



FACULTY OF COMMERCE LAW & MANAGEMENT

**FACTORS AFFECTING THE DEVELOPMENT OF THE
BOND MARKET OF SWAZILAND**

A thesis presented in partial fulfilment of the requirements for the degree of

**MASTER OF MANAGEMENT IN FINANCE AND
INVESTMENTS**

RESEARCH REPORT

BY: BABHEKILE GUGU MATSEBULA

SUPERVISOR: DR ODONGO KODONGO

Student Number: 1507112

ABSTRACT

This study investigated the factors affecting the development of the local bond market in Swaziland. Governments use amongst other sources, the local bond markets to raise capital for financing fiscal challenges rather to resort to foreign debt. The local bond market in this way becomes one of the channels for raising funds locally. To measure the size of bond market development, the market capitalisation of the bond market of Swaziland over GDP was used in this study. Other measures to ascertain the factors affecting bond market development in Swaziland were added namely the total listed issued securities, the total local short term debt as a ratio of GDP and the total local long term debt as a ratio of GDP.

This study used a number of factors as independent variables that theory has proved affect the development of the bond market in other African and Asian countries. The factors that were chosen for this study and tested using secondary data available in Swaziland were capital account openness, interest rate volatility, banking sector size, size of the economy, fiscal balance, trade openness, interest rate spread, exchange rate variability, and inflation rate.

The study used previous literature and ordinary least squares models to identify the major determinants for the bond market development in Swaziland by identifying the factors that have a relationship with bond market development in Swaziland. The findings revealed that a number of variables had a statistically significant influence statistically on the bond market development in Swaziland and these were tested under different estimation equations. The findings revealed that the significant factors for Swaziland were size of the economy, fiscal balance, interest rate volatility, banking sector size, inflation rate. These factors had an inverse relationship with the bond market development in Swaziland.

From the findings, recommendations were made for policy reform and implementation with emphasis on macroeconomic policies that encourage development and address the capital flight issues especially trade openness and capital account openness. Policy recommendations were made in line with creating an enabling environment that would make the Swaziland bond market attractive to investors.

Recommendations for further research in this area were made. It was recommended that different models to test the results of this study be employed and the results be validated using different models other than least squares. It was also recommended that other factors that may contribute to developing the Swaziland local bond market be identified.

CONTENTS

CHAPTER 1.....	9
1.0 INTRODUCTION.....	9
1.1 Background of the Study.....	9
1.2 Problem Statement.....	15
1.3 Objectives of the Study.....	16
1.4 Research Questions.....	17
1.5 Significance of the Study.....	17
1.6 Limitations of the Study.....	18
1.7 Outline of the Study.....	18
CHAPTER 2.....	20
2. LITERATURE REVIEW.....	20
2.1 Introduction.....	20
2.2 Theoretical framework.....	20
2.2.1 Economic size.....	23
2.2.2 Banking sector size.....	24
2.2.3 Interest Rate Variability.....	25
2.2.4 Exchange Rate Variability.....	25
2.2.5 Trade Openness.....	26
2.2.6 Capital Account Openness.....	26
2.2.7Fiscal Balance.....	27
2.2.8 Inflation Rate.....	28
2.2.9 Banking Lending Rate Spread.....	28
2.3 Empirical Literature.....	29
2.4 Summary of the Chapter.....	31
CHAPTER 3.....	32
3. DATA AND METHODOLOGY OVERVIEW.....	32
3.1 Introduction.....	32
3.2 Research Design.....	32
3.3 Data Gathering.....	33
3.4 Empirical Analysis.....	36
3.4.1 The stationarity test.....	37
3.4.2 The Johansen Test.....	38
3.5 The Variables of the Study.....	39
3.5.1 Dependent Variables.....	39
3.5.2 Independent Variables.....	39

3.5.2.1 Banking Lending Rate Spread.....	40
3.5.2.2 Capital Account Openness	40
3.5.2.3 Fiscal Balance	42
3.5.2.4 Size of the Banking Sector.....	42
3.5.2.5 Trade Openness.....	42
3.5.2.6 Inflation Rate.....	43
3.5.2.7 Size of the Economy	43
3.5.2.8 Exchange Rate Variability	43
3.5.2.9 Interest Rate Fluctuation.....	44
3.5.2.10 The Debt Ceiling.....	44
CHAPTER 4.....	46
4. EMPIRICAL RESULTS	46
4.1 Introduction.....	46
4.2 Descriptive Statistics	46
4.3 Correlation Matrix.....	48
4.4 Regression Analysis	50
4.5 The regression model robustness checks	53
4.6 The Unit Root Test.....	64
4.7 The Johaneson Test Results	66
4.6 Summary of the results.....	68
CHAPTER 5.....	71
5. CONCLUSION AND RECOMMENDATIONS	71
5.1 Conclusion	71
5.2 Summary Of The Findings.....	72
5.3 Recommendations	73
5.4 Further Research	74
REFERENCE LIST.....	76
ANNEXURE.....	83

Tables

Table 1: Descriptive statistics.....	47
Table 2: Correlation Matrix for independent variables	49
Table 3: Regression - Least Squares with the dependant variable being the market cap of local public debt as a ratio of GDP	51
Table 4: Variance Inflation Factors	53
Table 4(a): Regression Analysis with Capital Account Openness and Fiscal Balance deleted ..	54
Table 5: Short term debt as a ratio of GDP as a measure for dependent variable	55
Table 6: Long term debt as a ratio of GDP as a measure for dependant variable.....	56
Table 7: The number of issued listed securities as measure for dependant variable.....	58
Table 8: Regression model with the corresponding correlated variables removed	60
Table 9: Regression without GDP (size of the economy) and Tbills (interest rate fluctuation)- dependant variable: public domestic debt	83
Table 10: Regression without GDP (size of the economy) and Tbills (interest rate fluctuation) – dependant variable: short term debt.....	84
Table 11: Regression without GDP (size of the economy) and T-bills (interest rate fluctuation) – dependent variable: long term debt	85
Table 12: Regression without GDP (size of the economy) and T-bills (interest rate fluctuation) – dependant variable: number of issued listed securities	86
Table 13: Regression without interest rate spread and fiscal balance – dependent variable: public domestic debt	87
Table 14: Regression without interest rate spread and fiscal balance –dependant variable: short term debt.....	88
Table 15: Regression without interest rate spread and fiscal balance- dependant variable: long term debt.....	89
Table 16: Regression without interest rate spread and fiscal balance- dependant variable: number of listed securities	90
Table 17: Unit root test of public domestic debt.....	63
Table 18: Unit root test of number of listed securities	64
Table 19: Unit root test of T bills - short term debt	64
Table 20: Unit root test on bonds - long term debt	65
Table 21: Johanesen test on short term debt.....	66

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DECLARATION

This research report is my own work. I have given due acknowledgement in the references in instances where information is derived from another source other than me; I confirm that this report has not been submitted to any other university.

Signature:-----

Date:-----

CHAPTER 1

1.0 INTRODUCTION

The development of the capital market is one of the factors that have positively contributed to the developing economies worldwide. Securities markets over the last 20 years have been growing steadily as savers continue to invest in the security market. Due to global financial crises, the development of local bond markets has become more relevant, as it has become more difficult to raise foreign debt. Countries have embarked on actively developing their own capital markets as well as formulating policies that, enhance the development of the local bond market.

1.1 Background of the Study

The development of local capital market in a country is arguably one of the most important policy directions that any country can embark on. The promotion of capital markets has been encouraged by the International Monetary Fund (IMF) and the World Bank on the grounds that developing capital markets promotes economic growth by improving the efficiency of capital allocation (Laeven, 2014).

Local capital markets are responsible for assisting governments to fund fiscal imbalances without resorting to foreign debt (Turner, 2002). The development of local capital markets can promote financial stability for economies by enhancing the ability of financial institutions to manage risks, for example, using interest rate derivatives (Laeven, 2014). According to Laeven (2014) a diverse economy that has a well-functioning capital market and banking sector has the tendency of being more stable and able to absorb systemic risk shocks.

As a component of the capital market, the bond market is an important investment vehicle because the local bond market can improve access to local currency (Laeven, 2014). Local bond markets offer local currency investors a safe alternative to foreign exchange markets and in this way the country's foreign exchange rate exposure is reduced (Gormely et al, 2008).

The key role of bond development in any country can never be over emphasized. It is known that, amongst other reasons, the motivation for developing local bonds in countries is to finance fiscal challenges, make financial markets function efficiently and effectively as well as generally satisfying other financing needs. The second, and also important, reason for bond market development is the necessity to sterilise large capital inflows (Hawkins, 2002). The other most important reason is to avoid concentration on banks because banks are highly leveraged exposing economies to crises (Hawkins, 2002).

Developing the local bond market in countries would expand the variety of financing instruments available and potentially lower the cost of funds for enterprises. The debt market also helps the operation of monetary policy. Mu, Phelps and Stotsky (2013) emphasize that developed bond markets would enable a country to have an effective range of instruments.

Past research has focused on external debt because external borrowing increases a country's access to resources. The printing of money by central banks is not an alternative because it may result to debt crisis (Panizza, 2008). Africa's long term debt market is underdeveloped and makes up a very small proportion of the financial system (Andrianaivo and Yartey, 2009).

External debt dominates the debt market in Africa mainly due to the fact that governments rely on external loans and concessions (Andrianaivo and Yartey, 2009). Developing countries use domestic debt to sterilize foreign aid flows in cases where they did not have access to external resources (Panizza, 2008). McGuire and Schrijvers (2003) reiterate the opinion that foreign direct investment is the most significant source of funding in emerging markets. According to Amadou (2015) sub-Saharan countries rely on foreign assistance and loans from international institutions to fund domestic and foreign currency needs and this was largely attributable to low domestic savings.

Bond market development is important for the development of the capital market which is the role of the Capital Markets Development Division of the Financial Services Regulatory Authority in Swaziland in terms on Section 5 of the Securities Act, 2010 of Swaziland.¹ Capital market development will improve the availability of long term financing by channelling excess funds to long term instruments and this benefit applied particularly to the bond market (Eichengreen and Luengnaruemitchai 2006). Bond market development will improve access to local currency financing especially to retail and institutional investors thereby better managing inflation as well as exchange rate risk. Bond finance provides healthy competition to bank loans because it offers relatively cheaper financing to large corporations (Laeven, 2014). Bond development, according to Eichengreen and Luengnaruemitchai (2006), can improve market access by investors.

The financing of fiscal budget can be done through the local bond market without resorting to external funding. Swaziland is currently heavily dependent on external grants, loans and

¹ The Securities Act Of Swaziland 9/2010

Southern African Customs Union (SACU) receipts to fund capital spending and other components of the national budget.² In 2016 the SACU receipts funded 37 percent of total government expenditure and grants funded 5 percent. Fuel contributed 4.8 percent towards government funding whilst value added tax contributed 16.1 percent and non-tax revenue contributed 3.6 percent.³ The problem is that external donors and lenders now generally face fiscal challenges of their own which has resulted in reduced inflow of foreign capital into the Swazi economy.

Swaziland is a very small land-locked kingdom, surrounded by the Republic of South Africa on the one side and by Mozambique on the other side covering a land area of 17,364 square kilometres and with an estimated population of 1,419,623 people. Its monetary unit is called Lilangeni and is equivalent to the South African rand in value.⁴ The kingdom has two financial regulators. The Central Bank of Swaziland regulates the banking sector whilst the Financial Services Regulatory Authority regulates the non-bank financial services sector.

According to the Central Bank of Swaziland Annual Report (2016), public debt stock stood at 8.35 Billion Emalangeni which was equivalent to 16.2 percent of GDP as at the 31st March 2016. Domestic debt stood at 3.2 Billion Emalangeni which is 6.3 percent of GDP. Public external debt was 5.1 Billion Emalangeni which is 9.9 percent of GDP which included publicly guaranteed debt. The public external debt was made up of 3.2 Billion Emalangeni from

² Central Bank of Swaziland Report, 2016

³ Central Bank of Swaziland Annual Report, 2016

⁴ Swaziland Review, 2016

multilateral organisations, 958 Million Emalangeni from foreign governments and 924 Million Emalangeni from private lenders as at March 2016.⁵

The size of the capital markets in Swaziland was approximately 29 Billion Emalangeni as at 30th June 2017 made up of 2.3 Billion Emalangeni Government Bonds, 774 Million Emalangeni corporate bonds, 3.3 Billion Emalangeni Equities and 23 Billion Emalangeni held by Asset Managers. In terms of Investments the capital markets have invested above 10.1 Billion Emalangeni in the domestic market, 4.2 Billion Emalangeni in the Common Monetary Area and 6.7 Billion Emalangeni Offshore⁶.

