KEY DETERMINANTS OF GOVERNMENT BOND MARKET DEVELOPMENT IN MEFMI REGION

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Preface

This paper intends to investigate the major determinants of government bond market development in five MEFMI\(^1\) countries namely Tanzania, Mozambique, Kenya, Uganda and Zambia, using data obtained in the period between 2003 and 2012. The paper assesses whether identified macroeconomic factors influence bond market capitalization as a measure of bond market development; evaluates the nature of relationship between financial market variables with bond market capitalization and seeks to identify structural factors that may have strong relationship with bond market capitalization.

Variables investigated in this study are classified as macroeconomic, structural, financial or developmental in nature. Interest rate and exchange rate variability, capital openness and fiscal balance make up *macroeconomic* variables while economic size and trade openness are categorized as *structural*. The size of the banking sector and spread in interest rates are *financial sector* variables while GDP per capita is categorized as *developmental*.

This study has attempted to identify the major determinants of government bond market development in the countries afore-named using econometric analysis and involving simple ordinary Least Squares (OLS), multivariate OLS, Fixed Effects and Random Effects models while also applying relevant sensitivity analysis to cater for country specific situations.

From the findings, a combination of structure, policy and institutional variables have statistically significant influence on government bond market development (bond capitalization) under different estimation methodologies. In the simple OLS, fixed effects and random effects; variables that were found positive and significant are; *bank credit, capital account openness, exchange rate variability, legal origin, size of the economy and economic development*. In the multivariate OLS, fixed effects and random effects estimations; *bank credit to private sector, exchange rate variability, economic development, monetary freedom* showed positive and significant relationship with government bond market capitalization. Finally, the multivariate sensitivity analysis in OLS, fixed effects and random effects models under different scenarios (1, 2 and 3); exchange rate variability, fiscal freedom, fiscal balance, interest rate fluctuation, interest spread, economic development and monetary freedom are largely positive and significant in influencing bond capitalization.

\(^1\) Macroeconomic and Financial Management Institute of Eastern and Southern Africa
From the above findings, we can make several sentiments on possible initiatives that could be considered as part of recommendations for policy implementation and further research. Such initiatives could include improving macroeconomic policies and quality of institutions to encourage economic development, in order to address volatility of interest rates and the exchange rate, capital controls and promote better investment environment with high reliability of laws and increased safety. In order to deal with smaller economies that do not encourage debt financing and leverage on structural factors that are country specific and difficult to change, approach bond market development from a regional perspective. Further, encourage broader and innovative products range, stronger financial regulation and better access to regional and international investors.

As part of recommendations for further research, broader inferences can be made from the modelling results of this study. There is scope to undertake further work in the model in terms of fully testing its application as well as validating the findings using separate empirical work and taking into account the reform program that each country has been embracing to further promote the development of the domestic bond market.
1.0 INTRODUCTION

1.1 Financial Market Development

One element that has characterised the process of financial liberalisation witnessed in a large number of developing countries is the development of the capital market and securities market in particular. Indeed over the last 20 years or so, securities markets have been emerging in developing countries and economies in transition around the world. The recent global financial crisis has again placed the need for well-developed domestic securities market under the spotlight when many countries found themselves unable to raise much needed finance from the international market.

More and more countries have come to embrace greater openness and free market structures and as the governments of these economies embark upon macroeconomic and institutional reforms, activities in these emerging markets have been increasing at a rapid pace. As more economically developing countries accept the role of all agents including the private sector as their premier route to long-term growth, they see an important role to have a vibrant domestic financial sector. At the same time, international investors are gaining confidence in the policies espoused by the emerging economies and have directed their capital towards these new markets. Indeed with the bubbling state of such markets, international investors are finding it increasingly difficult to ignore the emerging economies - especially that they represent 20% of world GDP; they are the world's fastest growing economies, and are home to 85% of the world's population and much of the planet's natural resources. It is not surprising that these emerging markets are now considered as a distinct asset class.

It would therefore not be a fallacy to suggest that financial market development is one of the key development targets of every emerging economy around the world. Every Governments which are seeking independence in fiscal financing are putting in place deliberate measures to develop their domestic debt market and support capital market growth. A well-functioning financial market is a key determinant of a country’s economic growth and development. It promotes a strong market oriented economy with a robust financial system with resilience from external shocks and better integration to the international markets. Countries that seek to achieve this milestone need to develop their domestic debt markets with focus on creating efficiency of the local money markets, diversifying investor base, activating the secondary market, 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 attainment of market development goals for most countries (World Bank, 2007). Due to unavailability of data, plenty of research on market development has
focused more on development of banking systems and stock markets with limited emphasis on bond (especially corporate) market development even though its growth in recent years has been encouraging (Matias and Ignacio, 2006).

1.2 Domestic Securities Market
Developing the domestic debt market involves in part, proper domestic public debt management including issuance of government securities as well as involvement of the private sector in issuance and trading of corporate instruments. Public debt is composed of all outstanding financial liabilities of the Government arising from past borrowing which includes guaranteed debts to state agencies and municipalities (Bhattacharyay, 2011). Governments that have succeeded in market development have not only strategically managed their public debt\(^2\) which majorly comprise of Government securities but also promoted reforms for better market institutional and structural frameworks.

As countries continue to implement initiatives to develop their domestic and international bond markets, corporate issuers are taking cue by floating bonds in capital markets and reducing reliance on bank financing. There is growing necessity for corporate institutions to finance their infrastructure development from fixed rate debt with long term horizon which is available from the capital markets (The World Bank, 1995).

Initiatives such as the Highly Indebted Poor Countries (HIPC) were aimed at reducing government budgetary burdens of servicing external debt thus promoting spending on development projects. The HIPC program did not directly address domestic debt which if not well managed poses potential risk of significantly inflating the cost of debt service as a result of rise in domestic interest rates occasioned by factors such as macroeconomic instability and reduced lending to the private sector (Christensen, 2005). To deal with these challenges, development of domestic bond market should among other things focus on reducing the stock of short term securities in the debt portfolio, stimulating a broader investor base to increase competition and optimize the price for government paper, and improve the regulatory and

\(^2\) As discussed later, one is not trying to ignore the fact that domestic debt burden was a serious issue for many countries and affected fiscal sustainability for a number of years. However, it gradually became clear to those countries keen to tap the domestic debt market that they needed to comply with market discipline or else pay the consequences such onerous cost of new borrowing.
operating environment for efficient functioning of the market. It is imperative that government
debt management considers investor preferences and help in promoting development of
appropriate instruments, trading infrastructure and distribution channels for government
securities (World Bank and IMF, 2001).

Based on sound analysis, a country must target the right balance between domestic and foreign
borrowing – with such choices dictated by elements such as cost, maturity structure and risk
considerations. For foreign borrowing, most Sub-Saharan Africa (SSA) countries have access to
highly concessional loans which not only increase the supply of foreign currency to support
import requirements but comes with very low interest rates and long maturity periods from
multinational lenders (Christensen, 2005). There are risks however associated with currency
mismatches particularly because foreign debt service increases foreign currency demand
resulting in more foreign indebtedness. High reliance on foreign debt also introduces currency
devaluation risks in the wake of increasing domestic interest rates.

1.3 Promoting domestic debt markets
There is strong justification for governments to promote the growth of domestic debt markets
although domestic debt may be costly when interest rates increase and is usually short term when
the market is still small and underdeveloped.

- First, suppliers of foreign debt usually consider the economic prospects of the country
  they intend to lend to and, their lending capabilities might be constrained by their own
  budgets, hence the recipient country might not receive the much needed financing
  resources in the timing and quantum required.
- Secondly, domestic debt comes handy where a government has to finance a large portion
  of its budget deficit mainly created by recurrent expenditures. This is so because most
  multinational and commercial lenders lend to finance projects as opposed to supporting
government’s operations.
- Thirdly, countries with large balance of payments surpluses from exports such as oil may
  experience frequent excess liquidity from receipts of foreign exchange which usually
  weakens macroeconomic stability due to inflationary pressures. Central banks will

3 Adherence to sound debt management principles was equally important.
4 Thus introducing rollover/refinancing risks on the part of the government.
usually issue government securities to manage liquidity levels and achieve monetary policy targets (Christensen, 2005).

Government borrowing from the domestic market has great benefits if properly managed and when there is deliberate effort to develop the domestic financial market. However, a large part of government revenues may be eroded by domestic debt service as interest rates and stock of domestic debt continue to rise. The liberalization of financial systems in most African countries begun in late 1980s and involved allowing the market to freely determine interest rates taking cognizance of factors such as inflation, government credit risk and the size of the debt portfolio. Where financial markets are shallow with relatively narrow investor base, the increase in interest rates is accelerated because of the monopoly of certain groups of investors who are capable of holding the issuer hostage. The solution to this is to encourage a broad investor base to introduce competition, minimize monopolistic tendencies and reduce borrowing costs as well as rollover risks.

1.4 Mindful of the dangers of domestic over-borrowing

Before the year 2000, most countries in Sub-Saharan Africa (SSA) used domestic debt instruments to borrow from their local markets although these markets were still shallow and underdeveloped. Christensen (2005) found out that compared with foreign debt, most SSA countries had smaller domestic debt burdens averaging about 15 percent of GDP by 1990s and almost an identical ratio of domestic debt to broad money averaging 40 per cent over the period 1980-2000. Another attribute of domestic debt markets during the same period was dominance of government paper by the banking sector with small presence of non-bank investors subsequently constraining private sector lending. Additionally, governments were exposed to higher market risk as debt instruments were mainly short term with common maturity of three months while average maturity was only about 10 months among 15 out of 27 countries sampled. Fiscal financing from domestic borrowing was much more expensive than foreign financing because most SSA countries particularly those under the Heavily Indebted Poor Countries HIPC initiative were liberalizing their financial markets which resulted in high real interest rates but also because foreign funding was mostly highly concessional with much lower cost. This situation led to high debt service costs with some countries such as Malawi, Zimbabwe, Gambia, Sierra

\[5\] This can be achieved by promoting the growth of the pension and retail sectors, to invest in Government securities.
Leone, Ghana, South Africa and Kenya paying more than 15 per cent of revenues to meet interest payments.

Countries in SSA faced uncertainty in debt sustainability given their increasing levels of both foreign and domestic debt stocks. Initiatives such as the HIPC were useful in reducing debt levels for these countries although some other measures such as outright\(^6\) debt reduction would have been more effective. A more reliable solution to public debt management with focus on domestic debt entailed lengthening the maturity structure of existing portfolios of securities because local debt for most countries was short term exposing them to higher rollover and market risks. To achieve this milestone, deliberate efforts to develop the domestic market for government securities needed to be considered involving broader reforms that supported long term instruments as well as strengthening the market structure to support take up of securities. Implementation of such market development reforms target to increase competition\(^7\) for government paper and address higher debt service arguably from longer maturity securities.

1.5 Learning from elsewhere

African economies including those in MEFMI region can learn from the experiences of other economies and markets around the world (for instance, the Asian crises in 1997 and the Global Financial Crisis) and put in place appropriate mitigating measures. In addition to small underdeveloped bond markets the Asian financial crisis that begun in Thailand was majorly caused by overreliance on the banking sector for domestic financing. The Thai baht (Thailand’s local currency) was attacked by speculators resulting in abandonment of local currency peg to US dollar due to depletion of foreign reserves as foreign capital took freight and investor confidence dwindled. This scenario spread fast to other countries in the region such as Malaysia, Indonesia and Republic of Korea where domestic interest rates rose sharply in a bid to minimize capital freight, purchasing power of their economies reduced significantly and foreign currency borrowing increased resulting in double burden\(^8\) to private firms as they incurred high domestic

\(^6\) But would have introduced macroeconomic instability from higher inflation due to increased liquidity.

\(^7\) Increased competition for government paper would result in lower cost of borrowing as bid margins narrow.

\(^8\) The double burden caused twin risks associated with mismatches in currency and maturity of loans. Corporate sector borrowed from banks on short term basis in foreign currency for long term domestic investment. But this funding source finally dried up as capital outflow continued resulting in expensive loans. Projects could not be completed and loan repayment became much more impossible.
borrowing costs (from increased interest rates) as well as rise in foreign debt from foreign currency financing. The private sector could not service the loans therefore significantly increasing non-performing loans resulting in bank failures and prolonged recession.

Herring and Chatuspripiak (2000) observed that economies that heavily rely on the banking sector for domestic financing risk a financial crisis situation due to banking system instability that may kill critical economic and investment projects thus reducing aggregate demand. Majority of economies in Sub-Saharan Africa (SSA) heavily rely on banks both for government and private sector financing. Existence of sound and stable domestic currency bond markets not only addresses the problem of double mismatch risk but also significantly reduces corporate sector overdependence on bank financing as well as foreign currency financing. A deep and well developed domestic currency bond market can on one hand, grow regional demand through mobilization of funds, increased connectivity and integration, while on the other hand, stimulate the local economy.

Relatively underdeveloped financial markets create bottlenecks that impede economic growth and poverty reduction. Such economies may face problems bridging their fiscal gaps without having to resort to external aid which comes with stringent conditions (Christensen, 2005). A country may have to procure expensive debt domestically because of market inefficiencies, huge arbitrage opportunities, and wide margins of bids at auctions of government paper thus failing to achieve its public debt management objectives in terms of cost and risk optimization. A well-functioning financial market is not only a key element of a country’s economic growth path but also an easy fallback for government to fund its operations and develop key infrastructure, at the most optimal cost and risk. It promotes a strong market oriented economy with robust financial system which is resistant to external shocks.

Governments that do not plan to put in place deliberate measures to develop their domestic markets and support capital market growth, risk dependence on external sources for financing fiscal mismatches and will definitely miss out on the great benefits of a reliable domestic market. From a corporate financing point of view, economies that heavily rely on the banking sector for domestic financing will more definitely be vulnerable to a financial crisis due to instabilities in

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9 Corporate sector can borrow for longer maturity periods matching their investment profiles and helping solve asset-liability mismatches in their balance sheets.
the banking system thus stalling important economic and investment projects (from the experience of the 1997 Asian financial crisis) and this may result in significant reduction in aggregate demand.

A financial crisis may originate locally (or within the region) or from far markets around the world such as the case of the global financial crisis witnessed in 2007-2008, which originated in the USA. Majority of economies in Sub-Saharan Africa (SSA) heavily rely on banks both for government and private sector financing – and this is the problem. Developing sound and stable local currency bond markets not only solves the double mismatch risk problem but also in a big way minimizes overdependence by government and corporate sectors and on bank financing and foreign currency external financing. Bond markets are channels through which infrastructure development and productive investment financing gaps can be sealed through taping national savings and foreign exchange reserves. Most countries in Africa invest their huge foreign reserves in advanced markets at minimal return.

During 2000s there was a financial crises that mostly affected countries that had excessively relied on external debt denominated in foreign currency, most emerging countries tried to address their public debt vulnerabilities by reducing the sizes of external debt and short term domestic debt in their public debt portfolios. In Europe for example, Russia was the most successful in reducing the proportion of short term debt in the total domestic debt component. Brazil managed to reduce the share of foreign debt in total debt portfolio from 37 per cent before 2002 to 2.3 per cent by 2006 (Blomemestein and Santiso, 2007).

Increasing participation of emerging markets in the global financial system has tended to promote excessive reliance on foreign financing which in turn exposes countries to more vulnerability in terms of shifts in expectations and perceptions – may lead to periods of serious financial crises. If emerging markets are to competitively participate in the modern global financial landscape (which is uncertain and complex), they must put in place well-functioning domestic, local currency bond markets, taking into consideration the risk profile, complexities and constraints that come with it. Taking cognizance of policy-coherent macroeconomic viewpoint, promotion of risk based public debt management and liquid domestic bond markets are the two important strategies that emerging financial markets and developed countries can explore with an aim to achieve enhanced financial stability and greater participation in the global financial landscape (Blomemestein and Santiso, 2007).

