EFFECT OF BOND MARKET DEVELOPMENT ON GROWTH OF ECONOMY AMONG EAST AFRICAN COMMUNITY MEMBER COUNTRIES

BY

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DECLARATION

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

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This research project has been presented for examination with my approval as the University Supervisor.

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DEDICATION

This entire work is the hand of God upon me. My family has been a great pillar in my life.

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LIST OF ACRONYMS AND ABBREVIATIONS

AfDB   Africa Development Bank

DFH   Demand-Following Hypothesis

EAC   East African Community

FBH   Feedback Hypothesis

FBH   Feedback Hypothesis

FDI   Foreign Direct Investments

GDP   Gross Domestic Product

GNP   Gross National Product

IMF   International Monetary Fund

LCBMs   Local Currency Bond Markets

NI   National Income

NLH   Neutrality Hypothesis

NLH   Neutrality Hypothesis

SLH   Supply Leading Hypothesis

SLH   Supply-Leading Hypothesis

SSA   Sub-Saharan African

VECM   Vector Error-Correction Models

ABSTRACT

Effect of financial advancement and growth of the economy have been tested and found to be unidirectional model. This is supported by supply leading hypothesis that demonstrated the need to develop financial markets to achieve real growth of economy. The effect of bond markets on growth of economy exhibit bi-directional model. The above noted empirical findings so far are mixed on the causal direction of bond market development and Growth of economy at the international, regional and local study settings. No study is focused on the EAC financial development for instance bond market. It is conclusive that most of the empirical studies are contradicting in their conclusion over the direction of casual relationship between the development of bond markets and growth in the economy. The study sought to answer the question what id the relationship between bond market development and economic growth in EAC member state. The objectives of the study were Bond market development on growth of economy in EAC member countries, to established relationship between growth of economy and development of the bond market in EAC member countries and to determine Inflation the relationship between bond market and growth of economy in EAC member countries. The Descriptive study has been used to explain the effect of the variables over one another. The population of the study was member states of the East African Community were the population under study. Secondary data was collected for this stud. A number of regression analyses were used in a bid to find out the effect of bond market development of growth of economy within the EAC. The results East Africa Community recorded significant variations in the cost of living between 2009 and 2018. There existed strong variation between (R-value = 0.744) between GDP and bond markets growth in East African Community countries. Further, the study established that bond market development accounts for 51.3% of the total variance of the growth of economy among the EAC member countries. From the results, the study concluded that bond market development impact positively on economic growth in EAC member states. Bond market development lead to growth of economy of the EAC member countries. The study also concludes that bond market development and influences growth of economy of EAC member countries in a positive and statistically significant way while inflation rate, Interest rate, annual exchange rate have a negative and significant effect. The study also concludes that Granger causality exists between growth in the economy and development of the bond market and the causality was bidirectional.From the Granger causality, the study also concludes that annual Inflation rate, annual IR, annual exchange rate and significantly influences growth of economy and the causality is unidirectional. The national government of Kenya through CBK and capital market authority should come up with appropriate financial market regulations aimed at cushioning the economy from adverse effect of macroeconomics variables. The government should also strive to make the bond market attractive to investors who may prefer investment in bonds for longer period of time. In this regard, the government should offer investors attractive and returns on investment. This will attract more investors consequently leading to improvement in growth of economy.

CHAPTER ONE: INTRODUCTION

1.1 Study Background

In the studies of Ang (2008) and Levine (2005), proofed causal impact from development of financial markets to monetary growth is depicted. As revealed by Samargandi, Fidrmuc and Ghosh (2015) nations which have well established financial frameworks, among them developing securities exchanges, banks with large asset base and other dynamic fund related markets, have high opportunities of future financial development. Puente-Ajovin and Sanso-Navarro (2015) and Marques, Correa and Sapriza (2013) reinforce four likely theories that clarify the links between final market development and growth of economy in developed and developing countries Supply Leading Hypotheis (SLH), Neutrality Hypothesis (NLH), Request Feedback Theory (DFH) and Feedback Theory (FBH).

In the Barro's theory of neutrality, Barro and Grilli (1994) argued that the issuance of debt does not affect the wealth aggregate demand, IRs and capital formation. This study is guided by the theories of financial development attributed to Patrick (1966) in the demand and supply driven theories. The previous contends that advancement of financial related markets expands the stockpile of budgetary administrations and in this manner prompts real financial development. The last advances that demand for money related growth is made by monetary development since expanding demand for budgetary administrations prompts progression in the finance related part while the economy develops relatively.

Empirical study by Babu et al. (2015) revealed ht at EAC being among countries experience fast growth. Contrasted with the past periods, development rate has taken better over the most recent two decades subsequently exceeding different nations in South of Africa since 2000 with 3.7% per capital income relative to 3.2% in countries in EAC in a lag period of 15 years. Essers et al. (2016) present that greater part of the nations in Africa have gained large ground in growth of their nearby financial security markets (LCBMs). Progressively, governments in the district issue fixed-rate stock securities with tenors of ten years and more all the time. In addition, the non-bank, nearby institutional financial specialist base has additionally kept on growing.

1.1.1 Bond Market Development

According to Hakkanson (1999), elements that characterized bond markets that are well structured include; corporate financial structures that are efficient, rating offices, expansion of money related subordinates, and different intends to decrease fundamental hazard and maintain a strategic position from emergencies. Different components of a well-developed security market are money related detailing framework, well immense monetary investors, an open advertise with high liquidity, and the presence of productive redesign instrument when there is default.

According to Rethel and Sinclair (2014), bond finance improves the quality of available funds and the redistribution of funds among borrowers, intermediaries and lenders. Since capital accumulation through bond issue is economically rational for medium to large size companies, it affects power relationship in credit allocation and finance. Therefore, a firm's reputation is important in the market because of the credit history and worthiness.

In conclusion, bond financing is more accessible to medium and large firms and less accessible to younger and smaller companies. Beck, *et al*. (2012) while presenting bond market development indicators posits that the quotient of the domestic debt balance issued in total is the private bond market capitalization to GDP.

1.1.2 Growth of economy

An economy is subset of the world in physical form and it is made up of wealth, population and production flow (Daly, 2010). Growth of economy is an increased capacity of the country to produce products in comparison to different periods over a time span. Growth of economy is generally a rise in the level of production and consumption of products over a given period of time. Growth of economy is commonly measured through GDP or GNP (Waweru & Ochieng, 2017).

Per capita income measure growth of economy in a country. It is measured in terms of the changes recorded in GDP (Haller, 2012). Macroeconomic determinants such bond market, financial market development contribute to growth of economy in a country. It is perceived as the process which results to an increase in the sizes of national economies, macro-economic indicators (Agrawal & Khan, 2011). Growth of economy encompasses increases in a country's nation per capital income and real national income in a given period (Shah and Attullah, 2011).

1.1.3 Bond Market Development and Growth of economy

The development of bond markets has been associated with mitigation of international capital mobility risk and increased savings. Therefore, governments have put measures to encourage the same (Rethel and Sinclair, 2014).

The results of failure of instituting well developed bond market in an economy weaken economic determinants (Herring and Chatusripitak, 2000). Bond market development enhances economic factors through saving mobilization, increase size of investments and cater for occurrence of hazards. Inadequate developed bond market hinder efficiency in an economy and increase risk of financial turmoil. Financial organizations such as security markets act as significant instrument for growth of economy, alleviation of poverty and gaining economic development (Levine, 2005). Stock markets and banking financial services provide a market for savings and investment crucial for growth of economy. The supporters of SLH believe that through a number of ways channels like eliminating information asymmetries, mobilizing savings and mitigation of risk, bond market is the key element for development of the economy exhibiting unidirectional causality model.

The demand-following hypothesis (DFH) supporters argue that development of bond markets result from continuous growth of economy, as emergence of more bond coverage is realized since the demand for financial services increase. They further stipulate that bond market development only contributes a smaller margin on growth of economy; after all, linked to financial market.

The effect of bond markets on growth of economy exhibit bi-directional model. The two parameters require that existence of each other in order to thrive. There is a strong reinforcement in the relationship. Neutrality hypothesis (NLH) demonstrated that it there no existing relationship between growth of economy and bond markets growth.

1.1.4 The East African Community Member Countries

Founded in 1967, East Africa Community collapsed in the year 1977 before being revived in July, 7th of the year 2000. Currently there are six countries that form East Africa Community that include, Uganda, Tanzania, Burudi, South Sudan and Kenya. It is headquartered in Arusha, Tanzania. The Treaty that established the East Africa community guides the operations of the EAC. Currently, the EAC has a market size of 168 million people. The EAC is governed by the judiciary and the national assembly.

