growth, achieving low inflation and full employment, government should finance itself. Among the principles of this theory is that government has to intervene in the local as well as the global economy with key economic objective of ensuring a prosperous economy; fiscal policy should focus on impact on the economy, budget managed appropriately with emphasis on prosperity;
government’s desired level of activity should be used to set amount and pace of spending; and sound finance principles are not relevant to sovereign states which can issue money but to individuals, households, businesses, and non-sovereign governments.

Important rules for fiscal policy include that the government should maintain and sustain a reasonable demand level ensuring to reduce taxes or increase spending when there is little spending resulting in unemployment. With excessive spending, the government should reduce expenditures or increase taxes to manage inflation. To maintain interest rates that encourage optimum investment, the government should engage in public borrowing to raise interest rates and lend or repay debt to lower interest rates (Lerner, 1937).

The government may also print money sound public finance, limiting the national debt or balancing the budget is not feasible. This theory supports a number of variables in this study such as fiscal balance, size of the economy, size of the banking sector, trade openness because these variables are channels through which government ensures economic prosperity by intervening in the domestic as well as in global markets (Saito, Savoia & Fama, 2013). The fiscal policy that a government puts in place affects the growth of domestic government bond market. In this study, this theory supports the hypotheses the effect of fiscal balance on domestic government bond market growth. Fiscal balance is about government’s fiscal policy and financing needs while size of economy relates to proper economic management to achieve growth (Lerner, 1937).

2.2.2 Interest Rate Structure Theory
According to (Malkiel, 1966), investors of bonds are exposed to a number of risks such as default or credit risk, interest rate risk, inflation risk, political risk and currency or exchange rate risk. On the other hand, issuers of bonds are exposed to most of these risks with opposite potential impact of risk. The general assessment of all these risk factors by different participants of the market is reflected by the interest rate structure at given periods in time. The behavior or pattern of interest rates on bonds of different maturities
at a given point in time is the term structure of interest rates which is used to explain the links between real economic activity and monetary policy as well as the structure of prices on fixed income securities (Malkiel, 1966).

Through monetary policy, central banks mainly control the short term instruments market while real economic activity represented by firms’ investment behavior is related to long-term interest rates (Malkiel, 1966). This theory supports interest rate trend variable in this study which is related to bond holder’s risk and represents the general assessment of risk by bond investors as reflected in the interest rate structure at given periods in time.

2.2.3 Economic Growth Theory

The Law of Increasing State Activity proposed by Wagner (1890), relates to rise in national Government expenditure and states that activities and functions of the government increase as the economy develops over time. Comparison of different countries and times show increased activity by the government constantly and efficiently undertaking old and new functions, thus fulfilling economic needs of the people to some level of satisfaction. Increase in economic activities leads to increase in expenditure of government as the economy develops and this varies from country to country. As per capital income of an economy grows, public expenditure is increased due to government’s need to maintain law and order as urban centers grow and associated social crimes increase (Wagner, 1883).

Public spending plays an important role in economic development as it promotes the growth of financial sector markets and the external sector through international trade, provide development infrastructure, influence course and distribution of its benefits of economic growth and provide social services to meet basic needs of the citizens (World Bank, 2008). The main task of the government is to accelerate the pace of economic growth and development. Government spends sums of money to achieve the objectives contained in its economic plan including programmes to promote the development of the domestic financial market. The government invests in other sectors such as industry and commerce and agriculture to stimulate economic development (Wagner, 1883).
This theory supports the research hypothesis on the effect of size of the economy and openness of trade on domestic government bond market growth. Trade openness among countries has a bearing on the growth of financial markets, and that of domestic (and regional) government bond markets by extension.

2.2.4 Liquidity Preference Theory

Liquidity preference is preference for holding financial wealth in the form of short-term, highly liquid assets rather than long-term illiquid assets, based principally on the fear that long-term assets will lose capital value over time. The liquidity preference theory was advanced by John Maynard Keynes (1936) as he explained the determination of the interest rate by the supply and demand for money. The demand for money as an asset depends on the interest foregone by not holding bonds (or other less liquid assets). According to Keynes (1936), interest rate is a reward for parting with cash (liquidity) as investors put money in less liquid assets. Interest rate is not a reward for savings. Money is the most liquid asset and therefore any other asset that is convertible into money more quickly and easily is said to be liquid.

There are three motives that determine demand for liquidity. First is the transactions motive where individuals and households prefer to have liquidity to assure basic transactions because income is not constantly available. The level of income therefore determines the amount of liquidity demanded thus the higher the income, the more money demanded for carrying out more spending. Secondly, under the precautionary motive, households prefer liquidity to cater for unexpected social problems that bring unusual costs. As income rises, the amount of money demanded for this purpose also increases. Finally, speculative motive is where households retain liquidity for speculative purposes in the market such as that bond prices will fall. As the interest rate decreases there is demand for more money to hold onto until the interest rate rises. This would drive down the price of an existing bond so that its yield is consistent with the interest rate. The lower the interest rate, the more money is demanded and the higher the interest rate, the less demand for money (Keynes, 1936).
Liquidity is one of the key characteristics of the growth of a bond market that affect yields of bonds. Other major factors are interest-rate expectations, the term premium and credit risk (Vayanos, Dimitri & JiangWang, 2012). This is because, for risk-averse investors to be compensated for possible losses arising from increases in interest rates which increase with bond duration, they demand a risk premium (term premium) for investments in long-term bonds. The spread of longer maturity bond yields compared to shorter maturity bond yields results in a positive term spread regardless of whether the market expects an increasing and decreasing interest rates environment (Wong, Gilley and Gonzalez, 2015). According to Trebbi & Xiao (2016), credit risk refers to the risk of loss arising from failure of counterparty to a contract to perform according to a contractual arrangement. Example is loss due to a default by a borrower. Credit-risk premium is the spread between the yield of a credit-risk free bond and the yield of a bond with similar characteristics but with credit risk. Globally, credit risk of bonds and issuers of bonds are assigned by rating agencies such as Moody’s, Standard & Poor’s, and Fitch.

According to Kyle (1985), liquidity has three dimensions. First is tightness which refers to a low bid–ask spread which is the cost of turning around a position during a short period. Second, depth where a market is said to be deep if the impact on prices of securities is only due to large buy or sell orders. Third, resilience which refers to ability of the market prices to reflect fundamental values and where there are shocks, quickly return to fundamental values. Liquidity premium refers to the yield spread between a liquid bond and a similar but less liquid bond. In this study, this theory supports the hypotheses on effect of interest rate trend and size of banking sector on domestic government bond market growth.

2.2.5 Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis was developed by Eugene Fama (1970) and states that asset prices fully reflect all available information, that is, shares always trade at their fair value, making it impossible for investors to either buy undervalued stocks or sell at overvalued prices. On a risk-adjusted basis, it is impossible to consistently outperform the
overall market based on expert stock selection or market timing because market prices should only react to new information. The only way investors can possibly obtain higher returns is by chance or by buying riskier investments. A study by Fama and French (2012) confirmed the EMH by observing that the distribution of abnormal returns of mutual funds in the USA was very similar to the expected distribution where fund managers had no skill to undertake expert selection analysis.

Fama (1970) identified three forms of the EMH. Firstly, the weak form asserts that prices on traded financial assets already reflect all past publicly available information. Secondly, the semi-strong form is where prices of securities reflect all publicly available information and instantly change to reflect new public information. Share prices adjust very rapidly to new public information and in an unbiased fashion that no excess returns can be earned by trading on that information even with fundamental or technical analyses. Finally, the strong form of the EMH asserts that prices instantly reflect new public information and even hidden private or "insider" information.

Tests on weak EMH have concentrated on random walk analysis and momentum effect where prices of securities are studied over a period of time to establish repeat behavior (Thupayagale, 2015). The momentum strategy is based on past prices or returns and produces strong evidence against weak-form market efficiency. These outcomes have been observed in the stock returns of most countries, in industry returns, and in national equity market indices (Thupayagale, 2015). To test for semi-strong-form efficiency, event analysis is undertaken where there must be reasonable and instantaneous adjustments to previously unknown news. If there are consistent upward or downward adjustments observed after the initial change, it would suggest that investors had interpreted the information in a biased fashion and inefficient manner (Skeel, 2010). Strong-form efficiency test requires that a market where investors cannot consistently earn excess returns over a long period of time is in existence. Such tests have showed that a normal distribution of returns (as efficiency predicts) only produces few star performers among hundreds of thousands of fund managers worldwide (Marques & Gelos, 2016). This theory
supports the hypotheses on the effect of interest rate trend on the growth of domestic government bond market because the interest rate structure is determined by the level of information investors have in pricing financial instruments at points in time.

2.3 Empirical Literature Review

2.3.1 Size of Banking Sector and Domestic Government Bond Market Growth
Larger and liquid domestic bond markets are encouraged where large financial systems exist. Among financial drivers of the growth of bond markets is huge size of marketable domestic government bonds, privatization of pension sector, domestic credit (size of banking sector) (Vayanos, Dimitri & JiangWang 2012). Hu, Pan & Wang (2012) identified key financial market/sector drivers of bond market development including banking sector information availability (credit information- credit bureaus and shareholder information disclosure), degree of development of stock market in terms of size (measured by market turnover) and efficiency, and importance of institutional investors (such as pension schemes and insurance firms), as well as size and sector classification of listed firms.

Bae and Kee-Hong (2012) found that banking sector concentration negatively and significantly affected the growth of bond markets. The need to do away with sources of emerging market risks feeds into institutional structure factors that influence the degree of financial markets development. Such risks include weak and ineffective prudential oversight mechanisms, non-transparent supervisory practices (in terms of transactions in banking and capital markets) and fragile institutional infrastructure (Foucault, Pagano & Roell, 2013).