Domestic market development initiatives are geared towards eliminating structural and operational inefficiencies in the market by creating competitiveness and increasing demand for instruments to support financing of government fiscal gaps and capital expenditure for private sector as well as develop the financial sector. With the absence of a well-functioning and efficient government securities market which is usually the benchmark for pricing financial
products, the corporate sector may shy away from originating financial products and participating in capital market development, hurting their contribution to country’s economic growth.

1.6 This study
Different countries in MEFMI region and around the world are implementing various initiatives and programs to develop their local bond markets and by extension, the financial markets. This paper intends to investigate the major determinants of bond market development in five MEFMI countries namely Tanzania, Mozambique, Kenya, Uganda and Zambia during the period 2003-2012.

1.7 Objective of the assignment
The objective of the study is to analyze trends in bond market development which will be achieved through an assessment of major determinants of government bond financing and their relationship with select financial and economic factors. In addition to specific macroeconomic variables as part of explanatory factors, financial market indicators as well as structural factors will constitute measures of key Public Debt Management (PDM) and market reforms that these countries have undertaken with an aim to promote development of their local bond markets. In essence therefore, the study will provide information on whether the initiatives being undertaken, controlling for macroeconomic environment, are bearing fruit (explanatory variables have strong positive relationship with bond market development indicators) or may require reassessment (explanatory variables do not have strong relationship to indicators of bond market development) and whether there is justified necessity to continue supporting these initiatives. Kenya for example has since 2007 been implementing the benchmark bonds program and the infrastructure bonds program from 2009 as part of public debt management strategies aimed at enhancing low cost-risk fiscal financing, promoting corporate participation in debt issuance and the development of necessary physical infrastructure for economic growth. Key measurable variables that elucidate the benchmark and infrastructure bonds programs that are currently under implementation will be examined against indicators of bond market development to determine their degree of importance.

1.8 Key questions probed
The study seeks to answer the key question about what the major determinants of bond market development are in sampled MEFMI countries. Specifically:

a. Are macroeconomic factors major determinants of bond market development in Tanzania, Mozambique, Kenya, Uganda and Zambia?

b. Do financial market factors significantly influence the development of bond markets in selected countries?
c. What structural and developmental factors are relevant in explaining bond market development in sampled countries?

The study intends to examine whether specific macroeconomic, financial market factors and structural variables have relationship with indicators of bond market development (bond market capitalization as a per cent of GDP). Specifically:

a. Assess whether identified macroeconomic factors influence bond market capitalization as a measure of bond market development.

b. Evaluate the nature of relationship between financial market variables with bond market capitalization.

c. Identify structural factors that may have strong relationship with bond market capitalization.

This study will measure the level of development of government bond market as a proportion of the bond market capitalization to the country’s GDP. In retrospect therefore, this study will serve three purposes: provide an overview of current situation of government bond markets in Tanzania, Mozambique, Kenya, Uganda and Zambia; identify key determinants of bond market development and provide recommendations for policy on reforms to enhance the development of bond markets in these countries and perhaps for consideration by other MEFMI countries.

Other factors that impact on bond financing will not be examined in this study because of lack of comparable data across countries sampled. Of major concern is lack of data on the corporate debt market which has limited the study to the assessment of predictors on government bond market development only.

1.9 Organisation of the Paper

The paper is organised as follows: Section II of this paper contains a review of literature on the topic under investigation while Section III provides an overview of the current situation of government bond markets in the five countries. The empirical analysis is provided in section IV and contains a discussion on the choice of the analytical methodology used for estimation, section V presents and interprets the model results while section VI presents policy implications from the findings and provides a conclusion for the study.
2.0 BOND MARKET DEVELOPMENT: LITERATURE REVIEW

2.1 The merit of financial sector reform

Given that securities market and bond market development in particular takes place within the wider financial sector reform and is considered as an important element of such reform, it may be appropriate to first consider the development of the financial sector in countries striving to achieve higher rates of economic growth. However, before we look at the financial sector reform itself, it may be worthwhile to remind ourselves of the following basic function of finance - which one tends to take for granted: Finance is the key to investment and hence to growth. Providing saved resources to others with more productive uses for them raises the income of savers and borrowers alike. Without an efficient financial system, however, lending can be both costly and risky. Self-financed investment is one way to overcome these difficulties, but profitable investment opportunities may exceed the resources of the individual enterprise. Concomitant with the growth of the real sector, it is important for countries to develop the financial sector so that it can provide its supportive role in the economic development process.

Financial sector reform itself is the process of changing institutions, adding new ones, eliminating distorting financial policies and practices, and generally establishing the basis for greater efficiency in both the mobilisation and the allocation of scarce resources.

While many countries have embarked upon the reform of their financial sector, the need for such reform has been recognised (not always unanimously acknowledged) for a very long time. For instance, the pioneering work of Shaw (1973) and McKinnon (1973) in the early 1970s has suggested that financial development is important in economic growth, since an improved financial system fosters the efficient mobilisation of domestic savings and allocates resources to their optimum usage. Though the McKinnon/Shaw thesis has over the years encountered some scepticism on the part of certain financial pundits (as highlighted by Huw Dixon, 1997), others such as Maxwell Fry (1997) have shown that financial repression inhibits economic growth and prescribe that economies should encourage financial liberalisation. The development of a healthy financial sector at the early stage of the overall reform work will also contribute to mobilise savings. Monetary authorities can therefore help the savings process by removing barriers to "compartmentalisation" and segmentation of financial markets and promote the process of financial "deepening", i.e. the creation of non-financial instruments, institutions and markets.

The financial sector makes its biggest contribution to growth by providing a medium of
exchange. In addition, liquidity and ease of access may make financial instruments a more attractive home for savings. Savings determines the rate at which productive capacity and, hence income, can grow. On average, the more rapidly growing developing countries have had higher saving rates than the slower growing countries (World Development Report, 1989 and more recent studies as well). These rates are influenced by many factors: the rate of income growth, the age composition of the population, and attitudes toward thrift. The services provided by government, such as social security, can also affect savings, as can taxes and government deficits. Macroeconomic and political stability affect expectations and this affect savings.

However, while one is not very clear whether financial variables affect saving rate (this is still an open question), liquidity and ease of access may make financial instruments a more attractive home for saving. Even though, the financial system intermediates only a part of investible resources (firms finance much of their investment directly out their own saving), it plays a vital role in allocating saving. As more saving move through the financial system, financial depth increases. The financial systems of higher-income countries are usually deeper (as measured by the ratio of liabilities to GNP) than those in poorer countries. They are also deeper in most rapidly growing countries than in the slowest growing countries (as shown by the ratio of M2 - the broad definition of money - to GDP).

2.2 Importance of Securities Market

Having seen the possible benefits (though, admittedly, not unanimously recognised) of financial reforms, one can equally gauge the development benefits of a securities market in particular. One crucial element for enhancing economic development is the need for mobilising capital for investment and for ensuring that scarce capital is channelled into the most productive investment - the latter being crucial for economic development. In developing countries, domestic savings are usually inadequate to finance the required level of investment and foreign resources must be tapped to supplement local capital. While foreign capital can, to some extent, play that supplementary role, the greater part of investment usually comes from domestic sources, even for very poor countries. Therefore, every effort must be made to increase domestic savings.

Increasing both foreign and domestic investment in developing countries and ensuring that scarce capital is productively invested depend on the proper functioning of the financial sector - in particular, the securities market. In reviewing the finance literature, one notes that the importance of securities market is gauged through providing answers to questions such as: Are securities markets bringing any benefit to developing countries? Does its existence augment the quantity of real saving from any given national income? Does it increase the productivity of investment? Does it cheapen the cost of providing the investor with resources? Does it increase net capital inflow from abroad?
Securities markets provide a market for the trading of existing securities as well as a market for the issue of new securities. The market for the issue of new securities, known as the primary market, is of paramount importance for the evolution of the overall financial system. It allows the various entities - public companies, government and local authorities to raise capital for investment by issuing appropriate debt or equity instruments directly to the holders of saving and lending units, whether institutional bodies or individuals.

2.3 Effect on savings

The setting up and deepening up of financial systems, via, for instance, the development of securities markets will, in itself, not raise the savings rate (as measured by the level of savings as a percentage of GDP). There are a number of factors that affect the savings level of a country. While the mere provision of financial institutions for acquiring financial asset will not per se raise the rate of saving in an economy, there are some grounds for expecting savings to respond favourably to financial development (including the opportunity to acquire bonds and/or equity securities).

There are differing views on the effect of securities markets on the level of savings. For instance, U Tun Wai and Patrick (1973) argue that the existence of a securities market has relatively little effect on the aggregate rate of private savings - given the level of development of most developing countries - because these are sufficiently close financial substitute to satisfy would-be owners of financial assets. While they agree that the liquidity of publicly traded shares may attract savers who would not be willing to accept the illiquidity of investment in their own or their friends' projects, they do not judge this attribute to be important enough to influence the savings rate. On the hand, there is alternative and more recent evidence which suggests that smaller savers are attracted by the opportunity to acquire corporate securities in most cases probably because of the prospect of capital gain, although the liquidity and yield attributes of the securities cannot be disregarded (Drake 1969).

2.4 Allocative functions

What about the allocative functions of securities markets? Securities markets are important in linking institutions requiring funds (such as governments and their agencies, financial institutions and companies) with individual and institutional investors through the intermediation of brokers, dealers and underwriters (somebody who agree to purchase securities if they are not purchased by others). In this way, supply and demand, especially in terms of risks and maturities, are matched. The primary role of securities markets is to provide risk capital - through the issue of shares - and long-term debt financing - through the issue of long-term bonds. Borrowers of capital can thereby more fully meet the needs of investors for greater diversity of financial instruments that reflect the investors' attitudes towards risk, yield (the rate of return) and
liquidity.

As a result, the mobilisation of national savings is strengthened and financial resources are more efficiently allocated between the economy's competing investment needs. The savings investment process is rendered more efficient and the country benefits from improved production possibilities and higher national income.

The secondary market (for trading existing shares) is an essential element in supporting the savings-investment process in that it gives savers the ability to realise their investments at any time. Without the liquidity afforded by the secondary market, savers would prefer other investment alternatives than securities.

Certain researchers in the literature raise the question of whether the securities market improves the allocative machinery over and above the functioning of banks and other institutional lenders. This alternative line of thought argues that in contrast to financial institutions, the securities market does not intermediate and provides no institutional assessment of the competing claims for finance as is made, for example, by the loan officers of banks. The disposition of investible funds via the securities market is made in accordance with the apparent profit prospects of the companies which compete for share and debenture (fixed-interest securities issued by companies in return for long-term loans) issues. Unfortunately, relative profit rates (adjusted for risk) may not reflect relative efficiencies between firms because profit rates may be distorted by market imperfections arising from monopoly power, tariff protection, import quotas, credit rationing and so forth. In such circumstances, the allocative effect of the securities market may even be harmful. Those with this viewpoint conclude that one cannot come to any firm conclusion as to whether or not a securities market would improve upon the allocative machinery provided by the financial institutions. The most that can be said is that, since the securities market constitutes an additional avenue of borrowing and lending, the capital market is wider than hitherto and should function more competitively.

2.5 Effect on cost of finance

With the development of securities markets, the financial sector gets enlarged and this leads to additional and more sophisticated financing as well as additional source of financing. Such competition no doubt leads to a reduction in the cost of finance. At the same time, securities markets increase the opportunities for specialisation, division of labour and reduction of costs in financial activities. Securities markets need not be costly to operate. The issue of shares and debentures can be carried out with relatively small costs.
2.6 Effect on international capital flows

While a few years ago, there were serious doubt as to whether securities markets would have hitherto attracted, to developing countries, any foreign capital which was not already so destined for other reasons, recent developments and trends in capital flows - as reviewed earlier in Chapter 2, would suggest that financial improvements certainly facilitate international capital flows. The other possible contribution of local financial development may be to deter capital outflow by providing attractive financial assets, especially negotiable securities, in the home country.

Much effort is currently being made by developing countries to improve their financial sectors. The liberalisation of policies on foreign investment, privatisation and the contraction of the public sector, the movement towards market-oriented interest rate policies and greater efforts to mobilise local savings are all encouraging the development of the financial sector. These policies themselves require a financial system that facilitates change - especially in developing securities market. While commenting on the financial systems in the African region, Paul Popiel (1990) argued that the development of capital markets is a difficult and delicate process. Their existence and success depends upon an active private enterprise sector, and the role of the governmental authorities in creating the appropriate enabling environment, including a stable macroeconomic environment; the removal of any obvious legal, fiscal, and other obstacles to the success of the markets; and the provision of adequate regulatory and supervisory framework that provides a balance between market freedom and investor freedom.

Beyond these broad ways in which securities markets, and other financial developments, may assist economic growth, are the developmental benefits which may be derived more particularly from the existence of a securities market (Euromoney, 1991).

- The securities market provides a first-rate breeding ground for the skills and judgement needed for entrepreneurship, risk bearing, portfolio selection and management.

- Active securities markets serve as an 'engine' of general financial development and may, in particular, accelerate the integration of unorganised or traditional financial systems, with the organised and institutional financial sector.

- The existence of a securities market enhances the scope and provides institutional mechanisms, for the operation of monetary and financial policy.
2.7 Bond Market Development Studies around the World

Matias and Ignacio (2006) studied development of bond markets around the world and sampled 100,000 corporate bond issues, 90 per cent of which were bonds issued in developed countries, with 66 per cent constituting U.S. domestic bonds. Bonds issued in less developed markets also formed part of the sample. The study eluded that an effective examination of bond market development should consider a multidimensional concept, one that does not only refer to size of the bond market but also encompasses other characteristics of the market, type of issuer and type of instruments. The study generally classified the determinants of bond market development under general economic\textsuperscript{10} and financial\textsuperscript{11} market/sector indicators. The indicators for bond market development included the size of the bond market as a proportion of total stock of bonds to GDP, composition of the bond market (mainly consisting of stock issued by government, private sector – corporate and financial institutions), characteristics of instruments (maturity, credit rating, principal size), currency of issuance as well as type of issuers.

The findings from the analyses of the different measures of bond market development described a well-developed bond market as one which consist of characteristics such as; large size in terms of stock of bonds to GDP, relatively stable composition between private and public issuers (although there was some evidence of crowding out), promotion of financial institutions compared to non-financial institutions, bonds rated at investment grade, ease of market access by unlisted firms, longer maturity of bonds, large size of bonds and higher proportion of local currency bonds compared to foreign currency bonds (Matias and Ignacio, 2006). Bond market development was the dependent variable for the sampled data.

General economic development (per capita GDP), inflation rate as well as importance of institutional investors showed strong relationship with indicators of bond market development. Macroeconomic volatility however was not a significant variable but had the tendency of shortening maturities of bonds during periods of high inflation. The openness of the capital account represented increased demand and was strongly associated with issuers substituting

\textsuperscript{10} Economic development (Per Capita GDP), Size of the economy, Inflation rate, Government deficit, ease of foreign investment (capital account openness and exchange rate fixity)

\textsuperscript{11} Information availability (credit information- credit bureaus and shareholder information disclosure), degree of development (size and efficiency) of stock market – market turnover, and banking sector – bank’s spread and overhead costs, factors associated with demand of securities, supply factors-tax rate, importance of institutional investors (pension schemes and insurance penetration), size and sector classification of listed firms.
domestic markets in favor of the foreign market. In addition, findings pointed to the fact that growth of bond markets compared to the economy lagged behind, relative to growth of the banking sector. In the sample of countries studied and considering low economic development, Latin America had relatively smaller bond markets in terms of size of government and private issues. However, size and proportion of corporate bonds compared to overall size of bonds was found to be significantly large. For Chile, maturity profile of bonds was relatively longer at 13.6 years than average maturity of the countries sampled at 6 years. In addition, 80 per cent of Chilean bonds had maturity longer than 5 years compared to just 35 per cent for average country in the sample (Matias and Ignacio, 2006).

In an analysis of the degree of market development and its impact on reducing volatility\textsuperscript{12} Blomemestein and Santiso (2007) measured the degree of financial market development as the amount of money that a firm can borrow when the financial market is more developed, given a specified level of assets, considering factors such as firm’s capital adjusted cash flow, and working capital required to produce a particular level of output. But, they acknowledged that most typical models used for estimating the degree of financial market development do not take into consideration specific institutional structure which is critical for the development of a sound financial market.

In 2000s, most emerging countries particularly in Latin America were able to overcome original sin\textsuperscript{13} by issuing more local currency bonds in the international market and developing their domestic bond markets as well. Countries such as Mexico, Colombia and Peru increased issuance of international local currency bonds hence significantly reduced their original sin indices. During the period 2000-2005, there was notable shift from external to domestic financing as investors reallocated portfolios in favor of domestic bonds with more emphasis on promoting the growth of institutional players such as pension funds. This phenomenon contributed a great deal to the reduction of original sin which was caused by currency mismatches in debt portfolios (Blomemestein and Santiso, 2007).

\textsuperscript{12} Volatility was measured as size of cash flows such that high cash flows represent good times while low cash flows represent bad times

\textsuperscript{13} Refers to a situation where countries are unable to issue local currency denominated bonds in the international market or even in the domestic market, long term
The study identified a number of key features of institutional structures that contribute to lower volatility and higher stability in financial systems. One of these features was the diversification of sources of finance where a well-functioning domestic bond market introduces great benefits in reducing the impact on corporate finance during periods of scarce credit. One of the major reasons for the Asian financial crisis of 1990s was the dominance of banking finance in financial intermediation, with little market scrutiny as opposed to domestic bond market that would promote greater information disclosure and contribute to better and efficient financial intermediation. Another important feature of the institutional structure that is critical in reducing risks from quick movements in short term capital flows is the existence of a well-developed domestic fixed-income market that incorporates suitable risk valuation systems (Blomemestein and Santiso, 2007).

A developed domestic bond market would reduce the dependence on external sources of finance and encourage 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. Another feature of the institutional structure that may not be incorporated in a typical model for measuring financial market development are the challenges associated with vulnerable risk profile of governments and institutions (public and private) stemming from structural obstacles like those preventing full benefits of risk sharing offered by efficient domestic or international markets. Finally, 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, currency and maturity mismatches, non-transparent supervisory practices (in terms of transactions in banking and capital markets), insufficient exchange rate management and fragile institutional infrastructure (Blomemestein and Santiso, 2007).

In promoting the development of the domestic debt market, it is important to take into account modern risk management encompassing an asset and liability management (ALM) framework that acknowledges that, resources and the assets that generate those resources are important inputs for risk management. Also, a key component of public debt management is essentially a

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14 Credit crunch may occur when banks shy away from lending due to insufficient capital and interest rate mismatches, factors that investors in bond markets may not regard as constraints, thus bond market thrives.

15 These have been identified as key contributors of financial crises by countries around the world.
risk management approach especially for emerging markets (Blomemestein and Santiso, 2007). This would entail specification of preferences for the public debt portfolio including but not limited to level of risk tolerance comprising of trade-off between expected cost and risk which guides decisions on the optimal structure of the portfolio to minimize Government’s fiscal vulnerabilities form external shocks. Cost and risk tradeoff entails determination of the desired composition of the debt portfolio considering characteristics such as interest rate and currency mix, indexation, liquidity and maturity profile. Essentially, expected costs and risks of debt service are largely determined by the choice of new debt instruments to issue and the latter mainly depends on the structure of the economy, investor preferences and nature of shocks\textsuperscript{16} on the economy. A country should focus to reduce variability in its primary balance and the debt ratio\textsuperscript{17} because such efforts help to avert a potential fiscal crisis or financial crisis.

Reinhart and Rogoff (2004) observed that as a domestic market development strategy, emerging market countries should ideally aim to reduce external debt component and increase domestic debt because of the risk vulnerabilities (both foreign exchange and interest rate risks) associated with foreign debt and the fact that, these economies are vulnerable to slowdowns arising from external shocks. Advanced economies have a higher advantage of sharing their risks with external creditors because much of their foreign debt involves minimal net foreign currency exposure. Liquid domestic bond markets facilitate the risk-based approach to public debt management which does not only contribute to enhanced financial stability but also promotes a more successful participation of an emerging market in the global financial landscape. Even more, liquid domestic bond markets are crucial for better risk management by financial intermediaries. This is a strong points justification for development of a liquid and efficient domestic bond market (Blomemestein and Santiso, 2007).

Blomemestein and Santiso (2007) study on “Successful Emerging Domestic Bond Markets in the Global Financial Landscape”, noted that some emerging countries that registered healthy

\textsuperscript{16} An example; supply shocks to the budget would better be hedged by issuing fixed rate debt in local currency. Demand-side shocks can be hedged using inflation-indexed instruments. Compared to advanced markets and in relation to construction of a reliable debt portfolio as a dependable guide for domestic bond market development, emerging markets face more volatile macroeconomic environments with complex sovereign debt portfolios, hence more risks and difficulty in implementing financing strategies, and are not in a position to maximize the benefits of domestic/international risk sharing.

\textsuperscript{17} Public debt-to-GDP
financing positions with large budget surpluses do also have in place market development initiatives aimed at continued issuance of new Government securities to promote financial system liquidity, lengthen maturity structure of debt and provide a yardstick for issuance of corporate instruments. In addition, a number of emerging countries have enhanced their public debt management by adopting market-based issuance approaches which not only emphasize development of liquid secondary government bond markets but also entail risk management and use of benchmarks\textsuperscript{18}.

Private fixed income markets are strongly supported by the existence of well-functioning government securities markets, as they offer a tool for interest rate management and provide a pricing benchmark, which implies that development of a well-functioning government securities market is an important precursor to the growth of private sector corporate bond market. As part of market development; liquidity, transparency, and predictability of the domestic bond markets in emerging countries enhanced by use of risk based approach to public debt management entails setting certain benchmarks with regard to liquidity, currency and interest rates. As a result, the countries are empowered to more successfully participate in the global financial system (Blomemestein and Santiso, 2007).

2.8 Bond Market Development in Emerging Markets

Bhattacharyay, 2011 in his study on Asian bond markets, established major determinants of bond market development in Asia as; size of economy, stage of economic development, openness of the economy, size of banking sector and interest rate spread. 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 due to massive withdrawal of investments in Asia by foreign banks. Bond markets are important channels for funding long term infrastructure projects as well as other productive investment using local and regional capital.

Hong (1998) in his study on determinants of bond spreads in emerging markets observed that there exists scanty information on the determinants of pricing and yield spreads of new bond issues in emerging markets. External financing through bond issues has however improved as a

\textsuperscript{18} These benchmarks relate to liquidity, interest rate and currency considerations under the risk based approach.
result of increased interest by institutional investors and better economic prospects. Certain significant explanatory variables explained differences in bond spreads across emerging market countries. Among these variables was liquidity and solvency of the economy measured by indicators such as debt-to-GDP ratio, debt-service-ratio, international reserves-to-GDP ratio and net foreign assets. Also found significant was individual country macroeconomic fundamentals such as terms of trade and inflation rate. According to the study, both liquidity and macroeconomic environments influence the level of volatility of bond spreads, in a systematic way.

Countries that embrace effective public and private sector debt management (both domestic and external) have a more successful participation in the international financial system and have strong resistance to vulnerabilities brought about by sharp swings in perceptions of foreign investors. The major lesson from the Asian financial crisis of 1990s was that the structure of the domestic financial sector is an important factor for consideration by the macro-economic policy makers. For example, monetary tightening would result in an increase in interest rates attracting capital inflows but adversely impact on the balance sheets of firms, resulting in bankruptcies subsequently encouraging capital outflows and depreciation of local currency (Eijffinger and Goderis, 2008). The structure of the domestic financial sector is represented by factors such as size and composition of public and private debt, degree of capital market development and vulnerability of banks.

In a study on necessary conditions for the development of robust domestic bond markets in East Asia, Fabella and Madhur (2003) identified key prerequisite requirements as; (a) stronger regulatory framework for the bond market, (b) continued macroeconomic environment, (c) improved corporate governance, (d) strong government bond market as a benchmark for corporate market, (e) full banking sector reformation (after a crisis such as the Asian crisis), (f) broad investor base, (g) streamlined tax system particularly for the bond market and (h) advancement of regional bond market centres.

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19 In monetary policy implementation, particularly also take into account the outstanding stock of debt of firms which represents firms’ assets.
20 Ensuring low inflation and stable interest rates
2.9 Studies in Less Developed Countries (LDCs)

An empirical analysis of the determinants of bond market development in 23 sub-Saharan African countries by Adelegan and Radzewicz-Bak (2009) identified savings constraint as a major determinant of low financial intermediation by banks and a key impediment to domestic bond market development. A number of other factors important for the development of domestic bond market included the structure of the economy, investment profile, law and order, size of the banking sector, level of economic development among other macroeconomic variables. The findings showed that increased effort to strengthen the investment environment as well as encourage a regional approach to bond market development was necessary. Other opinions on the determinants of bond market development argue that there are more important fundamentals that practically explain bond market development such as stable macroeconomic policies, enhanced transparency and regulation as well as firmer investor protection.

Before 1996, 33 countries in Sub-Saharan Africa (SSA) were categorized as 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 SSA countries. To further reduce external indebtedness, most countries are resorting to mobilization of domestic resources as an alternative source of financing particularly because donor funding after the global financial crisis in 2008 dwindled forcing countries to revert to domestic financing sources. 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. The need to create a conducive environment for developing domestic debt markets cannot be overemphasized especially with an aim to increase independence in management of public finance affairs and enhance reliance on domestic non-bank sources to bridge fiscal deficits and increase development funding. With the exception of South Africa, most markets still remain shallow, illiquid and inefficient (Adelegan and Radzewicz-Bak, 2009).

Another situation that created the necessity for domestic market development is the overreliance on commercial banks for public and private funding. Whilst most of commercial banks in SSA are affiliates of foreign parent banks, financial sector remains exposed to global market swings due to market sentiment as well as negative risk perception by foreign investors. A well-developed bond market promotes better financial intermediation thus boosting channeling of funds into the domestic market for development. Additionally, domestic bond markets provide alternative sources of financing with enhanced capital allocation by attracting savings to assets with better returns, contributing to the growth of country’s financial system and facilitating risk management as risk is shared among different parties in the market place (Adelegan and Radzewicz-Bak, 2009).
Most countries in Sub-Saharan Africa (SSA) have resorted to mobilization of domestic resources as an alternative source of financing and to reduce increased external indebtedness. 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. 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. For a long time now, there has been overreliance on commercial banks in SSA for funding and these banks are mostly 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. With well-developed bond markets, there will be improved financial intermediation which will in turn boost the channeling of funds into the domestic market to finance development. Additionally, 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 (Adelegend and Radzewicz-Bak, 2009).

In analyzing the interest burden of public debt on the fiscal budget among SSA countries, Christensen (2005) compared interest payments to revenues and GDP and found out that interest payments on domestic debt increased significantly to more than 15 per cent of revenues and to more than 2 per cent on average as a proportion of GDP in Gambia, Ghana, Malawi, Sierra Leone, and Zimbabwe during the period 1980-2000 but reduced in other SSA countries where debt stocks fell. In addition, domestic interest payments remained high among HIPIC countries despite smaller domestic debt stocks compared to foreign debt due to high domestic interest rates.

Unchecked Government borrowing can also lead to crowding out of private sector lending where government securities compete for domestic private savings resulting in increased interest rates ultimately discouraging uptake of credit by private sector and killing private investment. Absence of non-bank investors in government securities investments further discourages private sector lending thus promoting the crowding out problem as banks prefer government paper to lending. By regressing private sector lending on domestic debt, the hypothesis that increased government borrowing crowds out private sector credit was supported where on average, among SSA countries, a 1 percent increase in the ratio of domestic debt relative to broad money caused a 0.15 per cent decline in the ratio of private sector lending to broad money, in the period 1980-2000. For South Africa however, the proportion of private sector credit to broad money increased even as domestic debt expanded and this was attributed mainly to the fact that commercial banks holdings of domestic debt were relatively small compared to most countries (Christensen, 2005).
Another important aspect of the domestic debt portfolio is the maturity structure of the instruments therein. Short term instruments are associated with rollover risk where government has to frequently rollover maturing securities leading to increases in interest rates for government securities as the market seeks a better return resulting in higher debt service. Frequent increases in interest rates has the potential to discourage investment in long term instruments such as bonds because market confidence gets eroded and the yield curve rises towards the longer segment. The government should seek to balance the maturity of domestic instruments with focus in medium and long term securities in order to minimize refinancing costs and risks associated with short term instruments as well as debt service costs associated with high interest payments for bonds. But also the choice of maturity structure should match 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.

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 debt service costs associated with long term bonds. Christensen (2005) observed that the length of maturity of government securities is an indicator of the degree of market development and although a longer maturity profile of government debt 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.

By 2005, Africa’s domestic debt was on average 10 months to maturity and almost half of the total portfolio comprised of 3-month Treasury bills indicating that the debt portfolios needed to be refinanced or rolled over on a quarterly basis. Comparing SSA countries sampled and six developed and emerging economies, Christensen (2005) found that the maturity structure of the latter was about 5.5 years which was more than 7 times that of the former and also that general economic development of a country measured by per capita income had a stronger relationship to the maturity length of domestic debt than the size of debt markets as a per cent of GDP.
A desirable investor base would be one containing both domestic and foreign investors and for each category to consist of the banking sector and the non-banking sector. The non-bank investors may include pension and collective investment funds, non-financial entities as well as retail segment of the market. Presence of foreign investors in the domestic market is an indication of low country risk, minimal capital account restrictions and an efficient trading infrastructure. For the SSA countries sampled, Christensen (2005) found out that on average commercial banks held the largest portion (more than half of total market holding) of government debt followed by the non-bank sector which accounted for one-third of outstanding debt. However, the proportion of holdings of government debt by non-bank sector (mainly pension and insurance companies) in countries such as Kenya, Rwanda, Madagascar, South Africa and Mauritius were found to be significant. A shallow market with holdings of government debt mainly dominated by banks is a reflection of weaknesses in the banking system characterized by; very minimal private sector lending, unreliable information on creditworthy borrowers and lack of efficient mechanisms to settle payment disputes due to weak legal systems and no commercial courts.

2.10 Hypotheses that will be tested in the current study

From the foregoing literature, this study will test the following hypotheses guided by data availability for various factors (indicators) and for the countries sampled:

a. Bond market development has a positive relationship with the size of the economy (GDP at purchasing power).

Eichengreen, Hausmann, and Panizza, (2002) noted that small economies lack the minimum capacity necessary for development of large and stable domestic bond markets resulting in discouragement for bond issuers such as multinational corporations which look for large financing volumes.

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21 Other non-bank players in Kenya, Rwanda, Madagascar, South Africa and Mauritius included building societies, public enterprises, retail market and post office savings banks
22 With little capability to screen and monitor loans
23 The degree of ineffective settlement mechanism for payment disputes is reflected in the size of Non-performing Loans (NPLs) to total loans advanced.
b. **Bond market development has a positive or negative relationship with openness of the economy (exports as proportion of GDP)**

Rajan and Zingales (2003) observed that an open economy allows competition for corporate financing reducing dominance by the banks which try to influence policies that discourage competition arising from other sources of corporate finance. But also higher incentive to develop the domestic bond market exists for economies that have lower integration with other economies and markets (Adelegan and Radzewicz-Bak, 2009).

c. **Bond market development has a positive relationship with the stage of development of an economy (per capita GDP)**

In their study on bond markets in Asian economies, Eichengreen and Luengnaruemitchai (2004) noted that even though some emerging Asian economies experienced high economic growth rates, they remained poor compared with advanced economies and lacked necessary institutions\(^{24}\) to promote financial markets hence the stage of development of an economy positively and significantly influences bond market development.

d. **Bond market development has a negative or positive relationship with interest rates spread**

With increasing interest rates spread, the purchasing power of long maturity bonds with fixed interest rates is diminished hence lower demand for long term bonds (Eichengreen and Luengnaruemitchai, 2004). For positive association, bank lending spread may reflect the level of efficiency and competition in the banking sector hence higher spreads representing inefficiency and opportunity for growth of debt market (Eichengreen, Panizza, and Borensztein, 2008).

e. **Bond market development has a positive relationship with the size of the banking system (domestic credit provided by banking sector as a percent of GDP)**

Hawkins (2002) highlighted that a strongly capitalized and large banking system is necessary for the development of a liquid and well-functioning bond market because banks play the dealership and market makers role in financial markets.

\(^{24}\) Lack frameworks for enforcement of contracts and increase certainty for investor rights
f. **Bond market development may have a positive or negative relationship with exchange rate variability.**

Where the exchange rate regime remains stable, bond market thrives because foreign investors perceive it as low risk hence higher volatility of the exchange rate discourages bond market development (Eichengreen and Luengnaruemitchai, 2004). As much as pegged or fixed exchange rate could pull foreign investors into the domestic bond market, underestimated risk of lending to banks and excessive foreign competition development of foreign intermediation (Goldstein, 1998). Exchange rate variability is measured as the standard deviation of the change in logarithm of the nominal exchange rate.

g. **Bond market development has a positive relationship with fiscal balance (moving average of country’s past budget balances)**

The development of the corporate bond market is highly influenced by the existence of a well-developed government bond market but again, dominance of government bond issuances may crowd out private sector financing thus limiting the latter’s growth (Harwood, 2000).

h. **Bond market development has a positive relationship with stronger law and order**

Yibin, Phelps and Stotsky (2013) in their study on Bond Markets in Africa stated that countries with English legal systems are more likely to promote financial systems that are market based compared to those that embrace legal systems based on civil law, where financial systems would generally be bank-based. In addition, common law systems in British tradition promote financial markets development by offering stronger protection to investors as opposed to civil law tradition of the French.

i. **Bond market development has a positive relationship with monetary freedom**

Monetary freedom is a subcomponent of the index of economic freedom published by The Heritage Foundation and is measured by the inflation policy index. Worse monetary policy or higher average inflation discourages bond investment. Inflation has a negative relationship with bond markets because higher inflation results in erosion of bond returns as interest rates rise and bond values decline (Stijn, Daniela and Sergio, 2007). The opposite is true for lower inflationary environment, which promotes bond market activity.

j. **Bond market development has a positive relationship with fiscal freedom**

Fiscal freedom is another subcomponent of the index of economic freedom published by The Heritage Foundation, measured by a fiscal burden of government index or fiscal pressure index. Lower index scores imply fiscal freedom reflective of conservative
government expenditure and lower income and corporate tax rates which relate positively with bond market development (Stijn, Daniela and Sergio, 2007).

**k. Bond market development has negative or positive association with interest rate fluctuation depending on risk appetite levels by investors**

With interest rate variability, risk averse investors mostly avoid holding onto bonds which precludes issuance of long term bonds and development of the bond market. But risk taking investors want to take advantage of volatility hence encourage bond market development. Risk-averse investors may not be interested to hold fixed rate bonds where interest rate variability is high (an indication of thin market) and thus reduce demand for long term bonds.

**l. Government bond market capitalization may relate positively or negatively with capital openness**

The quality of governance of domestic companies and access by foreign investors to domestic debt are enhanced with more openness to foreign portfolio investment (Adelegan and Radzewicz-Bak, 2009). Where there are capital controls, domestic debt market may be the only incentive source of financing for seekers of capital thus encouraging bond markets.
3.0 DOMESTIC DEBT MARKETS OVERVIEW IN SELECTED MEFMI COUNTRIES

3.1 Overview
Local debt markets offer government a cheaper and low risk alternative source of financing but most debt markets in MEFMI region are not only undeveloped but characterized by illiquidity, shallowness and lack of diversification. In most of these countries, secondary markets for bonds are inactive due to lack of proper infrastructure, few instruments, inexistence of institutional investors and inadequate regulatory frameworks.

3.2 Debt Outstanding
As shown in Table 1 and Figure 1 and in nominal terms comparing 2003 and 2012, Kenya recorded the highest growth in Central Government debt of 120.82 per cent from US$ 9,151 million in 2003 to US$ 20,207 million in 2012 compared to Zambia whose debt reduced by 4.64 per cent from US$ 6,338 million in 2003 to US$ 6,044 million in 2012. Over the 10 year period, Kenya’s central government debt increased slightly but constantly over the years with a slowdown in 2008 when it fell to US$ 11,054 million from previous year’s US$ 12,588 million.

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Source: OECD Statistical Year Book – African Central Government Debt

Tanzania’s central Government debt grew to US$ 2,166 by 2012 from US$ 1,204 in 2003, representing a 79.90 per cent increase. Uganda’s public debt levels remained in the range of US$ 4,964 million and US$ 5,540 million between 2003 and 2006 but declined to lows of US$ 3,134 million in 2008 before increasing to US$ 4,964 million in 2010 and US$ 5,883 million in 2012, representing 18.51 per cent rise from the 2003 level of US$ 4,964 million.

As a proportion of GDP in 2003, Zambia was leading the pack at 137.2 per cent followed by Mozambique at 87.5 per cent and Uganda at 75.4 per cent as shown in Figure 2. Tanzania’s debt compared to GDP was the lowest at 10.7 per cent in 2003. Contrary, by 2012, the scenario had changed significantly with no country recording higher debt than GDP (more than 100 per cent) and Kenya was highest at 46.7 per cent followed by Mozambique and Uganda at 40.2 per cent and 32.2 per cent. 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.

Comparing the amount of central government debt and proportion to GDP in the period between 2003 and 2012 as shown in Figure 3, Kenya stands out with nominal debt levels ranging between US$ 9,151 million and US$ 20,207 million while ratio to GDP ranged between 41.3 per cent and 61.0 per cent.
Tanzania had the least debt in nominal terms and as a ratio of GDP ranging between US$ 1,204 million US$ 2,932 million and 8.0 per cent and 15.1 per cent respectively. Comparing the amount of central government debt of each country with sample (5 countries) portfolio, Kenya dominated the pack with the highest proportion over the 10 year period at 36.37 per cent in 2003, 50.30 per cent in 2007, and 60.05 per cent in 2010 rising to 70.64 per cent in 2012 as shown in Appendix 1(a). Tanzania had the lowest share of the sample debt ranging from 4.78 per cent in 2003 to 8.14 per cent by 2012. On average in the period 2003-2012, the share of each country’s debt in the total sample debt was 50.65 percent, 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.

As shown in Figure 4 and compared to the other countries, average maturity of total central Government debt for Kenya has been the highest though declining steadily from 22.15 years in 2008 to 15.19 years by 2012. The average of Kenya’s debt maturity over the period was 17.81 years which would be classified as long term with minimal refinancing risks and critical for promoting market development. Uganda’s average maturity of debt was the shortest ranging between 1.06 years in 2008 and 1.62 years in 2012 and averaging 1.47 years over the period.

3.3 Average Terms of Debt Outstanding

Figure 4: Average Term to Maturity of Total Central Government Debt
Kenya has sustained the longest term to maturity of local currency debt at more than 15 years though on a decline since 2010. For Mozambique, maturity of total debt averaged 7.08 years in 2009 and 2010 while Zambia, Tanzania and Uganda have over the years maintained their debt maturity at 5 years, below 4 years and up to 2 years respectively.

Table 2, Figures 5 and 6 show amount of marketable central government debt and its proportion to country GDP. By 2012, Kenya had the highest amount of marketable central government debt at US$ 10,694 million (24.7 per cent of GDP) compared to Tanzania at US$ 2,932 million (10.4 per cent of GDP), Zambia at US$ 2,782 million (13.6 of GDP) and Uganda at US$ 2,377 million (13.0 per cent of GDP). Mozambique’s least marketable debt (US$ 633 million) represented 4.5 per cent of the country’s GDP.

### 3.4 Marketable Outstanding Debt

#### Table 2: Outstanding Central Government Marketable Debt (USD Million) and Proportion of GDP

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</tbody>
</table>

Source: OECD Statistical Year Book – African Central Government Debt

On average between 2003 and 2012, Kenya recorded the highest ratio of marketable debt to GDP at 23.4 per cent with Zambia, Tanzania and Uganda following closely at 12.8 per cent, 11.4 per cent and 10.8 per cent respectively. Mozambique’s marketable debt represented only about 3.5 per cent of GDP on average during the period.

**Figure 5: Marketable Central Government Debt**
As a proportion of total central government debt, Tanzania’s debt portfolio consisted only of marketable debt while Zambia increased its marketable debt from 8.73 per cent in 2003 to a high of 60.55 per cent in 2007 declining to 46.03 per cent by 2012 as shown in Figure 7. This trend compares to Uganda whose ratio of marketable debt in total debt rose significantly to 52.30 per cent in 2007 from 19.71 per cent the previous year declining slowly to 40.40 per cent in 2012. The growth of marketable debt for Kenya was the most stable rising consistently from 41.55 per cent in 2003 to 54.62 per cent by 2012. Mozambique’s highest proportion of marketable debt was 13.54 percent in 2010 reducing to 11.25 per cent in 2012 coming from the lowest of 3.04 per cent in 2004. On average and considering that issuance of marketable securities as an important step for promoting domestic market development; Tanzania, Kenya, Zambia and Uganda have taken cue in embracing the necessary reforms for market development.

25 This trend could be attributed to deliberate measures to develop the domestic debt market since 2001 as the country instituted several Public Debt Management reforms.
Comparing the amount of marketable government debt of each country with sample portfolio, Kenya dominated the pack with the highest proportion over the 10 year period at 60.11 per cent in 2003, 50.41 per cent in 2007, and 55.95 per cent in 2010 rising to 52.72 per cent in 2012 as shown in Appendix 1(b). Contrary to central government debt where Tanzania had the lowest share among her peers, Mozambique recorded the lowest marketable debt in the sample over the years ranging from 3.13 per cent in 2003 to 3.41 per cent by 2012. The average share of each country’s debt in the total sample debt in the period 2003-2012 was 54.42 percent, 2.69 per cent, 32.38 per cent, 21.19 per cent and 24.88 per cent for Kenya, Mozambique, Tanzania, Uganda and Zambia respectively. The type of distribution of marketable debt in the region covered by countries under this study is an indication of the size of the great potential that exists of cross-border financial market activity as countries continue to develop their domestic markets and hence regional financial markets. Countries with large shares of regional marketable securities would attract more cross border financial market trade compared to their peers with minimal share of the securities. These therefore further presses on the need for continued reforms to grow the domestic markets partly through issuance of public and private marketable debt among other initiatives.

Contrary to total central government debt, average maturity of marketable central government debt among the five countries was more erratic as shown in Figure 8 with Zambia having the longest debt at 5 years in the period 2005 and 2010. Compared to her peers, Mozambique’s maturity for marketable debt was at its peak in 2010 at 7.7 years followed by Kenya’s 5.8 years in 2011 which reduced to 5.3 years in 2012.

**Figure 8: Average Term to Maturity of Marketable Debt**
Tanzania and Zambia have similar maturities for total and marketable debt over the period indicating that their non-marketable debt portfolios are small (with short term to maturity) or completely non-existent. Tanzania’s and Uganda’s marketable debt is mainly short term (shorter than 5 years) reflecting more refinancing risks and lack of investor diversification. Considering that efforts to lengthen the average maturity of marketable debt are welcome initiatives for market development and an indication of a growing domestic debt market as investors take up longer dated instruments, Kenya stands out as her trend of average maturity for marketable instruments rose from 1.6 years in 2003 to 5.3 years in 2012 compared to her peers whose term to maturities remained constant at more or less similar levels over the 10 year period.

Figure 9 shows that Kenya has the highest amount of local currency marketable debt owned by residents ranging from US$ 3,681 million in 2003 and US$ 10,557 million in 2012, with a constant but steady growth path over the years. In addition, only Kenya recorded some marketable debt owned by non-residents with peak in 2012 at US$ 137 million and lowest at US$ 17 million in 2007. Tanzania’s total central government debt which grew from US$ 1,204 million in 2003 and US$ 2,932 million is all marketable debt owned by residents only.

3.5 Debt by Holders

Figure 9: Holders of Local-currency Marketable Debt

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26 Non-existence of institutional investors such as fund management firms and insurance companies who target to match their long term liabilities with long term assets.
### 3.6 Country Comparison of Structure of Marketable Debt by Term to Maturity

Figures 10(a) – 10(e) show that with the exception of Mozambique, all countries under investigation have large sizes of short term securities in their domestic marketable debt portfolios. For Kenya, medium term instruments account for the largest share of marketable debt at an average of 60.54 per cent over the 10 year period with short term instruments accounting for 22.67 per cent of the portfolio and 16.79 per cent long term securities as shown in Figure 10(a).

Interestingly, Kenya has been reducing the ratio of medium term securities and substituting with long term maturities as observed from 2007 when the latter rose to 12.80 per cent of the portfolio from 4.78 per cent in 2006 and to 33.82 per cent compared to 20.01 per cent short term in 2012. This is a clear indication of the country’s continued commitment to developing the bond market by lengthening the maturity of the instruments buoyed by growing market confidence and positive expectations. The initiative has helped to deepen the investor base in the domestic bond market as medium and long term investors provide demand for the instruments.

Mozambique’s marketable debt is 90.61 per cent long term and only 9.39 per cent short term with no medium term instruments as shown in Figure 10(b). The proportion of long term securities in the portfolio grew from 60.03 per cent in 2003 to 100 per cent in 2004-2009 and 2012 after declining to 70.66 per cent and 75.37 per cent in 2010 and 2011. The debt portfolio for Mozambique indicates that even though refunding risk is highly minimized, there are no deliberate efforts to diversify the products and develop the yield curve for market development.

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**Figure 10: Structure of Domestic Marketable Debt in Sampled MEFMI Countries**

Much of Tanzania’s marketable debt contains short term securities constituting 71.08 per cent with a sizeable 21.98 per cent in the medium term horizon and 6.94 per cent long term as shown in Figure 10(c). Tanzania has however embraced measures to lengthen the debt portfolio.
increasing the proportion of long term securities to 11.12 per cent in 2008 from a meager 1.28 per cent in 2007 sustaining it at 16.24 per cent in 2012.

Figure 10: Structure of Domestic Marketable Debt in Sampled MEFMI Countries

Figure 10(d) shows that Uganda’s marketable debt is mainly short term (averaging 56.76 per cent of the portfolio) but the country has endeavored to gradually increase the amount of medium term compared to short term securities since 2005 when the latter constituted 38 per cent of the debt and the former 62 per cent, growing to 53.35 per cent against 46.65 per cent by 2012. Complete absence of long term bonds in Uganda is however counter market development and call for effort to lengthen the maturity of the debt portfolio with an aim to stir market activity and build a reliable yield curve.

Similar to Uganda, Zambia’s domestic marketable debt is majorly short term (57.41 per cent) compared to 38.85 per cent medium term with only 3.74 per cent long term (Figure 10(e)). The proportion of short term securities increased from 53.89 per cent in 2003 to the highest of 63.87 per cent in 2006 before declining to 48.76 per cent in 2011 then peaking to 100 per cent in 2012. Medium term securities ratio grew from 46.11 per cent in 2003 to 49.39 per cent in 2008, then 50.07 per cent in 2011.
Zambia’s long term debt only constituted 1.17 per cent of the portfolio in 2011 reducing drastically from 14.52 per cent in 2009 and 17.08 per cent in 2010.

As shown in Figure 11, Kenya’s GDP in nominal terms was the highest in the sample over the period of study rising to its peak in 2012 at US$ 39,450.32 million (GDP growth of 4.60 per cent) from US$ 15,063.06 million in 2003 (growth of 2.93 per cent).