There has been an increasing trend in the level of external debts among East African countries. The statistics by IMF (2013) indicates that Burundi is the first indebted country with 72.3% followed by Kenya with 53%, Tanzania at 34%, Uganda at 27% and lastly Rwanda at 22%. The report further ranks Kenya as second with 28.5% foreign debt service while Burundi is leading with 50%

. According to East African Economic Outlook report (2018), countries in East Africa realized the best economic performance in the continent for the year 2017. The value of GDP growth of 5.9% compared to the continental average of 3.6% (African Development Bank, 2018).This growth according to the report was however attributed to Kenya, Ethiopia and Rwanda. The question therefore remains whether the external debt has affected growth of economy of other three East Africa countries (Uganda, Southern Sudan and Burundi) and this has informed this study.

1.2 The Research Problem

Most of the existing literature has tried to assess the link between debt market development and economic growth. However, existing literatures are contradicted in their

findings and conclusion over the question of the effect of debt market growth and economic development. Effect of financial advancement and growth of the economy have been tested and found to be unidirectional model. This is supported by supply leading hypothesis that demonstrated the need to develop financial markets to achieve real growth of economy.

According to Roman (2012) revealed that bond market development does not influence on GDP and revealed that financial market demands increase economic growth in debveloping and develop nations (Caporale et al , 2009). The bond market on EAC countries exhibit link between local currency and GDP where in Kenya is at 5%, 2.8% in Uganda and 1.9 in Tanzania. This demonstrated that on a mean, LCBMs exhibit the countries experience development in debt markets that contributed to contribute to economic growth. According to Popov (2018), financial market development has positive effect on growth of economy though in unidirectional. On the other hand. Caporale et al. (2009) found that security markets contribute to economic development in undeveloped countries.

In Nigeria, Odo et al (2016) used granger causality findings and revealed that there exist unidirectional causality between debt market expansion and GDP. However, bidirectional causality from financial advancement with growth of economy in South Africa. Empirical study by Roman (2012) revealed that there exist a unidirectional causality from growth of economy to debt market development while Ankilo et al (2010) indentified various causation for various countries identify different causation for different countries even if the countries are almost at the same level of Development.

Empirical studies in Kenya Nyasha and Othiambo (2017) Olweny and Kimani (2011) and Odhiambo (2008) revealed financial market growth contribute to economy growth in Kenya. The above noted empirical findings so far are mixed on the causal direction of bond market development and Growth of economy at the international, regional and local study settings. No study is focused on the EAC financial development for instance bond market. It is conclusive that most of the empirical studies are contradicting in their conclusion over the direction of casual relationship between the development of bond markets and growth in the economy. The study sought to answer the question what id the relationship between bond market development and economic growth in EAC member state.

1.3 Research Objective

Specifically, the study sought to analyze the effect of:

  i.   Bond market development on growth of economy in EAC member countries.

  ii.   The relationship between growth of economy and development of the bond market in EAC member countries.

  iii.   Inflation the relationship between bond market and growth of economy in EAC member countries.

1.4 Value of the Study

The study may be of great impact to the financial market sector stakeholders who could find the information of importance since they would clearly understand the major role

they play in assisting the development and growth of economy of the respective countries and how the bond market development influences growth of economy in a country.

The academicians and scholars, would get more information and even make them appreciate domestic debt and financial markets role in the economy of the country and it would also give them an opportunity to do more study to fill the existing research gaps thus they can Identify further studies that need to be done in the future. The government of Kenya being the main beneficiary of the growth of economy should align their policies to promote development in the financial markets and subsequent growth of economy.

The investors in the Bond Markets and Financial Institutions were also be informed of the factors that lead to Government issuance of Treasury Bonds and Treasury Bills to the market and the impact it has on financial markets development and the economy at large. This also includes the perennial identified challenge of lack of increased growth of economy and bond market activities.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The focus of the chapter is an empirical review of the literature, theoretical framework, and literature review overview aimed at determining research gaps. The reviewed literatures are international, regional and local on the topic.

2.2 Theoretical Review

There are numerous hypothetical reviews that relate financial market development to growth of economy. The relationship will therefore be looked at by the theoretical review between the two situations while focusing on the effect of one on the other.

2.2.1 Theories of Financial Development

Theories of supply –leading and demand –following theory were developed by Patrick (1966). The study assumes that financial market development link to long term performance in an economy in different countries. The development in financial markets and security contribute to positive growth in economic measured in GNP or GDP. The view were supported by King and Levine (1993). Greenwood and Jovanic (1990) and Demirgur-Kunt and Levine (2008). According to Patrick (1966) the demand increase for financial services from banks and insurances has effect on growth of economy. Further, Robison (1952) and Lucas (1988) support the theory of DFH and that financial development contribute to growth of economy in different nations. Theory of Demand-Following –Hypothesis form a strong foundation of creating a link between growth of economy and financial market product development.

2.2.2 Harrod Domar Model

The Harrod-Domar Model attributed to Harrod (1966) and Domar (1957) proposes that ratio between capital output and savings volume to financial product development in economies. High levels of savings mean more funds are available for borrowing and thus investments. As the level of investment grows, the level of capital stock also grows. The capital investment contributes to more financial product development and increase investment volumes which measures the productivity of an investment is employed to evaluate the viability in the economy. The lower the capital output ratio, the higher the level of growth of economy. Higher outputs mean that there is lower level of input.

The Harrods framework informed economic factors that contribute to growth of economy. If government various countries support saving mobilization, implementation of technology development would result into decrease in economy capital output ratio. Effective financial development policy would result into growth of economy in long run

2.2.3 Solow Model

The Solow theory was proposed and developed by Solow (1978). It assumes growth of economy is as a result of exogenous technological improvement as well as increase in capital accumulation. Solow indicated that technological change contributed 87.5% of growth of economy while 12.5% was as a result of capital accumulation. From his analysis, there was a conclusion that development of financial securities does not guaranteed increase in per capita; income. He further observed that production was organized by firms which employed the services of capital and households for labor.

Both capital and labor are supplied by households firms at the prevailing wage rate. The marginal products of labor and capital equal the IR and the wage rate.

2.3 Determinants of Growth of economy

This section presented the factors of growth of economy that include IR, rate of inflation, FDI, exchange rates and public debts.

2.3.1 Inflation Rate

Inflation is defined as persistent or a sustained upward trends in prices of products for a specific time (Akers, 2014). Inflation may negatively or positively affect growth of economy of the country. Inflation does not indicate an increased cost in one product or service, but rather, an increase in overall level of prices of goods and services. Inflation is usually expressed as annual percentage rise in prices of goods and services (Kimani & Mutuku, 2013). Consensus views however are that long sustained level of inflation is brought about by money supply growing faster than the rate of growth of economy (Faust & Wright, 2013).

2.3.2 Interest Rate

In Economic terms, rate of interest is the amount of capital allocation over a given period of time. Rate of interest charged on capital is regarded as one of the monetary tools for regulating the availability of credit facilities in an economy to increase savings and investments. According to Zaman*et al.* (2013), IRs significantly predict profitability of organizations.

An increased IR increases the lending rate compared to the deposit rate and therefore profitability as the spread of bank is high. A reduction in IR results into deposit volume as compared to the lending rate and therefore keeping spread within the bank low.

2.3.3 Exchange Rates

Exchange rate is the benchmarking for converting one's currency to a foreign one for example a Kenya shilling against a USA dollar. A rise in rate of exchange influence growth of the economy in terms of the value of exports and imports. In a study to determine how fluctuation in IR affected development of financial market. Majok (2015) found out positive link between fluctuation in foreign exchange rate and financial performance of financial institutions. Performance in this context was determined by return on assets.

2.3.4 Foreign Direct Investment

FDI occurs when an investor establishes businesses in a foreign country by acquiring foreign assets with control and ownership of the interest of the foreign country. Simply defined, as the ratio of capital to investment in a foreign enterprise with the view of having a voice in the enterprises management. FDI measurement is based on FDI stock which is expressed as a ratio of the per capital income of a country. FDI stock that includes residences equity investments and credits to foreign countries and inward FDI stock which is foreigners' equity investment and credits to host economy (Aleksynska & Havrylchyk, 2013).