Bhattacharyay (2011) in his study on Asian bond markets found out that size of banking sector was a major determinant of bond market development in Asia. Small and underdeveloped bond markets in Asia led to over dependence on commercial banks for domestic financing which was part of the reasons behind the financial crisis in 1997. The global financial crisis witnessed in 2008 brought with it constraints in acquisition of local
and foreign currency liquidity as massive withdrawal of investments in Asia by foreign banks took place. Bond markets are important channels for funding long term infrastructure projects as well as other productive investment from local and regional capital. Dick-Nielsen et.al, (2012) identified key prerequisite requirements for government bond market growth such as full banking sector reformation after a financial crisis and advancement of regional bond market centers.

Recent market developments such as change of business models by banks have contributed to unpredictable market liquidity hence affecting the growth of bond markets (Vayanos & Wang, 2012). A number of factors affect market liquidity and resilience including the risk appetite of investors, funding constraints, market risks faced by intermediaries, cost of information search and investor characteristics. Financial intermediaries do face market risks that affect their ability to take advantage of arbitrage opportunities and correct mispricing of assets as well provide liquidity services. The speed with which buyers and sellers can find each other is influenced by information search costs while investor characteristics and behavior also have influence on bond market liquidity. Reduced market making has a negative effect on market liquidity, as much as it contributes to higher returns as they invest in risky and less-liquid bonds.

Marques and Gelos (2016) found out that the introduction of electronic trading platforms and changes in the investor base (diversification from banks) have likely increased bond liquidity risk. The growing concentration of holdings of bonds among mutual funds, pension funds, and insurance companies, has resulted in less resilient bond market liquidity. Posner and Weyl (2013) found out that economies that heavily rely on the banking sector for domestic financing, risk a financial crisis situation due to banking system instability resulting from systemic risks that may kill critical economic and investment projects thus reducing aggregate demand.

Ngugi and Afande (2015) pointed that encouraging effective banking and financial systems was an important intervention in enhancing capital funding by the corporate sector from the bond market in Kenya. Their study also recommended policies geared
towards strengthening the market structure and infrastructure in promoting the growth of both government and corporate bond markets in the domestic market.

### 2.3.2 Interest Rate Trend and Domestic Government Bond Market Growth

Interest rate is the price of money at points in time (Bae, 2012). Interest rate trend refers to the movements of the interest rate during a specific period of time or at points in time. According to Thupayagale (2015), a few studies have sought to determine existence, magnitude and investment implications of long memory in bond interest rates and yield spreads. Numerous studies that present evidence for and against efficiency in financial markets have concentrated on global equity markets with little research on fixed income markets, mostly limited to developed markets. In Africa, South Africa’s domestic 10-year bond has shown evidence of liquidity.

On Kenya’s 10-year bond yield changes and volatility, Thupayagale (2015) showed statistical significance of long memory parameters suggesting that bond yield changes and volatility represented an important description of Kenya’s bond market liquidity. There was evidence of long memory during the entire sample period as well as the period after reforms. These findings indicated that even with the implementation of market development reforms, Kenya’s domestic bond market remained illiquid and inefficient. But, worth noting is the smaller size of post reform period long memory parameters, shedding some light that some good progress had been made and that strengthening of market reforms still needed to be considered as a matter of priority.

Cochrane (2014) identified maturity structure of bonds as an important factor for the growth of the domestic bond market. Maturity structure affects bond yields as short term instruments are associated with rollover risk where government has to frequently rollover maturing securities leading to increases in interest rates for bonds as investors seek better returns resulting in higher bond service costs. Frequent increases in interest rates has the potential to discourage investment in long term bonds because market confidence gets eroded and the yield curve rises towards the longer end (BIS,2015). The government would seek to balance the maturity of domestic instruments with focus on medium and long term securities in order to minimize refinancing costs and risks associated with short
term instruments as well as bonds service costs associated with high interest payments for bonds. But also ensure that the choice of maturity structure matches the maturity of short to long term capital expenditures of the government. Medium to long term bonds are important to various classes of investors aiming to match assets and liabilities (Dudley, 2015).

Bao, Pan and Wang (2011) found out that where the market is ready to take up short, medium and long term instruments, the government is able to attract a diversified investor base but must promote market development initiatives that enhance competition to minimize volatility of market yields resulting in a normal yield curve, thereby lowering bonds service costs associated with long term bonds. The length of maturity of government securities is an indicator of the degree of market development and although a longer maturity profile of government bonds is preferable, the market may not take up long term instruments especially if the country is on the verge of a macroeconomic instability and does not have an elaborate savings or mutual funds sector which would ordinarily seek investments with long term horizon (CGFS, 2014).

Economic growth with interest rate volatility showed negative and significant relationship with bond market growth in a study of 41 countries chosen from among developing and developed economies but focusing on emerging Asia by Bhattacharyay (2011). Negative and significant macroeconomic variables were GDP per capita at purchasing power parity, exchange rate volatility, and the fiscal balance. According to Ngugi and Afande (2015), a well-functioning money market enhances the liquidity of the bond market particularly as a precursor to an active secondary bond market and this is important for promoting market liquidity, efficiency and minimal volatility with diverse risk preference. Another study by Nyongesa (2012) used multivariate OLS model on time series data to determine the factors that influence liquidity in Kenya's secondary bond market. The results showed that significant factors for bond market liquidity included behavior of interest rates such as savings rate and bank lending rate. One of key policy recommendations was to have in place appropriate and prudent fiscal and monetary
policies to manage the volatility of interest rates to support government bond market growth.

2.3.3 Trade Openness and Domestic Government Bond Market Growth
Bessembinder et al., (2016) identified size of the country and openness of trade as important determinants of government bond market development. Bhattacharyay (2011) identified trade openness as a positive and significant determinant of Government bond market growth but negative and significant variables were GDP per capita at purchasing power parity, exchange rate volatility, and the fiscal balance. Country macroeconomic fundamentals such as terms of trade and net foreign assets were among certain significant explanatory variables that explain differences in bond spreads across emerging market countries (Bao et al., 2011). In a study by Yibin, Phelps and Stotsky (2013), macroeconomic environment systematically influences the level of volatility of bond spreads. Trade openness had a negative relationship with bond market development, with interest rate volatility relating positively.

According to Flood, Liechty, and Piontek, (2015), a country’s trade policy may promote or hinder the growth of its domestic government bond markets. A liquid government domestic bond market reduces the dependence on external sources of finance, that have foreign exchange risk arising from trade with other countries, and encourages the development of the corporate bond market by providing a pricing benchmark for corporate instruments as well as providing a tool for management of interest rate risk.

Bao et al., (2011) identified certain significant variables that explain differences in bond spreads across emerging market countries. Among these variables were country macroeconomic fundamentals such as terms of trade with other countries, inflation rate, liquidity and solvency of the economy measured by bonds-to-GDP ratio, international reserves-to-GDP ratio and net foreign assets.

According to Bhattacharyay (2011), the existence of favorable macroeconomic environment that promotes international trade with other countries is important to support
domestic investment and development of the government bond market. This entails majorly putting in place proper macroeconomic and trade policies that promote low inflation, stable prices (including prices of goods and services, the exchange rate, and interest rates), and enhanced revenue collection through fair tax policy among others.

There is strong rationale for governments to engage in public borrowing to finance rising expenditures on public goods and services for economic growth and better social welfare, achieve set economic development blue prints that require massive resources to implement whilst ordinary revenues are inadequate, external financing sources are unreliable where unpredictable disbursements and stringent financing terms call for home-grown solutions to budgetary financing, and to promote private sector financing as well as to support effective monetary policy operations (Yibin, PhelpS & Stotsky, 2013).

2.3.4 Size of the Economy and Domestic Government Bond Market Growth
As Posner and Weyl (2013) found out, the growth of bond markets relative to growth of the banking sector lags behind the growth of the economy. In addition, the expected costs and risks of bond service depends on choice of new bond issuance which is in turn dependent on the structure of the economy, investor preferences and nature of shocks on the economy.

Huge GDP per capita at purchasing power parity together with, exchange rate volatility and fiscal balance were found to have negative and significant influence on government bond market development (Bhattacharyay, 2011). Larger domestic bond markets are encouraged where certain conditions such as large economies exist (Vayanos, Dimitri & JiangWang, 2012). Hu, Pan and Wang (2012) in their study on liquidity of bond markets around the world found that size of the economy, among other variables was important for the growth of the government bond market. Other variables included inflation rate, government deficit and ease of foreign investment.

2.3.5 Fiscal Balance and Domestic Government Bond Market Growth
The difference between revenues and expenditure in the government’s financial budget is referred as the fiscal balance which can be positive (surplus) or negative (deficit). Large stock of government bonds to GDP is an important determinant of bond market development (World Bank Publications, 2012). This indicator would largely be determined by the size of the fiscal deficit that a government runs during a given financial year. A small fiscal deficit would imply less financing requirements hence less issuance of government bonds while a huge deficit would provide room for more issuance of bonds as a result of increased financing needs by the government (Hu, Pan & Wang, 2012).

According to Bhattacharyay (2011), low government financing needs (fiscal balance) negatively and significantly influenced the growth of government bond market while important promoters of bond market growth included exchange rate stability and capital openness. On the contrary, Vayanos, Dimitri and JiangWang (2012) found out that low fiscal burden encourages larger domestic bond markets. Hu, Pan and Wang (2012) found that government budget deficit, among other variables was important for the growth of the government bond market. A country should focus to reduce variability in its primary balance to avert a potential fiscal crisis.