According to the Governors Monetary Policy Statement for 2017, inflation averaged at 7.8 percent around mid-2016 rising up to 8.7 percent in December 2016. Economic activity slowed down in 2016 compared to previous years showing a 0.6 percent decrease in GDP from 2015. In terms of interest rate the bank rate was 6.5 percent in 2016 whilst prime lending rate grew up to 10 percent in 2016. The value of the Lilangeni declined in 2016 against major currencies in line with the falling of the Rand in 2016.

From the statistics above, there is a need for Swaziland to develop its own bond market to finance the fiscal budget as well as to improve its intermediation of savings. Forcing banks to hold government bonds as a means of financing fiscal balance is not ideal for the development of the banks in economies (Leaven 2014). Leaven (2014) suggested that a developed domestic bond market would reduce the dependence on foreign funding and encourage the development

⁵ Central Bank of Swaziland Report, 2016.

⁶ Financial Services Regulatory Authority Report, 2016

of different kinds of bonds in the market by providing a different pricing criteria for different instruments. This would also help provide a tool for interest rate risk management.

Swaziland needs a well-functioning secondary market. At the moment, there is no activity on the secondary market, the primary dealers, as market makers, are not currently active in the market. According to the World Bank (2007), *“well-functioning secondary markets promote efficient price discovery, and facilitate liquidity and risk management. They do so by providing a cost-efficient environment in which market participants can trade government securities in a fair and transparent manner. Active secondary markets improve the valuation and pricing of government securities, especially medium and long term bonds that are by definition, issued less frequently than short-term bills. They provide a mechanism for investors in medium-and long-term securities, while permitting governments to issue longer-term debt to better manage exposure to interest rate and rollover risk.”*⁷

This study reviewed literature on the factors that influence or impede the bond market development in different economies. It also considered the factors identified by past research and aligned their applicability to the case of Swaziland. This study further reviewed literature on the benefits of bond market development in economies as well produced an overview of the state of the bond market in Swaziland. The study focused on ascertaining the factors that affect the bond market development in Swaziland and reviewed the literature on factors that affect the bond market development in other countries in general.

⁷ World Bank. (2007) “Developing the domestic Government Debt Market: From Diagnostics to Reform Implementation”.

This study also sought to develop a policy guide for bond market development in Swaziland. It further made recommendations on areas of improvement in line with developing the bond market in Swaziland.

1.2 Problem Statement

The Swaziland bond market is characterised by the trading of relatively low volumes of bonds in the market and this means that capital is scarce in the market due to the lack of a developed capital market. The relatively low activity in the Swaziland bond markets means that there is a gap in the Swaziland bond market that needs to be addressed to make the market more robust. Swaziland has had lower activity than its peers. For instance, Lesotho which is a landlocked country just like Swaziland and which is almost equal to Swaziland in size with an area of 30,355 square kilometres traded 734.50 Million Rands⁸ in 2016 whereas Swaziland only traded 689 Million Rands in 2016.⁹ The study ascertained the cause for this relatively low activity in the Swaziland Bond market.

Previous studies have identified various factors that affect the development of the local bond market in economies. Mu *et al* (2013) found that economic size, trade openness, banking lending spread, law and order, banking sector size, fiscal balance, capital account openness, interest rate variability, economic development, investment profile, bureaucracy, country size and exchange rate variability have a significant relationship with bond markets development. Hawkins (2002) points out inflation rate as an additional factor whilst Jefferis (2009) further highlights the importance of market players in the development of the bond market. Goldsmith

⁸ Central Bank Of Lesotho Annual Report

⁹ Financial Services Regulatory Authority Report, 2016

(1969) established a relationship between economic growth and local bond market development.

Mu *et al* (2013) in their study included an empirical analysis of data of the Swaziland bond market as Swaziland was amongst the African countries that were being used for this study. The study, however is broad and does not do an in-depth examination of the Swaziland market or of any of the countries individually.

It is evident that none of the studies closely examine the applicability of these factors focusing on Swaziland as an economy on its own. This in-depth study of the factors affecting the development of the Swaziland Bond Market will differ from previous study in that whilst it may borrow a lot from the previous study because the African states are diverse in size, in terms of historical background as well as being either landlocked or with access to the sea. The data used by previous studies was for the whole of Africa and it may not necessarily mean that if Swaziland is isolated from the whole of Africa then the findings could still be the same, hence the need to conduct a study that focuses on Swaziland. This study sought to close this gap and attempt to answer the question: What factors affect local bond market development in Swaziland?

1.3 Objectives of the Study

The purpose of the study was to provide a detailed analysis and investigation of the factors affecting local bond market development in Swaziland. The objectives of the study were as follows:

- (1) To analyse and evaluate the current status of the Swaziland Bond Market.
- (2) To identify the enhancers of, and obstacles to the development of the Swaziland bond market.
- (3) To offer policy guidance and framework for facilitating the development of the Swaziland bond market.

1.4 Research Questions

The questions upon which the study was based covered the following areas;

- (a) What is the status of the local bond market in Swaziland and what are the bond types currently available in the Swaziland market?
- (b) What are factors that affect the local bond market development in Swaziland?

1.5 Significance of the Study

The study performed a gap analysis in the development of the bond markets in Swaziland. The aim of the report is that it will assist the relevant stakeholders by providing them with information regarding the factors affecting the development of the local bond market in Swaziland. It will assist the policy makers in Swaziland namely the Financial Services Regulatory Authority, The Central Bank of Swaziland as well as the Ministry of Finance by providing recommendations to policy development pertaining to the development of the local bond market in Swaziland.

The study will also assist other countries in a situation similar to Swaziland in so far as development and implementing policy towards the development of their bond markets is concerned.

1.6 Limitations of the Study

The study had the following limitations:

- (a) It focused only on the Swaziland bond market and its peculiarities. However, to the extent that other countries might share the same financial market structure as Swaziland, the results of the study may also form a basis for those other countries local debt market policy.
- (b) The data used for the Swaziland bond market is for a specific period of time from 1997 to 2016. There is also a possible limitation of the availability of relevant information outside the periods of study due to data unavailability. For that reason, the study focused on the period 1997–2016 for which data is available.

1.7 Outline of the Study

The report will be presented as follows:

Firstly the report will provide an introduction of the bond market and its importance in any country. In addition it will provide the background of Swaziland and the capital market as well as provide an executive summary and overview of the paper.

Secondly the writer will conduct literature review and summarise the findings. The literature review will reflect on various papers, journals, theses that discuss bond market, capital market and bond market development internationally. This will assist the writer to identify gaps in the Swaziland bond market that need policy formulation. This section will also provide an overview of the Swaziland bond market and the current status thereof.

Thirdly the report will address the research methodology employed by the writer to collect and analyse data and information of the study. The conceptual and empirical analysis of the study will be clearly explained as to how it has been applied to the research in establishing the effects of bond development in Swaziland.

Fourthly the report will present and discuss the results of the conceptual and empirical analysis.

Finally the report will draw conclusions from the conceptual and empirical results obtained as well as come up with policy guidelines and a recommended framework in line with the objectives of the study.

CHAPTER 2

2. LITERATURE REVIEW

2.1 Introduction

This chapter focuses on what previous studies have stated in advancing the importance of local bond market development in economies as well as a discussion of the empirical findings by some previous studies. The first section is the theoretical framework which focuses on the importance of the local bond market in economies followed by a discussion of the link between increased bond market activity and the growth of the economy. The latter part of the first section discusses transmission mechanism highlighting the factors that affect the bond market development. The second part covers the empirical study by previous writers and the last part of this chapter is the summary of the chapter.

2.2 Theoretical framework

Numerous research papers have outlined the importance of the local bond market in economies and have further provided evidence of a relationship between the growth in the economy and capital market development (Bitok, Tenai, Julius and Nehemiah, 2014).

Capital market development is important for any economy because it facilitates the efficient accumulation of a productive capital stock by bringing together those that have surplus funds and those that are in need of those funds (Wyman, 2015). The development of capital markets enables policy makers to support financial inclusion by promoting individual access to a larger pool of funding, it also transforms liquidity risks for products like insurances and annuities and promotes price transparency through the use of centralised exchanges (Wyman, 2015). Emerging markets are looking into channelling investments from the pension funds and

insurance funds towards long term investments. This has been necessitated by the growth in assets under management from assets of the institutional investors and these having been concentrated in short term government instruments and money markets (Laeven, 2014). What some countries have done is to introduce policies that have produced new debt instruments such as infrastructure bonds (Wyman, 2015).

Laeven (2014) states that the preconditions that need to be met in order to develop local capital markets are strong financial policies, strong regulatory structures and well established institutions. Governments first require these structures to be in place in order to adequately address the shortcomings of financial systems. A sound economic and stable macroeconomic policy is required to attract foreign investments in order to ensure that monetary policy actions are made without affecting interest rate volatility and this would in turn assist the development of bond markets (Leaven, 2014).

In discussing the rationale for local capital markets, Leaven (2014) stated that local capital markets can improve the availability of long term debt financing and allowing individuals and firms to improve interest rate volatility. He further stated that the development of local capital markets can improve investor access to local currency thus managing exchange rate risk. The liberalization of the local capital market and opening it to foreign investors can lower the cost of capital for local firms (Leaven, 2014).

Lack of access into alternative vehicles of finance such as local bond markets can cause many economies to find themselves in a difficult position looking for funding of critical government expenditure (Mu *et al*, 2013). The local bond market development can improve intermediation

of savings to absorb capital and also improve that structure of the financial markets which in undeveloped economies is dominated by the banking sector (Mu *et al*, 2013).

According to the report by IMF, World Bank, European Bank and OECD (2013),¹⁰ diversifying the financial sector to include an active local currency bond market can play an important role in minimising the impact of financial crises in economies. This does not mean that even if there are no immediate budgetary financial needs it is not necessary to issue government bonds, because this could assist in providing a benchmark yield curve for the corporate bond market, support liquidity management for the operations of the central banks, provide market infrastructure through a well-functioning payment system and a strong financial and legal framework.

Bond markets are very important because of the benefits that come with the development as their improved functioning and efficiency benefits the economy immensely. They enhance capital allocation by channelling excess funds and savings towards assets with a higher return and are a way to provide risk management as they facilitate the distribution of risks among many investors (Adelegan and Radzewicz-Bak, 2009).

Turner (2002) stated that one of the important reasons for developing local bond markets was in order to attract capital inflows which was a huge task for central banks in the past years. Another was to improve secondary market liquidity.

¹⁰ International Monetary Fund, World Bank, European bank and OECD (2013) “Local Currency Bond Markets- A diagnostic framework” downloaded from <https://www.imf.org/external/np/pp/eng/2013/070913.pdf> on 25 April 2017

The bond market has major importance in emerging economies hence financial sector development should start with the development of the government bond market (Eichengreen and Luengnaruemitchai 2004). This is because governments default rates are generally considered very low and yet they can borrow the funds in huge denominations.

Based on literature review above, the following section discusses some of the factors identified by the previous studies, and will also attempt to look at Swaziland in the light of these factors highlighted by previous literature.

2.2.1 Economic size

Country size and size of the economy according to Mu *et al* (2013) are important factors. They found that larger countries may achieve significant economies of scale compared to smaller ones and thus would have more developed markets. The economic size of a country matters because small economies, such as Swaziland, tend to lack capacity and efficiency required for deep and liquid markets. Eichengreen and Luengnaruemitchai (2004) found that economic development and the development of the local bond market are interlinked. They also found that, underdeveloped countries have volatile investment environments and sizeable government involvement in commercial business. This was a weakness of the financial system.

According to Mu, *et al* (2013), less developed economies have volatile investment environments and under developed countries often have weak legal systems. Mu *et al* (2013) say that less developed countries have volatile investment and countries that are larger may

achieve significant growth in terms of their domestic markets, meaning that the expectation would be that large countries will have more developed local bond markets.