2.3.5 Public Debts

Public debt is a means of financing government budget deficit. Public debts are composed of internal and external debts. External public debts take a long-time horizon with repayment if the interest and the principal amount. Examples of external debts include loans from IMF, World Bank and other financial partners like Africa Development Bank AfDB. External debts may also include issue of sovereign bonds like Eurobond in Kenya. Internal debts include issue of treasury bonds and treasury bills. These are regarded as risk free assets and they are highly demanded. Prudent external debts have is likely to result into growth of economy especially when used productively. Productive use of debts includes acquisition of assets and investments in machinery and manufacturing (Jawadi & Sousa, 2013).

2.4 Empirical Review

The focus in this section is international, regional and local studies on development o the bond market and growth of economy. It is critical to note that some of the studies are not focusing on a direct relationship between the two phenomena and includes a focus on the researches with related topics.

2.4.1 Global Studies

Popov (2018) explored the connection between monetary market improvement and financial development in Europe. The study uncovered that account advancement instrument added to monetary development among European Countries. The study found that banks and markets improvement positively affects monetary development.

Further results demonstrated that money market, for example, contract credit contributed less to supportable financial development

Caporale et al. (2009) decide the trait of banking and money related showcase advancement of European Union nations. The investigation uncovered that stock security in created nations add to monetary development of EU nations

Chang and Seteven (2005) Analyzed monetary advancement and financial execution in Taiwan. The examination utilized Vector Auto relapse model. The examination uncovered that there exist positive connection between debt market improvement and GDP in Taiwan.

2.4.2 Regional Studies

Odo et al (2016) explored the causality and impact of bond market development on GDP in Nigeria and South Africa by using co compromise, VECM and granger causality test. The eventual outcome of granger causality shows a unidirectional causality running from cash related improvement to fiscal improvement in Nigeria anyway a bidirectional causality from budgetary headway to money related advancement in South Africa supporting the Supply driving theory of cash related improvement by Patrick (1996), which communicates that the course of causality between fiscal progression and monetary advancement changes through the range of progress. The examination uncovered that .money related advancement added to financial development in Nigeria and South Africa

Rodgers et al. (2014) researched the link of debt market development and monetary development in Africa using data from 50 countries for the period 1980-2008 The study

applied board backslide and causality testing using credit to the private parts to signify GDP and the extent of far reaching money (M2) to indicate GDP as segments being created of debt market. Curiously the Roman (2012) revelations, the backslide total a positive connection between debt market growth and economic development. Likewise, the causality test by Rodgers and others (2014) shows a bi-directional association between cash related headway and monetary advancement in Africa. It is similarly clashing with the enthusiasm following hypothesis that express the association between fiscal improvement and cash related improvement is a uni-directional from budgetary headway to money related advancement.

Roman, (2012) researched using the VAR and VECM approach to manage choose the since quite a while prior run and short-run association between cash related progression and money related advancement in Ethiopia. In addition, the granger causality test is used to choose the course of causality. Using the fiscal improvement pointer PRIV, Roman (2012) found uni-directional causality from fiscal advancement to cash related headway; this derives past money related advancement rate is a critical determinant for the progression of the budgetary system. As the economy builds up the enthusiasm for budgetary resources will addition and this therefore will bolster the progression of cash related region.

2.4.3 Local Studies

Nyasha and Odhiambo (2017) examined the impact of money related improvement on financial development in Kenya. The study considered an investigation period between 1980to 2012. The examination sent autoregressive circulation slack point of confinement test approach.

To catch past what many would consider conceivable the broadness and significance of the Kenyan monetary advancement, the examination uses the technique for implies expelled typical to fabricate banking and market money related improvement. The examination uncovered that monetary improvements in banking and market based industry positively affected financial development.

An exact investigation by Uddin, et al. (2013) evaluated the connection between budgetary advancement and financial growth in Kenya. The examination concentrated on an investigation period somewhere in the range of 1971 and 2011. The examination embraced reenactment Based ARDL model test, co-coordination Gregory and Hansen's auxiliary break. Results uncovered that there exist a positive relationship between financial market growth and economic performance in Kenya

An observational examination by Olweny and Kimani (2011) evaluated the impact of monetary development on securities exchange execution in Kenya. The study utilized Granger causality test as educated by Vector-Autoregression (VAR) structure. The investigation utilized optional information. The study revealed that financial growth contribute to economic performance

Odhiambo (2008) evaluated the impact of budgetary improvement and monetary development in Kenya. The examination used powerful Granger Causality Framework. The examination thinks about money related improvement intermediary and genuine GDP, Per capita. The investigation found that causality between budgetary advancement and monetary development was touchy where request Following Theory will in general be transcendent.

2.5 Conceptual Framework

Figure 2.1: Conceptual Framework


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┌─────────────────┐
│  Bond Market    │ ──────────┐
│  Development    │           │
└─────────────────┘           │
┌─────────────────┐           │
│ Exchange rates  │ ──────┐   │
└─────────────────┘       │   │        ┌──────────────┐
┌─────────────────┐       ├───┼──────→ │  Economic    │
│ Inflation rates │ ──────┤   │        │   Growth     │
└─────────────────┘       │   │        └──────────────┘
┌─────────────────┐       │   │
│ Interest rates  │ ──────┤   │
└─────────────────┘       │   │
┌─────────────────┐       │   │
│ Foreign direct  │ ──────┘
│   investment    │
└─────────────────┘
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Independent variables   **Dependent Variables**
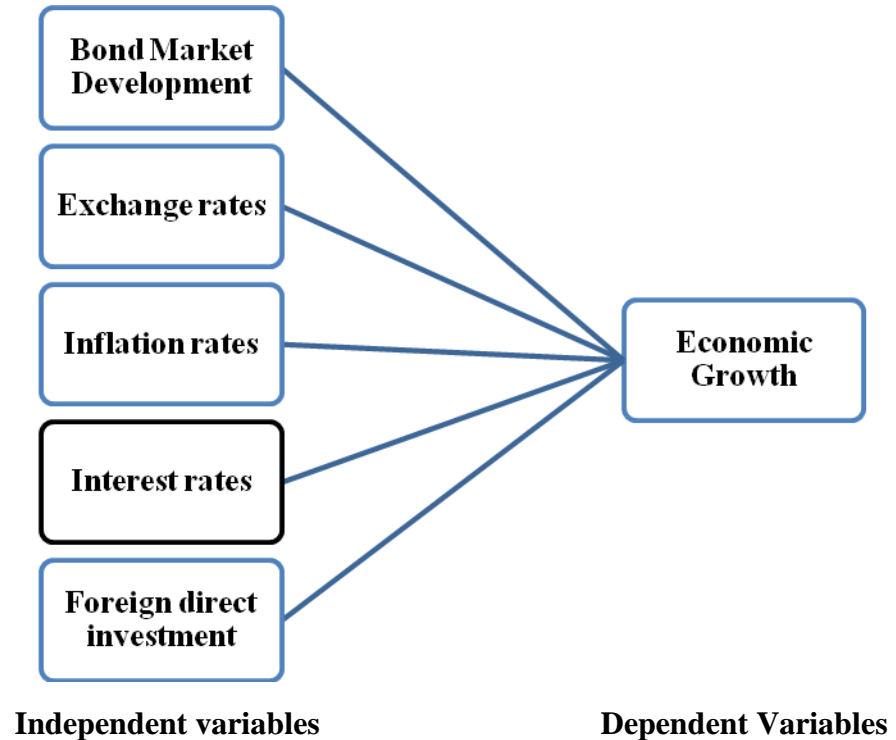
The above figure depicts the research study's conceptual framework. The dependent variable is growth of economy while the dependent variables are bond market development, s, InfRs, IRs and exchange rates.

2.6 Literature Review Summary and Knowledge gaps

The review of the past studies demonstrate that financial development contribute to improvement in per capita income level of different countries. However, Popov (2018), Caporale et al. (2009) and Chang and Seteven (2005) using VECM demonstrated a unidirectional causality running from monetary headway to financial development. Locally, Nyasha and Odhiambo (2017), Uddin, et al. (2013) and Odhiambo (2008)

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revealed that causality between financial development and growth of economy existed. The empirical study failed to establish the relationship between bond market developments to growth of economy in Kenya

Table 2.1: Table Summary of Literature Review

Study author	Study focus	Methodology	Findings	Knowledge gap
Nyasha and Odhiambo (2017)	Examined the impact of both bank and market-based financial development on economic growth in Kenya	Autoregressive distributed lag bounds testing approach	Market based financial development has a positive impact on economic growth in Kenya. However, the results have also shown that bank based financial development has no impact on economic growth in Kenya	The study looked at financial market development generally without focusing on Bond and Stock market segments
Olweny and Kimani (2011)	Investigated the causal relationship between stock market performance and economic growth in Kenya	Vector Autoregressive Model	The causality between economic growth and stock market runs unilaterally or entirely in one direction from the NSE 20-share index to the GDP.	The study is based on share capital market and not development of bond market in Kenya specifically and not in the EAC countries
Odhiambo (2008)	Examined the direction of causality between financial development and economic growth in Kenya	Granger Causality	Although the causality between financial development and economic growth in Kenya is sensitive to the choice of measure for financial development, on balance the demand following response tends to predominate.	The study is based on share capital market and not development of bond market in Kenya specifically and not in the EAC countries

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is critical to achieve research objective. This chapter presented design selected, data collection methodology, population set, data analysis techniques, and research design used in the study.