Yibin, Phelps and Stotsky (2013) found that fiscal balance had a negative relationship with bond market development, while interest rate volatility presented a positive relationship. In Kenya, Nyongesa (2012) studied the determinants of liquidity in secondary bond market and found that the level of public domestic debt significantly and positively affected bond market liquidity.

2.4 Summary of Literature Review

The forgoing literature review presents important drivers of the growth of the domestic Government bond market as shown in Table 2.1.
Table 2.1: Summary of Empirical Literature Review

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title (Focus of study)</th>
<th>Findings</th>
<th>Research gaps</th>
<th>Focus of current study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhattacharyay</td>
<td>Bond Market Development in Asia: An Empirical Analysis of Major Determinants</td>
<td>Low inflation, stable exchange rates, low and stable interest rates, large and developed banking sector, pension sector reforms, importance of institutional investors, fiscal balance with high deficits, risk based approach to public debt management, diversified and deep investor base</td>
<td>Study analyzed both government and corporate bond markets in Asia, hence did not concentrate or focus deeply on either market</td>
<td>This study focuses on the domestic government bond market in Eastern and Southern Africa and provides more specific recommendations for this particular segment of the bond market</td>
</tr>
<tr>
<td>Bae and Kee-Hong</td>
<td>Bond Market Liquidity in Asia – Theory and Empirical Evidence</td>
<td>Economic development, structure of the economy, strong investment environment, enhanced transparency and regulation, firm investor protection, large size of the banking sector, and regional approach to bond market development</td>
<td>Study focused on bond market liquidity at secondary market in Asia</td>
<td>This study focuses on the growth of primary market for domestic government bonds in Eastern and Southern Africa</td>
</tr>
<tr>
<td>Yibin, Phelps and Stotsky</td>
<td>Bond Markets in Africa</td>
<td>Interest rate volatility, English legal systems based on civil law, strong regulatory framework</td>
<td>Study analyzed both government and corporate bond markets in SSA, hence did not concentrate on either market deeply</td>
<td>This study focuses more on the domestic government bond market in Eastern and Southern Africa and provide more specific recommendations for this particular market</td>
</tr>
</tbody>
</table>

This study makes use more rigorous panel OLS analysis.
<table>
<thead>
<tr>
<th>Source</th>
<th>Title</th>
<th>Findings/Methodology</th>
<th>Focus/Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood, Liechty, and Piontek</td>
<td>System-wide Commonalities in Bond Market Liquidity</td>
<td>Low country risk, positive investment environment and large size of the market, mix of local and foreign investors, strong legal and regulatory framework.</td>
<td>Study concentrated on financial market variables only and focused on bond market liquidity, a different measure of bond market growth</td>
</tr>
<tr>
<td>Thupayagale</td>
<td>Fixed Income Market Efficiency: Evidence from Kenya’s 10-Year Local Currency Bond</td>
<td>Kenya’s local currency bond market remains inefficient despite implementation of financial market reforms. Evidence of long memory in volatility of bond yield changes</td>
<td>Study focused on the 10-year bond yield only whereas other bond tenors have been issued in Kenya, Study analyzed long memory of bond yields using ARFIMA-FIGARCH model</td>
</tr>
<tr>
<td>Nyongesa</td>
<td>Factors that influence liquidity in Kenya's secondary bond market</td>
<td>Behavior of interest rates such as savings rate and bank lending rate</td>
<td>Study focused on bond liquidity at secondary market in Kenya. Liquidity is a measure of bond market growth.</td>
</tr>
<tr>
<td>Ngugi and Afande</td>
<td>Raising Finance in the Kenyan Bond Market (A Case of Listed Companies on the Nairobi Stock Exchange)</td>
<td>Sound and prudent macroeconomic and fiscal and debt management policies, credible and stable macroeconomic environment, diversified investor base</td>
<td>Study focused on corporate bond market in Kenya and used descriptive statistics in the analysis of data</td>
</tr>
<tr>
<td>Ngugi and Agoti</td>
<td>Microstructure Elements of the Bonds Market in Kenya</td>
<td>Issuance of longer tenor bonds, instrument diversification, information dissemination, automation of market operations</td>
<td>Study focused on microstructure or institutional elements of the bond market in Kenya</td>
</tr>
</tbody>
</table>
2.5 Conceptual Framework
The conceptual framework in figure 2.1 shows the relationship between size of banking sector, interest rate trend, trade openness and size of the economy (independent variables), fiscal balance (moderating variable) and Government bond market growth (dependent variable) in ESA. The study therefore seeks to determine the effect of independent variables and moderating variable dynamics on the dependent variable.

Figure 2.1: Conceptual Framework

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Moderating Variable</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of banking sector</td>
<td>Fiscal balance</td>
<td>Government Bond Market</td>
</tr>
<tr>
<td>- Bank industry credit/GDP</td>
<td>- Budget surplus or deficit/GDP</td>
<td>Growth</td>
</tr>
<tr>
<td>Interest rate trend</td>
<td>H₀₁</td>
<td></td>
</tr>
<tr>
<td>- Nominal T-bill rate</td>
<td>H₀₂</td>
<td></td>
</tr>
<tr>
<td>Trade Openness</td>
<td>H₀₃</td>
<td></td>
</tr>
<tr>
<td>- Total Exports/GDP</td>
<td>H₀₄</td>
<td></td>
</tr>
<tr>
<td>Size of the economy</td>
<td>H₀₅</td>
<td></td>
</tr>
<tr>
<td>- GDP PPP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author, 2018
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction
This Chapter discusses the methodology that was used in gathering data, analyzing the data and translating the data into meaningful information. The chapter contains sections on the research philosophy, research design, target population, sampling design, data collection, data analysis, measurement of variables, empirical model, diagnostic tests and ethical considerations for the study.

3.2 Research Philosophy
This study was based on one of the research philosophies known as positivism which aims to mirror scientific method and uses deductive reasoning, empirical evidence and hypothesis testing. The type of data involved in this philosophy is numeric and quantitative, involves larger sample sets and surveys based on scientific methods (Cooper & Schindler, 2006). Whilst the ontology under this philosophy is that the world is objective and independent of our subjective experience, the epistemology postulates that the world is knowable, and that this knowledge is communicable between agents (Mugenda & Mugenda, 2003). The philosophy of positivism is used in this study because observations of variable trends are independent with no human interest; explanations demonstrate causality; generalization was through statistical probability; research progressed through hypotheses and deductions; concepts were operationalized for purpose of measurement and study involved simplification of units of analysis (Sekaran & Bougie, 2010).

3.3 Research Design
This study employed descriptive research design. Descriptive design is a systematic empirical inquiry where observations on the variables have already occurred and the researcher does not have direct control on them (Mugenda & Mugenda, 2003). This design involves building a profile on what, why, where, when and how a phenomenon takes place (Sekaran, 2010). Descriptive research design is relevant to this study because
it involves quantitative variables which were observed for the sampled elements over a period of time in the past and study seeks to build a profile about the impact of the drivers of domestic government bond market growth.

### 3.4 Empirical Model

Inference analysis aimed to identify significant variables that influence government bond market growth through panel ordinary Least Squares (OLS) regression. Panel regression analysis was used in line with modeling by Yibin, Phelps and Stotsky (2013) who included fixed effects estimation and accounted for both time-variant as well as time invariant effects. Panel models provide more insight than pure time series and pure cross section data models because they offer theoretical possibility of isolating effects of specific elements in the sample (Hsiao, 2007). Panel analysis also captures heterogeneity among variables and sample elements.

The model used in this study was developed from Solow’s economic growth model which considers capital and labour as factors influencing productivity. The model assumes that there is single good produced in the economy, which is consumed and saved and that a given part of income is consumed while the rest is saved. However, saving will be equal to investment with the assumption that the economy is a closed (Osewe, 2013). The model was as shown below;

\[ Y = F(K, L) \]

Where

- Y represents Production
- K represents Capital
- L represents Labour

This is because Solow’s growth model analyses long-term economic growth. Modifications to the above model yielded the general model shown below:

\[ GBC = f(BS, IRT, TO, SE, FB) \]

As variables are time series, GBC was explained by the explanatory variables through a multivariate statistical model that was fitted to analyze the variables as shown below;
\[ GBC_{i,t} = \beta_o + \beta_1 BS_{i,t} + \beta_2 IRT_{i,t} + \beta_3 TO_{i,t} + \beta_4 SE_{i,t} + \epsilon_{i,t} \]  \hspace{1cm} \text{(3.2)}

Where:

- \( GBC_{i,t} \)  Government bond market capitalization as a ratio of GDP for country \( i \) in time \( t \).
- \( \beta_{i,t} \) represents the vector of estimated coefficients of different explanatory variables in country \( i \) at time \( t \).
- \( BS \)  Size of the banking sector as a ratio of GDP for country \( i \) in time \( t \).
- \( IRT \)  Interest rate trend (trend of T-bill rate) for country \( i \) in time \( t \).
- \( TO \)  Trade openness (exports as a ratio of GDP) for country \( i \) in time \( t \).
- \( SE \)  Size of the economy (GDP PPP) for country \( i \) in time \( t \).
- \( \epsilon_{i,t} \) is the error term in time \( t \).

Model 3 includes the moderating variable (fiscal balance) to account for the effect of other independent variables on GBC.

\[ GBC_{i,t} = \beta_o + \beta_1 BS_{i,t} + \beta_2 IRT_{i,t} + \beta_3 TO_{i,t} + \beta_4 SE_{i,t} + \beta_5 FB_{i,t} + \epsilon_{i,t} \]  \hspace{1cm} \text{(3.3)}

Where

- \( FB \)  Fiscal balance (budget deficit as ratio of GDP) for country \( i \) in time \( t \).