Fink, Haiss and Hristoforova (2003) in their paper titled “Bond markets and Economic growth” examined “the relationship between the development of aggregate bond markets and the real GDP in 13 highly developed economies” (USA, Japan, Germany, Austria, Netherlands, Spain, UK, Switzerland amongst others) and found that the bond market and economic growth were positively related and that the bond market accounted for a relatively larger share of economic growth whilst the equity market accounted for relatively smaller share of the market.

Mu *et al*, (2013) argued that less developed countries have volatile investment policies and have poor transparency and inefficient corporate governance, hence the need for economies to ensure the development of the bond market.

2.2.2 Banking sector size

In economies with developed banking sector bond finance may be discouraged because the two are competitors however the same banks may also seek to place surplus funds in bonds. Banks and Bonds could either be complements or substitutes as greater development of the banking sector may discourage the bond market and on the other hand banks may seek to place their surplus funds in bonds as they are also market players (Mu, *et al*, 2013). Sibanda and Dubihlela (2013) argued that it was important that banks operate on a fair level playing ground without

political interference. This would enable the development of a viable bond market as it provides a healthy interplay between markets by promoting competition.

Eichengreen *et al* (2008)¹¹ suggested that the banking lending spread could in a way reflect the effectiveness of the banking sector and thus also the completion in that sector. Eichengreen and Luengnaruemitchai, (2004) stated that where the spread was higher it could be associated with inefficiency of the banking sector leading to investors wanting to invest in the bond market as opposed to the banking sector.

2.2.3 Interest Rate Variability

Mu *et al* (2013) found that interest rate volatility is a factor and is positively correlated with private bond markets however they also found that this is not the case when it comes to government bond markets because higher interest rates discourage the bond market. The bond market is a catalyst for financial markets and it is important because it generate interest rates and also reflect opportunity costs of funds (Myers, 2004).

2.2.4 Exchange Rate Variability

Mu, *et al* (2013) state that exchange rate variability or volatility is important because fixed exchange rates could encourage foreign investors to invest in bonds thereby encouraging bond

¹¹ Eichengreen B., Panizza U., Borensztein E. (2008). Prospects For Latin American Bond Markets: a cross country view downloaded from <https://www.econbiz.de> on 24th March 2017

market development but could also result in too much competition for the banks and other corporates. Eichengreen and Luengnaruemitchai (2004) averred that exchange rate variability or volatility discouraged foreign participation by introducing an element of risk thereby encouraging local bond development.

2.2.5 Trade Openness

Mu *et al*, (2013) argued that trade openness is an important factor. They specifically state that open economies encourage bond development because established interests tend to interfere with policy. Rajand and Zingales (2003) were of the opinion that if an economy trades openly with other economies, it encourages bond market development because influential entities with interest may not be influential in supporting policies that suppress competing sources of supply.

However Adelegan and Radzewicz-Bak (2009), differ as they felt that countries which are less integrated with external economies have more reason to concentrate on developing their own local bond market so that they can finance their fiscal needs.

2.2.6 Capital Account Openness

Opening the market to foreign portfolio on the one hand, enhances governance and quality of local firms and enables them to have access to foreign debt whilst controlling capital may also on the other hand encourage raising funds in the local market (Mu *et al*, 2013). However Eichengreen (2001) argued that the controls on capital account transactions sheltered intermediaries from foreign competition and that they tend to weaken market discipline by

vesting power on policy makers. According to Chinn and Ito (2005) Capital Account liberalisation can lead to a developed financial system.

Ellyne and Charter (2016) found that financial liberalisation could facilitate development in poorer countries. This was primarily based on the assumption that capital from rich countries would flow to the poorer countries, hence their assertion that capital openness would benefit countries with low savings rates. Theory suggests that allowing capital account liberalisation enables foreign and domestic investors to be exposed to diversified products. Capital account liberalisation reduces the cost of capital because its availability is increased (Henry, 2000, Stiltz 1999, Stiglitz, 2000).

2.2.7Fiscal Balance

Harwood (2000) argues that fiscal policy is important because the government bond market may indirectly promote the corporate bond market however where there is a large portfolio of government bonds then it could also negatively affect the corporate bond market development. Chinn and Ito (2005), emphasise the need to have goals before implementing capital controls.

According to Gray, Felman, Carvajal and Jobst (2011) the factors that influence development of bond markets are issuer base, investor base, and financial intermediation. They suggest that policy can broaden the investor and issuer base by reducing barriers to the market like reducing information gaps, and administrative gaps.

2.2.8 Inflation Rate

Hawkins (2002) observed that low inflation is an essential precondition for the development of the bond market because it creates the right incentives for investors. According to Thotho (2014) general economic development and inflation showed strong relationship indicators with bond market development.

Abbas and Christensen (2007) suggest that domestic debt or market based domestic borrowing contributes to economic stability, low inflation and reduced vulnerability to external shocks. Almarzoqi, Naceur and Kotak (2015) suggest that macroeconomic stability is important for the smooth functioning of the financial system because higher inflation rate reduces real returns and makes investment and savings less attractive.¹²

2.2.9 Banking Lending Rate Spread

Mu *et al* (2013) contrasted the lending rate spread to the interest rate fluctuation and found that whilst bond issuance would be discouraged by high interest rates, the lending spread itself demonstrated the level of efficiency of the banking sector in an economy and thus if the spread was high then the bond market could be encouraged.

¹² Almarzoqi R, Naceur S and Kotak A (2015) IMF Working Paper WP/15/173 ,pp1-44 International Monetary Fund, Washington downloaded from <https://www.imf.org/external/pubs/ft/wp/2015/wp15173.pdf> on 25 April 2017

Eichengreen *et al*, (2008) stated that institutions would take advantage of favourable margins resulting in the development of the bond market due to the association of a wide spread to inefficiency of the banking sector. According to Chinn and Ito (2005) where spread is wider, there is financial liberalisation thus also reduced financial repression and this would encourage bond market development.

2.3 Empirical Literature

Empirical research has been extensively conducted by writers like Mu *et al* (2013) Hawkins (2002), Jefferis (2009), Eichengreen and Luengnaruemitchai (2004) and many more and the research results have shown the existence of a relationship between bond market development and the factors affecting bond market development. After regressing the various explanatory variables on the bond market capitalisation in various countries including African and Asian countries they find that there is either a negative or positive correlation.

According to Mu *et al* (2013) the following factors are significant determinants of bond market development; economic size, banking sector size, banking lending spread, interest rate variability, capital account openness, fiscal balance, trade openness, economic development, law and order, investment profile, exchange rate variability, and country size. Hawkins (2002) points out inflation rate as another factor that may affect bond market development and Jefferis (2009) further highlights the importance of market players in the development of the bond market.

Contrarily, Sibanda and Dubihlela (2013) identify major impediments to the development of a viable bond market to include, among others, lack of credit rating agencies, unfavourable tax environment, shortage of demand and supply for bonds amongst others.

Eichengreen, Panizza and Borensztein (2008)¹³ used panel data on a range of developed and undeveloped countries focusing on Latin America and they found similar results to those found by Eichengreen and Luengnaruemitchai (2004) who had considered the determinants on 41 developing and developed countries focusing on Asia. They found that country size and trade openness were correlated with all types of bonds and interest rate volatility was correlated to the government bonds. They also found that some policy variables like macroeconomic stability and investor protection had explanatory power on bond market development.

Claessens, Klingebiel, and Schmukler (2007), incorporating a number of variables used data from developing countries to find that larger economies have greater domestic investor bases and have larger bond markets. Bae (2012) conducted a research on “the determinants of bond market development” and used data from 43 developing countries as well as focusing on China and found that the degree of economic development was the most important variable.

Burger and Warnock (2006) used data from 49 countries and examined “the factors influencing public and private bond markets” and they found that there was a positive correlation where

¹³ Eichengreen B., Panizza U., Borensztein E. (2008). Prospects For Latin American Bond Markets: a cross country view downloaded from <https://www.econbiz.de> on 24th March 2017

countries had lower inflation rates and efficient legal system. Jeanne and Guscina (2006) used data from 19 emerging economies from 1980-2002 and also found that inflation was positively correlated to the level of domestic currency debt.

2.4 Summary of the Chapter

It is clear from the literature review that there is a direct link between local bond market development and the growth of an economy. The key role for developing the local bond market in countries is to finance fiscal challenges. Secondly bond market development is necessary for to sterilise large capital inflows (Hawkins, 2002). Another reason that has been advanced by writer is to avert concentration on banks (Hawkins, 2002).

Having an additional source of domestic funds allows firms to better withstand incidences of financial hardships in countries, this is done especially where the firms raise funds by issuing debt securities. In this case, the existence of deep and liquid domestic capital markets would assist the banking sector in terms of availing finance to firms thereby providing a wide variety of finance options. This in turn would enable firms to deal with maturity mismatches financial statements.¹⁴ Harwood (2000) suggests that a well-developed government bond market may indirectly enhance the development of corporate bond market in that, “it helps promote a class of dynamic, profitable fixed-income dealers.”¹⁵

¹⁴ UK Essays Study on the development of the bond market in finance essay downloaded from <https://www.ukessays.com/dissertation/literature-review/study-on-the-development-of-the-bond-market.php>

¹⁵ Harwood A. (2000). Building Local Currency Bond Markets: An Asian Perspective *International Finance Corporation*, Washington. pp13

CHAPTER 3

3. DATA AND METHODOLOGY OVERVIEW

3.1 Introduction

This section focuses on the research methodology which is the outline of the strategy adopted when conducting the study. Section 3.2 outlines the research design and strategy used, which describes the researcher's plan for obtaining the answers to the research questions. Section 3.3 outlines the type of data used and also describes how it was collected. Section 3.4 outlines how the data was analysed and how the empirical and conceptual models were used. Section 3.5 describes the variables and how they were relevant to finding the answers to the questions of the study.

3.2 Research Design

The research design is the plan that was used by the writer to obtain answers to the research questions. Creswell (2009) describes the research design as a plan and procedure for research that considers decisions from broad assumptions to detailed methods of data collection and data analysis. Burns and Grove (2001) described research design as a way to help a researcher to plan the study in a manner that will help them obtain intended results. Polit and Hungler (1999) described the research methodology as “an outline for conducting a study in a way that maximum control will be exercised over factors that could interfere over the validity of the results”.

The first step taken to gather preliminary information on the factors affecting the development of bond markets was through the reading of published articles, journals, textbooks and papers

to gather enough information on factors that affect development of bond markets in various jurisdictions as well as the importance of bond markets in economies in order to ascertain the variables to be used in the study.

The study then utilised secondary data sourced from different sources from 1997 to 2016 (20 years) reported on various relevant variables in reports from the Ministry of Finance in Swaziland, the Central Bank of Swaziland and the Financial Services Regulatory Authority Of Swaziland among other sources. The study then used descriptive statistics in order to adequately explore the characteristics of the variables.

The study made use of the deductive approach to test the theory and come up with a hypothesis. It used the theoretical framework to test the hypothesis and also apply regression analysis on time series data for Swaziland. The study's dependent variable is the measure of local debt proxied by several observable debt indicators namely; the ratio of outstanding local debt to GDP, the number of outstanding listed local debt securities, the ratio of long term debt to GDP and the ratio of short term debt to GDP. There were a number of explanatory variables as discussed in the theoretical framework section in Chapter 2 which were regressed against the dependent variable.

3.3 Data Gathering

According to Polit and Hungler (1999) data is information obtained whilst undertaking a study. Data was gathered in three stages. Firstly, the study analysed the body of the literature and then drew parallels between it and the state of bond markets of Swaziland. The study then used

existing theories and the literature to organise an analytical framework of the factors affecting bond market development.

One of the most used indicators of a well-developed bond market is the market capitalisation of the bond market in relation to the size of the economy (Mu *et al*, 2013). The study measured the bond market development in Swaziland and established its relationship with other variables. Following Mu *et al* (2013), this study measured the dependent variable as market capitalisation of the outstanding local currency debt as a ratio of GDP at a particular time. For robustness checks, the study also used other dependent variables, namely, the number of issued outstanding local debt instruments per quarter, short term debt as a ratio of GDP and long term debt as a ratio of GDP.