3.2 Research Design

The Descriptive study has been used to explain the effect of the variables over one another. Calderon et al. (2010) say that descriptive research describes data as well as population characteristics. The study aims to explain the public debt effects on financial market development.

3.3 Population

The member states of the East African Community were the population under study. EAC membership. The data to be used in this study was collected from the four EAC member countries with functional bond markets namely; Kenya, Uganda, Tanzania and Rwanda.

3.4 Data Collection

Secondary data was collected for this study. This data was collected using data collection sheet (Appendix I). The researcher collected data from reports of respective bureaus of the countries, the World Bank reports, the IMF reports and the Africa Development Bank AfDB reports. The study covered a period of ten years (2009-2018). This period is considered sufficient to produce a sizeable panel data suitable for regression analysis.

According to Westland (2010), the sample size of 30 elements is sufficient for regression and this justifies the period in this study. The study used secondary data because it is readily available and therefore saving on costs. Specific data to be collected is on annual FDI inflows, bond market capitalization, Annual GDP rates, Annual InfRs, Annual IRs, Annual Average exchange rates.

3.5 Diagnostic Tests

3.5.1 Normality Test

Methods of Kurtosis and skewness were examined to test for normality. The rule of thumb, in this case, is that a variable is close reasonably to normal if its kurtosis and skewness fall within the range of -1 to +1 or -2 to +2 as a stricter criterion at the time normality is critical.

3.5.2 Tests of Multicollinearity

The test of multicollinearity was conducted to determine the correlation between independent variables. The relationship variables were established inferential statistics. The R-Squared statistics and t-statistics are the major multicollinearity tests. The problem with multicollinearity comes when the correlation between study themes is high that is, greater R-square value than t-statistics.

3.5.3 Homoscedasticity

The similarity level in the variance regarding the relationship between variables was measured utilizing Homoscedasticity. Upon getting the results by subjecting a number of

dependent variables on independent variable effects, then it is considered that the relationship has homoscedasticity.

3.6 Data Analysis

A number of regression analyses were used in a bid to find out the effect of bond market development of growth of economy within the EAC. The study used the model by Bulle (2014) for the analysis. The following is the model:

$Y = \beta_0 + \beta_1 BMD_1 + \beta_1 AIR_1 + \beta_2 INTR + \beta_3 AAER_3 + \beta_4 FDI_4 + \beta_5 FDI_5 + \varepsilon$

$Y =$

Where:

$Y =$ Growth of economy $(GDP_1 - GDP_0/GDP_0)$

$BMD_1 =$ Bond Market development (Measured by the log of the total market capitalization value in US $).

$AIR_2 =$ Annual InfR

$INTR_3 =$ Annual IR

$AAER_4 =$ Average Annual Exchange rate

$FDI_5 =$ (Measured by the log of the total annual inflow value in US $).

$\varepsilon =$ Error Term

The study deployed co-integration test to assess loan term factor of GNP IN EAC countries. VECM and VAR methods were applied to test relationship between variables.

3.6.1 Test of Significance

To ascertain the extent to which data collected fitted the model of regression, the statistics of R squared (R2) was used. The outcome of zero percent represents that the model is not explaining variability. An outcome of 100 percent depicts that the model is explaining the existing variability. The level of significance was tested using statistics of the P-value. If the p-value was 0.05, the null hypothesis is rejected as there is a strong relationship between independent and dependent variables. A P-value greater than 0.05 required that the null hypothesis is accepted as it shows the presence of weak evidence against opposing null hypothesis. 95 percent was the set significance level of the study.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND INTERPRETATION

4.1 Introduction

This section presented results. The study sought to establish how bond markets development affect growth of economy in the member countries of the EAC. Descriptive analysis was used to assess the trend of the variables and regression analysis was used to establish the correlation between bond markets development and growth of economy.

4.2 Descriptive Analysis

Descriptive analysis was undertaken to assess the trend of the growth of economy, bond market development in for the period between 2009 and 2018.

4.2.1 Growth of economy

The growth of economy of the EAC countries was measured using percentage in real GDP between 2009 and 2018. Uganda recorded the highest growth of economy rate with an average of 6.48% (SD= 0.790) followed by Kenya with an average growth of economy rate of 5.53% (SD= 1.421). Tanzania recorded the slowest growth of economy over the study period with an average score of 5.28 %(SD= 2.025). However, per capital income of the three countries varying as presented in figure 4.1

Figure 4.1: Growth of economy

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kenya	2.7	8.4	6.1	4.6	5.9	5.4	5.7	5.9	4.9	5.7
Uganda	5.4	6.4	7.9	5.1	6.8	6.7	6.2	6.9	6.8	6.6
Tanzana	8.1	7.7	6.8	2.2	4.7	4.6	5.7	2.3	4.5	6.2
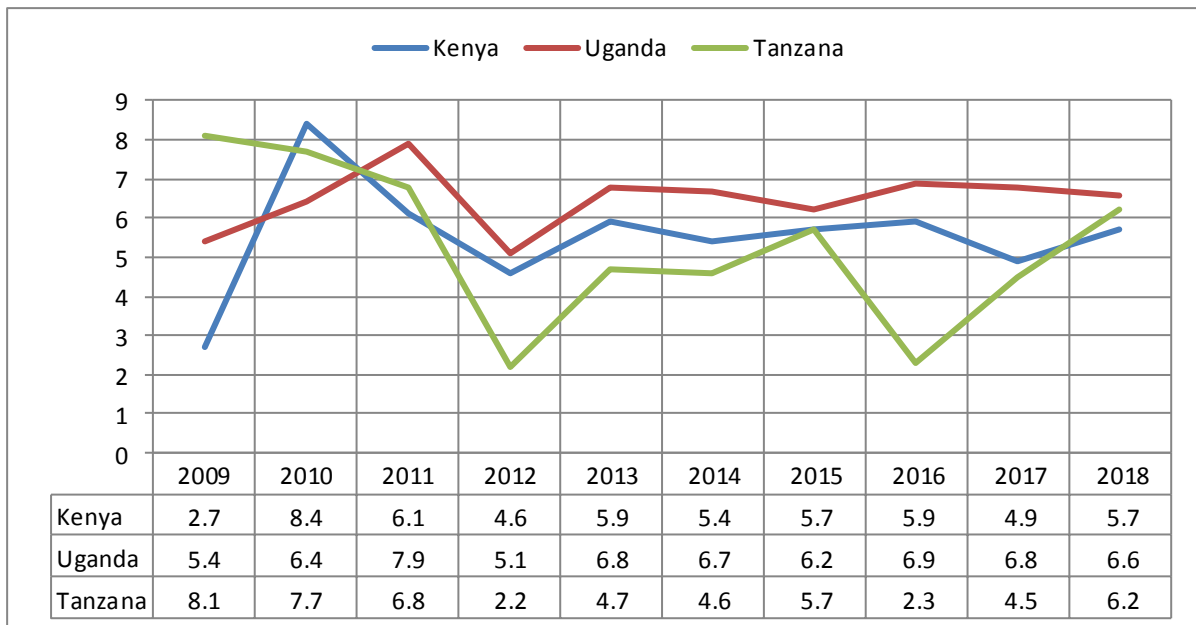
Source: Research Data (2019).

4.2.2 Bond Market Development

The results indicated that Bond Market growth of the EAC countries (Kenya, Uganda and Tanzania) had been on an upward trend over the study period (2009-2018). Kenya recorded the highest bond market turnover with an average of 10.95(SD= 0.224) followed by Uganda with an average of 10.78(SD= 0.285) and then 10.12(SD= 0.229). This indicates that Bond Market was most developed in Kenya followed by Uganda and then Tanzania. Figure 4.2 exhibit varying trend of the bond market in EAC between 2009 and 2018.