### 3.5 Target Population

A study population is the collection of all the elements or cases which a researcher wishes to make inferences about (Cooper & Schindler, 2007). A population may also be defined as the entire group of cases, events or objects with a common observable characteristic or that meet a criterion that needs to be included in a particular study (Mugenda & Mugenda, 2003). The target population of this study was 21 countries that comprise the Eastern and Southern region in Africa.

### 3.6 Sampling Design

Purposive sampling was used to pick five (namely Kenya, Uganda, Tanzania, Zambia and Mozambique) out of the 21 countries in the population. This sampling technique was chosen because it involved a non-probability sample that was selected based on characteristics of a population and the objective of the study (Sekaran, 2010). For this
study, the aim was to pick countries that took deliberate measures to implement key reforms to strengthen the growth of their domestic Government bond markets during the period from 2003 to 2015. In addition to deliberate initiatives to develop the bond market, these countries had adequate data on the variables considered in this study. Other countries in the population did not have adequate data on the variables in this study. The period from the year 2003 constitutes the beginning of the reform period during the implementation of initiatives to develop the domestic government bond markets, with complete data on the variables updated up to 2015.

3.7 Data Collection Instrument
The researcher used MS Excel to tabulate a panel of data series on the variables and countries studied covering the period from 2003 to 2015.

3.8 Data Collection Procedure
The study exclusively utilized annual secondary data covering the year 2003 to 2015 from different standard databases. Data on government bond market growth was collected from the African Statistical Year book of the OECD and measured as Government bond capitalization as a ratio of GDP. Data on size of banking sector, size of economy and fiscal balance was collected from the World Development Indicators (WDI) of the World Bank. Trade openness was drawn from the International Financial Statistics of the IMF. Data collected from standard secondary sources has higher accuracy compared to survey data involving manual process. Secondary data is also cost effective, valid and reliable.

3.9 Data Analysis and Presentation
Data analysis involved different levels of assessment; exploratory analysis where descriptive statistics were used to understand the messages in the data while inferential analysis was used to identify relationships among the variables and for measurement of relationships between particular variables. In the assessment of causal relationship and testing hypothesis of association, linear regression analysis was used to establish statistical significance of the independent variables (size of banking sector, interest rate trend, trade openness, size of economy and fiscal balance) on the dependent variable
(domestic government bond market capitalization). The dependent variable (government bond market growth) was denoted as \((GBC_{i,t})\) and measured as a ratio Government bond capitalization to GDP for country \(i\) at time \(t\).

The independent variables, size of banking sector (denoted as \(BS_{i,t}\)) was measured as a ratio of banking sector credit to GDP for country \(i\) at time \(t\); interest rate trend (denoted as \(IRT_{i,t}\)) measured as lending interest rate minus risk premium on lending for country \(i\) at time \(t\); size of economy (denoted as \(SO_{i,t}\)) measured as GDP at current prices for country \(i\) at time \(t\) while fiscal balance (denoted as \(FB_{i,t}\)) was measured as proportion of government budget cash surplus/deficit to GDP for country \(i\) at time \(t\). Trade openness (denoted as \(TO_{i,t}\)) was measured as a ratio of exports of goods and services to GDP for country \(i\) at time \(t\). Data analysis and presentation of findings was conducted in E-view 8 which is a powerful statistical tool for data analysis and econometric modeling.

3.9.1 Measurement of Study Variables

The operationalization and measurement of the dependent variable (government bond capitalization) and the independent variables (size of banking sector, interest rate trend, trade openness, size of economy and fiscal balance) is shown in Table 3.1.
### Table 3.9.1: Measurement of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operationalization</th>
<th>Measurement</th>
<th>Hypothesis Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government bond market growth</td>
<td>Government bond capitalization or stock of marketable debt</td>
<td>Ratio of Government bond capitalization to GDP</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Bhattacharyay, 2011)</td>
<td></td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of banking sector</td>
<td>Banking sector credit and GDP</td>
<td>Ratio of banking sector credit to GDP</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Yibin, Phelps and Stotsky, 2013)</td>
<td></td>
</tr>
<tr>
<td>Interest rate trend</td>
<td>Nominal Treasury bill rate</td>
<td>Treasury bill rate</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Bae and Kee-Hong, 2012)</td>
<td></td>
</tr>
<tr>
<td>Trade openness</td>
<td>Exports of goods and services and GDP</td>
<td>Ratio of exports of goods and services to GDP</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Yibin, Phelps and Stotsky, 2013)</td>
<td></td>
</tr>
<tr>
<td>Size of economy</td>
<td>GDP at current prices</td>
<td>GDP at current prices</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Bhattacharyay, 2011)</td>
<td></td>
</tr>
<tr>
<td>Fiscal balance</td>
<td>Government budget surplus/deficit and GDP</td>
<td>Ratio of government budget surplus/deficit to GDP</td>
<td>Negative/Positive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Bae, 2012)</td>
<td></td>
</tr>
</tbody>
</table>

### 3.9.2 Diagnostic Tests

To ascertain the goodness of the empirical model, diagnostic tests were performed to find out whether all the estimated coefficients are statistically significant based on the t and F tests and have the right signs (Gujarati, 2003). Diagnostic tests help to avoid problems of violation of the assumptions of the classical linear regression by checking that the stochastic properties of the model are met.
3.9.2.1 Stationarity Test

Time series data in a regression model is required to be in order that the standard assumptions for asymptotic analysis are valid and that the t-statistic follows a t-distribution to enable a valid hypothesis testing about the regression parameters. The statistical properties of a stationary process, that is, mean, variance and covariance do not change over time (Brockwell & Davis, 1996).

Non-stationary series may result in spurious regression where the model results appear good but may be meaningless. Testing stationarity in this study involved the use of the Augmented Dickey-Fuller (ADF) unit root test which is a common test for unit root (Ayat & Burridge, 2000). If the ADF on a variable series was found to approximate or be higher than 2, then the series was considered to be stationary. If ADF is significantly lower than 2, the series was considered nonstationary where a first or second difference was taken to achieve stationarity.

3.9.2.2 Normality test

The study investigated whether the variables followed the normal distribution and relied on the Jargue-Berra test where a null hypothesis of normality was tested against the alternative hypothesis of non-normal distribution. For normal distribution the JB statistic was expected to be statistically indifferent from zero.

Ho: \( \text{JB} = 0 \) (normally distributed)

H1: \( \text{JB} \neq 0 \) (not normally distributed)

Rejection of the null for any of the variables would imply that the variables were not normally distributed and a logarithmic transformation is necessary.

3.9.2.3 Granger-Causality Test

One of the statistical tests to determine whether one time series can be useful in predicting another time series is the Granger causality test. Causality can be reflected through the measurement of the prediction ability where past values of a time series are used to determine future values of another time series (Clive Granger, 1969). A series
of $t$-tests and $F$-tests on lagged values of series $X$ together with lagged values of series $Y$, are used to determine that $X$-series values provide significant information about future values of $Y$-series.

Granger-Causality test can be applied in three types of situations. A simple Granger-Causality test involves two variables and their lags, while a multivariate Granger-Causality test involves more than two variables and their lags while a third Granger-Causality test is in a VAR framework where a multivariate model is extended to test for the simultaneity of all variables included (Foresti, 2007). This study adopted a simple Granger-Causality test to test whether the independent variables Granger-cause the dependent variable and vice versa.

### 3.9.2.4 Multicollinearity test

Multicollinearity occurs when there is an exact linear relationship or correlation between the values of the explanatory variables in a regression model which can be detected through several tests such as the coefficient of determination ($R^2$), correlation matrix, tolerance values and variance inflation factor (VIF) (Ghozali, 2002). The adjusted $R$-squared ($R^2$) measures the explanatory power of the independent variables and tests goodness of fit of the model. This study used the $R^2$ and the correlation matrix to assess multicollinearity.

### 3.9.2.5 Hausman test

The Hausman test is used to make a decision on whether a fixed or random effects regression model is with the null hypothesis being that the unique errors ($u_i$) are not correlated with the regressors (Greene, 2008). This study used the Hausman test to determine whether to use a random or a fixed effects model.

The diagnostic tests to be used in this study are summarized in Table 3.2:
Table 3.9.2.52: Detailed Diagnostic Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Purpose of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of the model's underlying statistical assumptions</td>
<td></td>
</tr>
<tr>
<td>• R²</td>
<td>Test goodness of fit of the model</td>
</tr>
<tr>
<td>• Adjusted R²</td>
<td></td>
</tr>
<tr>
<td>• Correlation matrix</td>
<td>Test multicollinearity</td>
</tr>
<tr>
<td>• F-test of the overall fit</td>
<td>Test statistical significance of the estimated parameters</td>
</tr>
<tr>
<td>• t-tests of individual parameters</td>
<td></td>
</tr>
<tr>
<td>Examination of the structure of the model</td>
<td></td>
</tr>
<tr>
<td>• Unit root test (Augmented Dickey–Fuller - ADF)</td>
<td>Test whether a time series variable is non-stationary and possesses a unit root</td>
</tr>
<tr>
<td>• Granger-Causality</td>
<td>Prediction ability of time series</td>
</tr>
<tr>
<td>• Durbin Watson Test</td>
<td>Examine Autocorrelation</td>
</tr>
<tr>
<td>• Student's t test</td>
<td>Determine whether to add or drop some explanatory variables</td>
</tr>
<tr>
<td>• Hausman test</td>
<td>Determine whether to use fixed or random effects model</td>
</tr>
</tbody>
</table>

3.10 Ethical Considerations

As a branch of philosophy, ethics focuses on human action and the relationship between persons or individuals and the social world (Foresti, 2007). Ethical considerations involve the consent of individuals in participating in the research process. Although this study exclusively used secondary data, where individuals were involved, ethical considerations included allowing voluntary participation, assurance of confidentiality and research was carried out only for academic purposes. The study avoided plagiarism by recognizing sources of information from other authors through citations and referencing.
4.1 Introduction

This chapter presents the results of the descriptive and empirical analysis of the data, discussion and interpretation of the statistical inferences towards attainment of the objective of the study. The data was analyzed using E-views 8. Natural logs of the study variable values were used in the analysis. The dependent variable was Government bond market capitalization (GBC) while independent variables included size of the banking sector (BS), interest rate trend (IRT), trade openness (TO), size of the economy (SE) and fiscal balance (FB) used as the moderating variable.