Tanzania’s nominal GDP was second highest after Kenya reaching US$ 28,313.28 million by 2012 representing a 6.86 per cent GDP growth up from US$ 11,269.72 million (or growth of 6.89 per cent) in 2003. GDP levels for Uganda and Zambia were in the range of US$ 4 billion and US$ 9 billion in the period between 2003 and 2005 but rose to more than US$ 15 billion

- 38 -
mark from 2009 for Uganda and 2010 for Zambia reaching US$ 18.28 billion and US$ 20.51 billion by 2012 for Uganda and Zambia respectively. Mozambique’s GDP was US$ 4.72 billion in 2003 rising to US$ 8.76 billion in 2007, US$ 13.70 billion in 2011 and US$ 13.95 billion in 2012. GDP growth for Uganda peaked in 2006 at 10.78 per cent from 6.47 per cent in 2003, slowing down to 8.71 per cent in 2008, 5.86 per cent in 2010 and 3.43 per cent in 2012. Zambia’s GDP growth was highest in 2010 at 7.62 per cent after rising from 5.13 per cent in 2003 and 6.16 per cent in 2007, increasing again to 7.32 per cent in 2012. Mozambique recorded the highest growth in 2012 at 7.40 per cent after rising steadily from 6.02 per cent in 2003 to 8.67 per cent in 2005 peaking at 7.28 in 2007. On average over the period 2003-2012, Mozambique’s economic growth rate was highest at 7.20 per cent followed by Uganda at 7.07 per cent, Tanzania at 6.98 per cent, Zambia 6.21 per cent and Kenya at 4.63 per cent.
Box 1: Domestic Debt Market Development Initiatives
Kenya

Primary Market
Deliberate measures to lengthen the yield curve were put in place in 2002. Average maturity of the government securities portfolio is currently at 5 years 5 months (24% Treasury bills 76% Treasury bonds) up from 8 months only (or 76% Treasury bills and 24% Treasury bonds) back in 2001. Rollover risks associated with short term debt instruments have largely been minimized. Since 2007, Kenya has been implementing an aggressive benchmark bonds program aimed at minimizing bonds fragmentation in the secondary market thereby boosting bond market liquidity and building a reliable benchmark yield curve. The program has entailed issuance of large sizes of specific maturities of bonds (2, 3, 10, 15, 20 and 25 years) and reopening of these benchmark tenors to build liquidity. By the end of 2013, 25 bonds had been reopened since 2007 bringing to the market $US 4.03 billion compared to 20 bonds worth $US 3.21 billion by end 2012. Concurrent with building large size bonds, Kenya is currently considering redemption smoothing options such as bond switches or exchanges and the use of a sinking fund.

Infrastructure bonds have been issued successfully in Kenya since 2009. The Government’s intention of this program was to create a financing channel for specific infrastructure projects identified in the national budget as well as attract other issuers (corporate and government agencies) to tap the local capital market and raise funds backed by the strength of their balance sheets. Eleven companies have issued corporate bonds now trading in the market. By end 2013, six infrastructure bonds worth $1.97bn had been issued increasing the range of tradable instruments for diversification.

The central bank engages market stakeholders through the Market Leaders Forum (MLF) on a monthly basis in its determination of bonds to offer to the market as well as on market development choices. The collaboration between the issuer and the market has increased market confidence and largely promoted the uptake of bonds at the primary market translating to more secondary market activity. To educate the public and investors on financial market investment, different players particularly regulators share information on technical and operational concepts of capital market investment through channels such as national trade fairs, media, websites, road shows, and specialized educational challenge activities for the youth among others.

Secondary Market
The automated trading system was put in place in 2009 to increase efficiency in trading of bonds and settlement safety at transaction level. The full automation of the auction process at the primary market in the central bank is currently being finalized to achieve faster, safer and efficient procedures, such that newly issued bonds can be settled and traded within shortest time (preferably on T+1 basis). The Central Depository for Securities (CSD) for Government securities is domiciled and managed at the central bank while for corporate instruments, there is a different CSD known as Central Depository for Securities Corporation (CSDC). Current initiatives are geared towards a national depository for all securities in line with East African regional efforts for harmonized market practices to promote cross-border trading of securities. The national payment system is the Real Time Gross System (RTGS) used for the settlement leg in trading securities. The East African Cross-Border payment System (EAPS)\(^1\) was commissioned in November 2013 to aid cross-border trade.

Figure 12: Treasury Bonds Annual Trading Turnover in US$ Billions
As shown in Figure 12, the various initiatives have significantly contributed to the increase in turnover in the secondary market for bonds by more than 3,299 per cent to an annual high of US$ 6.08 billion in 2012 and US$ 5.13 billion in 2013 up from a meagre US$ 0.18 billion in 2001. The outcome of this is a more reliable, normal and firm yield curve which acts as a pricing benchmark for issuance and trading of government and corporate securities and reduced issuance costs for the Government due to increased competition for bonds at the primary market.

The market makers framework is currently under implementation as a first phase for a primary dealership arrangement. Market makers are expected to spur bond market liquidity and price discovery. One of the key requirements for market makers shall be sustained presence in the market by providing two-way (bid-ask) quotes with reasonable spreads and standing ready to honour such quotes. Other projects that are expected to ignite more trading activity and deepen the market include: introduction of Over The Counter (OTC) trading to run along with exchange trading, demutualization of the securities exchange to enhance corporate governance and introduction of derivative instruments with underlying assets such as government bonds.

The Capital Markets Authority (CMA) regulates the market and all laws and regulations relating to enhancing ethical behaviour of brokers and dealers as well as investor protection fall under its purview.

Uganda

Primary market
The Bank of Uganda issues securities on behalf of government and uses primary dealers to sell the debt. Some commercial banks have issued corporate bonds in the market. The Central Bank is considering allowing non-primary dealers to access the primary market to increase competition for government debt. Major investors in government debt are commercial banks, non-bank financial institutions and offshore investors, although the national security fund also takes up a sizeable proportion of the portfolio.

Uganda issues Treasury bills of maturities of 91-days, 182-days and 364-days with weekly auctions with Treasury bills taking the largest share of the portfolio at 55 per cent. Bonds maturities range from 2 years, 3 years, 5 years and 10 years with auctions conducted every 28 days. The African Development Bank issued a local currency bond in Uganda in 2012 valued UGX 125 billion (second tranche in 2013) benchmarked on the 2-year bond. The Bank of Uganda together with stakeholders is putting down measures to encourage demand for long term instruments and lengthen the maturity of the marketable debt. Uganda is working on the establishment of benchmark bonds.

Secondary Market
Uganda has been operating a primary dealer system since 2003. Eight stockbrokers and dealers are licensed as members of the Uganda Securities Exchange (USE). The Central Depository System (CSD) was put in place in 2010 and Stanbic Bank is the settlement bank for all listed securities with the exception of government securities. Bonds are listed and traded on the USE with relatively active trading and settlement time within T+3. The process of demutualizing the USE is in advanced stages with an aim to facilitate full automation of operations at the exchange. In addition, upgrading of the Reuters system is in process to facilitate efficient reporting of trades from the market.
The investment code of 1991 under the Ugandan constitution recognizes private property and provides the legal mechanism for settling international and multiparty disputes relating to investment in Uganda. The enforcement of responsible and ethical behaviour for brokers and dealers is contained in the Capital Markets Authority (CMA) and USE regulations.

Tanzania

Primary Market
Tanzania issues Treasury bills of tenors ranging from 35 days, 91 days, 182 days and 364 days while bonds maturities are 2 years, 5 years, 7 years and 10 years. Bonds account for the highest proportion of domestic government instruments reflecting efforts to lengthen the maturity of instruments in the portfolio. The bulk of government securities are held by commercial banks and pension fund firms with plans to further diversify the investor base through various initiatives. Tanzania has licensed 19 primary dealers with an aim to make the market by promoting uptake of government paper and trading of securities at the secondary market.

Secondary Market
Trading of debt instruments at the Dar Es Salaam Stock Market (DSE) is fully automated since 2006 and brokers trade on a wide area network from their offices. The Central Depository System (CDS) facilitates clearing, settlement and custody of securities. There are plans to fully demutualize the DSE and trading rules are currently being reviewed by the Capital Markets and Securities Authority (CMSA). Tanzania has laws and regulations for market discipline and investor protection under the Capital Markets Authority.

Mozambique

Primary Market
The agent of government in the issuance of securities is the central bank - Banco de Moçambique with a few corporate entities having issued some corporate debt in Mozambique. The major participants in government securities market are commercial banks although insurance companies and fund management firms also take sizeable proportion of the securities. Government securities are issued through primary dealers who are local and foreign owned commercial banks. Instruments that are on issue are Treasury bills of maturities of three, six and twelve months with bonds ranging from one to 10 years all issued on a weekly basis through auctions.

Secondary Market
All government and corporate securities are listed and trade on the Maputo Stock Exchange (also called Bolsa de Valores de Maputo -BVM) which opens for two hours every three days weekly. Trading happens on an automated system dubbed Operators Exchange Trading System accessed via a web platform and that is linked to the Central Securities Depository (CSD) to facilitate settlement of cash and transfer of securities. The BVM guided by a commercial code that was ratified in 2006 plays the role of enforcing rules and regulations regarding efficient market operations as well as investor rights and protection.
Zambia

Primary market
The Bank of Zambia (BOZ) issues securities on behalf of government and there are 7 corporate issues in the market. Zambia issues Treasury bills of maturities of 91-days, 182-days, 273-days and 364-days on a bi-weekly basis and bonds on quarterly basis with maturities of 2 years, 3 years, 5 years, 7 years, 10 years and 15 years. The frequency of issuance of government securities was reduced in 2012 to promote secondary market activity by allowing the market time to trade the securities.

The BOZ publishes the issuance calendar every beginning of the financial year. Bids submitted at the primary market auctions can either be competitive or non-competitive. The BOZ policy rate introduced in 2012 signals the direction of short term interest rates. Major investors in Treasury bills are commercial banks and non-bank financial institutions while Treasury bonds are dominated by non-bank public sector and commercial banks. There is rising demand for medium term instruments including 2-year, 5-year and 10-year bonds.

Secondary market
Treasury bills and bonds are traded through authorised dealers at the Lusaka Stock Exchange (LuSE) with bills traded on a Book Entry System. Both Government and corporate securities (including equities) are kept at the Central Shares Depository (CSD) but the book entry system is a separate CSD for Treasury bills run by BOZ. LuSE harmonized its trading rules and guidelines with those of the Johannesburg Stock Exchange (JSE). In 2013, market laws and guidelines were revised to improve efficiency and accommodate establishment of a derivatives market as well as a separate bond exchange. To ensure that investors in the financial market are duly protected that the market is orderly, fair, efficient and well regulated, a set of laws that are being enforced include; Securities Act, Companies Act, Stock Exchange listing requirements and Banking and Financial Services Act.
4.0 RESEARCH DESIGN AND METHODOLOGY

This section describes in detail the strategy adopted in designing the research for testing the agreed premises related to domestic securities market and in particular those factors identified as important. It contains the key elements involved in the research process, including:

- **Hypothesis**: Reiterating the research tasks
- **Data collection**: description of the tools and methods used to collect information
- **Model to be used and the** variables identified
- **Data analysis**: description of data processing and analysis procedures

4.1 Research Design and Strategy

Using deductive research approach, the focus of the research will be on a cross-sectional study – making use of a theoretical framework to test hypotheses and apply regression analysis on time series data. That is a well-known approach extensively used elsewhere including for testing inferences in the area of financial markets and securities market development.

The study focuses specifically on the following selected MEFMI countries: Mozambique, Kenya, Uganda, Tanzania and Zambia.

4.2 Methodology

4.2.1 Descriptive Analysis

This sub-section explores the characteristics of the study variables including correlation among explanatory variables as well as descriptive statistics.

4.2.2 Model Analysis

At the inference level, the analysis borrows a lot from Yibin Phelps and Stotsky (2013) who improved the model initially used by Eichengreen and Luengnaruemitchai (2004) to include fixed effects estimation and account for both variables that vary with time as well as those that do not vary with time and also investigated a number of variables that they perceived to have critical influence on bond market development. In line with their model, variables are classified as *macroeconomic, structural, financial or developmental* in nature.

- **Macroeconomic** variables include interest rate and exchange rate variability, capital openness and fiscal balance
- Economic size and trade openness are categorized as *structural*
- The size of the banking sector and spread in interest rates are *financial sector* variables while
- GDP per capita is categorized as *developmental*.

To determine the relationship of explanatory variables on the outcome variable taking cognizance of random and fixed effects, the analysis involves three sets of models;
- Pooled simple and multivariate ordinary least squares
- Random effects and fixed effects.

The model is presented as shown in equation 1 below.

$$Z_{i,t} = \beta_0 + \beta_1 (\mu_i + \mu_t) + \sum_{m=1}^{M} \beta_m U_{i,t} + \sum_{n=1}^{N} \beta_n V_{i,t} + \epsilon_{i,t}$$

$Z_{i,t}$ is government bond market capitalization for country $i$ in time $t$ while country\textsuperscript{27} and time\textsuperscript{28} fixed effects are represented by $\mu_i$ and $\mu_t$ respectively.

$U_{i,t}$ represents a set of explanatory variables which are time-variant in nature and these are:

- Banks’ lending to private sector
- GDP per capita, GDP
- Exchange rate variability
- Trade openness
- Capital account openness
- Fiscal balance
- Interest rate variability and
- Interest rate spread.

Explanatory variable, legal origin does not vary with time and is represented by $V_{i,t}$ in equation 1.

$\epsilon_{i,t}$ is the error term which represents the variability in $Z_{i,t}$ that is not explained by $U_{i,t}$ and $V_{i,t}$ singly or in sets.

$\epsilon_{i,t}$ is Gaussian with normal distribution of mean of zero and constant standard deviation.

**Pooled Multivariate Least Squares Model**

This analysis will explore the relationship with the dependent variable, between sets of explanatory variables at one level and all variables at another. In essence, each indicator of the dependent variable will be regressed against explanatory variables as shown in equation 2 below.

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\textsuperscript{27} Country specific effects are important to control for differences that are systematic across countries such as differences in data sources.

\textsuperscript{28} Common shocks across countries during certain points over the period of study are controlled for through the time specific effects.
4.3 Data


Data on local currency marketable government debt which forms the dependent variable is obtained from the Statistical Year Book, 2003-2012 of OECD.

Annual data for the explanatory variables is obtained from World Bank’s World Development Indicators including; banking sector credit as a ratio of GDP which is used as a measure of size of the banking system,

GDP per capita – PPP (logs) which is a measure of economic development, GDP – PPP (logs) a measure of size of the economy, exports as a ratio of GDP as a measure of trade openness, interest rate fluctuation as measured by Treasury bill rate, interest rate spread (lending rate minus deposit rate) and exchange rate variability measured by standard deviation of log of foreign exchange rates.

Data obtained from IMF, International Financial Statistics database comprises of nominal effective exchange rate which is a measure of exchange rate volatility.

Data on capital account openness is obtained from Chinn and Ito (2006) Index while data on tax burden imposed by governments to corporates and individuals (a measure of fiscal freedom) and inflation index (a measure of monetary freedom) are obtained from heritage foundation database as subcomponents of economic freedom index.

Data on a dummy variable, legal origin is sourced from La Porta et. al. (1997).

4.4 Variables

Outcome Variable

One of the key indicators of a well-developed bond market is its large size (outstanding volume of bonds or market capitalization) relative to the size of the economy. This study will make an assessment of this measure of bond market development and establish its relationships with specific explanatory variables. The dependent variable ($Z_{i,t} = \text{gmd}$) therefore is market
capitalization of outstanding local currency government marketable debt as a ratio of GDP\textsuperscript{29} for country \(i\) at time \(t\) and is obtained from OECD’s African Statistical Year book as well as from IMF’s IFS and World Bank’s ADI.

\textit{Explanatory Variables}

Independent variables are classified into four categories representing either the macro economy, structure of the economy, financial sector/markets or development. Interest rate fluctuation (intfl) and exchange rate variability (excv), capital openness (caopen), fiscal balance (fisbal), monetary freedom (mfdm) and fiscal freedom (ffdm) are classified as macroeconomic variables while measures of structure of the economy are size of economy (sizecon) and openness of trade (tradopen). Financial sector variables are banking sector credit (bankcr) and interest rates spread (intsprd) as economic development (gdpcap) represents development. Legal origin (leg) is a dummy variable to be included in the analysis.

\textit{a. Exchange rate variability (excv)}

Using data from IFS of the IMF, this variable is the nominal exchange rate. The hypothesized effect of variability in exchange rates on bond markets is increased demand for bonds by foreign investors especially in markets with fixed exchange rate regime. But this may undermine the growth of domestic intermediation due to increased foreign competition arising from low risk profiling for lending to domestic institutions – banks and corporations (Yibin, Phelps, and Stotsky, 2013). Of the countries sampled per unit of US$, Kenya’s nominal effective exchange rate was highest during the period 2003-2012 compared to Mozambique and Tanzania at the lowest levels as shown in Figure 13a. In terms of the stability of the exchange rate, all countries except Zambia and Mozambique sustained a stable path with a common distortion in 2011 perhaps as a result of the effect of the global financial crisis. Exchange rate variability compares favorably with government bonds capitalization indicating increased domestic market appetite by foreign investors as shown in Figure 13b.

\textsuperscript{29} Country’s GDP at time \(t\)
b. Capital openness (caopen)

In this study, capital openness is measured using the Chinn-Ito Index\textsuperscript{30} developed by Chinn and Ito (2006) which is an indicator of the intensity of capital controls. Adelegan and Radzewicz-Bak, (2009) eluded that foreign investors better access the debt market of a country where there are limited restrictions on foreign portfolio investment. In addition, domestic corporate governance for local corporations is also enhanced. Contrary, development of local capital markets may greatly benefit from existence of capital controls as an enticement for local financing of governments and firms. Figure 14a shows capital openness indices for the sample. Zambia and Uganda stand out with highest scores indicating reduced capital restrictions while Kenya has moderate restrictions. Mozambique and Tanzania score badly indicating rigid economic openness policies.

\textsuperscript{30} This measure uses dummy variables representing restrictions on cross-border financial transactions as reported in IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Less financially open economies are represented by lower scores.
Fiscal balance in this study is measured as a proportion of cash surplus/deficit to GDP and this data was obtained from the world development indicators of the World Bank. The presence of sophisticated fixed income traders in an environment where the government securities market is well developed may encourage the growth of the corporate bond market but also, dominance of government securities where capital market financing opportunities are limited by issuance of government securities may have a negative effect on private sector development by discouraging issuance of corporate securities (Harwood, 2000). A 3-year moving average of the fiscal balances is calculated instead of single year observations to cater for momentary factors prevalent in the latter. Figure 15a shows mixed fiscal balance outcomes among countries in the sample where Zambia had the most favorable budgetary period, except in 2005, dominated by surplus cash (as a proportion of GDP) during the period 2003 to 2012. All other countries reported budget deficits with Kenya recording the highest negative balance among her peers. Figure 15b reveals a positive association between fiscal balance and capitalization of the government bond market - perhaps supporting the fact that large issuances of government bonds resulting from higher budget deficits promote the increase of fixed income traders who in turn ignite activity in the secondary bond market.
Size of economy (sizecon) is measured using GDP at purchasing power parity (GDP, PPP) with data obtained from World Bank’s ADI. The size of an economy may have an influence on the level of bond market development. Liquid bond markets are more likely to thrive in large size economies than in smaller ones because such economies have created the necessary efficiencies for bond markets to flourish. Small economies on the other hand may not have adequate capacity to attract multinational institutions and foreign investors because of the small volumes of bond issues, hence domestic securities cannot be traded in global markets to provide price and liquidity (Eichengreen and Luengnarumitchai, 2004).

Figure 16: GDP, Purchasing Power Parity (PPP) and Government Bond Market Capitalization

As shown in Figure 16a, GDP at purchasing power parity (GDP PPP) has been rising steadily for all countries over the study period. Compared to the rest of the countries, Kenya recorded the highest GDP PPP followed by Tanzania with Zambia recording the lowest in the period. Figure 16b confirms positive relationship between government bond market capitalization and size of the economy.

e. Openness of trade (tradopen)
To measure openness of trade, total exports of goods and services as a percentage of GDP is used and such data was obtained from the ADI database. On one hand, the level of trade openness may be important for the growth of government bond markets while on the other it may suppress the development of such markets. Economies that have embraced external competition may be less vulnerable to certain established interests that aim to suppress rival sources of supply but also, countries that are less integrated with international markets are likely to foster the growth of domestic bond market as they concentrate on diversifying local financing sources (Yibin, Phelps and Stotsky, 2013).

**Figure 17: Exports as % GDP and Government Bond Market Capitalization**

*Figure 17a: Exports of Goods and Services as % GDP  Figure 17b: Government Bond Market Cap and Exports as % GDP*

In terms of proportion of total exports of goods and services in GDP, Figure 17a shows that Zambia has a more open economy than its peers while Kenya and Tanzania encourages moderate trade with foreign partners. According to Figure 17b, there is a strong positive relationship between trade openness and government bond market development, an observation that may be supported by the fact that countries in the sample relatively encourage external trade which promotes external financing partly for investment in the domestic markets.

**f. Size of Banking Sector (bankcr)**

Banking sector credit as a proportion of GDP is used as a measure for size of banking sector and is an important variable associated with growth and development of local bond markets where banks have excess liquidity to participate actively in taking up bond offers as well as act as makers of the market for such instruments. But at the same time, banks can discourage bond market growth as issuers of bonds and banks compete for same liquidity in the same market (Harwood, 2000 and Hawkins, 2002). Data for this variable is sourced from ADI database. From Figure 18a, Kenya’s banking sector grew considerably during the period 2003-2012 compared with the other countries. Zambia experienced some growth in 2003 to 2004 with noticeable drop from 2005 onwards. Uganda and Tanzania experienced slow but consistent banking sector growth over the period.

**Figure 18: Banking Credit as % GDP and Government Bond Market Capitalization**
As size of banking sector can either complement or substitute bond market development, Figure 18b shows some sort of balancing act for the sample in this study with an almost flat relationship between the two variables. This outcome is a two-way indication of the role the banking sector (as it continues to grow) in supporting bond market growth as well as its role in discouraging bond market development.

g. **Interest rate spread (intsprd)**
The lending spread which is represented in this study as bank lending rate minus deposit rate may be viewed as an indicator of the level of competition and efficiency among banks. The wider the spread the more it may be associated with inefficiency and as a catalyst for bond market growth as institutions in the banking sector take advantage of favorable margins (Eichengreen, Panizza, and Borensztein, 2008). Data for this variable is sourced from World Bank’s ADI database.

Figure 19: Interest Rate Spread and Government Bond Market Capitalization

Figure 19a: Interest Rate Spread  Figure 19b: Government Bond Market Cap and Interest Rate Spread

Figure 19a shows that Zambia’s spread dominated the highest spot for most of the period narrowing drastically in 2011 then to the lowest level among its peers in 2012. Kenya’s spread sustained low levels before 2007 widening slightly thereafter while that for Uganda, Mozambique and Tanzania exhibited mixed behavior. According to Figure 19b there exist a
positive association between government bond market capitalization and bank lending spread for the sample, indicating inefficiency in the banking sector in promoting bond market growth as traders’ cash in high margins.

h. Economic development (gdpcap)
The level of development of an economy is measured as GDP per capita, PPP (gdpcap) with such data obtained from World Bank’s ADI. The relationship between government bond market development and economic development is supported by numerous literature where more developed economies encourage stable investment environments that are transparent, have stronger corporations and corporate governance and lender rights compared to less developed economies. As shown in Figure 20a in the period 2003-2012, Kenya’s economic development was highest among its peers followed by Zambia with Uganda recording the lowest figures over the period. There is, however, a notable rise in GDP per capita, PPP among all countries over the period of study.

Figure 20a: GDP Per Capita, PPP

Figure 20b: Government Bond Market Cap and GDP per Capita, PPP

Figure 20b shows a strong positive relationship between government bond market capitalization and economic development.

i. Legal origin (lego)
The measure for legal origin in this study is a dummy variable (1 = English legal system, 0 = non-English legal system) which is used to classify countries in the sample, with data obtained from La Porta et al (2008). Different legal origins have different influences on the development of financial markets and how markets operate generally. British common law system (English
law) for example has been thought to encourage the growth of market-based financial systems because the system has stronger provisions for promoting investor rights compared to other systems such as French or German. Other legal systems such as civil law have been found to promote bank-based financial systems (Yibin, Phelps and Stotsky, 2013). From Figure 21 there is a stronger positive association for English legal origin with government and bond market capitalization compared to other legal system orientations.

**Figure 21: Government Bond Market Capitalization and Legal Origin**

Interest rates represent the price of money and hence the cost of debt. Bank lending rate or Treasury bill interest rate is the proxy for interest rate fluctuation computed as lending interest rate minus risk premium on lending. Data is obtained from world development indicators database of the World Bank. Where investors have different risk appetites, the unpredictability of interest rates becomes an ingredient for lower uptake of long term fixed return bonds. Risk averse investors would generally not buy bonds of any maturity in a market environment characterized by unstable interest rates. According to Figure 22a, between 2003 and 2010, Zambia and Tanzania recorded the most erratic Treasury bill rates compared to Kenya and Uganda, but in 2010, the Treasury bill rates shot sharply in all countries sampled. An intrinsic linkage between interest rates and government bond market development exists where higher interest rates would discourage bond issuance because this increases erosion of bond values. Figure 22b shows a strong inverse relationship between government bond market capitalization and Treasury bill interest rate, confirming that a lower interest rates environment is good for bond market to thrive.

**Figure 22: Government Bond Market Capitalization and Interest Rate Fluctuation**

Figure 22a: Treasury Bill Rate Figure 22b: Government Bond Market Cap and Treasury Bill Rate
The proxy for monetary freedom (originally known as monetary policy) is an inflation policy index which is a subcomponent of the index of economic freedom published by The Heritage Foundation. A country’s weighted average annual inflation rate is computed over a period of 10 years to arrive at the inflation index variable which has a 5-point scale with higher values representing worse monetary policy or higher average inflation. Inflation has a negative relationship with bond markets because higher inflation results in erosion of bond returns as interest rates rise and bond values decline. The opposite is true for lower inflationary environment, which promotes bond market activity. Where Government’s intention is to promote development of the bond market, initial objectives may not be focused on minimization of cost of debt but rather on issuance of large size bonds to create a spring board for corporate issuances and ignite trading activity to have a vibrant market. This in turn, has cost benefits to the government as the market determines the yield curve (price of money) through forces of demand and supply and in such a case, government market capitalization may be seen to increase even with moderate inflation rises. In addition, countries that have larger marketable debt stocks have a better advantage for financing budgetary needs and may not bank on inflation to increase revenues (Stijn, Daniela and Sergio, 2007). Figure 23a shows that Uganda has sustained higher scores of inflation policy index among its peers during the period of study while Zambia recorded significantly lower indices only shooting above peers’ levels in 2011.

**Figure 23: Government Bond Market Capitalization and Monetary Freedom**

**Figure 23a: Inflation Policy Index**

**Figure 23b: Government Bond Market Cap and Inflation Policy Index**
Figure 23b presents a somewhat flat relationship between government bond market capitalization and inflation policy index for the countries in the sample. The outcome can be supported by the argument that countries with larger marketable debt easily finance their budgetary requirements even during periods of slightly higher inflation, with intention to develop the bond market, which in turn becomes a reliable source of lower-cost-risk government financing.

1. Fiscal Freedom (ffdm)

The proxy for fiscal freedom is fiscal burden of government index or fiscal pressure index which is another subcomponent of the index of economic freedom published by The Heritage Foundation. The index measures the amount of fiscal pressure imposed by government to individuals and corporates through income and corporate taxes as well as government expenditure. It is a 5-point scale measure with lower scores representing conservative government expenditure as a proportion of GDP and lower income and corporate tax rates. From Figure 24a, Zambia recorded the highest scores over the period 2003-2012 while Kenya had the least scores. Fiscal burden to individuals and corporates was highest in Zambia, followed by Uganda, Tanzania, Mozambique and Kenya in that order.

Figure 24: Government Bond Market Capitalization and Fiscal Freedom

There is an inverse relationship between government bond market capitalization and fiscal freedom as shown in Figure 24b. This outcome may be supported by the argument that lower taxation regime is aimed at promoting the growth of bond markets as governments target to plug in much of their budgetary needs from domestic sources, mainly bond markets.
5.0 SIMULATIONS, INFERENCES AND EMPIRICAL RESULTS

This section describes the results from running the model described in Section 4- simple linear regression ordinary least squares (OLS) and multivariate OLS - as well as the sensitivity analysis performed in different scenarios. A descriptive analysis of the concerned variables and their behavior is also looked into in detail.

5.1 Descriptive Statistics

The descriptive analysis of the variables is shown in Table 3. Average size of government bonds capitalization as a ratio of GDP represented by the variable ‘gmd’ was 12.373% during 2003-2012 indicating relatively small stocks of government bonds for countries in the sample. A standard deviation of 6.693 reflects further that volume of government bonds to the size of economies in the different countries is largely in the region of the mean for the sample. The average credit provided by banking sector as a percentage of GDP was 22.047% with a standard deviation of 12.825 indicating rather high differentials in credit to private sector by banks for the countries sampled over the period of the study.

Table 3: Descriptive analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
</tr>
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<tr>
<td>BANKCR</td>
<td>22.047</td>
<td>18.340</td>
<td>52.320</td>
<td>5.490</td>
<td>12.825</td>
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<td>CAPEN</td>
<td>0.732</td>
<td>1.120</td>
<td>2.440</td>
<td>-1.170</td>
<td>1.643</td>
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<td>EXCV</td>
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<td>59.985</td>
<td>97.910</td>
<td>37.390</td>
<td>16.439</td>
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<tr>
<td>FISBAL</td>
<td>-2.052</td>
<td>-2.354</td>
<td>5.050</td>
<td>-7.220</td>
<td>2.454</td>
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<tr>
<td>FFDM</td>
<td>78.140</td>
<td>78.900</td>
<td>82.400</td>
<td>68.700</td>
<td>3.260</td>
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<tr>
<td>GDPCAP</td>
<td>1,185.607</td>
<td>1,211.275</td>
<td>1,736.900</td>
<td>594.180</td>
<td>309.257</td>
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<tr>
<td>GMD</td>
<td>12.373</td>
<td>11.060</td>
<td>25.890</td>
<td>1.520</td>
<td>6.693</td>
</tr>
<tr>
<td>INTFL</td>
<td>9.536</td>
<td>9.300</td>
<td>16.320</td>
<td>2.960</td>
<td>3.169</td>
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<tr>
<td>LEGO</td>
<td>0.800</td>
<td>1.000</td>
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<td>0.000</td>
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<td>MFDM</td>
<td>73.240</td>
<td>74.650</td>
<td>90.300</td>
<td>57.800</td>
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</table>
Capital openness as measured by Chinn-Ito index (2006) averaged 0.732 reflecting fairly open economies while deviation of 16.439 from the mean variability in the exchange rate indicates notable differences in exchange rate variability in the sample in the period 2003 to 2012. Average fiscal deficit as a proportion of GDP was 2.052%, GDP per capita $1,185.607, GDP $35,604.8 and openness of trade at 28.208 percent reflecting the nature of the economies being investigated during the period under review in this study. Focusing on the financial market variables, average fluctuation and spread in interest rates of 9.536% and 9.989% accompanied by small deviations of 3.169 and 3.109, is an indication of the high level of interest rates in these markets as well as huge differences between savings and lending interest rates respectively.

5.2 Simple Ordinary Least Squares Analysis

Table 4 shows the results of simple linear regression in which ordinary least squares (OLS) is model A, fixed effects is model B and random effects is model C.

Credit provided by banks to private sector, on its own as an explanatory variable has a positive influence on government bond capitalization and is significant at 1% level under all the three estimation models. This confirms the hypothesis that bond market development has a positive relationship with the size of the banking system as Hawkins (2002) observed. Bank credit increases the government bond capitalization by 36.3%, 39.5% and 36.3% under the ordinary least squares, fixed effects and random effects estimations respectively.

Capital account openness was also found to positively influence government bond capitalization with 58.2 more odds of success at 5% significance level across the three models hence confirming the hypothesis that bond market capitalization is positively associated with capital openness.

Exchange rate variability was found to have positive influence at 1% level increasing government bond capitalization by 28.6% under the OLS and random effects estimations and by 34.9% in the fixed effects model. Positive relationship of exchange rate variability and government bond capitalization in this result conflicts with the hypothesis that bond market thrives where the exchange rate regime remains stable because foreign investors perceive it as low risk hence higher volatility of the exchange rate discourages bond market development (Eichengreen and Luengnarumitchai, 2004).

Fluctuation in interest rates reduces government bond capitalization by 63.9% under the OLS and random effects models and by 94.3% under the fixed effects, all at 5% level of significance. This observation is in line with hypothesis that bond market development has negative association with interest rate fluctuation.

Originality of legal systems positively influences government bond capitalization increasing it by 11.1% at 1% level of significance across all the three models while size of the economy as measured by GDP, PPP was positive with 5.9 more odds of success under the OLS and random effects models and 7.1 more odds of success under the fixed effects estimation, all at 1% level of significance. This results support the hypothesis that stronger law and order is critical for bond market development. The finding on size
of the economy is in line with the hypothesis that government bond capitalization has positive relationship with size of the economy.

Level of economic development measured by GDP per capita was positive and significant at 1% level across all three models increasing government bond capitalization significantly by 16.3 more success odds in OLS and random effects estimation and 23.2 more odds of success in the fixed effects estimation. This result confirms the hypothesis that economic development has positive relationship and enhances bond capitalization as observed by Eichengreen and Luengnaruemitchai (2004) in their study of bond markets in Asian economies. Finally, fiscal freedom index (negative), fiscal balance (negative), interest rate spread (positive), trade openness (negative) and monetary freedom index (positive) were not significant in explaining government bond capitalization. For fiscal balance and fiscal freedom, the result of a negative association conflicts with earlier stated hypothesis that government bond capitalization has a positive relationship with fiscal balance as well as fiscal freedom. Although monetary freedom is not significant, its positive relationship with bond capitalization confirms earlier hypothesis.
### Table 4: Simple Regression Results of Determinants of Government Bond Capitalization

<table>
<thead>
<tr>
<th>Model</th>
<th>Bankcr</th>
<th>Capen</th>
<th>Excv</th>
<th>Ffdm</th>
<th>Fisbal</th>
<th>Intfl</th>
<th>Intsprd</th>
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<th>Tradopen</th>
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<td>A</td>
<td>0.363*</td>
<td>1.582**</td>
<td>0.286*</td>
<td>-0.255</td>
<td>-0.084</td>
<td>-0.639**</td>
<td>0.106</td>
<td>11.111*</td>
<td>0.119</td>
<td>6.930*</td>
<td>-0.076</td>
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<td>(0.542)</td>
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<td>(0.393)</td>
<td>(0.291)</td>
<td>(0.310)</td>
<td>(1.773)</td>
<td>(0.136)</td>
<td>(1.329)</td>
<td>(0.120)</td>
<td>(2.314)</td>
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<td>(2.917)</td>
<td>(3.244)</td>
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<td>(9.973)</td>
<td>(13.737)</td>
<td>(3.505)</td>
<td>(16.303)</td>
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<td>0.133</td>
<td>0.484</td>
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<td>0.073</td>
<td>-0.018</td>
<td>0.438</td>
<td>-0.005</td>
<td>0.348</td>
<td>-0.012</td>
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<td>B</td>
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<td>0.349*</td>
<td>-0.239</td>
<td>-0.077</td>
<td>-0.943**</td>
<td>0.264</td>
<td>11.111*</td>
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<td>(4.313)</td>
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<tr>
<td>C</td>
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<td>1.582**</td>
<td>0.286*</td>
<td>-0.255</td>
<td>-0.084</td>
<td>-0.639**</td>
<td>0.106</td>
<td>11.111*</td>
<td>0.119</td>
<td>6.930*</td>
<td>-0.076</td>
<td>17.298*</td>
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<td></td>
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<td>(0.595)</td>
<td>(0.039)</td>
<td>(0.324)</td>
<td>(0.433)</td>
<td>(0.310)</td>
<td>(0.340)</td>
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<td>d.f. or N</td>
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* *, **, *** Significance level at 1%, 5% and 10% levels
Model A – simple ordinary least squares
Model B – Fixed effects
Model C – Random effects
I – Hausman Test

### Table 5: Multivariate Results of Determinants of Government Bond Market Capitalization

<table>
<thead>
<tr>
<th>Model</th>
<th>Bankcr</th>
<th>Capen</th>
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<th>Ffdm</th>
<th>Fisbal</th>
<th>Intfl</th>
<th>Intsprd</th>
<th>Lego</th>
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<td>(0.294)</td>
<td>(0.393)</td>
<td>(0.291)</td>
<td>(0.310)</td>
<td>(1.773)</td>
<td>(0.136)</td>
<td>(1.329)</td>
<td>(0.120)</td>
<td>(2.314)</td>
</tr>
<tr>
<td></td>
<td>(1.376)</td>
<td>(0.966)</td>
<td>(2.835)</td>
<td>(22.999)</td>
<td>(1.251)</td>
<td>(2.917)</td>
<td>(3.244)</td>
<td>(1.586)</td>
<td>(9.973)</td>
<td>(13.737)</td>
<td>(3.505)</td>
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<td>Adj. R-squared</td>
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<td>0.133</td>
<td>0.484</td>
<td>-0.005</td>
<td>-0.020</td>
<td>0.073</td>
<td>-0.018</td>
<td>0.438</td>
<td>-0.005</td>
<td>0.348</td>
<td>-0.012</td>
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<td>C**</td>
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<td>C</td>
<td>B*</td>
<td>C</td>
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Preferred: B & C

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60
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<thead>
<tr>
<th>Variable</th>
<th>Ordinary Least Squares</th>
<th>Fixed effects</th>
<th>Random effects</th>
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<td>Bankcr</td>
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<td>0.116***</td>
<td>0.111*</td>
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<td></td>
<td>(0.052)</td>
<td>(0.040)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>Capen</td>
<td>-0.900***</td>
<td>-1.038**</td>
<td>-1.116**</td>
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<tr>
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<td>(0.483)</td>
<td>(0.504)</td>
<td>(0.464)</td>
</tr>
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<td>Excv</td>
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<td>0.238*</td>
<td>0.243*</td>
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<tr>
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<td>(0.040)</td>
<td>(0.039)</td>
<td>(0.037)</td>
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<td>(0.141)</td>
<td>(0.148)</td>
<td>(0.140)</td>
</tr>
<tr>
<td>Intsprd</td>
<td>0.084</td>
<td>0.449**</td>
<td>0.418**</td>
</tr>
<tr>
<td></td>
<td>(0.237)</td>
<td>(0.180)</td>
<td>(0.170)</td>
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<tr>
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<td>0.202**</td>
<td>0.141***</td>
<td>0.167***</td>
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<td>(0.086)</td>
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<td>Sizecon</td>
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<td>Tradopen</td>
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<td>0.064</td>
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<td>(0.130)</td>
<td>(0.102)</td>
<td>(0.101)</td>
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<tr>
<td>Gdpcap</td>
<td>0.935</td>
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<td>Ffdm</td>
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<tr>
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<td>(0.367)</td>
<td>(0.383)</td>
<td>(0.349)</td>
</tr>
<tr>
<td>Fisbal</td>
<td>-0.044</td>
<td>0.211</td>
<td>-0.031</td>
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<tr>
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<td>(0.241)</td>
<td>(0.383)</td>
<td>(0.263)</td>
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<tr>
<td>Lego</td>
<td>7.953**</td>
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</tr>
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<td>(3.555)</td>
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<td>Adj. R-</td>
<td>0.881</td>
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<td>squared</td>
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</table>

* *, **, *** indicates significance levels at 1%, 5% and 10% respectively
1 Model with all explanatory variables
2 Model without variable legal origin (lego)
3 Model without fiscal balance (fisbal) and fiscal freedom (ffdm)
5.3 Multivariate Ordinary Least Squares Analysis

Table 5 shows the multivariate analysis of determinants of government bond capitalization. Different models are estimated under OLS, fixed effects and random effects, controlling for certain variables that may have influence on each other such as fiscal balance, fiscal freedom, interest rate fluctuation and interest rate spread. In the fixed and random effects estimations, legal origin is eliminated to deal with model errors (near singular matrix).

As hypothesized, bank credit to private sector has positive relationship to government bond capitalization and is significant at different levels across all model estimations. Specifically, bank credit increases government bond market capitalization by 19.7% at 1% significance level (under all variable OLS), 11.6% at 10% significance (OLS controlling for legal origin), 11.1% at 1% significance level (OLS controlling for fiscal balance and fiscal freedom) and 13.1% at 1% significance (OLS controlling for interest spread and fiscal balance). Under the fixed effects and random effects models, bank credit was positive and significant at 1% increasing government bond capitalization by a range of 11.1% and 12.8%.

Capital account openness was negative across all models but significant only under OLS and random effects estimations. It reduces government bond capitalization by 10.0% at 10% significance level (under all variable OLS), 3.8% at 5% significance (OLS controlling for legal origin), 11.6% at 5% significance (OLS controlling for fiscal balance and fiscal freedom) and 4.2% at 10% significance (OLS controlling for interest spread and fiscal balance). For the random effects, capital account openness has 11.6 less odds at 1% level (controlling for fiscal balance and fiscal freedom), 0.02 less odds at 5% level (controlling for fiscal balance and interest fluctuation) and 0.04 less odds at 5% level (controlling for fiscal balance and interest rate spread). The nature of relationship between bond capitalization and capital openness as per these findings is positive indicating presence of capital controls that encourage existence of domestic debt financing as main source of capital.

Exchange rate variability was positive and significant at 1% across all models. It increases government bond capitalization by 20.5% (under all variable OLS), 23.8% (OLS controlling for legal origin), 24.3% (OLS controlling for fiscal balance and fiscal freedom) and 24.2% (OLS controlling for interest spread and fiscal balance) while in the fixed effects model, it increases by 19.8% (controlling for legal origin), 20.1% (controlling for fiscal balance and fiscal freedom) and 16.6% (controlling for fiscal balance and interest rate fluctuation) and 20.0% (controlling for fiscal balance and interest rate spread). For the random effects, exchange rate variability has 0.2 odds of increasing government bond capitalization under all estimations (controlling for fiscal balance and fiscal freedom, controlling for fiscal balance and interest fluctuation, controlling for fiscal balance and interest rate spread).

Interest rate fluctuation was positive for all estimations but only significant under the fixed effects model increasing government bond capitalization by 40.3% at 10% level, 41.4% at 5% level and 42.3% at 5% level controlling for legal origin, fiscal balance and fiscal freedom and fiscal balance and interest rate spread respectively. The hypothesized relationship between interest rate fluctuation and bond capitalization is either negative or positive hence for this case, positive relationship indicates presence of investors that are not risk averse and possibility of thin markets.
Interest rate spread has positive association with government bond capitalization across board but was only significant under the OLS and random effects estimations. These results are as hypothesized where positive relationship may be an indicator of inefficiency in the banking sector which provides opportunities for debt markets. For the OLS, the variable increases bond capitalization by 44.9% at 5% level where legal origin is eliminated and 41.8% at 5% level where fiscal balance and fiscal freedom are eliminated. In the random effects, it enhances bond capitalization by 41.8% at 1% level where fiscal balance and freedom are excluded and by 39.0% at 5% level where interest rate fluctuation and fiscal balance are not included.

Monetary freedom index is positively associated with government bond capitalization and significant in almost all estimations. Under OLS, the index increases bond capitalization by 20.2% at 5% level (all variables included), 14.1% at 10% level (controlling for legal origin), and 16.7% at 10% level (controlling for fiscal balance and fiscal freedom). For fixed effects, the index increases bond capitalization by 18.5% at 5% level (controlling for legal origin), 18.1% at 5% level (controlling for fiscal balance and fiscal freedom), 15.7% at 10% level (controlling for fiscal balance and interest rate fluctuation) and 17.7% at 5% level (controlling for fiscal balance and interest rate spread). For the random effects, monetary freedom increases bond capitalization by 16.7% at 10% level under the estimations controlling for fiscal balance and fiscal freedom, and by 14.6% at 10% level while controlling for fiscal balance and interest fluctuation. Positive association confirms the hypothesis that monetary freedom encourages bond market.

Trade openness has positive relationship with government bond capitalization but only significant in the OLS estimation containing all variables and in three estimations under fixed effects. For OLS, it increases bond capitalization by 25.1% at 10% level while under fixed effects, it increases bond capitalization by an average of 18.7% at 10% level of significance for the controlled fixed effects. Positive association could suggest existence of lower integration with other economies hence creating incentive to develop the domestic bond market.

Economic development is positive and significant under OLS, fixed effects and random effects in line with hypothesis. It increases government bond capitalization by 15.2% at 1% level (OLS controlling for fiscal balance and fiscal freedom) and 18.6% (OLS controlling for interest spread and fiscal balance) while in the fixed effects model, it increases capitalization by 15.1% at 10% level (controlling for legal origin), 14.6% at 1% level (controlling for fiscal balance and fiscal freedom), 15.7% at 5% level (controlling for fiscal balance and interest rate fluctuation) and 14.7% at 5% level (controlling for fiscal balance and interest rate spread). For the random effects, economic development increases capitalization by 15.2% at 1% level under the estimation controlling for fiscal balance and fiscal freedom, by 14.6% at 5% level while controlling for fiscal balance and interest fluctuation and by 18.6% at 1% level while controlling for fiscal balance and interest rate spread.

Size of the economy is not significant across board but is positive in OLS (all variables model and model excluding legal origin) and all fixed effects estimations. It is negative under OLS (model controlling for fiscal balance and model excluding fiscal balance and spread) and in all random effects estimations. Negative association of economic size and government bond capitalization could be a reflection of small economies which cannot attract investors wishing to take up large debt issuances.
Fiscal balance and fiscal freedom are generally insignificant with both showing mixed behavior of association (positive or negative) with government bond capitalization. Legal origin is positive under the all variables OLS with strong odds (7.95) of increasing bond capitalization at 5% level of significance.

5.4 Sensitivity Analysis of Determinants of Bond Market Capitalization

Further analysis of the determinants of government bond capitalization involves a sensitivity analysis where three scenarios involving exclusion of countries in the sample are investigated based on country specific considerations in terms of fiscal management, level of development of financial markets, economic development and regional affiliations.

These scenarios are expected to either yield different findings or confirm earlier findings on the determinants of government bond market capitalization using similar modeling techniques (ordinary least squares, fixed effects and random effects).

Scenario 1 excludes Mozambique from the sample on the basis that the country’s average government bond capitalization to GDP ratio during the period 2003 – 2012 was the lowest at just 3.48% among peers in the sample. Comparative ratios for other countries are 23.40%, 11.44%, 10.75% and 12.79% for Kenya, Tanzania, Uganda and Zambia respectively. In terms of economic development, Mozambique’s average GDP per capita over the study period was the lowest at $765.58 compared to $1,488.25, $1,248.46, $1,084.75 and $1,341.00 for Kenya, Tanzania, Uganda and Zambia.

Scenario 2 considers a sample of east African countries as members of East African Community (EAC) given that the countries are in the process of harmonizing their economic, fiscal and market practices.

Finally, scenario 3 excludes Kenya in the sample on the assumption that country’s average government bond capitalization to GDP ratio during the period 2003 – 2012 was the highest at 23.40% while average GDP per capita was also highest at $1,488.25. Further, Kenya’s financial sector and markets advancement is regarded higher than its peers in the sample and hence its exclusion could provide different findings.
Table 6: Sensitivity Analysis for the Determinants of Government Bond Market Capitalization

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ordinary Least Squares</th>
<th>Fixed Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bankcr</td>
<td>0.201*</td>
<td>0.404*</td>
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<tr>
<td></td>
<td>(0.056)</td>
<td>(0.143)</td>
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<tr>
<td>Capen</td>
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<td>-5.197**</td>
</tr>
<tr>
<td></td>
<td>(0.600)</td>
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<tr>
<td>Excv</td>
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<td>(0.077)</td>
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<td></td>
<td>(0.481)</td>
<td>(1.823)</td>
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<tr>
<td>Fisbal</td>
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<td>0.179</td>
</tr>
<tr>
<td></td>
<td>(0.283)</td>
<td>(0.315)</td>
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<tr>
<td>intfl</td>
<td>0.181</td>
<td>0.601**</td>
</tr>
<tr>
<td></td>
<td>(0.150)</td>
<td>(0.179)</td>
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<tr>
<td>Intsprd</td>
<td>0.073</td>
<td>1.182**</td>
</tr>
<tr>
<td></td>
<td>(0.250)</td>
<td>(0.437)</td>
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<td>(0.191)</td>
<td>(0.275)</td>
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<td>Gdpcap</td>
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<td>C</td>
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<td>(58.468)</td>
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<tr>
<td>Adj. R-squared</td>
<td>0.817</td>
<td>0.893</td>
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</table>

* ** *** indicates significance levels at 1%, 5% and 10% respectively
1 Sample excludes Mozambique
2 Sample contains East African Community (EAC) Countries - Tanzania, Uganda and Kenya
3 Sample excludes Kenya
Table 6: Sensitivity Analysis for the Determinants of Government Bond Market Capitalization (cont’d)

<table>
<thead>
<tr>
<th>Variable</th>
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<td>0.206*</td>
<td>0.469**</td>
<td>0.270**</td>
</tr>
<tr>
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<td>(0.054)</td>
<td>(0.042)</td>
<td>(0.146)</td>
<td>(0.101)</td>
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<tr>
<td>Capen</td>
<td>-0.849</td>
<td>-0.913***</td>
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<td>(0.508)</td>
<td>(0.473)</td>
<td>(1.796)</td>
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<td>Excv</td>
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<td>0.182*</td>
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<td>0.105***</td>
</tr>
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<td>(0.045)</td>
<td>(0.044)</td>
<td>(0.071)</td>
<td>(0.056)</td>
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<td>-0.393</td>
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<td>(0.379)</td>
<td>(0.366)</td>
<td>(1.591)</td>
<td>(1.251)</td>
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<tr>
<td>intfl</td>
<td>0.182</td>
<td>0.343***</td>
<td>0.356*</td>
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</tr>
<tr>
<td></td>
<td>(0.139)</td>
<td>(0.111)</td>
<td>(0.105)</td>
<td></td>
</tr>
<tr>
<td>Intsprd</td>
<td>-0.040</td>
<td>0.734**</td>
<td>0.229***</td>
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</tr>
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<td>(0.231)</td>
<td>(0.346)</td>
<td>(0.119)</td>
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</tr>
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<td>Mfdm</td>
<td>0.226**</td>
<td>0.238**</td>
<td>0.041</td>
<td>0.050</td>
</tr>
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<td>(0.097)</td>
<td>(0.093)</td>
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<td>(0.120)</td>
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<td>(3.967)</td>
<td>(3.766)</td>
<td>(33.516)</td>
<td>(24.400)</td>
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<td>Tradopen</td>
<td>0.022</td>
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<td>0.137</td>
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<td>(0.156)</td>
<td>(0.166)</td>
<td>(0.229)</td>
<td>(0.176)</td>
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<tr>
<td>Gdpcap</td>
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<td>3.327</td>
<td>-24.875</td>
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<td>(9.888)</td>
<td>(9.424)</td>
<td>(52.968)</td>
<td>(36.924)</td>
</tr>
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<td>C</td>
<td>-16.833</td>
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<td>189.786***</td>
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<td>(55.860)</td>
<td>(47.165)</td>
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<td>Adj. R-squared</td>
<td>0.814</td>
<td>0.823</td>
<td>0.909</td>
<td>0.863</td>
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</table>

* *, **, *** indicates significance levels at 1%, 5% and 10% respectively
1 Sample excludes Mozambique
2 Sample contains East African Community (EAC) Countries - Tanzania, Uganda and Kenya
3 Sample excludes Kenya

Table 6 shows the results of multivariate sensitivity analysis under OLS, fixed effects and random effects and all three scenarios.

Bank credit to private sector is positive and significant under OLS (scenario 1 and 2) and random effects (scenario 1& 2) but negative and significant under scenario 3 for both OLS and random effects. Fixed effects estimation shows that bank credit is positive for scenarios 1& 2 and negative for scenario 3 but all insignificant. For scenario 1, bank credit increases government bond capitalization by 20.1% at 1% significance level under OLS and by 20.8% at 1% level and 20.6% at 1% level under random effects controlling for interest rate fluctuation and fiscal balance, and interest spread and fiscal balance respectively. For scenario 2, bank credit increases bond capitalization by 40.4% at 1% significance level under OLS and by 46.9% at 5% level and 27.0% at 5% level under random effects controlling for interest rate fluctuation and fiscal balance, interest spread and fiscal balance respectively. For scenario 3 under OLS, bank credit decreases bond capitalization by 15.9% and 5% level of significance while under
random effects, the reduction is 22.3% at 1% level (controlling for interest rate fluctuation and fiscal balance) and 12.8% at 5% level (controlling for interest spread and fiscal balance).

*Capital openness* has mixed behavior of relationship with government bond capitalization (negative and positive) and level of significance under the three estimations. Capital openness reduces bond capitalization by 519.7% at 5% level of significance for scenario 2, 101.7% at 5% level for scenario 3 under OLS and fixed effects models. Under random effects, capital openness reduces bond capitalization by 91.3% at 10% level for scenario 1 (controlling for interest spread and fiscal balance) and for scenario 3, by 64.9% at 10% (controlling for interest rate fluctuation and fiscal balance) and 7.1% at 1% level (controlling for interest spread and fiscal balance).

*Exchange rate variability* increases bond capitalization by 17.5% at 1% level of significance for scenario 1 under OLS and by 19.2% at 5% level for scenario 3 under the fixed effects model. Under random effects for scenario 1, variability in exchange rate has strong significance (at 1% level) in increasing bond capitalization by 15.7% when controlling for interest fluctuation and fiscal balance and 18.2% when suppressing interest spread and fiscal balance. In scenario 2 for random effects, bond capitalization is enhanced by 10.5% at 10% level and in scenario 3, by 10.7% at 10% level when interest spread and fiscal balance are excluded.

*Fiscal freedom* enhances bond capitalization by 47.8% at 5% level in scenario 3 under the fixed effects model and by 67.5% at 1% level in scenario 3 under random effects estimation excluding interest spread and fiscal balance.

*Fiscal balance* has a positive relationship with bond capitalization increasing it by 31.7% at 10% level in scenario 3 under OLS and by 35.9% at 5% level in scenario 3 under the fixed effects model.

*Interest rate fluctuation* is positive and significant at 5% under OLS increasing bond capitalization by 60.1% in scenario 1 and by 29.0% in scenario 3 while under fixed effects, it increases capitalization by 71.2% at 1% level in scenario 3. Under random effects, there is a 34.3% increase significant at 10% in scenario 2 and 35.6% increase significant at 1% for scenario 3 both with control for interest rate fluctuation and fiscal balance.

*Interest spread* increases bond capitalization by 118.2% at 5% in scenario 2 and by 25.0% at 10% level in scenario 3 both under OLS. In the random effects estimation, there is a 73.4% increase at 5% level in scenario 3 and 22.9% increase at 10% level in scenario 2 both controlling for interest fluctuation and fiscal balance.

*Monetary freedom* has largely positive association with bond capitalization across all estimation models but is only significant at 5% level under random effects for scenario 1 enhancing capitalization by 22.6% while controlling for interest fluctuation and fiscal balance and by 23.8% controlling for interest spread and fiscal balance.

*Size of the economy* has mixed association behavior with bond capitalization with odds of decreasing capitalization at 81.5 (10% level) in scenario 2 under OLS, 8.0 (at 5% level) controlling for interest
fluctuation and fiscal balance and 9.65 (1% level) controlling for interest spread and fiscal balance under random effects model.

Under the random effects estimation, *trade openness* is positive and insignificant in scenarios 1 and 2 but decreases bond capitalization by 28.2% at 1% level in scenario 2 controlling for interest fluctuation and fiscal balance and by 17.5% at 5% in scenario 3 controlling for interest spread and fiscal balance. There is mixed behavior of association with bond capitalization which is not significant under OLS and fixed effects models.

*Gross Domestic Product per capita* which is the measure of economic development is generally positive and significant under all three estimations. Under OLS, GDP per capita has 123.1 odds of increasing bond capitalization at 10% in scenario 2, and 17.8 odds at 5% in scenario 3. Under fixed effects model, GDP per capita has 22.1 odds of increasing capitalization at 1% level of significance in scenario 3. Under random effects, GDP per capita has 26.5 odds of increasing bond capitalization at 1% level in scenario 2 while in scenario 3, it has 30.7 odds of enhancing bond capitalization.
6.0 CONCLUSION AND POLICY IMPLICATIONS

6.1 Government debt financing in 5 MEFMI countries

This paper has tried to present insights into the government debt financing situation prevailing in a sample of countries from the MEFMI region – namely Kenya, Uganda, Tanzania, Zambia and Mozambique. It is apparent that reliance on external sources of budget financing is still high and most domestic government securities markets are small and illiquid. Corporate debt market is almost inexistent and where there are a few issuers, secondary market for corporate debt instruments is practically invisible. However, in the quench to close financing gaps for key economic infrastructure needs, a number of countries have taken cue in establishing and sustaining liquid government bond markets as a prerequisite for corporate debt markets through dedicated market development initiatives.

6.2 Determinants of government bond market development: inferences from study

This study has attempted to identify the major determinants of government bond market development in the 5 afore-named MEFMI countries using econometric analysis and involving simple OLS, multivariate OLS, Fixed Effects and Random Effects models while also applying relevant sensitivity analysis to cater for country specific situations.

From the findings, a combination of structure, policy and institutional variables have statistically significant influence on government bond market development (bond capitalization) under different estimation methodologies.

In the simple OLS, fixed effects and random effects; variables that are positive and significant are; bank credit, capital account openness, exchange rate variability, legal origin, size of the economy and economic development while those with positive effect but not significant include interest rate spread and monetary freedom. Interest rate fluctuation is significantly negative while fiscal freedom, fiscal balance and trade openness are negative and insignificant.

In the multivariate OLS, fixed effects and random effects estimations; bank credit to private sector, exchange rate variability, economic development, monetary freedom show positive and significant relationship with government bond market capitalization while interest rate fluctuation, interest rate spread, trade openness and economic size showed positive association with bond capitalization but not significant in all estimation models. Capital account openness is negative across all models but significant only under OLS and random effects estimations while fiscal balance and fiscal freedom are generally insignificant both showing mixed behavior of association (positive or negative) with government bond capitalization.

Although Eichengreen and Luengnaruemitchai (2004) found interest rate spread and exchange rate volatility to have negative relationship with bond market development while capital account openness was positive, results in this study present some similarities where size of the economy and trade openness
are positive and significant and fiscal balance is negative (in OLS - controlling for legal origin). Adelegan and Radewicz-Bak (2009) found out that fiscal balance was positive which agrees with multivariate OLS – all variables, and fixed effects model results in this study. Yibin, Phelps and Stotsky (2013) in their study on bond markets in Africa found interest rate spread, fiscal balance, trade openness, capital openness and exchange rate volatility to have a negative relationship with bond market development, while interest rate volatility and English legal origin presented a positive relationship. Investigating the major determinants of bond market development in Asia, Bhattacharyay (2011) found the following variables significant and positive; stage of economic development, size of the economy, size of banking system and interest rate spread.

In the multivariate sensitivity analysis for the different scenarios (1, 2 and 3) under OLS, fixed effects and random effects models; exchange rate variability, fiscal freedom, fiscal balance, interest rate fluctuation, interest spread, economic development and monetary freedom are largely positive and significant in influencing bond capitalization. Bank credit is not significant but is positive for scenarios 1 & 2 and negative for scenario 3 while capital openness has mixed association behavior. Size of the economy and trade openness are negative and discourage bond capitalization.

6.3 Relevance for MEFMI region: Few tentative pointers

While one would not strive to immediately propose a blueprint for domestic bond market development from this modelling exercise, it is worth referring to what broad inferences can be made from the results generated from the exercise.

In particular, the results of the detailed analysis described herein provide pointers for the MEFMI region in identifying priority areas for development of the domestic government bond markets as well as stimulate the growth of corporate debt market. Countries and the region should implement initiatives that enhance determinants identified to have positive relationship with bond market capitalization. Well-developed bond markets provide alternative sources of financing and increase financial system resilience by reducing and balancing banking sector reliance. To achieve this objective, policy making must be geared towards reforms that foster liquidity and depth of the local bond markets.

It must be pointed out that while these are the conclusions that came out of the study conducted, one would expect countries to validate these findings using other analysis, separate empirical work already conducted and taking into account the reform program that each country has already been embracing to further promote the development of the domestic bond market.

6.4 Suggested initiatives that may be relevant for concerned countries

In line with the sentiment expressed above, one may tentatively present some of the possible initiatives that could well be considered as they have arisen from the findings of the study. Such initiatives could include the following:
- Improve macroeconomic policies and quality of institutions to encourage economic development. These efforts will help address volatility of interest rates and the exchange rate, capital controls and promote better investment environment with high reliability of laws and increased safety.
- Approach bond market development from a regional perspective to deal with smaller economies that do not encourage debt financing and leverage on structural factors that are country specific and difficult to change such as origin of legal systems, openness of the economy and size of the economy.
- Broader and innovative products range
- Stronger financial regulation
- Better access to regional and international investors

6.5 A final note beckons…

A final note on the study described in this paper beckons. The detailed study of the domestic debt situation in the 5 MEFMI countries, inferences summarized in this section and tentative proposals put forward for MEFMI’s consideration is just a start. There is scope to undertake further work in the model, especially in fully testing the application of the model as well as critically testing any downside risk on inferences that may not be backed by other studies or policy guidelines. For instance, one area that warrants further scrutiny relates to the development of regional securities market and the impact that this may have on individual markets – while also not losing sight of such impact on trade including regional trade, growth and development. There is also scope to scrutinize further the individual relationships among the most important variables used and bringing in other qualitative factors in the analysis so that more concrete policy prescriptions can be further articulated – for the benefit of the whole MEFMI region.
7.0 APPENDICES

7.1 Appendix 1(a): Country Comparison of Central Government Debt in Sample Portfolio
7.2 Appendix 1(b): Country Comparison of Marketable Debt in Sample Portfolio

Country Proportion in Total Sample Marketable Debt in 2003

- Kenya: 40.13%
- Zambia: 13.12%
- Uganda: 9.52%
- Tanzania: 10.02%
- Mozambique: 3.13%

Country Proportion in Total Sample Marketable Debt in 2005

- Kenya: 50.74%
- Tanzania: 33.31%
- Uganda: 14.94%
- Mozambique: 2.07%

Country Proportion in Total Sample Marketable Debt in 2007

- Kenya: 59.43%
- Tanzania: 43.29%
- Uganda: 25.61%
- Mozambique: 1.81%

Country Proportion in Total Sample Marketable Debt in 2010

- Kenya: 55.95%
- Zambia: 22.39%
- Uganda: 25.73%
- Tanzania: 31.88%
- Mozambique: 3.51%

Country Proportion in Total Sample Marketable Debt in 2012

- Kenya: 52.72%
- Tanzania: 44.05%
- Uganda: 37.40%
- Mozambique: 6.10%
### Appendix 3: Data Sources

<table>
<thead>
<tr>
<th>Variable</th>
<th>Depiction</th>
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<td>Lego</td>
<td>Origin of legal systems – 1=English, 0=Otherwise</td>
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### Appendix 2: Correlation Matrix of the Determinants of Bond Market Development

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<http://dx.doi.org/10.1787/aegd-2012-en>