Figure 4.2: Bond Market Development

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kenya	10.6009	10.6922	10.7790	10.8611	10.9109	10.9596	11.1279	11.1587	11.1934	11.2494
Uganda	10.3663	10.4273	10.5706	10.6195	10.7025	10.8029	10.9788	11.0906	11.1135	11.1167
Tanzania	9.8224	9.8363	9.9132	10.0321	10.0628	10.1404	10.2639	10.3000	10.4173	10.4504
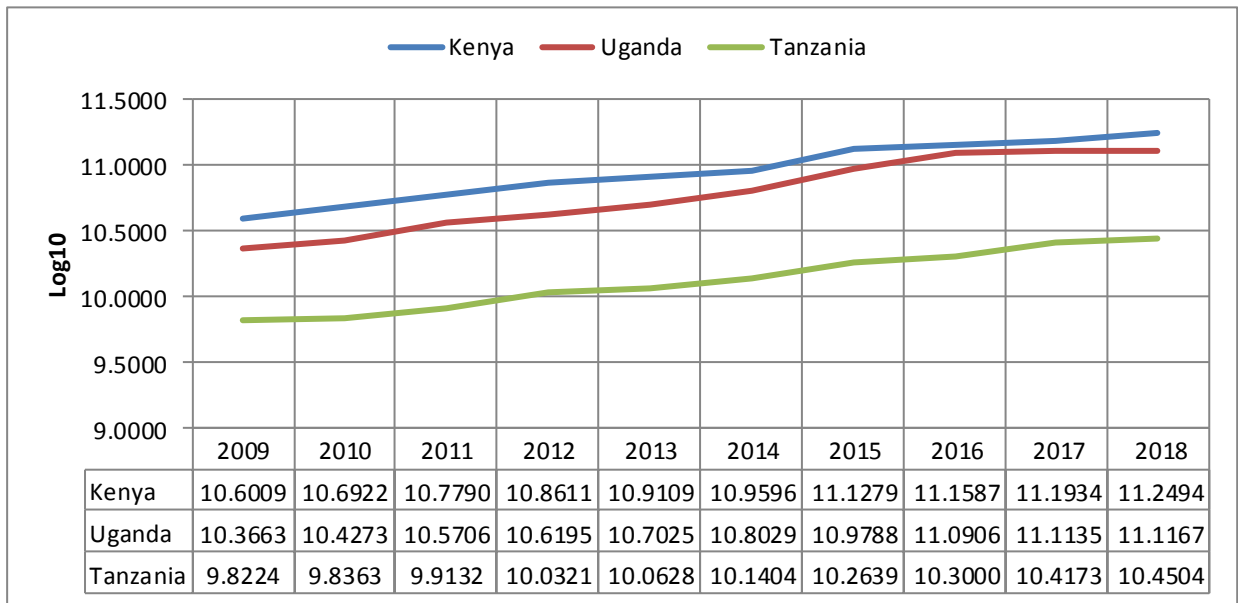
Source: Research Data (2019).

4.2.3 Annual InfR

East Africa Community recorded significant variations in the cost of living between 2009 and 2018. Uganda recorded the highest average InfRat 8.32% (SD= 5.255) followed by Tanzania with an average of 8.20% (SD= 4.080) and then Kenya with an average InfR of 8.07% (SD= 3.331). Results presented in Figure 4.3. On average, Uganda experienced the highest high inflationary pressure followed by Tanzania while Kenya experienced the least.

Figure 4.3: Annual InfR

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kenya	14.11	5.61	7.99	14.28	5.56	6.81	6.54	6.58	7.67	5.59
Uganda	12.7	9.4	18.7	14	6.2	3.08	5.41	5.46	5.63	2.63
Tanzana	12.4	7.19	12.69	16	7.87	6.13	5.69	5.17	5.32	3.51
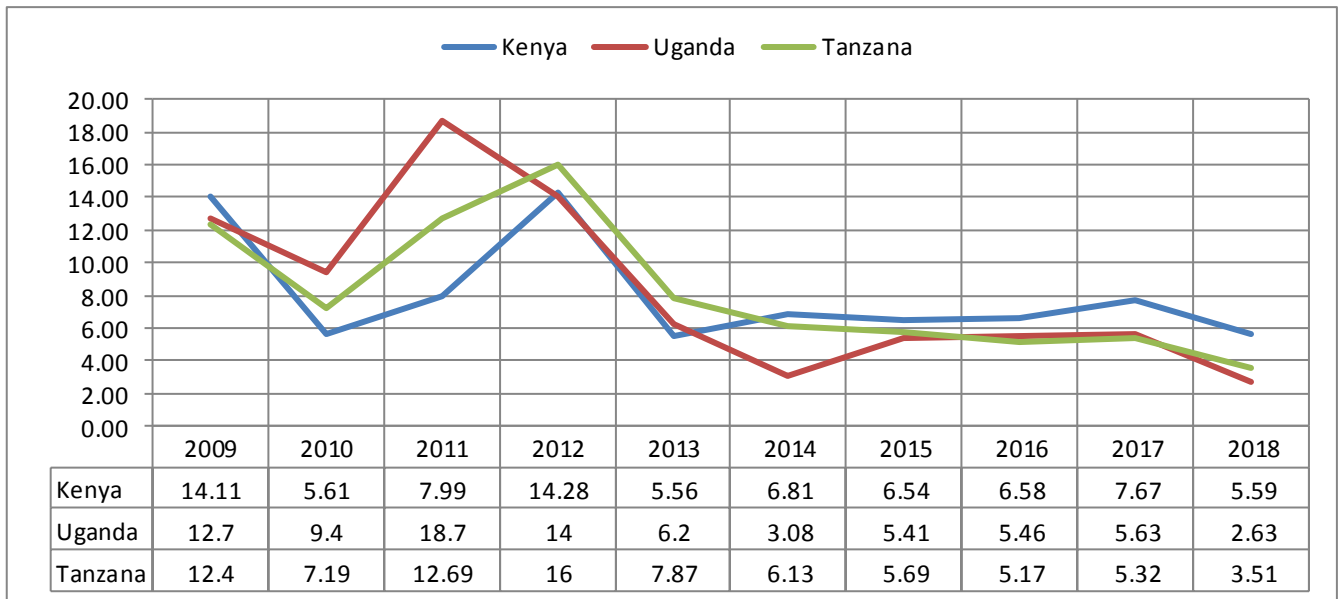
4.2.4 Annual IRs

The IRs of Kenya, Uganda and Tanzania had been significantly fluctuating over the study period (2009-2019). Kenya recorded the highest average IR of 15.72% (*SD*= 1.942) between 2009 and 2018 followed by Uganda with an average of 10.64% (SD= 3.334) and then Tanzania with an average of 7.95% (SD= 3.515). This indicated that the cost of capital was highest in Kenya followed Uganda while Tanzania had the lowest and results presented in Figure 4.4.

Figure 4.4: Annual IRs

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kenya	14.80	14.36	15.05	19.65	17.31	16.51	16.16	16.58	13.67	13.06
Uganda	7.05	4.86	13.32	14.23	9.35	9.62	14.38	14.45	9.93	9.24
Tanzana	7.15	3.87	6.37	12.71	12.34	12.08	8.80	7.85	5.49	2.89
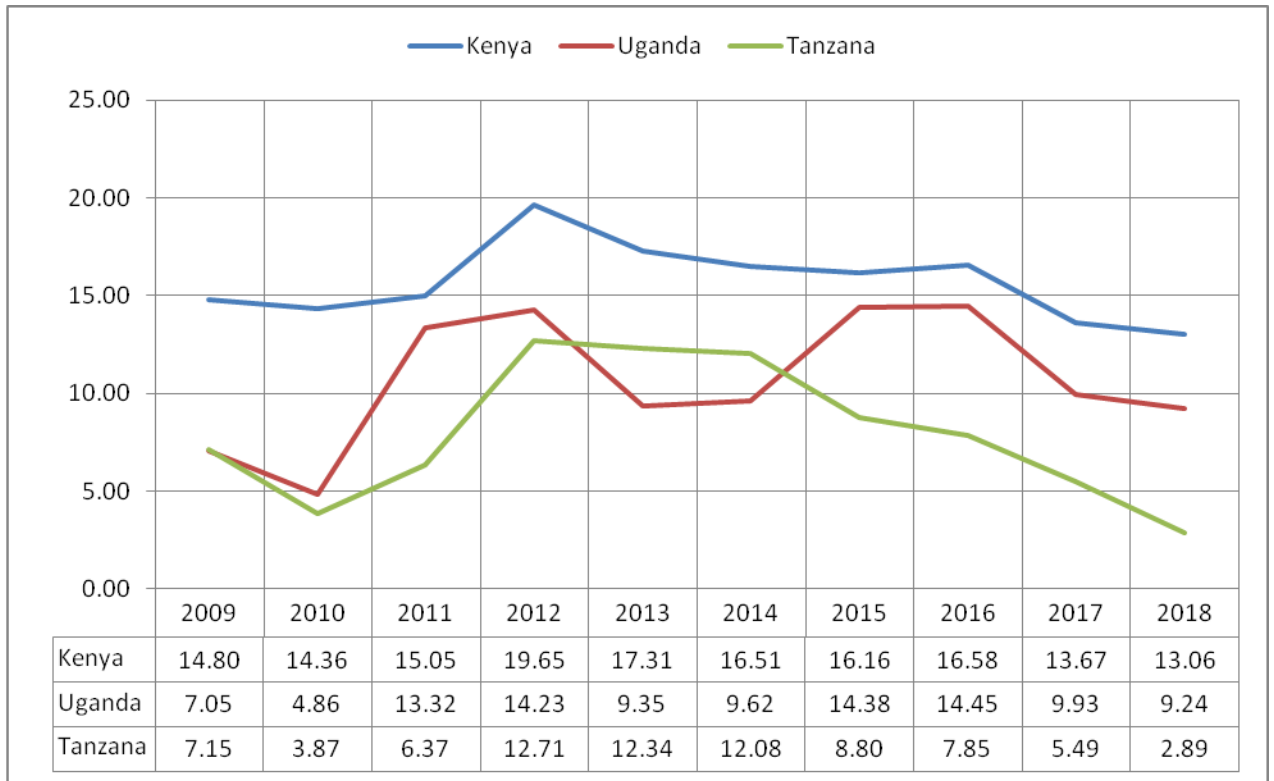
4.2.5 Foreign Exchange Rates

The results indicate that foreign exchange rates were on an upward trend over the study period. Kenya recorded an average exchange rate of 90.83(SD= 9.568) over the study period while Uganda recorded an average of 2902.19(SD= 637.051). Tanzania recorded an average exchange rate of 1785.33(SD= 358.794). The upward trend of the exchange rate of the three countries indicates that the currency of the three countries had been weakening over the study period 2009-2018 as presented in Figure 4.5.

Figure 4.5: Foreign Exchange Rates

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kenya	1.8885	1.8989	1.9485	1.9270	1.9351	1.9441	1.9920	2.0065	2.0141	2.0056
Uganda	3.2787	3.3633	3.3964	3.4291	3.4028	3.4430	3.5285	3.5576	3.5605	3.5698
Tanzana	3.1207	3.1462	3.1971	3.1995	3.2039	3.2211	3.3028	3.3401	3.3504	3.3570
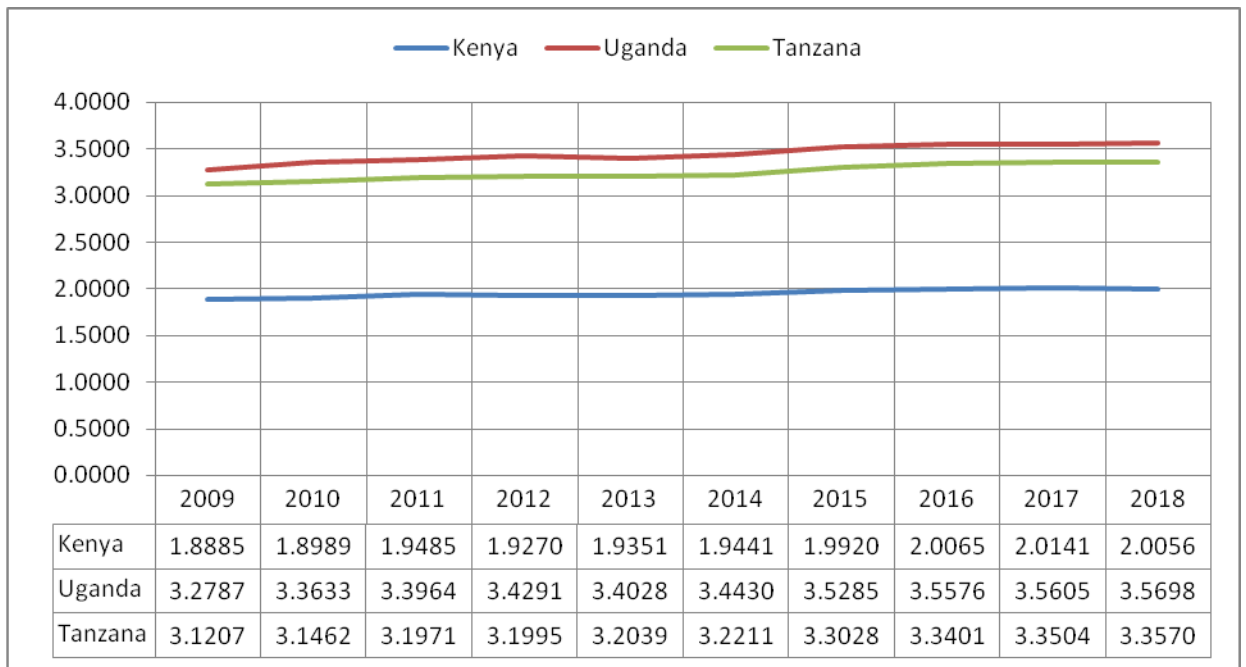
Source: Research Data (2019).

4.2.6: Foreign Direct Investment

FDI net inflows in this study were measured as a % of GDP. All the three countries (Kenya Uganda and Tanzania) recorded significant variations in FDI over the study period (2009 – 2019). High signals improving business opportunities and ease of doing business that are attracting foreign investors in a country. Overall the study period, Tanzania recorded the highest average FDI of 3.82(SD= 1.225) followed by Uganda with an average FDI of 3.75 (SD= 1.172). Kenya rerecorded the lowered average FDI with an average of 1.45(SD= 1.044). This shows that over the study period, Tanzania was the preferred investment destination followed by Tanzania and then Kenya. The trend of the FDI to GDP ratio between 2009 and 2018 as presented in Figure 4.6.

Figure 4.6: Foreign Direct Investment

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kenya	0.31	0.45	3.46	2.74	2.03	1.34	0.97	0.56	0.90	1.80
Uganda	4.63	2.69	4.43	5.21	4.46	3.88	1.99	2.17	3.10	4.90
Tanzania	5.05	3.33	5.77	3.63	4.60	4.71	3.47	3.52	2.20	1.90
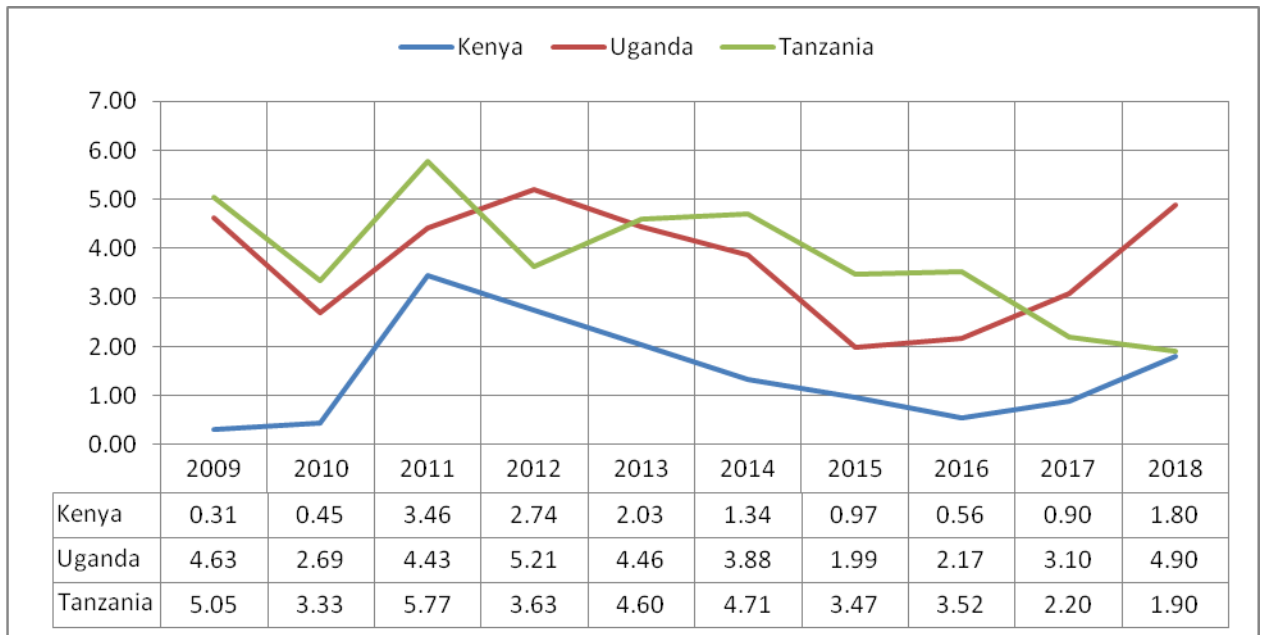
Source: Research Data (2019).