4.2 Descriptive Analysis

Table 4.1 presents a summary of descriptive statistics from natural log values of the study variables.

<table>
<thead>
<tr>
<th></th>
<th>GBC</th>
<th>BS</th>
<th>IRT</th>
<th>TO</th>
<th>SE</th>
<th>FB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.382821</td>
<td>3.010970</td>
<td>2.853615</td>
<td>3.269850</td>
<td>0.291275</td>
<td>0.226016</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.308351</td>
<td>3.957379</td>
<td>3.425239</td>
<td>3.845456</td>
<td>1.350667</td>
<td>1.619388</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.418710</td>
<td>1.702928</td>
<td>2.253395</td>
<td>2.432736</td>
<td>-0.579818</td>
<td>-3.218876</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.674857</td>
<td>0.562894</td>
<td>0.233111</td>
<td>0.315085</td>
<td>0.424608</td>
<td>0.674231</td>
</tr>
<tr>
<td>Observations</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
</tbody>
</table>

Government bond market capitalization averaged 2.383 with a maximum value of 3.308 and a minimum value of 0.419 and standard deviation of 0.675. Positive average capitalization indicates that all the five countries were on average making an effort to promote the growth of their domestic government bond markets as shown in figure 4.1.1 supported by the fact that the minimum value is non-negative.

The results in figure 4.1.1 indicate that Kenya’s Government bond market capitalization was highest and steadiest during the period, declining slightly in 2007 then rising from 2010 to 2015. This trend may be explained by Kenya’s sustained and growing budget deficits leading to sustained issuance and trading of Government bonds over the period. Mozambique recorded the lowest and most irregular Government bond capitalization
during the period with highest point in 2010 and lowest in 2009 indicating irregular budgetary financing needs from issuance of government bonds.

**Figure 4.1.1: Results of trend of Government bond capitalization (individual countries) during the period from 2003 to 2015**

Banking sector size recorded a mean value of 3.011 with respective maximum and minimum values of 3.957 and 1.703, and standard deviation of 0.563 (Table 4.1). The results indicate that on average the five countries had a certain size of bank sector in place and the variability of bank industry sizes among the countries was small.

The results in figure 4.1.2 show the trend of banking sector size in ESA region during the period 2003 to 2015. Kenya’s banking sector was largest among the five countries during the period, with size of the banking sector in Mozambique and Tanzania growing significantly and steadily from 2003 to 2015. The growth of the banking sector in Uganda dipped in 2009 perhaps due to the effects of the global financial crisis, peaked in 2010 and declined again in 2014-2015. In Zambia, the growth of the banking sector was at its peak in 2004 but declined from 2005 to 2012, then recovered in 2013 and maintained steady growth towards 2015.
Average interest rate trend was 2.853, with maximum of 3.425 and minimum value of 2.253 and standard deviation of 0.233. This shows that average trend of interest rates in the five countries was positive while variability from the mean was low given standard deviation of 0.233 (Table 4.1).

Figure 4.1.3 shows the trend of interest rate trend across the five countries where interest rates were on a steady path in Kenya from 2003 up to 2010, then rose steeply in 2011 and took a downward path from 2012 towards 2015. In Mozambique, interest rates were highest in 2004, took a downward shift in 2005 remaining largely stable to 2010, then shot up in 2011, after which a downward path was maintained up to 2015. There was low volatility of the interest rates among the five countries during the study period, although Zambia recorded the highest interest rates than the rest of the countries.
Figure 4.1.3: Results of trend of interest rate trend during the period from 2003 to 2015

Trade openness recorded a mean value of 3.270 with respective maximum and minimum values of 3.845 and 2.432, and standard deviation of 0.315. The results indicate that the five countries engage in international trade as shown by the positive average, minimum and maximum values of exports and imports as a proportion of GDP. The amount of individual country trade compared to the mean trade of the five countries is not extremely different (Table 4.1).

According to figure 4.1.4, openness of trade was highest in Zambia followed by Mozambique, with erratic growth for the two countries during the period. Kenya’s trade openness was steady from 2003 to 2013 when it declined towards 2015 while Tanzania’s openness of trade grew steadily from 2003 to 2015.
The mean, maximum and minimum values of size of the economies as measured by GDP (current prices) in the five countries were 0.291, 1.351 and -0.580 respectively while standard deviation was 0.425 (Table 4.1). The results indicate that some countries had bigger economies than others as shown by the positive maximum and negative minimum values, even though economic size variability is not large as shown by the standard deviation.

Figure 4.1.5 shows the trends of size of economies among the five countries during the period 2003 to 2015. Kenya and Zambia recorded steady growth in the period 2003 to 2012, then rose sharply in 2013 and flattened in 2014 and 2015. The lowest economic size was observed in Mozambique although its growth was steady during the period.
According to table 4.1 and figure 4.1.6, the mean value for fiscal balance was 0.226 with respective maximum and minimum values of 1.619 and -3.219 and standard deviation of 0.674. The trends on fiscal balance which was measured as government budgetary surplus/deficit as percent of GDP reveal that some countries may have been experiencing budgetary deficits while others were on surplus budgets as shown by the negative minimum and positive maximum values. The low mean value indicates that countries on average run budgetary deficits. There was large variability of budgetary deficits/surplus among the five countries compared to the mean as shown by the standard deviation. Fiscal balance had second the highest standard deviation at 0.674, indicating that the observations were spread out over a wider range from the mean compared to the other variables which had standard deviations lower than 1 indicating that the observations were close to the mean value of each variable.
Figure 4.1.6: Results of trend of fiscal balance during the period from 2003 to 2015

4.3 Multicollinearity

Multicollinearity test is used to analyze correlation between independent variables. Multicollinearity in a regression model can be detected by analyzing the correlation matrix (Ghozali, 2002). The correlation matrix in Table 4.2 was used to test multicollinearity. As a general rule, when correlation between two variables is greater than or equal to 0.70, there exists a high degree of interrelationship and therefore a possibility of multicollinearity (Kieu, 2004).

Table 4.2: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>GBC</th>
<th>BS</th>
<th>IRT</th>
<th>TO</th>
<th>FB</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBC</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS</td>
<td>0.630101</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRT</td>
<td>-0.249665</td>
<td>-0.265959</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TO</td>
<td>-0.217267</td>
<td>0.128061</td>
<td>-0.018503</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FB</td>
<td>-0.112037</td>
<td>-0.345840</td>
<td>0.104605</td>
<td>0.349649</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>0.472860</td>
<td>0.367675</td>
<td>-0.365566</td>
<td>0.056690</td>
<td>-0.228729</td>
<td>1.000000</td>
</tr>
</tbody>
</table>
The level of significance for the correlation between variables was 5%, with mixed direction of correlation, either positive or negative. As shown in table 4.2, the strongest positive correlation observed was between government bond market capitalization and the banking sector size ($r = 0.630$), indicating that the variables were generally independent from each other and therefore no multicollinearity between the variables as $r < 0.7$.

### 4.4 Stationarity Test

The unit root test was carried out to assess prevalence of stationarity in the variables. Checking for stationarity of the data series before estimating the relationships between dependent and explanatory variables is of great importance because standard econometric methodologies assume stationarity in time series data while they are, in fact, non-stationary. Several tests for unit roots have been proposed in the literature but this study used the Augmented Dickey-Fuller (ADF) (1979).

#### 4.4.1 Unit root test for Government Bond Capitalization

The tests for Government Bond Capitalization indicate no presence of a unit root at 1st difference as the probability was less than 5% as shown in table 4.3(a), indicating that we reject the null hypothesis for presence of unit root thus the data is stationery.

#### Table 4.3 (a): Unit root test, Government Bond Capitalization

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>36.8936</td>
<td>0.0001</td>
</tr>
<tr>
<td>ADF - Choi Z-stat</td>
<td>-4.16037</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
4.4.2 Unit root test for Size of the Banking Sector

The tests for size of the banking sector indicate no presence of a unit root at 1st difference as the probability was less than 5% as shown in table 4.3(b), indicating that we reject the null hypothesis for presence of unit root thus the data is stationery.

Table 4.3(b): Unit root test, Bank Size

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>22.8681</td>
<td>0.0112</td>
</tr>
<tr>
<td>ADF - Choi Z-stat</td>
<td>-2.68232</td>
<td>0.0037</td>
</tr>
</tbody>
</table>

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

4.4.3 Unit root test for Interest Rate Trend

The test for interest rate trend indicates no presence of a unit root at 1st difference as the probability was less than 5% as shown in table 4.3(c). We reject the null hypothesis for presence of unit root thus the data is stationery.

Table 4.3(c): Unit root test, Interest Rate Trend

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>41.2344</td>
<td>0.0000</td>
</tr>
<tr>
<td>ADF - Choi Z-stat</td>
<td>-4.69591</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
4.4.4 Unit root test for Trade Openness

The test for trade openness indicates no presence of a unit root at 1st difference as the probability was less than 5% as shown in table 4.3(d). We reject the null hypothesis for presence of unit root thus the data is stationery.