Eichengreen and Luengnaruemitchai (2004) who was followed by Mu *et al* (2013) classified the independent variables into four categories namely; financial, structural, developmental and macroeconomic. Banking sector size and interest rate were financial variables whilst economic development was developmental. Interest rate fluctuation, capital account openness, exchange rate variability, fiscal balance were macroeconomic variables while size of the economy and trade openness were structural variables.

Data on government and commercial bonds was obtained from the Financial Services Regulatory Authority of Swaziland and the Central Bank of Swaziland. Data for capital account openness was obtained from the Central Bank of Swaziland quarterly reports and this was calculated by getting data on the financial account quarterly and calculated as a percentage of

GDP. Data on inflation rate and fiscal balance was obtained from Ministry of Finance Annual Reports.

The size of the economy was obtained from GDP logs kept by the Central Bank of Swaziland. Trade openness was obtained from figures of exports and imports from the Central bank and calculated as a percentage of GDP. Interest rate fluctuation was obtained from the Central Bank of Swaziland and measured by Treasury bill rates on a quarterly basis. Interest rate spread was measured by subtracting the deposit rate from the lending rate and this data was obtained from the Central Bank of Swaziland quarterly report.

The study utilised quarterly secondary data from 1997 to 2016 (20 years) from different databases such as the Central Bank of Swaziland, the Ministry of Finance and the Financial Services Regulatory Authority. The period chosen was important for the study because during this period there were a number of financial crises that occurred some of which affected the whole world. In 1997, there was the stock market crash which affected global markets and blame was put on the growth of programme trading. During 1997-1998, there was the Asian Crisis and during 2007-2008, there was the Global Financial crisis which also affected the entire world and slowed global economy. This study looked at how the bond market in Swaziland reacted to the World Financial Crisis during that period mainly because Swaziland is dependent on external finance for funding as demonstrated in the background of this study.

3.4 Empirical Analysis

Analysing data involves “working with data, organizing it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others” (Bogdan & Biklen, 1982, 145). The data was analysed using quantitative approaches in Eviews to come up with inferences about the bond market in Swaziland. The data was summarised using descriptive statistics.

To perform empirical analysis, the study borrowed a lot from Mu *et al* (2013) who wrote a paper on the bond market in Africa. Mu *et al* in their paper improved a model that was initially used by Eichengreen and Luengnaruemitchai (2004). To the initial model by Eichengreen and Luengnaruemitchai (2004), Mu *et al.* (2013) introduced the generalised methods of moments to account for possible endogeneity amongst variables.

The study estimated the equation used by Mu *et al* (2013) which was as follows:

$$Z_t = \beta_0 + \sum_1^M \beta_m U_t + \sum_1^M \beta_n + \varepsilon_t \dots \dots \dots 1$$

The study employed the ordinary least squares to test the model in equation 1. In this paper the variables in equation 1 are defined as follows:

Z_t = market capitalisation of the outstanding local currency debt as a ratio of GDP is the dependant variable, while, U_t represents the set of explanatory variables which are time variant

including banks' lending spread, exchange rate variability, trade openness, capital account openness, fiscal balance, interest rate variability and interest rate spread, and ε_t = error term.

In conducting a robustness test of the equation the writer estimated variance inflation factors and also added three more dependent variables which were used namely the number of listed local security issuances over the period of the study, the value of short term debt issuance and the value of long term debt issuance.

3.4.1 The stationarity test

To further test for robustness of the methodology used a stationarity test was conducted to test for the existence of shocks on the time series data. The assumptions that the regression model is based on would not be valid if the regression model is non-stationary however if the series was found to have been stationary then that would mean that the distribution of the variables over the period of time of the study would be the same over the progression of time. This would mean that properties like the mean, variance and autocorrelation would be the same over the quarters (Brooks, 2008). Where there is non-stationarity then it would mean that the assumptions of the asymptotic analysis cannot be valid.

There was a need to detect the existence of non-stationarity because if there is then the time series shocks have an increasing impact over time (Brooks, 2008). The unit root test was used to test for stationarity and this meant that the null hypothesis evidenced the presence of a unit root. The Dickey Fuller Test was introduced to examine that the null hypothesis is equal to 1 against being less than 1. However because the Dickey Fuller tests are greater in absolute terms

then the test will be augmented using p values of the dependant variable (Brooks, 2008). Four lags were introduced on the dependent variable because the data is quarterly.

The following Augmented Dickey Fuller test was employed (Brooks, 2008)

$$\Delta y_t = \Psi y_t - 1 + \sum_{i=1}^p \alpha_i \Delta y_{t-i} + u_t$$

Where y_t = time series, u_t = white noise disturbance term, p = lags.

The result was a reduction in the number of parameters and then implying that to test for stationarity the null hypothesis will be rejected less frequently.

3.4.2 The Johansen Test

The Johansen test was used to test for cointegration because the sample is large and this will help ascertain whether or not there was more than one cointegratory relationship. Where there was no cointegration the Vector Auto regression was used on EViews and where there was cointegration then the Vector Error Correction model on EViews was used to correct the cointegration factor. The following formula was employed (Brooks, 2008):

$$\Delta y_t = \Pi y_t - k + \Gamma_1 \Delta y_{t-1} + \Gamma_2 \Delta y_{t-2} + \dots + \Gamma_{k-1} \Delta y_{t-(k-1)} + u_t$$

Where $\Pi = (\sum_{i=1}^k \beta_i) - I_g$ and $\Gamma_1 = (\sum_{j=1}^l \beta_j) - I_g$. The Johansen test was used to test for cointegration where Π the long run coefficient matrix is. The test for cointegration was done by observing the Π matrix via its eigen values. The null hypothesis would be rejected if the test statistic is greater than the critical value from the Johansen's tables.

The long and short run relationship was assessed in the event of cointegration. The long run relationship if detected would then assume that the results were not valid for every quarter but on average over the twenty year period they become valid.

3.5 The Variables of the Study

3.5.1 Dependent Variables

According to Mu *et al* (2013) one of the most important indicators of the level of development of a country's bond market is the measure of outstanding volume of bonds in relation to the size of the economy. The study uses local public domestic debt as a ratio of GDP as a measure of the development of the Swaziland bond market and this is the dependant variable of the study. The study assess the relationship of the bond market development to the various independent variables. To test the effectiveness of the model the study introduced three more measures of the dependant variable namely; the number of listed securities, the market capitalisation of short term debt as a ratio of GDP and the market capitalisation of long term debt as a ratio of GDP.

3.5.2 Independent Variables

The study used the following independent variables; interest rate spread, banking sector size, size of the economy, fiscal balance, trade openness, capital account openness, interest rate spread, exchange rate variability, inflation rate, interest rate fluctuation and total debt.

3.5.2.1 Banking Lending Rate Spread

This Banking Lending Rate Spread was calculated using the bank lending rate minus the deposit rate. The wider the spread may be considered as an indication for the level of competition (Eichengreen et al 2008). However, this may serve as a catalyst for the development of the bond market as more institutions would like to take the opportunity and invest in bonds due to favourable interest rates. Chinn and Ito (2005) posit that a wider spread is indicative of financial liberalisation and reduced financial repression.

3.5.2.2 Capital Account Openness

The existence of capital controls may have the impact of positive development in local bond market (Chinn and Ito, 2005; Stultz, 1999). Literature has also shown that this also leads to enhancement of corporate governance for local corporations (Chinn and Ito, 2005; Stultz, 1999; Stiglitz, 2000).

There are numerous measures of financial openness. The study used the capital inflows versus outflows as a percentage of GDP. The capital inflows were subtracted from the capital outflows, these figures were taken from the balance of payments financial accounts which comprised of figures containing direct investments, portfolio investments, financial derivatives, reserve assets, values of portfolio stocks and other investments. Some writers have proposed that the measure of *de facto*¹⁶ financial openness is the sum of foreign assets and foreign liabilities over GDP (Lane, and Milesi-Ferreti, 2003 and 2007). The International

¹⁶ *De facto* capital openness means financial integration amongst countries whilst *de jure* capital openness means rules or policy based control. Chinn and Ito (2008)

Monetary Fund (IMF) reports on the presence of control through its report on exchange arrangements and exchange restrictions. The report demonstrates the presence or lack of restriction in the IMF member states (Kraay, 1998). Quinn (1997) assigned scores to numerous restrictive rules by countries that govern capital account transactions, which was actually a measure of the intensity of the controls.

Saadma and Steiner (2016) proposed an adjusted measure which only measured the financial openness of an economy with respect to private capital and sought to quantify the contribution by private investors to a country's economy. The adjusted measure sought to distinguish the magnitude between official and private capital openness.

Chinn and Ito (2008) proposed a new measure of capital account openness stating that some measures did not actually quantify the intensity of openness and further that they were too aggregative because they measured the presence of controls rather than the intensity of controls. The Chinn and Ito index focused on the de jure openness or the intensity of regulatory restrictions to openness and constructed an index called KAOPEN which measures the extent of intensity of capital controls.

The Chinn and Ito Index has data on 182 countries from 1970 to 2015 based on information released by the IMF, however Swaziland does not have data on the Chinn Ito Index. The study will obtain the data from the Balance of Payment Division reports of the Central Bank of Swaziland. The data obtained was capital inflows versus outflows as a percentage of GDP. This is an indicator of foreign investor's access to the market of Swaziland.

3.5.2.3 Fiscal Balance

In this study fiscal balance was measured by calculating cash surplus or deficit as a ratio of GDP and the figures were obtained from the Ministry of Finance. Harwood (2000) suggests that the presence of fixed income traders in a country where government bonds are developed may encourage growth in the corporate bond market sphere in that country. On the other hand, there may be a negative impact on private sector development where government securities are dominant and capital financing is limited to the issuance of such securities (Thotho, 2014).

3.5.2.4 Size of the Banking Sector

Size of the Banking sector was measured as banking sector credit as a proportion of GDP. Size of the banking sector is associated with development of the local bond market because when banks have excess funds or liquidity they take up government bonds and also act as market makers (Harwood, 2000). However banks may also discourage the growth of the local bonds especially when they compete for the same liquidity in a country (Hawkins, 2002).

3.5.2.5 Trade Openness

Trade openness was measured by the total of exports and imports as a percentage of GDP. The data was obtained from the Central Bank Balance of Payments division. Trade openness is a catalyst for the growth of the local bond market in any economy however it may also suppress the development of the same market because external competition is welcomed (Mu *et al*, 2013). Trade Openness is important because it acts as a catalyst for economies to concentrate on local financing sources because the advantage would be that the country becomes resilient to certain established interests as foreign competition is encouraged (Thotho, 2014).

3.5.2.6 Inflation Rate

Inflation rate data was obtained from the Central Bank of Swaziland reports. Literature suggests that countries with low inflation rate have a very strong local bond market as well as well developed economies (Mu *et al* 2013; Abbas and Christensen, 2007). Furthermore Stijn *et al* (2007) found that countries with a larger market will not opt to finance budgetary needs using inflation but instead will use other avenues like debt and stocks to finance budgetary needs.

3.5.2.7 Size of the Economy

The study used nominal GDP to measure the size of the economy of Swaziland and the data was sourced from the Central Bank of Swaziland. Where the market is too small there may be price volatility and thus affecting the uptake of the bond in the local market (Eichengreen and Luengnaruemitchai, 2004). This may translate into the market being too small to justify global bond indices hence no demand for local bond to track the index (Eichengreen and Luengnaruemitchai, 2004). A large body of literature supports the relationship between the local bond market and economic development (Thotho, 2014; Mu *et al*, 2013). Where a country has a developed local bond market it is almost always the case that its economy is well developed (Fink *et al*, 2003).

3.5.2.8 Exchange Rate Variability

Exchange rate variability was measured by calculating the standard deviation of selected foreign exchange rates and the data was sourced from the Central Bank of Swaziland. The

quarterly foreign exchange rates for the European Euro, British Pound and United States Dollar were obtained and the standard deviations of the quarterly currencies were calculated on excel.

Mu *et al* (2013) found that there is a higher demand for bonds by foreign investors where the exchange rate is fixed however they also noted that this may limit the growth of the local bond market due to the foreign direct competition. Goldstein (1998) argued that exchange rate flexibility is important for the growth of the local bond market because it discouraged international investors by introducing an element of risk that they would prefer to avoid.

3.5.2.9 Interest Rate Fluctuation

Interest rate fluctuation was measured by using the Treasury bill rate on a quarterly basis. A large body of literature has shown that investors have different risk appetites thus where the interest rate is highly unpredictable there will be a low uptake of long term fixed bonds (Mu *et al*, 2013, McKinnon, 1973, Shaw 1973). High interest rates have proven to have a negative impact on debt issuance. Eichengreen and Luengnaruemitchai (2004) find that when interest rates fluctuate investors also tend to have little appetite for long term instruments.

3.5.2.10 The Debt Ceiling

The local debt ceiling was measured by calculating total public debt as a ratio of GDP, this data was readily calculated in the Central Bank Quarterly Reports. Swaziland has a regulation imposed by the Ministry of Finance that total public debt must not exceed 35% of GDP and

the ceiling for local debt was placed at 25% of GDP.¹⁷ This local debt ceiling was set by government during the financial crisis when Swaziland was facing fiscal challenges and there was a need for the government to raise finances locally. In order for Government to demonstrate its ability to repay debt an assessment was made to ascertain the Swaziland Governments ability to repay debt as well as to cap the debt as a percentage of GDP.¹⁸

¹⁷ The Ministry Of Finance Of Swaziland Government Circular of 2010

¹⁸ The Central bank of Swaziland Report.

CHAPTER 4

4. EMPIRICAL RESULTS

4.1 Introduction

The study addressed the research questions by using ordinary least squares to test the hypothesis. This chapter presents the results of the tests conducted on the hypothesis. This section will address the results of the descriptive statistics of the dependent and independent variables of this study, then it will also present the results of the regression analysis as tested by ordinary least squares. A robust check of the findings which was conducted will be explained and results shown. The results will determine which of the factors identified by previous literature are relevant to the development of the Swaziland bond market.

4.2 Descriptive Statistics

The descriptive statistics of the study are presented in table 1 below. The descriptive statistics present a summary of the variables of the study and summarise the values of the variables in the study. The table presents the mean, median maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera statistics, p-values for all the independent and dependant variables of the study.

Table 1: Descriptive statistics

	Independent Variables										Dependent Variables			
D Stats	Capit Acc	Inflation	F. Balance	Loans	T. Bills	Exchange Rate	GDP	Int Spread	TPD/GDP	Trade Open	PDD/GDP	Issuance	Long term debt/GDP	Short term debt /GDP
Mean	0.0000	7.0030	-0.6395	4962243.	8.5040	2.3861	6666.127	7.2681	25.4770	0.2607	0.0065	25.8625	0.004886	0.037299
Median	-0.0005	6.4100	-0.5907	4722435.	7.7800	2.3009	5827.765	6.3550	17.3311	0.2588	0.0048	23.3750	0.002816	0.021509
Maximum	0.0676	13.730	2.7539	12187920	14.5900	3.6004	13985.59	14.500	95.9011	0.3843	0.0149	39.0546	0.011567	0.106557
Minimum	-0.0841	3.1200	-3.9808	786421.0	5.7200	1.1019	2122.504	3.7500	6.3853	0.1641	0.0007	17.0937	0.001978	0.003610
Std. Dev.	0.0275	2.4520	1.2629	3510465.	2.3190	0.6053	3583.528	2.4528	24.9276	0.0588	0.0051	7.2370	0.003554	0.037573
Skewness	-0.3193	0.7782	0.2906	0.4286	1.1863	0.2028	0.5342	1.2778	1.5586	0.3584	0.6604	0.41518	0.779917	0.625052
Kurtosis	3.7527	3.0255	3.8779	1.9382	3.3906	2.1351	2.0425	3.9353	4.0687	2.2811	1.8277	1.5638	1.853158	1.832715
Jarque-Bera	3.2477	8.0776	3.6946	6.2078	19.2726	3.0421	6.8618	24.686	36.1968	3.4356	10.396	9.1729	9.751050	9.751050
Probability	0.1971	0.0176	0.1577	0.0449	0.0000	0.2185	0.0324	0.0000	0.0000	0.1795	0.0055	0.0101	0.007631	0.007631
Observations	80	80	80	80	80	80	80	80	80	80	80	80	80	80

Table 1: Descriptive statistics

Legend: *Capit Acc* – Capital Account Openness, *Trade Open* – Trade Openness, *Inflation* – Inflation Rate, *PDD/GDP* – Public Domestic Debt per GDP, *F. Balance* – Fiscal balance, *Issuance* – Number of Listed Securities Issued, *Loans* – Banking Sector Size, *Long debt* – Outstanding long term debt, *T Bills* – Interest Rates, *Short debt* – Outstanding short term debt, *Exch rate* – Exchange Rate, *GDP* – Size of the Economy, *Int Spread* – Interest Rate Spread, *TPD/GDP* – Total public debt to GDP, *GDP* – Size of the Economy, *Int Spread* – Interest Rate Spread, *TPD/GDP* – Total public debt per GDP.

Table 1 shows that Capital Account Openness is negatively skewed and the other independent variables namely inflation, fiscal Balance, banking sector size, interest rate, exchange rate, GDP, interest rate spread, trade openness, and the total public debt are positively skewed. The dependent variables public domestic debt, issuance, long term debt and short term debt are positively skewed.

The values of kurtosis reveal the extent of the frequency distributions and table 1 reveals that total public debt is thick tailed relative to the normal distribution. The kurtosis values for the other independent variables namely GDP, banking sector size, and the dependant variable public domestic debt follow a platykurtic distribution whilst the kurtosis values for the rest of the independent variables and total public debt follow a leptokurtic distribution.

The Jarque Bera statistics and the p values demonstrate if the selected variable follows a normal distribution. From the results of Table 1 it can be seen that the normality assumption is rejected for all the variables at 5%, however not all the variables normality assumption is rejected at 1%. The results reflect that the normality assumption is rejected at 1% for interest rate spread, total public debt and total domestic dept. Thus, the descriptive statistics prove that the variables are not normally distributed for the Swaziland bond market which shows that there is some inefficiency in the development of the Swaziland bond market.

4.3 Correlation Matrix

The study estimated the correlation matrix as shown in table 2 below in a bid to ascertain the linear dependence between variables.

Table 2: Correlation Matrix for independent variables

	Variable	1	2	3	4	5	6	7	8	9
1	Log of Interest Rate Spread	1.0000								
2	Log of Exchange Rate	0.0702	1.0000							
3	Log of Trade Balance	-0.2047	0.1197	1.0000						
4	Log of Capital Account	0.0881	-0.0647	0.0297	1.0000					
5	Log of Fiscal Balance	0.0465	0.1476	-0.0444	-0.0566	1.0000				
6	Log of Total Public Debt to GDP	0.2368	0.1533	0.2098	0.0598	-0.0641	1.0000			
7	Log of GDP	0.1416	0.0376	-0.0209	0.0596	0.3338	-0.0455	1.0000		
8	Log of Treasury Bills	0.3389	-0.1337	-0.1017	0.1153	0.0580	0.0851	-0.0169	1.0000	
9	Log of Banking Sector	-0.0953	0.1050	0.1734	0.0771	0.0621	0.0489	-0.0158	-0.0935	1.0000
10	Log of CPI	0.1180	0.0044	-0.0693	0.2422	0.05366	0.0805	0.1405	0.2032	-0.0501

Table 2 above which is the correlation matrix reflects coefficients between sets of variables. From the matrix in the table there is evidence of a linear dependence between two sets of variables. The results of the correlation matrix reflect a linear dependence between fiscal balance and GDP and between interest rate spread and the Treasury bill rate which is interest rate fluctuation.

4.4 Regression Analysis

The ordinary least squares was used to establish the relationship of the dependent variable to the chosen set of independent variables of this study. The results of the regression analysis are contained in the tables and figures below. Section 4.5 which follows will address how consistent the findings actually are with the theoretical analysis of this study. Robustness tests will also be performed on the results of the regression analysis in order to ascertain the reliability of the variables of the study and the model employed.

When the regression model was estimated there was presence of heteroscedasticity and serial autocorrelation hence the study estimated the model using heteroscedasticity robust standard errors and covariance on Eviews. The results of the regression model follow below.

Table 3: Regression - Least Squares with the dependant variable being the market cap of local public debt as a ratio of GDP

Dependent Variable: Lpublic_Domestic_Debt as a ratio of GDP Method: Least Squares: White Heteroskedasticity-Consistent Standard Errors & Covariance		
Variable	Coefficient	Std. Error
C	15.5993	12.0356
Lint_Spread	0.1234	0.1683
Lexchange_Rate	0.3053	0.2369
Ltrade_Balance	0.2525	0.2377
Lcapital_Account	143.8768	134.4582
Lfiscal_Balance	2.5392	6.6041
Ltotal_Public_Debtgdg*	-0.2441	0.0936
Lbanking_Sector	0.2475	0.3971
Lcpi	-0.0267	0.1358
Lgdp	-6.3545	4.4762
Ltbills	-0.0161	0.1635
Lpublic_Domestic_Debt(-1)	0.3110	0.2258
Lpublic_Domestic_Debt(-2)	0.1096	0.2100
Lpublic_Domestic_Debt(-3)	-0.1035	0.1296
R-Squared		0.3926
Adjusted R-Squared		0.2653
F-Statistic		3.0829
Prob(F-Statistic)		0.0014
Durbin-Watson stat		1.7896

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend: Banking sector- Banking sector size; capital Account- Capital Account openness; fiscal balance- Fiscal Balance ; gdp- Size of the Economy; tbills- Interest rate fluctuation; trade balance – Trade openness; total public debt – total public debt /GDP ; exchange rate- exchange rate volatility; cpi- Inflation rate; , int spread- Interest rate spread; public domestic debt: dependant variable public domestic debt

Table 3 above shows results of a regression model estimated using heteroscedasticity robust standard errors and covariance, thus, test statistics of the model are asymptotically standard normally distributed therefore the p-values of the coefficients can be used to interpret the data. Further, three lags of the dependent variable were introduced into the model in order to eliminate the autocorrelation and normalise the regression.

The adjusted R-square is used to measure how well the independent variables explain the dependent variable, taking care to remove the effects of information that may be shared between or amongst variables. The results of the R-square in Table 3 suggest that the independent variables have a relatively weak relationship with the dependent variable. Table 3 above shows that heteroscedasticity has been removed and the adjusted R- squared value is 26.53%.

As shown in table 3 above, thus, this regression estimates models are asymptotically standard normally distributed therefore the p-values of the coefficients can be used to interpret the data. The results of Table 3 also show that total public debt is significant at the 10% level of confidence. The coefficient of the total public debt is negatively correlated to bond market development suggesting a negative relationship between total public debt and the bond market development.

The negative relationship between the two variables could mean that if the market capitalisation of the Swaziland bond market grows it does not necessarily mean the total local public debt would move the same way meaning the local public debt could be sourced from other lines other than the local bond market.

4.5 The regression model robustness checks

The study also estimated variance inflation factors in order to ascertain how much variance of the estimated regression is inflated by the correlation between independent variables.

Table 4: Variance Inflation Factors

Variance Inflation Factors			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	59.2675	15.9654	NA
Lbanking_Sector	0.0775	1.3097	1.0650
Lcapital_Account	7147.647	1.1010	1.0991
Lfiscal_Balance	26.3392	1.1988	1.1841
Lgdp	9.2694	15.4127	1.1901
Lint_Spread	0.0468	1.3474	1.3251
Ltbills	0.0477	1.2362	1.2288
Ltrade_Balance	0.0450	1.1712	1.1712
Ltotal_Public_Debtgdg	0.0059	1.1891	1.1816
Lexchange_Rate	0.0333	1.1123	1.1106
Lcpi	0.0154	1.1351	1.1345

Legend: Banking sector- Banking sector size; capital Account- Capital Account openness; fiscal balance- Fiscal Balance ; gdp- Size of the Economy; tbills- Interest rate fluctuation; trade balance – Trade openness; total public debt – total public debt /GDP ; exchange rate- exchange rate volatility; cpi- Inflation rate; , int spread- Interest rate spread

Table 4 above shows the variance inflation factors and it shows capital account openness and fiscal balance with a variance inflation factor above 10. This suggests that there is a high correlation between the capital account openness and the fiscal balance suggesting that there is inflated variance due to the presence of the two independent variables. In order to conduct robustness tests the study eliminated capital account openness and fiscal balance from the equation because they had a high variance inflation factor as shown in table 4. Table 4(a) below show the regression model with capital account openness and fiscal balance removed from the model.

Table 4(a): Regression model with Capital Account openness and fiscal balance deleted

Dependent Variable: Total Public Debt Method: Least Squares White heteroskedasticity-consistent standard errors & covariance		
Variable	Coefficient	Std. Error
C	-0.0050	0.0023
LTOTAL_PUBLIC_DEBTGDP	-1.6800	2.0600
LINT_SPREAD	-3.0500	6.9500
LEXCHANGE_RATE	6.1600	5.4700
GDP	6.9300	3.0500
LCPI	4.6300	3.4700
LTRADE	-9.9000	6.0200
LBANKING_SECTOR	6.4900	7.3000
LOANS	-2.0100	1.2300
PUBLIC_DOMESTIC_DEBTGDP(-1)	0.874343	0.0606
R-squared	0.952764	Prob(F-statistic) 0.000000
Adjusted R-squared	0.946223	Prob (Wald F Statistic) 0.001295
F-statistic	145.6733	Durbin-Watson stat 2.008251

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **gdp**- Size of the Economy; **tbills**- Interest rate fluctuation; **trade balance** – Trade openness; **total public debt** – total public debt /GDP; **exchange rate**- exchange rate volatility; **cpi**- Inflation rate , **int spread**- Interest rate spread; **bill**- short term debt

From the variance inflation factor, capital account and fiscal balance were omitted from the regression model. The results of the test are shown in the table 4(a) above, the results indicate that there is no heteroscedasticity present since the DW test is at 2. Further, the R-squared shows that the independent variables explain the dependent variable with a 95% accuracy.

Tables 5, 6 and 7 present the results of the further tests conducted to evaluate the robustness of the OLS method by using three different measures of the dependent variables that is; short term

local debt estimated using the outstanding value of treasury bonds and bills , as a ratio of GDP, long term bond estimated using the value of outstanding long term securities as a ratio of GDP and the number of listed securities issued.

Table 5: Short term debt as a ratio of GDP as a measure for dependent variable

Dependent Variable: DBILL as a ratio of GDP Method: Least Squares White heteroskedasticity-consistent standard errors & covariance		
Variable	Coefficient	Std. Error
C	1.6675	1.8624
LBANKING_SECTOR	0.2292	0.3508
LCAPITAL_ACCOUNT	-115.0568	104.7968
LINT_SPREAD	-0.2968	0.2412
LFISCAL_BALANCE	-18.3065	21.0595
LTRADE_BALANCE	-0.5548	0.4513
LTOTAL_PUBLIC_DEBTGDP	0.0699	0.0632
LEXCHANGE_RATE	0.1858	0.2239
LCPI	0.2104	0.1888
DBILL(-1)	-0.0329	0.0533
DBILL(-2)	-0.0344	0.0476
DBILL(-3)	-0.0155	0.0180
C	1.6675	1.8624
LBANKING_SECTOR	0.2292	0.3508
R-squared	0.1342	Prob(F-statistic) 0.7183
Adjusted R-squared	-0.0474	Prob (Wald F Statistic) 0.9544
F-statistic	0.7390	Durbin-Watson stat 0.4259

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness; **fiscal balance-** Fiscal Balance ; **gdp-** Size of the Economy; **tbills-** Interest rate fluctuation; **trade balance** – Trade openness; **total public debt** – total public debt /GDP; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate , **int spread-** Interest rate spread; **bill-** short term debt

Table 5 shows the results of the ordinary least squares regression model. Table 5 the shows that adjusted R-squared value to be at -4.74%, which is the total variance of the of the dependant variables as explained by the regression model. None of the variables were found

to be significant at all levels namely 1%, 5% and 10%. The F statistic value was at 0.77390 for this regression equation. Table 6 below shows results of the regression model where the dependant variable measure is long term debt.

Table 6: Long term debt as a ratio of GDP as a measure for dependant variable

Dependent Variable: DBOND as a ratio of GDP Method: Least Squares White heteroskedasticity-consistent standard errors & covariance			
Variable	Coefficient		Std. Error
C	6.4453		3.9899
LBANKING_SECTOR	-5.7000		5.0900
LCAPITAL_ACCOUNT	-142.9268		151.1174
LFISCAL_BALANCE	-2.3058		4.4700
LGDP*	-0.0239		0.019687
LINT_SPREAD	-0.5558		1.3644
LTBILLS	-0.1070		0.1070
LTRADE_BALANCE	-0.3085		0.2383
LTOTAL_PUBLIC_DEBTGDP	-0.0581		0.0701
LEXCHANGE_RATE	-0.1349		0.1986
LCPI*	0.2126		0.1150
DBOND(-1)	0.0413		0.0541
DBOND(-2)	0.0613		0.0870
DBOND(-3)	-0.1030		0.0817
R-squared	0.2595	Prob(F-statistic)	0.0902
Adjusted R-squared	0.1042	Prob(Wald F –Statistic)	0.8488
F-statistic	1.6710	Durbin-Watson stat	1.9294

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend: Banking sector- Banking sector size; capital Account- Capital Account openness; fiscal balance- Fiscal Balance ; gdp- Size of the Economy; tbills- Interest rate fluctuation; trade balance – Trade openness; total public debt – total public debt /GDP ; exchange rate- exchange rate volatility; cpi- Inflation rate , int spread- Interest rate spread; bond- long term debt.

The results of the regression model where the dependent variable measure is long term debt are shown in Table 6 above. The results show the adjusted R-squared value of 10.42% which is significantly lower than the results of the regression when the measure of the dependent variable is the number of listed securities as shown in Table 7.

Inflation rate was found to be significant at the level of 1% and it is positively correlated to the development of the bond market. In terms of Table 6, inflation has a positive coefficient to the value of 21.26% in Swaziland. This finding is in line with literature as was found by Mu *et al* (2013) that there should be an inverse relationship between inflation rate and bond market developments. Countries with a well-developed bond market have a lower inflation rate. This would then mean that Swaziland does not bank on inflation to finance budgetary needs (Stign, Daniela and Sergio, 2007).

The size of the economy as measured by GDP was found to be significant at the 1% level negatively correlated to bond market development in Swaziland. The results of Table 6 reveal a negative confidence between the size of the economy and the development of the bond market. This negative relationship is not in line with literature (see e.g., Mu *et al.*, 2013 and Eichengreen and Luengnaruemitchai, 2004). This would be explained by the fact that Swaziland is not entirely dependent on the bond market for financing the fiscus but a large portion of the economy is funded by SACU receipts and other foreign debt.

Table 7: The number of issued listed securities as measure for dependant variable.

Dependent Variable: LISTED_SECURITIES Method: Least Squares White heteroskedasticity-consistent standard errors & covariance		
Variable	Coefficient	Std. Error
C*	1.6710	0.6530
DLBANKSECTOR	-4.8600	8.5500
DLCAP	-9.1742	19.5472
LFISCAL_BALANCE*	-1.4164	0.5860
DLGDP	-0.0043	0.0032
DLSREAD	-0.1784	0.4170
LTBILLS	0.0180	0.0322
LTRADE_BALANCE	-0.0080	0.0317
LTOTAL_PUBLIC_DEBTGDP	-0.0112	0.0146
LEXCHANGE_RATE	-0.0332	0.0308
LCPI	-0.0132	0.0179
R-squared	0.1901	Prob(F-statistic) 0.1265
Adjusted R-squared	0.0710	Prob(Wald F-statistic) 0.7183
F-statistic	0.1265	Durbin-Watson stat 1.0433

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account**- Capital Account openness; **fiscal balance**- Fiscal Balance ; **gdp**- Size of the Economy; **tbills**- Interest rate fluctuation; **trade balance** – Trade openness; **total public debt** – total public debt /GDP ; **exchange rate**- exchange rate volatility; **cpi**- Inflation rate; **int spread**- Interest rate spread, listed securities- dependant variable : listed securities

The results displayed in Tables 7 shows the value of adjusted R-squared when the number of listed securities is used as the measure of the dependent variable to be 7.10% whilst the unadjusted R-squared for long term debt as a measure of the dependent variable being improved to 10.42%. On the other hand the adjusted R- Squared for the regression where short-term debt is used as a measure of the dependent variable is significantly reduced to -4.74 %

proving that there was a high explanatory factor between long term debt and the independent variables.

Fiscal balance was found to be significant at 1% and negatively correlated to the bond market development in Swaziland. And this was in line with the finding by Mu *et al* (2013) and the basis for that was that there is less reliance on the bond market for financing fiscal balance.

The study thereafter estimated four regression models to further test the equation. However as the Table 2 above shows four variables to be correlated the writer eliminated each of the correlated variables from the independent variables in order to test the formula.

The study examined how the regression behaved when some of highly correlated independent variables were removed from the equation. The two sets of independent variables that were correlated were GDP and the Treasury bill on the one hand and interest rate spread and fiscal balance on the other hand. The full results of the regression are shown on the annexure from Table 9-16. The results of the regression are summarised and shown in table 8 below.

Table 8: Regression model with the corresponding correlated variables removed

Independent variables removed	Dependant variable	R- Squared	Adjusted R-Squared	F Statistic	Prob (F-Statistic)	Durbin-Watson Stat
Without GDP and T Bills	Public Domestic Debt	0.3471	0.2348	3.0927	0.0022	1.8310
Without GDP and T Bills	Listed Securities	0.1620	0.0663	1.6923	0.1156	1.0357
Without GDP and T Bills	Long term debt	0.2312	0.0991	1.7501	0.08223	1.9916
Without GDP and T Bills	Short Term Debt	0.1296	-0.0100	0.8666	0.5764	1.8850
Without Interest rate Spread and Fiscal balance	Public Domestic Debt	0.3689	0.2815	3.6713	0.0005	1.7674
Without Interest rate Spread and Fiscal balance	Short term Debt	0.0638	-0.0971	0.3963	0.9526	1.9712
Without Interest rate Spread and Fiscal balance	Long term debt	0.3442	0.2316	3.0542	0.0024	2.0410
Without Interest rate Spread and Fiscal balance	Listed Securities	0.2427	0.1562	2.8042	0.0094	1.1096

Legend GDP- Size of the economy; **T Bills**- Interest rate fluctuation; **listed securities**- number of listed securities issued

From the results shown in Table 8 it was found that the adjusted R-squared was low at 20.89% where interest rate spread and fiscal balance were removed from the equation where long term debt is the dependent variable. Compared to the equation where the size of the economy and

interest rate fluctuation was removed with long term debt as the dependent variable the R-squared value was reduced to 20.56%. This shows a slight significance of the removal of the variables as explanatory variables for the long term debt. Table 8 above shows that the adjusted R-squared value was 66.49% where the size of the economy and interest rates fluctuation were removed from the equation and at 65.24% interest rate spread and fiscal balance were removed where short term debt is the measure of the dependent variable. The high Adjusted R-squared means that the remaining explanatory variables are highly related to the dependent variables and they level of relevance to the dependant variables is very high.

Tables 9- 16 shown in the Annexure hereto represent the regression results of the formulas summarised in Table 8. Table 9 of the annexure shows that the inflation rate is significant at the 10% of the level of confidence and reflects that there is a negative correlation between the inflation rate and local domestic debt as the measure of the dependent variable even where the measure of the size of the economy and interest rates fluctuations were removed from the equation. The negative correlation is in line with that found in literature in Hawkins (2002) because low inflation is essential and a precondition for bond development.

Table 10 of the annexure reveals that there is no significant variable when short term debt is used as a dependent variable measure with size of the economy and interest rate fluctuation removed as variables of the study.

Table 11 of the annexure is the formula where the long term bond market capitalisation was used as a measure of the dependent variable with the size of the economy and the interest rate fluctuation removed from the equation. The results reflected that banking sector size was

negatively correlated and significant at the 10% level of confidence and inflation rate was positively correlated to and also significant at the 10% level of confidence. Thotho (2014) found a generally strong relationship between inflation rate and economic development. The inverse relationship between banking sector size and bond market development was explained by Mu *et al* (2013) that bond market development may be discouraged where banking sector is well developed. The banking sector in Swaziland is largely owned by South African Banks and the funds held in the banking sector are transmitted out of the country through the financial system and in line with the common monetary area agreements.

Table 11 also reflect that inflation rate is significant at 10% and there is a positive relationship between inflation rate and bond market development and this according to Thotho (2014) reflected a strong relationship between bond development and inflation rate.

Table 12 on the annexure reveals the p-value of fiscal balance significant at the 10% level of confidence. The results reveal a negative coefficient value between fiscal balance and the development of the bond market as measured by listed securities with the size of the economy and the interest rate fluctuation removed from the regression formula. The reason for the negative relation could be because budget deficit could encourage bond market development (Thotho, 2014).

Table 13 of the annexure reflect that the total public debt to GDP is significant at the 10% level of confidence but reveals that there is a negative correlation between the regression formula where the measure of the dependent variable is the number of listed securities and the interest rate spread and fiscal balance were removed from the equation.

Table 14 of the annexure represent the regression formula where the dependent variable is measured by the value of short term debt with interest rate spread and fiscal balance removed from the equation and the results showed that none of the variables are significant at the 10% level of confidence.

Table 15 of the annexure shows the results of the regression where long term debt was used to measure the market capitalisation with interest rate spread and fiscal balance removed from the regression formula and the findings were that inflation rate was positively correlated and significant at 5%, interest rate fluctuation and size of the economy were also significant at the 5% level but negatively correlated to the bond market development. Banking sector was significant and negatively correlated to bond market development and the inverse relationship was explained by Mu *et al* (2013) that the banking sector and bond market are competitors of in terms of savings and investments.

Table 16 of the annexure showed listed securities used as a measure of bond market development, the interest rate spread and fiscal balance were removed from the equation. The results showed that the size of the economy was significant at the level of 1% of confidence however there was a negative correlation between the size of the economy and bond market development as measured by the number of listed securities. Literature suggests that the inverse relationship between the size of the economy and local bond market development could be because small economies lacked the capacity to attract large investors in the local market (Thotho, 2014; Eichengreen and Luengnaruemitchai, 2004). Table 16 also showed total public debt to be significant at 10% and that it was negatively correlated to bond market development.

Table 18: The Unit Root Test on Number of Listed Securities

Null Hypothesis: STARESIDS2 has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic - based on SIC, maxlag=4)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.4867	0.1233
Test critical values: 1% level	-3.5229	
5% level	-2.9018	
10% level	-2.5883	

*MacKinnon (1996) one-sided p-values

The results of table 18 reflect that the p-value for the unit root test for the number of listed securities is 0.1233 and this means that the null hypothesis is not rejected at all critical levels.

Table 19: The Unit Root Test on TBills – Short Term Debt

Null Hypothesis: STAREIDS3 has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=4)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.7970	0.0000
Test critical values: 1% level	-3.5216	
5% level	-2.9012	
10% level	-2.5880	

*MacKinnon (1996) one-sided p-values

The results as shown in table 19 above reveal that the p-value for short term debt is 0.000. The null hypothesis is strongly rejected even at the 1% level. The results suggest that there is no stationarity.

Table 20: The Unit Root Test on Bonds – Long Term Debt

Null Hypothesis: STAREIDS4 has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=4)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.7273	0.0743
Test critical values: 1% level	-3.5216	
5% level	-2.9012	
10% level	-2.5880	

*MacKinnon (1996) one-sided p-values

The results of table 20 which is the unit root test on long term debt reflect the p-value to be 0.00743 and this reveals that the null hypothesis is not rejected at the level of 5%. The result show stationarity.

4.7 The Johaneson Test Results

The Johaneson test was conducted on the treasury bills (short term debt) as the unit root test results revealed non stationarity and the results are as shown in table 21 below.

Table 21: The Johaneson Test for Cointegration on T Bills – short Term Debt

Sample (adjusted): 1998Q1 2016Q4 Included observations: 76 after adjustments Trend assumption: Linear deterministic trend Series: LTPGDP LOANS LINTSPR LEXR LCPI LCAP LBORR FISCAL_BAL LTRADE GDP LTBILLS Lags interval (in first differences): 1 to 2 Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.809343	471.6188	285.1425	0.0000
At most 1 *	0.652113	345.6657	239.2354	0.0000
At most 2 *	0.573573	265.4189	197.3709	0.0000
At most 3 *	0.494588	200.6431	159.5297	0.0000
At most 4 *	0.461824	148.7821	125.6154	0.0009
At most 5 *	0.400713	101.6948	95.75366	0.0183
At most 6	0.252241	62.78176	69.81889	0.1601
At most 7	0.206297	40.69055	47.85613	0.1987
At most 8	0.166691	23.13110	29.79707	0.2397
At most 9	0.086089	9.272461	15.49471	0.3408
At most 10	0.031477	2.430743	3.841466	0.1190
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.809343	125.9531	70.53513	0.0000
At most 1 *	0.652113	80.24679	64.50472	0.0008
At most 2 *	0.573573	64.77580	58.43354	0.0106
At most 3	0.494588	51.86095	52.36261	0.0563
At most 4 *	0.461824	47.08733	46.23142	0.0404
At most 5	0.400713	38.91306	40.07757	0.0672
At most 6	0.252241	22.09122	33.87687	0.6006
At most 7	0.206297	17.55945	27.58434	0.5322
At most 8	0.166691	13.85864	21.13162	0.3768
At most 9	0.086089	6.841718	14.26460	0.5080
At most 10	0.031477	2.430743	3.841466	0.1190

Trace test indicates 6 cointegrating equations at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level and **MacKinnon-Haug-Michelis (1999) p-values

The results of table 21 which is the Johaneson test performed on short term debt reflect that the null of no cointegration vectors is rejected, also the null hypothesis of at most one cointegrating vector is also rejected.

The trace results shows that there exists 6 cointegrating equations at the 5% significant level. The eigen value displayed in table 21 indicates that three cointegrating equations exist in contrast to the trace test above. This conflict suggests that there may be no cointegration in the long run.

4.6 Summary of the results

Fiscal balance was found to have a negative correlation to bond market development in Swaziland when the number of securities was used as a measure of the dependent variable with the size of the economy and interest rate fluctuation removed from the equation. The inverse relation between the fiscal balance and the bond market could be supported by that budget deficit could promote bond market development (Thotho, 2014, Mu *et al*, 2013).

Total public debt to GDP was found to have a negative correlation when size of the economy and interest rate fluctuation were removed with the local public debt market capitalisation as the measure of the dependent variable. This was also the case when the number of listed securities were used to measure bond market development with fiscal balance and interest rate spread removed from the regression model.

The size of the economy as measured by GDP was negatively correlated to bond market development when the number of listed securities were used as a measure of bond market development with interest rate spread and fiscal balance removed from the equation. The inverse relationship could be due to that Swaziland is a small economy and unable to attract large investors to take up large debt issuance (Thotho, 2014; Eichengreen and Luengnaruemitchai, 2004).

Inflation Rate was found to be negatively correlated with bond market development when public domestic debt is used as a measure for bond market development with the size of the economy and interest rate fluctuation removed from the regression formula. However there was a positive correlation when long term debt was used as a measure for bond market development with interest rate fluctuation and size of the economy removed from the equation. This is in line with finding by Mu *et al* (2013) that the inverse relationship is evidence for the need to develop bond markets when the inflation is low.

Banking Sector Size was significant and negatively correlated to bond market development when long term bond were used as a measure for bond market development with interest rate fluctuation and size of the economy removed from being dependent variables in the formula. The inverse relationship is as a result of a well-developed banking sector which may discourage bond finance Mu *et al* (2013) and the fact that the Banks are owned by South African companies in Swaziland.

Interest rate fluctuation as measured by the T Bill rate was significant and found to be negatively correlated to bond market development when measured by the long term bond with fiscal balance and interest rate spread removed as variables. This inverse relationship is occasioned by the assertion by literature that lower interest rates are good for the development of the bond market (Thotho, 2014).

CHAPTER 5

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The role of the bond market in economies has become increasingly important in mobilising local funds as it is one of the main channels for providing capital to governments and corporates. Since Swaziland economy is largely dependent on external funding this study focused on the factors affecting the development of the local bond market in Swaziland.

Having an efficient local bond market attracts borrowers and investors; those that seek to raise funds through long term debt and those with excess funds they wish to place in debt securities. The local bond market is a platform that brings together different market players with different needs to enhance the maturity match for the debt and improve the fiscal balance of a country. The development of debt market is considered part of the reform of a country's economy from being dependent on foreign funding.

Liquid and well-functioning bond markets can help minimise systemic risks that are a result of integration of global and financial markets, thus great effort has to be made by Swaziland to manage the infiltration of risks through the development of the local debt market.

The development of the local bond market would help introduce the much needed competition to the banking sector and it would allow the transfer of risks within a financial system through

securitisation. The benefits of a well-developed bond market include diversification of risks, improved corporate governance as well as controlled liquidity and pricing risks in an economy.

5.2 Summary Of The Findings

The findings of the study were supported by literature in that the regression analysis revealed that independent variables that are significant and inversely related to the bond market development were size of the economy, fiscal balance, inflation rate, interest rate fluctuation, and banking sector size.

The study found size of the economy and interest rate fluctuation to be negatively correlated to bond market development. Eichengreen and Luengnaruemitchai (2004) also found interest rate variability and size of the economy to be negatively correlated to the development of the local debt market, this was due to the fact that higher interest rates discourage bond market development.

The study found fiscal balance to be positively correlated to bond market development whilst Thotho (2014) found fiscal balance to be negatively correlated to bond market development. And this meant that Swaziland did not use the bond market to finance fiscal challenges.

Mu *et al* (2013) found banking sector size to be inversely related to bond market development because the banking sector and bond markets were competitors in terms of seeking funds from investors.

In the short run the short term debt has no relationship with the independent variables. However in the long run these variables have an impact on the short term debt. The public domestic debt, long term debt and number of listed bonds have a short run relationship with the independent variables. As such, these variables have an impact in the short term.

5.3 Recommendations

Swaziland needs to improve its macroeconomic policies to encourage the development of the bond market in Swaziland. The improvement of the policies should address the volatility of interest rates, to encourage the banking sector to be a means of developing the bond market.

The policies that Swaziland has to look into should speak to the heavy reliance of the country on the banking sector and to stimulate the local economy as well as to promote regional integration in such a way that Swaziland benefits from other countries by getting investors from the region to invest in the local bond market. Swaziland needs to formulate policies that will allow the country better access to both regional and international investors to invest in the local bond market. There is a need for Swaziland to learn from other African states, and other economies around the world in order to benefit from their experiences as well as ascertain how some countries have managed to reduce foreign debt by developing the local bond market.

Swaziland needs to address the capital control policies that will be aimed at minimising capital flight by creating more lucrative instruments that will attract foreign investors locally. There is a need for Swaziland to review its trade openness policies and look into ways to curb the large

outflow of funds and devise ways that will make the local bond market attractive to the investors.

Swaziland needs to develop a policy that involves both the private sector and public sector in order to promote better public debt management as well as foster institutional and infrastructure development using locally sourced funds. Swaziland should make deliberate efforts to formulate policy that supports the development of long term debt instruments because the shorter term exposes the government to a higher turnover rate. Swaziland should look into a policy that will encourage the funding of the fiscal balance from the internally sourced fund through developing the local bond market.

Swaziland needs to approach the bond market development issue by separating the different kinds of bonds and formulating policies that will separately and individually address the shortcomings of the Swaziland market in the development space as far as the local bond market is concerned and in so far as addressing the inflation challenges faced by the country.

5.4 Further Research

The study of the factors affecting the development of the Swaziland local bond market is just a start. There is a lot of ground that can be covered to undertake further empirical work in this topic such as finding more factors that were identified by previous literature and testing whether these also relate to the Swaziland bond market.

There may be further studies that can separate the government bond market from the corporate bond market and ascertain which factors are significant for each of these types of local debt securities. There is also room to further test the effect of the variables by using other models to scrutinize the relationship of the variables to bond market development in Swaziland.

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ANNEXURE

Table 9: Regression without GDP (size of the economy) and Tbills (interest rate fluctuation)- dependant variable: public domestic debt

Dependent Variable: LPUBLIC_DOMESTIC_DEBT AS A RATIO OF GDP				
Method: Least Squares				
White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.2121	2.3986	0.0884	0.9298
LEXCHANGE_RATE	0.0727	0.1904	0.3817	0.7040
LTRADE_BALANCE	0.3206	0.2333	1.3742	0.1742
LCAPITAL_ACCOUNT	0.2421	0.2360	1.0256	0.3089
LTOTAL_PUBLIC_DEBTGDP	138.4292	125.7443	1.1009	0.2751
LBANKING_SECTOR	-1.2920	4.9059	-0.2634	0.7931
LCPI**	-0.2289	0.1201	-1.9064	0.0611
LPUBLIC_DOMESTIC(-1)	0.3455	0.2388	1.4467	0.1529
LPUBLIC_DOMESTIC (-2)	0.1308	0.2187	0.5982	0.5518
LPUBLIC_DOMESTIC (-3)	-0.1075	0.1321	0.8137	0.4188
R-squared	0.3471	Prob(Wald F-statistic)		0.0213
Adjusted R-squared	0.2348	Prob(F-statistic)		0.0021
F-statistic	3.0927	Durbin-Watson stat		1.8310

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness; **fiscal balance-** Fiscal Balance ;; **trade balance –** Trade openness; **total public debt –** total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate; , **int spread-** Interest rate spread, **public domestic debt-** dependant variable : public domestic debt

Table 10: Regression without GDP (size of the economy) and Tbills (interest rate fluctuation) – dependant variable: short term debt

Dependent Variable: DBILL AS A RATIO OF GDP Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.6675	1.8624	0.8953	0.3740
LBANKING_SECTOR	0.2291	0.3508	0.6532	0.5159
LCAPITAL_ACCOUNT	-115.0568	104.7968	-1.0979	0.2764
LINT_SPREAD	-0.2968	0.2412	-1.2305	0.2230
LFISCAL_BALANCE	-18.3066	21.0595	-0.8693	0.3879
LTRADE_BALANCE	-0.5548	0.4513	-1.2293	0.2234
LTOTAL_PUBLIC_DEBTGDP	0.0699	0.0632	1.1062	0.2728
LEXCHANGE_RATE	0.1858	0.2239	0.8299	0.4097
LCPI	0.2105	0.1888	1.1144	0.2693
DBILL(-1)	-0.0329	0.0533	-0.6165	0.5397
DBILL(-2)	-0.0344	0.0476	-0.7225	0.4726
DBILL(-3)	-0.0155	0.0181	-0.8583	0.3940
R-squared	0.1296	Prob (F-statistic)		0.5764
Adjusted R-squa	-0.1200	Prob(F-Statistic)		0.9619
F-statistic	0.8666	Durbin-Watson stat		1.8850

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness; **fiscal balance-** Fiscal Balance ; ; **trade balance –** Trade openness; **total public debt –** total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate; , **int spread-** Interest rate spread, **dbill-** dependant variable : short term debt

Table 11: Regression without GDP (size of the economy) and T-bills (interest rate fluctuation) – dependent variable: long term debt

Dependent Variable: DBOND Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.6593	1.6698	1.5926	0.1162
LBANKING_SECTOR***	-0.2102	0.1254	-1.6765	0.0985
LCAPITAL_ACCOUNT	-149.1814	159.6542	-0.9344	0.3536
LINT_SPREAD	-0.0719	0.1238	-0.5805	0.5636
LFISCAL_BALANCE	-2.4681	4.8423	-0.5097	0.6120
LTRADE_BALANCE	-0.3310	0.2643	-1.2525	0.2149
LTOTAL_PUBLIC_DEBTGDP	-0.0632	0.0700	-0.9028	0.3700
LEXCHANGE_RATE	-0.0940	0.1935	-0.4858	0.6288
LCPI***	0.1919	0.1107	1.7341	0.0877
DBOND(-1)	0.0314	0.0548	0.5742	0.5679
DBOND(-2)	0.0523	0.0867	0.6030	0.5486
DBOND(-3)	-0.0942	0.0786	-1.1984	0.2352
R-squared	0.2312	Prob(Wald F-statistic)		0.7625
Adjusted R-squared	0.0991	Prob(F-statistic)		0.0823
F-statistic	1.7501	Durbin-Watson stat		1.9916

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account**- Capital Account openness; **fiscal balance**- Fiscal Balance ; ; **trade balance** – Trade openness; **total public debt** – total public debt /GDP ; **exchange rate**- exchange rate volatility; **cpi**- Inflation rate; , **int spread**- Interest rate spread, **dbond**- dependant variable : long term debt

Table 12: Regression without GDP (size of the economy) and T-bills (interest rate fluctuation) – dependant variable: number of issued listed securities

Dependent Variable: LISTED_SECURITIES				
Method: Least Squares				
White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	0.9835	0.2794	3.5205	0.0008
LBANKING_SECTOR	-0.0108	0.0208	-0.5187	0.6056
LCAPITAL_ACCOUNT	-9.8908	20.5149	-0.4821	0.6312
LINT_SPREAD	-0.0065	0.0272	-0.2405	0.8107
LFISCAL_BALANCE*	-1.4148	0.6035	-2.3443	0.0219
LTRADE_BALANCE	-0.0099	0.0333	-0.2979	0.7667
LTOTAL_PUBLIC_DEBTGDP	-0.0119	0.0148	-0.8038	0.4243
LEXCHANGE_RATE	-0.0307	0.0292	-1.0499	0.2974
LCPI	-0.0123	0.0183	-0.6703	0.5049
R-squared	0.1621	Prob(F-statistic)		0.1156
Adjusted R-squared	0.0663	Prob(Wald F-Statistic)		0.1064
F-statistic	1.6923	Durbin-Watson stat		1.0358

***, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively**

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness; **fiscal balance-** Fiscal Balance ; **trade balance** – Trade openness; **total public debt** – total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate; **int spread-** Interest rate spread, listed securities- dependant variable : listed securities

Table 13: Regression without interest rate spread and fiscal balance – dependent variable: public domestic debt

Dependent Variable: LPUBLIC_DOMESTIC_DEBT AS A RATIO OF GDP Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.5013	10.2839	1.3129	0.1939
LEXCHANGE_RATE	0.3387	0.2248	1.5067	0.1368
LTRADE_BALANCE	0.2192	0.2316	0.9462	0.3476
LCAPITAL_ACCOUNT	146.4413	129.7207	1.1289	0.2632
LTOTAL_PUBLIC_DEBTGDP*	-0.2348	0.0909	-2.5824	0.0121
LBANKING_SECTOR	0.2438	0.4006	0.6087	0.5449
LCPI	-0.0289	0.1327	-0.2180	0.8282
LGDP	-5.5699	3.8929	-1.4308	0.1574
LTBILLS	0.0388	0.1702	0.2282	0.8202
LPUBLIC_DOMESTIC_DEBT(-1)	0.3098	0.2302	1.3455	0.1832
LPUBLIC_DOMESTIC_DEBT(-2)	0.1264	0.2093	0.6039	0.5480
LPUBLIC_DOMESTIC_DEBT(-3)	-0.1195	0.1212	-0.9858	0.3279
R-squared	0.3869	Prob(Wald F-statistic)		0.0032
Adjusted R-squared	0.2815	Prob(F-statistic)		0.0005
F-statistic	3.6713	Durbin-Watson stat		1.7674

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness;; **gdp-** Size of the Economy; **tbills-** Interest rate fluctuation; **trade balance –** Trade openness; **total public debt –** total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate;; **pub domestic debt-** **dependant variable :** public domestic debt

Table 14: Regression without interest rate spread and fiscal balance –dependant variable: short term debt

Dependent Variable: DBILL AS A RATIO OF GDP Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.0456	11.7009	1.3713	0.1751
LBANKING_SECTOR	0.1345	0.2643	0.5087	0.6127
LCAPITAL_ACCOUNT	-94.9519	104.2506	-0.9108	0.3658
LGDP	-5.4759	3.9473	-1.3872	0.1702
LTBILLS	-0.1730	0.1588	-1.0893	0.2801
LTRADE_BALANCE	-0.4526	0.3823	-1.1839	0.2408
LTOTAL_PUBLIC_DEBTGDP	0.0597	0.0608	0.9813	0.3301
LEXCHANGE_RATE	0.0589	0.1077	0.5472	0.5862
LCPI	0.2085	0.1677	1.2437	0.2181
DBILL(-1)	-0.0284	0.0348	-0.8157	0.4177
DBILL(-2)	-0.0119	0.0239	-0.4992	0.6193
DBILL(-3)	-0.0090	0.0159	-0.5676	0.5723
R-squared	0.0634	Prob(Wald F-statistic)		0.8682
Adjusted R-squared	-0.0971	Prob(F-statistic)		0.9526
F-statistic	0.3963	Durbin-Watson stat		1.9713

***, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively**

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness;; **gdp-** Size of the Economy; **tbills-** Interest rate fluctuation; **trade balance** – Trade openness; **total public debt** – total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate; **dbill** - dependant variable : short term debt

Table 15: Regression without interest rate spread and fiscal balance- dependant variable: long term debt

Dependent Variable: DBOND AS A RATIO OF GDP Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C**	18.669	9.0320	2.0670	0.0428
LBANKING_SECTOR***	-0.2421	0.1418	-1.7074	0.0926
LCAPITAL_ACCOUNT	-136.5220	126.2296	-1.0815	0.2835
LGDP**	-6.5562	3.2450	-2.0204	0.0475
LTBILLS**	-0.1675	0.0900	-1.8615	0.0673
LTRADE_BALANCE	-0.3149	0.2283	-1.3796	0.1725
LTOTAL_PUBLIC_DEBTGDP	-0.0709	0.0634	-1.1178	0.2678
LEXCHANGE_RATE	-0.1245	0.1852	-0.6724	0.5038
LCPI**	0.2410	0.1155	2.0863	0.0409
DBOND(-1)	-0.0068	0.0459	-0.1488	0.8821
DBOND(-2)	0.0284	0.0583	0.4874	0.6276
DBOND(-3)	-0.1419	0.0913	-1.5536	0.1252
R-squared	0.3442	Prob(Wald F-statistic)		0.2448
Adjusted R-squared	0.2315	Prob(F-statistic)		0.0024
F-statistic	3.0542	Durbin-Watson stat		2.0410

***, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively**

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness; **gdp-** Size of the Economy; **tbills-** Interest rate fluctuation; **trade balance** – Trade openness; **total public debt** – total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate; **dbond-** dependant variable : long term debt

Table 16: Regression without interest rate spread and fiscal balance- dependant variable: number of listed securities

Dependent Variable: LISTED_SECURITIES Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	4.0795	1.5863	2.5716	0.0122
LBANKING_SECTOR	-0.0170	0.0221	-0.7687	0.4447
LCAPITAL_ACCOUNT	-7.3482	17.753	-0.4139	0.6802
LGDP*	-1.2590	0.5881	-2.1408	0.0358
LTBILLS	0.0017	0.0201	0.0827	0.9343
LTRADE_BALANCE	-0.0053	0.0338	-0.1571	0.8756
LTOTAL_PUBLIC_DEBTGDP***	-0.0130	0.0076	-1.7181	0.0902
LEXCHANGE_RATE	-0.0350	0.0298	-1.1742	0.2443
LCPI	-0.0081	0.0183	-0.4438	0.6585
R-squared	0.2427	Prob(Wald F-statistic)		0.0112
Adjusted R-squared	0.1561	Prob(F-statistic)		0.0094
F-statistic	2.804	Durbin-Watson stat		1.1096

*, **, *** denotes probability value that is significant at the level of 1%, 5% and 10% confidence respectively

Legend

Banking sector- Banking sector size; **capital Account-** Capital Account openness;; **gdp-** Size of the Economy; **tbills-** Interest rate fluctuation; **trade balance –** Trade openness; **total public debt –**total public debt /GDP ; **exchange rate-** exchange rate volatility; **cpi-** Inflation rate;; **listed securities- dependant variable :** listed securities