4.3 Diagnostic Tests

4.3.1 Test of Normality

Normality test was carried using Shapiro-Wilk and Kolmogorov-Smirnov tests. Table 4.1 presents the results of the normality test.

Table 4.1: Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Growth of economy	.112	59	.114	.665	59	.146
Bond Market Development	.129	59	.123	.817	59	.127
AIR	.119	59	.125	.753	59	.175
INTR	.116	59	.134	.856	59	.147
AAER	.124	59	.139	.789	59	136
	.158	59	.111	.845	59	.121

Growth of economy, bond market development, AIR, AINTR, FDI and annual exchange rate recorded Kolmogorov-Smirnov and Shapiro-Wilk tests statistics with p-values greater 0.05. This indicated absence of evidence of deviation from normality.

4.3.2 Test of Multi-collinearity

Table 4.2: Test of Multi-collinearity

Multi-collinearity Coefficients[a]		
Model	Collinearity Statistics	
	Tolerance	VIF
Bond Market Development	.862	3.160
Annual InfR	.968	3.033
1 Annual IR	.788	3.269
Annual Exchange Rate	.819	3.220
	.842	3.188

Source: Research Data (2019).

The variables (bond market development, annual InfR, annual IR, annual exchange rate and recorded VIF statistics are greater than 3. VIF statistics greater than 3 indicates absence of multi-collinearity among the study variables.

4.4 Pearson Correlation Analysis

Correlation analysis was done using Pearson product-moment test to establish the level of association among the study variables. Ap-value ≤ 0.05 was used to flag significant associations. Table 4.3 correlation analysis results.

Table 4.3: Correlation Matrix

		Growth of economy
Bond Market Development	r	.835
	Sig. (2-tailed)	.000
Annual InfR	r	-.780
	Sig. (2-tailed)	.000
Annual IR	r	-.745
	Sig. (2-tailed)	.000
Annual Exchange Rate	r	-.834
	Sig. (2-tailed)	.000
	r	.834
	Sig. (2-tailed)	.000

Source: Research Findings (2019).

The results indicate that Growth of economy was positively and significantly associated with to Bond Market Development(r = .835, p = .000) and (r = .834, p = .000).However, Growth of economy was negatively and significantly correlated with Annual InfR(r = -.780, p = .000), Annual IR(r = -.745, p = .000) and Annual Exchange Rate(r = -.834, p = .000). No significant correlations were recorded among the independent variables.

4.5 Inferential Statistics

Regression analysis was done to determine the relationship that existed between variables and the results are as shown in the in the model summary Table 4.4.

4.5.1 Model Summary

The study tested whether there existed variation between variables and results presented in model summary results in tables 4.4

Table 4.4: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.744[a]	0.554	0.513	1.34347

a. Predictors: (Constant), Annual IR, Bond Market Development, Annual InfR, AER, Growth of economy , FDI

Source: Research Data (2019).

The regression statistics indicated that there was an R-value of 0.744 implying that the variation between financial market development and growth of economy among EAC member states. Further, the study established that bond market development influences 51.3% of the total variance of the growth of economy among the EAC member countries as evidenced by the Adjusted R Square value of 0.513. This indicates that there are other major factors that influence the increase in GDP among the EAC member countries other than bond market development.

4.5.2 Analysis of Variance

ANOVA was done to assess goodness of fit of the regression model and results Table 4.5 shows the results of ANOVA.

Table 4.5 Analysis of Variance (ANOVA) [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	724.523	5	144.905	4.353	.004[b]
	Residual	1131.829	34	33.289		
	Total	1856.352	39			

a. Dependent Variable: Growth of economy

b. Predictors: (Constant), Annual IR, Bond Market Development, Annual InfR, Annual Exchange Rate,

Source: Research Data (2019).

The ANOVA statistics revealed that F-statistic of 4.353 and a significance level (p-value) of 0.004, implying that the model was ideal for predicting growth of economy given bond market development..

4.5.3 Coefficients of Determination

Table 4.6: Coefficients of Determination [a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	-1.930	.120		-16.083	.000
Bond Market Development	.692	.150	-.124	4.613	.001
AIR	-.726	.128	.028	-5.672	.000
AINTR	-.584	.127	-.474	-4.598	.001
AER	-.478	.096	-.217	-4.979	.001
	.429	.079	.051	5.430	.000

a. Dependent Variable: Growth of economy

Source: Research Data (2019).

The t-stat and p-values recorded for each independent variable are as follows: bond market development (t-stat = 0.692, p-value= 0.001), annual InfR(t-stat = -5.672, p-value= 0.000), annual IR(t-stat = -4.598, p-value= 0.000), annual exchange rate (t-stat = -4.979, p-value= 0.000) and (t-stat = 5.430, p-value= 0.000). These results indicate that bond market development and FDI influences growth of economy of EAC member countries in a positive and statistically significant way while annual InfR, annual IR, and annual exchange rate with negative and significant effect.

This was evidenced by the high t-stat values and the p-values that were less than 0.05. The following equation regression equation was formulated:

$$Y= -1.930+ 0.692X_1 – 0.726X_2 – 0.584X_3 - 0.478X_4 + 0.429X_5$$

From the above regression equation, the intercept value of -1.930indicates that the Growth of economy of EAC member countries would be a meager -1.930in the absence bond market development. A unit increase in bond market growth would lead to increase in development of economy by 0.692. InfR, IR and exchange rate led to decrease in growth of economy by0.726, 0.584 and 0.478 respectively. An increase in FDI increase growth in the economy by 0.429.

4.6 Co-integration and Causality Tests

The co-integration results were Table 4.7 shows the Johansen co-integration tests results.

Table 4.7: Johansen Co-integration Tests

Country	H0	Trace Statistic	Sig at 0.05	Max Eigen-value	Sig Value (0.05)
	R*= 0	16.25	15.42	16.21	15.23
Kenya	r≥1	5.321	3.453	4.689	3.721
	r = 0	6.758	5.201	5.871	15.98
Uganda	r≥1	3.025	2.341	1.998	3.89
	r = 0	2.351	1.111	1.458	16.78
Tanzania	r≥1	1.064	0.124	0.108	13.01
	r = 0	0.452	1.046	0.106	3.417

Source: Research Data (2019).

The results of the Johansen tests of co-integration indicate presence of co-integrating vector between the study variables. At maximum rank 0, the H_0; there was no co-integration between the variables. This rank recorded a trace statistic (73.95) which was greater than the critical value of 31.52 at 95% confidence level hence the null hypothesis

was rejected. Ranks 1 to 6 recorded trace statistics values that were less than the corresponding values at significant level of 0.05. The H_0= the 1 to 6 ranks were therefore not rejected. This indicated presence of six co-integrating equations. Presence of co-integration implied that VECM framework should be adopted.

4.6.1 Granger Causality Tests

The researcher further carried out Granger causality test to establish if unidirectional causality exists among the variables. The null hypothesis was that no Granger causality exists between Growth of economy (Y) and Bond Market maturity t(X_1).The hypothesis that Yi does not Granger Cause X1 recorded an F-Statistic of 9.452 and a p-value 0.0039 hence the null hypothesis was rejected. The hypothesis X_1 does not Granger because Y_i recorded an F-Statistic of 7.364 and a p-value 0.0054 and the null hypothesis was also rejected. It was evident that bidirectional correlation exists between Growth of economy and Bond Market growth. X_2 does not Granger Cause Y_i (F-stat = 8.758, p-value= 0.0048), X_3 does not Granger Cause Y_i (F-stat = 8.447, p-value= 0.0047), X_4 does not Granger Cause Y_i (F-stat = 8.116, p-value= 0.0051) and X_5 does not Granger Cause Y_i (F-stat = 9.347, p-value= 0.0042) also recorded significant results. This implies that the causality between bond market orientation and development of economy as being unidirectional.

4.7 Interpretation of Research Findings

The study sought to establish how bond markets development affect growth of economy in the member countries of the East African Community. The dependent variable of the study was growth of economy while the independent variable credit market maturity. It

was established that there is strong variation (R-value = 0.744) financial maturity and GDP of the member countries of the East African Community.

Further, the study established that debt market growth for 51.3% of the total variance of the growth of economy among the EAC member countries as evidenced by the R^2 = 0.513. This indicates that there are other major factors that influence growth of economy among the EAC member countries other than bond market development. The study established existenceof Granger causality between growth in economy and bond market development and the causality was bidirectional. Further, the unidirectional causality exist between financial development and growth of economy. The results were consistent with Nyasha and Odhimbo (2017) that debt markets growth contribute to increase GDP of a country.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section exhibited the summary of the results, conclusion and recommendation. The chapter also present the recommendation and limitations of the study as well as suggestion for further studies..

5.2 Summary of Findings

Uganda recorded the highest growth of economy rate followed by Kenya. Tanzania recorded the slowest growth of economy over the study period. Results revealed that the Bond Market Development of the EAC countries (Kenya, Uganda and Tanzania) had been on an increasing trend over the study period. Kenya recorded the highest bond market turnover followed by Uganda and then Tanzania. This indicates that Bond Market is most developed in Kenya followed by Uganda and then Tanzania.

East Africa Community recorded significant variations in the cost of living between 2009 and 2018. Uganda recorded the highest average InfR followed by Tanzania and then Kenya with an average InfR. This indicates that on average, Uganda experienced the highest high inflationary pressure followed by Tanzania while Kenya experienced the least. The IRs of Kenya, Uganda and Tanzania had been significantly fluctuating over the study period (2009-2019). Kenya recorded the highest average IR followed by Uganda and then Tanzania. Exchange rate in the three countries was increasing over the study period. Tanzania recorded the highest average FDI followed by Uganda and then Kenya.

There existed strong variation between (R-value = 0.744) between GDP and bond markets growth in East African Community countries. Further, the study established that bond market development accounts for 51.3% of the total variance of the growth of economy among the EAC member countries as evidenced by the R^2 =0.513. This indicates that there are other major factors that influence the growth of economy among the EAC member countries other than bond market development.

Granger causality exist between development of market bond and growth in economy, and the causality was bi-directional. Further, the causality between determinants of bond market and growth of economy being unidirectional.

5.3 Conclusions

From the results, the study concluded that bond market development impact positively on economic growth in EAC member states. Bond market development lead to growth of economy of the EAC member countries.

The study also concludes that bond market development and influences growth of economy of EAC member countries in a positive and statistically significant way while InfR, IR, annual exchange rate have a negative and significant effect.

The study also concludes that Granger causality exists between growth in the economy and development of the bond market and the causality was bidirectional.From the Granger causality, the study also concludes that annual InfR, annual IR, annual exchange rate and significantly influences growth of economy and the causality is unidirectional.

5.4 Recommendations

The studies found that InfR, annual IR, annual exchange rate has reverse relationship with growth of economy. This implies that high borrowing cost, high cost of living and high cost of exchanging currency leads to poor growth of economy. The national government of Kenya through CBK and capital market authority should come up with appropriate financial market regulations aimed at cushioning the economy from adverse effect of macroeconomics variables.

The study also established that bond market growtht lead to a positive influence on development of economy as increase in FDI increase investments that trigger saving mobilizations. The study recommends that the government should strive at creating an enabling environment that encourages foreign investors.

The government should also strive to make the bond market attractive to investors who may prefer investment in bonds for longer period of time. In this regard, the government should offer investors attractive and returns on investment. This will attract more investors consequently leading to improvement in growth of economy.

5.5 Limitations of the Study

The researcher found it difficult to obtain the data needed data since it was not available from a centralized location. The task was further complicated by the fact that the data was being collected from Kenya, Uganda and Tanzania. The researcher had to spend a lot of time scraping different websites to get the data.

The researcher had no absolute control over the accuracy of the data collected. This is usually a general problem when dealing with secondary data. The researcher countered

the problem by seeking data from only reliable websites such as KBS and CBK, Uganda and Tanzania.

The study sought to establish how bond markets development affect growth of economy in EAC member states. The study established that bond market development controlled by annual IR, annual InfR, annual exchange rate and accounts for 51.3% of the total variance of the growth of economy among the EAC member countries. The study recommends that future researchers should try to establish if the findings holds for other economic blocks other than EAC.

5.6 Suggestions for Future Studies

Bond market development, annual IR, annual InfR, annual exchange rate and could only explain 51.3% of the total changes in the growth of economy. This indicates that there are other major factors that influence the growth of economy other than bond market development and the determinants variables

A future study should consider collecting the data for analysis over a longer period of time preferably 15 to 20 years. This will allow researchers to compare how growth of economy is affected by bond market development, annual IR, annual InfR, annual exchange rate and over long period of time.

The study was carried out among member countries of the East African Community. The results may therefore not apply in non-EAC countries. The study recommends that future researchers should try to establish if the finding that Bond market development influences growth of economy positively holds in other economic blocks other than EAC.

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Appendix I: Data Collection Sheet

Name of Country……………………………………………………

Year	Growth of economy (Annual Growth of economy rate)	Bond market capitalization (US$)	s Flow (US$)	Average Exchange Rate	Inflation	IR
2009						
2010						
2011						
2012						
2013						
2014						
2015						
2016						
2017						
2018						

Appendix II: Panel Data

Real GDP Growth Rate	Year	Kenya	Uganda	Tanzania
	2009	2.7	5.4	8.1
	2010	8.4	6.4	7.7
	2011	6.1	7.9	6.8
	2012	4.6	5.1	2.2
	2013	5.9	6.8	4.7
	2014	5.4	6.7	4.6
	2015	5.7	6.2	5.7
	2016	5.9	6.9	2.3
	2017	4.9	6.8	4.5
InfR	**Year**	**Kenya**	**Uganda**	**Tanzania**
	2009	14.11	12.7	12.4
	2010	5.61	9.4	7.19
	2011	7.99	18.7	12.69
	2012	14.28	14	16
	2013	5.56	6.2	7.87

	2014	6.81	3.08	6.13
	2015	6.54	5.41	5.69
	2016	6.58	5.46	5.17
	2017	7.67	5.63	5.32
IR	**Year**	**Kenya**	**Uganda**	**Tanzania**
	2009	14.80	7.05	7.15
	2010	14.36	4.86	3.87
	2011	15.05	13.32	6.37
	2012	19.65	14.23	12.71
	2013	17.31	9.35	12.34
	2014	16.51	9.62	12.08
	2015	16.16	14.38	8.80
	2016	16.58	14.45	7.85
	2017	13.67	9.93	5.49
	2018	13.06	9.24	2.89
Exchange Rates (Log10)	**Year**	**Kenya**	**Uganda**	**Tanzania**
	2009	1.888	3.279	3.121

	2010	1.899	3.363	3.146
	2011	1.948	3.396	3.197
	2012	1.927	3.429	3.200
	2013	1.935	3.403	3.204
	2014	1.944	3.443	3.221
	2015	1.992	3.529	3.303
	2016	2.006	3.558	3.340
	2017	2.014	3.561	3.350
	2018	2.006	3.570	3.357
FDI(% of GDP)	**Year**	**Kenya**	**Uganda**	**Tanzania**
	2009	0.31	4.63	5.05
	2010	0.45	2.69	3.33
	2011	3.46	4.43	5.77
	2012	2.74	5.21	3.63
	2013	2.03	4.46	4.60
	2014	1.34	3.88	4.71
	2015	0.97	1.99	3.47

	2016	0.56	2.17	3.52
	2017	0.90	3.10	2.20
	2018	1.80	4.90	1.90
Bond Market Turnover (Log10)	**Year**	**Kenya**	**Uganda**	**Tanzania**
	2009	10.6009	10.3663	9.8224
	2010	10.6922	10.4273	9.8363
	2011	10.7790	10.5706	9.9132
	2012	10.8611	10.6195	10.0321
	2013	10.9109	10.7025	10.0628
	2014	10.9596	10.8029	10.1404
	2015	11.1279	10.9788	10.2639
	2016	11.1587	11.0906	10.3000
	2017	11.1934	11.1135	10.4173
	2018	11.2494	11.1167	10.4504

Source: EAC Open Data(2019).