Table 4.3(d): Unit root test, Trade Openness

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>29.6432</td>
<td>0.0010</td>
</tr>
<tr>
<td>ADF - Choi Z-stat</td>
<td>-3.54199</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

4.4.5 Unit root test for Fiscal Balance

The test for fiscal balance indicates no presence of a unit root at 1st difference as the probability was less than 5% as shown in table 4.3(e). We reject the null hypothesis for presence of unit root thus the data is stationery.

Table 4.3(e): Unit root test, Fiscal Balance

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>50.6244</td>
<td>0.0000</td>
</tr>
<tr>
<td>ADF - Choi Z-stat</td>
<td>-5.52335</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
4.4.6 Unit root test for Size of the Economy

As shown in table 4.3(f), the test for size of economy indicates no presence of a unit root at 1st difference as the probability was less than 5%. We reject the null hypothesis for presence of unit root thus the data is stationery.

Table 4.3(f): Unit root test, Size of the Economy

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>27.9784</td>
<td>0.0018</td>
</tr>
<tr>
<td>ADF - Choi Z-stat</td>
<td>-3.36760</td>
<td>0.0004</td>
</tr>
</tbody>
</table>

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

4.5 Normality test

Using the Jarque-Bera test, a null hypothesis of normality is tested against the alternative hypothesis of non-normal distribution. The JB statistic is expected to be statistically indifferent from zero for a normal distribution.

Ho: \( JB = 0 \) (normally distributed)
H1: \( JB \neq 0 \) (not normally distributed)

Figure 4.2: Normality test
A p value of 0.000 was obtained indicating that we fail to reject the null hypothesis $H_0$: $JB= 0$ (normally distributed), thus the residuals are normally distributed as shown in figure 4.1. Presence of normality rules out the possibility of nonstandard estimators. Rejection of the null hypothesis would imply that the variables are not normally distributed and a logarithmic transformation would be necessary.

4.6 Granger-causality Test

The Granger-causality test was used to determine whether one-time series is useful in forecasting another (Enders, 1995). Table 4.4 shows the results of Granger causality tests which revealed existence of either bi-directional or uni-directional relationships between Government Bond Capitalization and independent variables (BS, IRT, TO, SE, FB) and among the independent variables. The results suggest that the null hypothesis of no causality should be rejected for F-statistic tests for interest rate trend and banking sector size which has lowest P value. This implies that granger causality between IRT and BS run one way as p-value 0.0004 for one direction and 0.1658 for the opposite direction.

Hypothesis that size of banking sector (BS) does not granger cause Government bond capitalization (GBC) and Government bond capitalization does not granger cause size of banking sector cannot be rejected due to high probability values of 0.2750 and 0.9906 respectively. We fail to reject the hypothesis that interest rate trend does not granger cause Government bond capitalization and Government bond capitalization does not granger cause interest rate trend because of high p-values 0.5030 and 0.8051. Similarly, all other hypotheses for no granger causality between pairs of the remaining variables cannot be rejected due to high probability values as shown in Table 4.4.
Table 4.4: Granger Causality Tests

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS does not Granger Cause GBC</td>
<td>55</td>
<td>1.32496</td>
<td>0.2750</td>
</tr>
<tr>
<td>GBC does not Granger Cause BS</td>
<td></td>
<td>0.00946</td>
<td>0.9906</td>
</tr>
<tr>
<td>IRT does not Granger Cause GBC</td>
<td>55</td>
<td>0.69679</td>
<td>0.5030</td>
</tr>
<tr>
<td>GBC does not Granger Cause IRT</td>
<td></td>
<td>0.21776</td>
<td>0.8051</td>
</tr>
<tr>
<td>TO does not Granger Cause GBC</td>
<td>55</td>
<td>1.06172</td>
<td>0.3535</td>
</tr>
<tr>
<td>GBC does not Granger Cause TO</td>
<td></td>
<td>0.98079</td>
<td>0.3821</td>
</tr>
<tr>
<td>FB does not Granger Cause GBC</td>
<td>55</td>
<td>1.54252</td>
<td>0.2238</td>
</tr>
<tr>
<td>GBC does not Granger Cause FB</td>
<td></td>
<td>0.26501</td>
<td>0.7683</td>
</tr>
<tr>
<td>SE does not Granger Cause GBC</td>
<td>55</td>
<td>0.17705</td>
<td>0.8383</td>
</tr>
<tr>
<td>GBC does not Granger Cause SE</td>
<td></td>
<td>0.10901</td>
<td>0.8969</td>
</tr>
<tr>
<td>IRT does not Granger Cause BS</td>
<td>55</td>
<td>9.34263</td>
<td>0.0004</td>
</tr>
<tr>
<td>BS does not Granger Cause IRT</td>
<td></td>
<td>1.86296</td>
<td>0.1658</td>
</tr>
<tr>
<td>TO does not Granger Cause BS</td>
<td>55</td>
<td>2.45188</td>
<td>0.0964</td>
</tr>
<tr>
<td>BS does not Granger Cause TO</td>
<td></td>
<td>1.37133</td>
<td>0.2631</td>
</tr>
<tr>
<td>FB does not Granger Cause BS</td>
<td>55</td>
<td>0.56464</td>
<td>0.5721</td>
</tr>
<tr>
<td>BS does not Granger Cause FB</td>
<td></td>
<td>2.51011</td>
<td>0.0915</td>
</tr>
<tr>
<td>SE does not Granger Cause BS</td>
<td>55</td>
<td>0.44769</td>
<td>0.6416</td>
</tr>
<tr>
<td>BS does not Granger Cause SE</td>
<td></td>
<td>0.09960</td>
<td>0.9054</td>
</tr>
<tr>
<td>TO does not Granger Cause IRT</td>
<td>55</td>
<td>1.81631</td>
<td>0.1732</td>
</tr>
<tr>
<td>IRT does not Granger Cause TO</td>
<td></td>
<td>0.25989</td>
<td>0.7722</td>
</tr>
<tr>
<td>FB does not Granger Cause IRT</td>
<td>55</td>
<td>2.26694</td>
<td>0.1142</td>
</tr>
<tr>
<td>IRT does not Granger Cause FB</td>
<td></td>
<td>0.62696</td>
<td>0.5384</td>
</tr>
<tr>
<td>SE does not Granger Cause IRT</td>
<td>55</td>
<td>0.21900</td>
<td>0.8041</td>
</tr>
<tr>
<td>IRT does not Granger Cause SE</td>
<td></td>
<td>1.32679</td>
<td>0.2745</td>
</tr>
<tr>
<td>FB does not Granger Cause TO</td>
<td>55</td>
<td>1.08664</td>
<td>0.3452</td>
</tr>
<tr>
<td>TO does not Granger Cause FB</td>
<td></td>
<td>1.00711</td>
<td>0.3726</td>
</tr>
<tr>
<td>SE does not Granger Cause TO</td>
<td>55</td>
<td>0.66217</td>
<td>0.5202</td>
</tr>
<tr>
<td>TO does not Granger Cause SE</td>
<td></td>
<td>2.08256</td>
<td>0.1353</td>
</tr>
<tr>
<td>SE does not Granger Cause FB</td>
<td>55</td>
<td>0.47545</td>
<td>0.6244</td>
</tr>
<tr>
<td>FB does not Granger Cause SE</td>
<td></td>
<td>2.49686</td>
<td>0.0926</td>
</tr>
</tbody>
</table>
4.7 Panel Regression Analysis

Panel regression models were run to determine independent variables that had significant influence on the dependent variable.

Table 4.5: Random Effects Regression Results
Dependent Variable: GBC  
Method: Panel EGLS (Cross-section random effects)  
Sample: 2003 2015  
Periods included: 13  
Cross-sections included: 5  
Total panel (balanced) observations: 65

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.124356</td>
<td>0.600511</td>
<td>5.202829</td>
<td>0.0000</td>
</tr>
<tr>
<td>BS</td>
<td>0.281854</td>
<td>0.071905</td>
<td>3.919805</td>
<td>0.0002</td>
</tr>
<tr>
<td>IRT</td>
<td>0.124680</td>
<td>0.154245</td>
<td>0.808324</td>
<td>0.4221</td>
</tr>
<tr>
<td>TO</td>
<td>-0.670883</td>
<td>0.111333</td>
<td>-6.025888</td>
<td>0.0000</td>
</tr>
<tr>
<td>SE</td>
<td>0.850432</td>
<td>0.094035</td>
<td>9.043814</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared 0.890239  
Adjusted R-squared 0.886010  
S.E. of regression 0.497746

| F-statistic | 14.41231 |
| Prob (F-statistic) | 0.000000 |
| Mean dependent var Durbin-Watson stat | 2.382821 1.667237 |

4.7.1 Hausman test

The null hypothesis for the Hausman test was that random effect model was preferred to the fixed effects model, to decide between random and fixed effects. The results of the fixed effects model are shown in Table 4.7 below.

Table 4.6: Hausman test  
Test cross-section random effects

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>76.365506</td>
<td>3</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

A chi-square of 76.36 with a p-value of 0.0000 implies that the obtained chi-square value was statistically significant at 5 percent level. The null hypothesis for preference of the
random effects model is therefore rejected (Greene, 2008). Interpretations of model inferences were therefore based on the fixed effects panel regression models.

### 4.7.2 Panel Regression Results for the Direct ( Reduced) Model

The reduced model consists of all the independent variables without fiscal balance which is the moderating variable. The results of this analysis are presented in table 4.7 below.

**Table 4.7: Regression Results ( Reduced Model)**

<table>
<thead>
<tr>
<th>Dependent Variable: GBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification: GBC C BS IRT TO SE</td>
</tr>
<tr>
<td>Method: Panel Least Squares (cross section fixed, period fixed effects)</td>
</tr>
<tr>
<td>Sample: 2003 2015</td>
</tr>
<tr>
<td>Periods included: 13</td>
</tr>
<tr>
<td>Cross-sections included: 5</td>
</tr>
<tr>
<td>Total panel (balanced) observations: 65</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C*</td>
<td>21.14933</td>
<td>3.582752</td>
<td>5.903096</td>
<td>0.0000</td>
</tr>
<tr>
<td>BS*</td>
<td>0.377290</td>
<td>0.049723</td>
<td>7.587774</td>
<td>0.0000</td>
</tr>
<tr>
<td>IRT</td>
<td>0.087931</td>
<td>0.132308</td>
<td>0.664588</td>
<td>0.5096</td>
</tr>
<tr>
<td>TO*</td>
<td>-0.411558</td>
<td>0.075949</td>
<td>-5.418866</td>
<td>0.0000</td>
</tr>
<tr>
<td>SE*</td>
<td>5.475999</td>
<td>1.157046</td>
<td>4.732741</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

**Effects Specification**

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

<table>
<thead>
<tr>
<th>R-squared</th>
<th>Prob (F-statistic)</th>
<th>0.000000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted R-squared</td>
<td>0.812221</td>
<td>2.382821</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>1.777229</td>
<td>0.674857</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>138.9759</td>
<td>2.056168</td>
</tr>
<tr>
<td>F-statistic</td>
<td>45.29409</td>
<td>2.056168</td>
</tr>
</tbody>
</table>

* 5% level of significance

BS – Size of Banking Sector, IRT – Interest Rate Trend, TO – Trade Openness, SE – Size of the Economy

**Estimation Equation:**

\[
GBC = C (1) + C (2) \times BS + C (3) \times IRT + C (4) \times TO + C (5) \times SE
\]

\[
GBC = 21.14933 + 0.37729\times BS + 0.087931\times IRT - 0.411558\times TO + 5.475999\times SE
\]
From table 4.7 above, Government Bond Capitalization would be 21.149 when all independent variables are constant at zero and this relationship is significant at 5 percent level (p=0000). A unit increase in size of the banking sector, trend of interest rate, size of the economy results in 0.377, 0.087 and 5.476 increase in Government bond capitalization respectively, while trade openness reduces GBC by 0.411. Banking sector size, trade openness and size of the economy were significant at 5 percent (p=0.0000) level while interest rate trend was statistically insignificant. Coefficient of determination (R²) explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable. R² indicates that the explanatory variables in the model account for 81.36 percent of the change in GBC while the adjusted R-square of 81.22 percent reinforces this effect.

These results show that the size of the banking sector has a positive and significant coefficient (β = 0.377290, p-value = 0.0000). This means that banking sector development contributes positively to the expansion of the Government bond market in Eastern and Southern Africa (ESA). The findings collaborate with Bhattacharyay (2011) and Bae and Kee-Hong (2012) where large and developing banking sector was found to positively and significantly affect the growth of the bond market in Asia. Flood, Liechty, and Piontek, (2015) found that large size of the market was positive and significant. The plausible explanation of the significant effect of banking sector size is that the banking sector provides financing and invests in most of government (and corporate) bond issues in Sub-Saharan Africa. A unit increase in the size of the banking sector results in 0.377 increase in Government bond uptake.

Interest rate trend has a positive but insignificant coefficient (β = 0.087931, p-value = 0.5096). This means that interest rate trend does not contribute to the expansion of the Government bond market in Eastern and Southern Africa. The findings are inconsistent with Yibin, Phelps and Stotsky (2013) where interest rate trend was found to have positive and significant effect on the growth of the bond market in Africa. This is also
against findings by Thupayagale (2015) who found evidence of long memory in volatility of bond yield changes, which indicated a level of growth of the government bond market in Kenya. He however concluded that Kenya’s domestic government bond market remained inefficient despite implementation of various financial market reforms. Nyongesa (2012) found that the behavior of interest rates had positive and significant effect on liquidity of secondary bond markets in Kenya. Bae and Kee-Hong (2012) and Bhattacharyay (2011) found that interest rate volatility was negative and significant. The probable explanation of the positive but insignificant effect of interest rate trend is that the volatile interest rates may have attracted bond investments in ESA, but not enough to cause significant market growth.

Trade openness has a negative and significant coefficient ($\beta = -0.412$, p-value = 0.0000). This means that trade openness discourages the expansion of the Government bond market in Eastern and Southern Africa. The result is consistent with the findings by Yibin, Phelps and Stotsky (2013) where openness of trade was found to have negative and significant impact on the growth of bond markets in Africa. Fostel and Geanakoplos (2010) also found openness of trade negative and significant. Felman et al. (2011) also showed evidence for negative and significant effect of trade openness on the growth of the bond market in Asia. The plausible explanation of the significant negative effect of trade openness is that liberalization of trade provides opportunity for foreign investors to come to the domestic bond markets when yields are favorable and exit (capital flight) when yields become unfavorable to them, thus discouraging expansion of the bond market.

The size of the economy has a positive and significant coefficient ($\beta = 5.475999$, p-value = 0.0000). This means that larger economies contribute to the expansion of the Government bond market in Eastern and Southern Africa. The findings were consistent with Bhattacharyay (2011) where size of the economy measured as GDP per capita at purchasing power parity was found to have positive and significant effect on the growth of the bond market in Asia. Christensen and Gillan (2016) also found positive and
significant relationship between the size of the economy and bond market liquidity. Bae (2012) found size of the economy positive and significant. The plausible explanation of the significant effect of size of the economy is that larger economies promote financial intermediation and investment in the bond markets in ESA.

4.7.3 Panel Regression Results for the Full Model
The full regression analysis introduces fiscal balance (FB) as the moderating variable to the reduced model so that the regression consists of explanatory variables (size of baking sector (BS), interest rate trend (IRT), trade openness (TO), size of economy (SE) and fiscal balance (FB)) on Government bond market Capitalization. The results of the analysis are presented in Table 4.8 below.
Table 4.8: Regression Results (Full Model)

Dependent Variable: GBC
Specification: GBC C BS IRT TO SE FB
Method: Panel Least Squares – fixed effects
Sample: 2003 2015
Periods included: 13
Cross-sections included: 5
Total panel (balanced) observations: 65

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>7.484403</td>
<td>3.970748</td>
<td>1.884885</td>
<td>0.0656</td>
</tr>
<tr>
<td>BS</td>
<td>0.094291</td>
<td>0.047378</td>
<td>1.990171</td>
<td>0.0528</td>
</tr>
<tr>
<td>IRT</td>
<td>-0.025614</td>
<td>0.078167</td>
<td>-0.327675</td>
<td>0.7447</td>
</tr>
<tr>
<td>TO</td>
<td>-0.093266</td>
<td>0.074694</td>
<td>-1.248640</td>
<td>0.2184</td>
</tr>
<tr>
<td>FB</td>
<td>0.760644</td>
<td>0.289366</td>
<td>2.628659</td>
<td>0.1115</td>
</tr>
<tr>
<td>SE*</td>
<td>1.992605</td>
<td>0.805443</td>
<td>2.473925</td>
<td>0.0173</td>
</tr>
</tbody>
</table>

Effects Specification

<table>
<thead>
<tr>
<th>Period fixed (dummy variables)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
</tr>
<tr>
<td>S.E. of regression</td>
</tr>
<tr>
<td>Sum squared resid</td>
</tr>
<tr>
<td>Log likelihood</td>
</tr>
<tr>
<td>F-statistic</td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
</tr>
</tbody>
</table>

* 5% level of significance

Estimation Equation:

\[ GBC = C(1) + C(2) \times BS + C(3) \times IRT + C(4) \times TO + C(5) \times SE + C(6) \times FB \]

\[ GBC = 7.484403 + 0.094291 \times BS - 0.025614 \times IRT - 0.093266 \times TO + 1.992605 \times SE \]

When fiscal balance is introduced in the regression equation and taking all independent variables constant at zero, Government bond market capitalization would be 7.484, but this is not significant at 5% level.

With all other independent variables at zero, a unit increase in size of the baking sector led to a 0.094 increase in Government bond market capitalization, insignificant at 5% level while a unit increase in interest rate trend led to a 0.026 decrease in Government
bond market capitalization which was also insignificant. A unit decrease in trade openness led to a 0.093 decrease in Government bond market capitalization and was insignificant at 5% level while a unit increase in government fiscal balance led to increase in GBC by 0.761 but was insignificant. An increase in size of the economy by one unit led to a 1.992 increase in Government bond market capitalization and was significant at 5% level. R² indicates that the explanatory variables in the model account for about 75.42% of the change in Government bond market capitalization while the adjusted R-square of 72.46% reinforces this effect further.

The results of the reduced model in table 4.6 present more useful findings to make inferences and conclusions because three independent variables were significant at 5% level compared to just one explanatory variable in the full model (with fiscal balance included in table 4.7). Bank sector size and size of the economy were positive and significant at 5% level (p=0000) while interest rate trend was positive but insignificant. Trade openness had a negative but significant (at 5% level) effect on government bond market capitalization.

4.8 Discussion of the Findings

The study sought to determine the drivers of domestic government bond market growth in five Eastern and Southern African countries in the period from 2003 to 2015 using secondary data. There was strong positive and significant effect of banking sector size and size of the economy on government bond market capitalization while trade openness was negative and significant, as interest rate trend was positive but statistically insignificant. The hypotheses were tested at 5% level of significance. The t critical value was 1.96 as the data was normally distributed. The results on the five hypotheses are discussed below.

H₀₁: Size of banking sector does not have significant effect on the growth of domestic government bond market in Eastern and Southern Africa

The t-calculated for size of the banking sector was 1135.318 and its p value was <0.05 which resulted in rejecting the null hypothesis that stated that size of banking sector did
not have effect on the growth of domestic government bond market in Eastern and Southern Africa.

The regression results indicate that size of the banking sector is significant at 5 percent level (p-value of 0.0000) with a coefficient of 0.377. The results indicate that there was a significant positive relationship between size of banking sector and Government bond market capitalization in Eastern and Southern Africa.

\( H_{02} \): Interest rate trend does not have significant effect on the growth of domestic government bond market in Eastern and Southern Africa

The t-calculated for interest rate trend was 37.923 and thus the study accepted the null hypothesis which stated that interest rate trend does not have significant effect on government bond market capitalization in Eastern and Southern Africa. The regression results show a coefficient of 0.088 for interest rate trend, though statistically insignificant with probability value of 0.5096, implied a positive relationship between interest rate trend and government bond market capitalization.

\( H_{03} \): Trade openness does not have significant effect on the growth of the domestic government bond market in Eastern and Southern Africa

The t-calculated for trade openness was 112.305 and the p value obtained was 0.000 and thus the study also rejected the null hypothesis as TO was significant and negatively affected government bond market capitalization in Eastern and Southern Africa.

The coefficient of -0.412 was statistically significant at 5% level with a P value of 0.0000 which is lower than 0.01. The results indicate that there was a significant negative relationship between trade openness and Government bond market capitalization in selected Eastern and Southern Africa countries.

\( H_{04} \): Size of the economy does not have significant effect on the growth of the domestic government bond market in Eastern and Southern Africa

The t-calculated for the size of the economy was 87.735 and the p value was less than 0.05 and thus leading to rejection of the null hypothesis. The coefficient of 5.476 was
statistically significant at 5% level with a P value of 0.0000. The results indicate that there was a significant positive relationship between size of the economy and Government bond market capitalization in selected Eastern and Southern Africa countries.

**H₀₅:** Fiscal balance does not have significant moderating effect on the relationship between drivers and domestic government bond market growth in Eastern and Southern Africa

The t-calculated for the fiscal balance was 107.346 and the p value was more than 0.05 resulting in the acceptance of the null hypothesis. Fiscal balance was statistically insignificant with a P value of 0.1115 and a coefficient of 0.761, indicating an insignificant positive relationship between fiscal balance and Government bond market capitalization in selected Eastern and Southern Africa countries.

The analysis used stationary data series as given in the ADF results of unit root group level series (GDC, BS, IRT, TO, SE and FB). The findings point to the existence of a long run relationship between the dependent and independent variables, which implies that in the long run, the dependent variable; GDC may be well predicted using the specified independent variables (i.e. size of banking sector, trend of interest rates, trade openness and size of the economy). Means and variances of the dependent and independent variables vary over time because their level series were found to be non-stationary.

There was no evidence for existence of bi-directional or uni-directional relationships between the dependent variable (GBC) and independent variables (BS, IRT, TO, SE, FB) as shown by the results of the Granger causality test. According to the regression analysis and taking all independent variables constant at zero, bond market capitalization would be 21.149, at a 5% level of significance. With all other independent variables at zero, the magnitude of increase in Government bond market capitalization resulting from a unit increase in size of the banking sector, size of the economy and interest rate trend was 0.377 (significant at 5% level), 5.476 (significant at 5% level) and 0.088 (insignificant) respectively. A unit increase in trade openness led to a 0.412 decrease in
GBC and was significant at 5%. The Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable. The coefficient of determination ($R^2$) indicates that the explanatory variables in the model account for about 80.36% of the change in GBC while the adjusted R-square of 79.22% reinforces this effect further.
CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This chapter is a synthesis of the entire research with the aim of providing a summary of the research, conclusions drawn on the basis of the findings as well as recommendations to promote the growth of domestic government bond markets in Eastern and Southern African region based on the objectives selected. The first part of this chapter focuses on the summary of findings; the second part is on the various conclusions while the third part provides recommendations for policy and suggestions for future research studies.

5.2 Summary
The study sought to determine the drivers of domestic government bond market growth in five Eastern and Southern African countries in the period from 2003 to 2015 using secondary data. The specific objectives were to; (i) determine the impact of size of banking sector on domestic government bond market growth in Eastern and Southern Africa; (ii) evaluate the effect of interest rate trend on domestic government bond market growth in Eastern and Southern Africa; (iii) establish the effect of trade openness on domestic government bond market growth in Eastern and Southern Africa; (iv) determine the size of the economy on domestic government bond market growth in Eastern and Southern Africa and (v) evaluate the moderating effect of fiscal balance on the relationship between drivers and domestic government bond market growth in Eastern and Southern Africa. Literature review adopted a theoretical and empirical approach involving theories guiding the study and discussion of other empirical research studies.

Panel Ordinary Least Squares (POLS) was used to determine the effect of the independent variables on domestic government bond markets growth (measured as bond market capitalization) in selected countries in Eastern and Southern Africa and data was analyzed using E-views 8. Various diagnostic tests such as stationarity, normality, multicollinearity, and granger causality among others were undertaken. From the empirical results, there was strong positive and significant effect of banking sector size
and size of the economy on government bond market capitalization while trade openness was negative and significant, as interest rate trend was positive but statistically insignificant.

5.3 Conclusion
The study established that when the moderating variable (fiscal balance) is excluded in the model; banking sector size and size of the economy positively and significantly impacted on domestic Government bond market growth, openness of trade had a negative and significant effect while interest rate trend was positive and insignificant.

5.3.1 Effect of size of banking sector on the growth of domestic government bond market
The results showed a positive and significant effect of size of banking sector on Government bond market growth in the five Eastern and Southern Africa countries selected for the study. This means that an increase in the size of the banking sector would help enhance the growth of the domestic government bond market. Conversely, a reduction in the size of the banking sector would reduce the growth of the domestic government bond market.

5.3.2 Effect of interest rate trend on the growth of domestic government bond market
The results showed a positive but statistically insignificant effect of interest rate trend on government bond market growth in the five Eastern and Southern Africa countries selected for the study. This means that a slight increase or decline in interest rates would slightly enhance or discourage the growth of the domestic government bond market.

5.3.3 Effect of size of economy on the growth of domestic government bond market
The results indicated that there was a significant positive relationship between size of the economy and Government bond market growth in the five Eastern and Southern Africa countries selected for the study. This means that an increase in the size of the economy would help enhance the growth of the domestic government bond market. Conversely, a
reduction in the size of the economy would reduce the growth of the domestic government bond market.

5.3.4 Effect of trade openness on the growth of domestic government bond market

The results showed a negative but significant effect of trade openness on Government bond market growth in the five Eastern and Southern Africa countries selected for the study. This means that an increase in trade openness would discourage the growth of the domestic government bond market.

From the above inferences, there is need for proper macroeconomic and fiscal management policies that would encourage the banking sector to thrive, reduce volatility of interest rates, manage openness of trade and promote economic growth in order to foster the growth of the domestic government bond markets in Eastern and Southern Africa countries.

5.4 Recommendations and Policy Implications

The underdevelopment of the domestic Government bond market has been a problem in many Eastern and Southern Africa countries particularly because these markets do not have the capacity to offer a reliable source of financing for Government’s budgetary requirements and act as benchmark for the development of the domestic capital market as is the case in most developed and emerging economies around the world.

The results of the empirical analysis described in this study provide pointers for Eastern and Southern Africa countries in identifying priority areas for the growth of the domestic government bond markets.

5.4.1 Effect of size of banking sector on the growth of domestic government bond market

The study recommends promotion of proper macroeconomic and fiscal management policies that would encourage the banking sector to thrive in order to foster the growth of the domestic government bond markets in Eastern and Southern Africa countries. The Ministries of Finance and Central Banks in respective countries should implement initiatives that promote development of the financial (banking) sector and economic
growth. Well-developed government bond markets provide alternative sources of financing for the government and increase financial system resilience by reducing and balancing reliance on the banking sector. To achieve this objective, policy making should be geared towards reforms that foster the growth of the domestic government bond market.

**5.4.2 Effect of size of economy on the growth of domestic government bond market**

The study recommends promotion of proper macroeconomic management policies that encourage economic growth to foster domestic government bond market growth in Eastern and Southern Africa countries. The Ministries of Finance and Central Banks in respective countries should implement initiatives that promote economic growth.

**5.4.3 Effect of trade openness on the growth of domestic government bond market**

The study recommends that Ministries or departments of Government charged with commerce and trade should put in place initiatives to promote openness of trade with regional and international markets, putting appropriate measures to avert the impact on the domestic bond market due to massive exit of foreign investors.

**5.5 Suggestions for Further Research**

The study used five variables that affect the growth of Government bond market in selected Eastern and Southern Africa countries from 2003 to 2015. Other studies may focus on factors not included in this study that explain the growth of Government bond markets in developing countries.

There is scope for other researchers to undertake further work in the model, especially in fully testing its application as well as critically testing downside risks on inferences that may not be backed by other studies or policy guidelines. Also researchers may further scrutinize the individual relationships among the most important variables used in this study so that more concrete policy prescriptions can be articulated.
REFERENCES


Research.


APPENDICES

Appendix 1: List of 21 Countries in Eastern and Southern Africa (Population)

| Eastern and Southern Africa | Angola, Botswana, Burundi, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Seychelles, Somalia, South Africa, South Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe |