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The relationship between Macroeconomic Variables and Capital Structure Decisions: Empirical Evidence from Botswana and Mauritius.

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Masters of Management in Finance and Investments

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at the

UNIVERSITY OF THE WITWATERSRAND

DECLARATION

I, Ngodya Chimbwete declare that the research work reported in this dissertation is my own, except where otherwise indicated and acknowledged. It is submitted for the degree of Master of Management in Finance and Investment at the University of the Witwatersrand, Johannesburg. This thesis has not, either in whole or in part, been submitted for a degree or diploma to any other universities.

Signature of candidate: Date:

Abstract

The relationship between the impact of macroeconomic variables and capital structure decisions has been extensively researched through the years and across many countries. Despite the extensive research done, these studies have not been conclusive. This research paper studies this relationship of the impact of selected macroeconomic variables on the capital structure of companies in Botswana and Mauritius. These countries were chosen due to their differences in economic structure; Botswana has been seen to be a resource-based economy whilst Mauritius has been seen to been diversified economy. Furthermore, Stock Market Capitalization (MC) and Credit Growth in each country, were used as proxies for capital structure decisions. Results were both in support of and contrary to the theory and therefore arrived at the conclusion that because Botswana and Mauritius are subjected different economic dynamics (resource-based and diversified economies) it can be inferred that firms in the various countries will need to adjust their capital structures depending on how these variables interact within their respective economies.

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Contents

1. Introduction 8

1.1 Statement of the problem 10

1.2 Literature Review 12

1.2.1 Capital Structure theories 12

1.2.2 Economic Growth and the Financial system 13

1.2.3 Impact of Macroeconomic variables on capital structure choice theories. 15

1.3 Research questions 16

1.4 Hypothesis 16

1.5 Objectives of the study 17

1.6 Methodology 17

1.7 Outline of the Study 17

2. Introduction to Sub Saharan Africa Economies 18

2.1 SSA Economies 18

2.1.1 Resource Based Economies 19

2.1.2 Diversified Economies 20

3 Profiles of Stock Market and the country 22

3.1 Botswana 23

3.1.1 Stock Market 23

3.1.2 Banking sector 24

3.1.3 The Economy 27

3.1.4 External Position 28

3.1.5 Monetary Policy 29

3.1.6 Business Environment 30

3.2 Mauritius 30

3.2.1 Stock Market 31

3.2.2 Banking sector 32

3.2.3 The Economy 34

3.2.4 External Position 35

3.2.5 Monetary Policy 36

3.2.6 Business Environment 37

3.2.7 Similarities in the chosen Markets 38

4 Conceptual Framework 40

4.1 Stock Market Capitalization 40

4.1.1 GDP 42

4.1.2 Interest rates 42

4.1.3 Inflation 42

4.1.4 Exchange rate 42
4.2 Macroeconomic Transmission channel to bank lending 43
4.2.1 GDP 43
4.2.2 Interest rates 43
4.2.3 Inflation 44
4.2.4 Exchange rate 44
4.3 Conclusion of the Macroeconomic Analysis 44
5 Methodology for the Econometric Analysis **45**
5.1 Data limitations 45
5.2 Panel Data ..... **Error! Bookmark not defined.**
5.3 Unit Root Analysis 45
5.3.1 Augmented Dickey Fuller Unit Root Test 45
5.4 Lag Length 46
5.5 Co-integration Analysis ..... **Error! Bookmark not defined.**
5.5 Granger Causality 46
5.6 Vector Autoregression (VAR) 47
6 Econometric Analysis of Macroeconomic Environment on Market Capitalization and Credit Growth **49**
6.1 Descriptive Statistics 49
6.2 Unit Root Tests 49
6.3 Vector Autoregressive Modelling (VAR) 51
6.3.1 Optimal Lag Length 51
6.3.2 Vector Autoregressive Models 54
6.3.3 Diagnostic Testing 55
6.4 Impulse Response Functions and Variance Decomposition 55
6.4.1 Impulse Response Functions 55
6.4.2 Variance Decomposition 58
6.5 Summary of Chapter 61
7 Findings and Conclusions **63**
7.1 Introduction 63
7.2 Findings and Conclusions 63
8. References **65**

List of Figures and Tables

Fig.1 Value Added (Services) and the Herfindahl Index……19

Fig.2 The business environment, Macroeconomy, Stock Market and Credit Market……22

Fig.3 Market Capitalisation (%of GDP) and Turnover Ratio……..24

Fig.4 Number of Listed Companies and Market Capitalization (USD 'Billions)……..24

Fig.5 Banking Sector Total Assets vs GDP……25

Fig.6 Banking sector: Loan Book (USD'billion) vs NPL ratio vs Loan Book Growth……...26

Fig.7 Financial Sector Size and Depth Indicators……...26

Fig.8 Real GDP Growth……..28

Fig.9 Trade Balance vs Market Capitalisation vs Corporate Credit……..29

Fig.10 Average Annual Inflation vs Prime lending rate vs Stock Market Index……...29

Fig.11 Market Capitalisation (%of GDP) and Turnover Ratio……32

Fig.12 Number of Listed Companies and Market Capitalization (USD 'Billions) (Combined SEM and DEM)….....32

Fig.13 Banking assets (% of GDP) vs Bond (% of GDP)……33

Fig.14 Banking sector: Loan Book (USD'billion) vs NPL ratio vs Loan Book Growth……..33

Fig.15 Nominal GDP vs Total Banking Loans vs Market Capitalization (USD'billion)……34

Fig.16 Growth: Real GDP vs Total Banking Loans vs Market Capitalization (%)……...35

Fig.17 Balance of trade Total Banking Loans vs Market Capitalization (USD'billion)……36

Fig.18 Growth: MUR-USD vs Total Banking Loans vs Market Capitalization (%)…….....36

Fig.19 M2 Supply vs Market Capitalisation vs Total Banking Loan book (as % of GDP)……...37

Fig.20. Average Annual Lending Rate vs Average Annual Inflation (%)……..37

Fig.21. Macroeconomic Variables and the Discounted Cash Flow Model……..41

Fig.22. Botswana MC and Banking Sector Loan Book Growth Impulse response to GDP…...56

Fig.23. Botswana MC and Banking Sector Loan Book Growth Impulse response to Lending Rate……..56

Fig.24. Botswana MC and Banking Sector Loan Book Growth Impulse response to Exchange Rate.....57

Fig.25. Mauritius MC and Banking Sector Loan Book Growth Impulse response to GDP……57

Fig.26. Mauritius MC and Banking Sector Loan Book Growth Impulse response to Lending Rate……..57

Fig.27. Mauritius MC and Banking Sector Loan Book Growth Impulse response to Exchange Rate…...……...57

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Table.1 Botswana Descriptive Statistics……..49

Table.2 Mauritius Descriptive Statistics……...49

Table.3 Botswana variables Unit Root Test: ADF……..50
Table.4 Mauritius variables Unit Root Test: ADF ……..50
Table.5 Botswana MC and GDP Lag Order Selection……...52
Table.6 Mauritius MC and GDP Lag Order Selection……..…52
Table.7 Botswana Banking sector loan book growth and GDP Lag Order Selection……....52
Table.8 Mauritius Banking sector loan book growth and GDP Lag Order Selection……..…52
Table.9 Botswana MC and Lending rate Lag Order Selection……..…….…52
Table.10 Mauritius MC and Lending rate Lag Order Selection……..…52
Table.11 Botswana Banking Sector Loan Book Growth and Lending rate Lag Order Selection……..52
Table.12 Mauritius Banking Sector Loan Book Growth and Lending rate Lag Order Selection……..……53
Table.13 Botswana MC and USD/BWP exchange rate Lag Order Selection……..…53
Table.14 Mauritius MC and USD/MAU exchange rate Lag Order Selection……..…53
Table.15 Botswana Banking Sector loan book growth and USD/BWP exchange rate Lag Order Selection……..53
Table.16 Mauritius Banking Sector loan book growth and USD/MAU exchange rate Lag Order Selection…….53
Table.17 Botswana LM Test……..55
Table.18 Mauritius LM Test……..……55
Table.19 Botswana MC Variance Decomposition……..58
Table.20 Mauritius MC Variance Decomposition ……..59
Table.21 Botswana Banking Sector Loan Book Growth Variance Decomposition..……..……59
Table.22 Mauritius Banking Sector Loan Book Growth Variance Decomposition ……..…...59
Table.23 Botswana Granger Causality: MC and GDP……..….59
Table.24 Botswana Granger Causality: MC and Lending Rate……..…..60
Table.25 Botswana Granger Causality: MC and Exchange Rate……..……60
Table.26 Botswana Granger Causality: Loan Book Growth and GDP……..…..60
Table.27 Botswana Granger Causality: Loan Book Growth and Lending Rate……..……60
Table.28 Botswana Granger Causality: Loan Book Growth and Exchange Rate……..……60
Table.29 Mauritius Granger Causality: MC and GDP……60
Table.30 Mauritius Granger Causality: MC and Lending Rate……..……60
Table.31 Mauritius Granger Causality: MC and Exchange Rate……..……60
Table.32 Mauritius Granger Causality: Loan Book Growth and GDP……..……60
Table.33 Mauritius Granger Causality: Loan Book Growth and Lending Rate……...……61
Table.34 Mauritius Granger Causality: Loan Book Growth and Exchange Rate……61

1. Introduction

Anywhere in the world, the ability and the choice of financing is a pertinent decision regarding the financial stability and going concern of a firm. Essentially it is impossible for a firm to achieve its long-term and short-term goals without effectively managing its financing, in-turn its capital structure. Capital structure refers to the different options used by a firm in financing its assets (Bhaduri, 2002) to ultimately attain managerial goals of the maximization of the firm's market value. The optimal capital structure is also defined as the combination of debt and equity that minimizes the firm's overall cost of capital. These financing decisions, however, have a significant impact on the success of a business. Financing is important for firms because it helps in the expansion of operations, innovation, and investing in production facilities and new staff (OECD, 2006b). The debt-equity decision is one of the most researched areas in finance and capital structure determinants have been centre of most discussions in the past decades. Based on these capital structure theories, numerous studies confirmed that asset-structure, tax shield, firm size, liquidity, profitability, growth, product uniqueness and risk are the key attributes that are firm specific that directly impact toward determining the capital structure of firms (Titman & Wessels, 1988; Samarakoon, 1999). To a certain extent, these are factors that are within the firm's managements control. However, Frank and Goyal (2003) deduced that around 30 percent of differences in the capital structure inside the country can be explained by internal determinants, which postulates that there are other factors other than internal determinants influencing financing choices (Bokpin, 2009). These include external conditions such as the macroeconomic environment. Hackbarth et al (2006) discovered that macroeconomic conditions have considerable impacts on a firm's target capital structure. While internal factors and their impacts can be managed by the firm, macroeconomic factors cannot be controlled by managers and both determinants significantly affect corporate capital structure. Therefore, it is vital that that one grasps the influences that determines a firm's ideal capital structure and the conditions that measure the limitations on a firm's ability to raise external capital.

It has been well acknowledged that the 2008 Global Financial crisis impacted financial systems of African countries in various ways, depending on the idiosyncratic economic structures of the different countries. According to the World Bank, banks have increased their collateral/deposit requirements, widened their spreads and re-focused their portfolios on blue-chip companies, making access to credit even more difficult for SMEs (World Bank 2009). The crises amplified margins applied to loans in the international markets, forcing some governments to turn instead to local markets to fund increased fiscal deficits (World Bank 2019) in turn crowding out the private sector from accessing bank funding. In addition, the slowdown in economic activity mostly caused by the steep decline in commodity prices, resulted in rising nonperforming loans, have also been cited as primary reasons for the deceleration in lending to the private sector (AfDB, 2009). Essentially, the macroeconomic

environment since the global financial crisis in 2008 seems to be influencing the supply side of credit by banks to firms for investment or operations. Given banks reluctance to lend, government paper often represents a viable investment opportunity for African banks, especially in turbulent periods with rising risk-aversion on the part of banks (World Bank 2009).

There is a fair amount of literature, especially in the context of developing countries, on the crowding out of private credit by government borrowing from the domestic banking sector and its negative effects on private investment. A study by Samah Shetta and Ahmed Kamaly (2014) suggested that government borrowing crowds out private investment through its dampening effect on private credit. As the government issues more debt instruments to finance its growing deficit, banks shift their portfolio away from risky private loans and opt for lazy behavior characterized by a shifting overall credit more and more toward government debt-instruments (Samah Shetta & Ahmen Kamaly, 2014). According to the study, this behaviour not only limits their exposure to the private sector, hence reducing private investment, but also adversely affects investment and hence overall growth potential. Intuitively this suggests that as fiscal pressures mount due reduced fiscal revenues caused by a sluggish macroeconomic environment, crowding-out the private sector by governments domestic borrowings from local banks negatively affects the supply of credit to the private sector.

The media has been reporting that corporations in South Africa have been hoarding significant cash balances recent times. Since 2006, there have been several reports about the level of cash holding of South African firms, and this number has grown from ZAR 300 billion in 2006 to ZAR 570 billion in 2013. A report by Intellidex showed that when the economy is doing poorly, firms hold more cash relative to assets, indicating that firms are motivated primarily by caution in the face of difficult conditions, increasing cash holdings in order to absorb any negative earnings shocks. That is to say that the macroeconomic environment that has been from the 2008 global financial crisis seems to be dictating they way companies have been making their investments. Companies will only invest when there are profitable opportunities to do so, with a net present value higher than low-risk returns on cash (Tambo & Theobald, 2017).

Some authors have argued that, managers of excess cash companies may deploy excess cash in value destroying activities (Harford, 1999). This conclusion was supported by Jensen and Meckling's agency theory (1976) stating that because of the separation of ownership and control, negligence often prevails in the management of listed companies. Whilst on the other hand, some have argued that asymmetric information makes obtaining funds difficult and expensive, and companies prefer to retain cash, thus reducing the costs associated with the external dependence on financing (Kim at al., 1998). It has been further argued that maintaining enough reserves is necessary to effectively cope with future financial emergencies or constraints without selling assets or raising external financing (Keynes, 1936). Essentially, as the economic environment recovers, firms can deploy their excess cash to fund

opportunistic investments in the market. Furthermore, the rate of growth in the gross domestic product (GDP) of the country is essential for effective and sound decision making of firm's financial policies (Riaz et al., 2014). Therefore implying that macroeconomic condition have an influence on how financing decisions are made by managers.

After Modigliani and Miller's (1958) publication of the ground breaking "irrelevance theory of capital structure" about five decades ago that debated that a firm's leverage has no effect on the market value of the firm, the study of corporate capital structure has been a study of interest to finance academia. The debate of the aforementioned publication persisted, and over the years a number of other theories of capital structure developed which deviated from the assumption of perfect capital markets under which the "irrelevance model" is premised (Kraus & Litzenberger, 1973; Myers & Majulf , 1984; Bakers & Wurgler, 2002). Furthermore, most capital structure determinants research has been conducted on developed economies and more research is required for the developing economy context, especially in Africa. Although there have been a few studies on capital structure choice in some African countries (Gwatidzo and Ojah, 2009; Bokpin, 2009; Doku, Adjasi and Sarpong-Kumanjuma, 2011), however these did not emphasis on the implication of prevailing macroeconomic conditions. There is no universally accepted theory which can fully explain a firm preference in choosing the financing source (Camara, 2012). The aim of this study is to add to the debate by examining the impact of macroeconomic variables on financing decisions of companies operating in Botswana and Mauritius.

1.1 Statement of the problem

Despite the extensive research done on the area of capital structure since Modigliani and Miller (1958) and Myers (1977) published their papers, understanding in the area remains inconclusive (Al-Najjar & Hussainey, 2011). Deesomak et al (2004) found that empirical evidence on the effect of determinants on leverage is mixed and inconsistent while Beattie et al (2006) found that understanding in the area remains incomplete. Myers (2001) stresses that there is no universal theory of debt-equity choice and there is no reason to expect one. The reason may be because these theories differ in their emphasis (Razali Haron, 2014). They emphasize that no theory is able to independently explain the complexity in the determination of capital structure. Considering that the problem of inconsistent empirical findings keeps recurring in the literature provides scope for further research on whether capital structure decisions are impacted by a combination of internal and external conditions.

Various studies have been proposed on how firms determine their capital structures, however the studies on firm-specific determinants and the impact of macroeconomic variables on capital structure have not been conclusive, and different researchers have arrived at different conclusions while considering similar factors. This is most likely because only the demand side of capital by corporates is largely investigated instead of investigating both the demand side as well as the supply of capital by financial institutions. According to Gaud, Hoesli and Bender (2007), after 40 years of capital structure research , no single theory fully details how

managers establish their leverage policies. Furthermore, most capital structure determinants research has been conducted on developed economies and more research is required for the developing economy context, especially in Africa. There has been a few studies on capital structure choice in some African Countries (Gwatidzo & Ojah, 2009; Bokpin, 2009; Doku, Adjasi & Sarpong-Kumanjuma, 2011), however these did not emphasis on the implication of prevailing macroeconomic conditions. For example, Gwatidzo & Ojah (2009) discovered that tangibility profitability and tangibility of assets is negatively related to leverage for most of the sample countries in their study. This was attributed to more profitable firms tending to use retained earnings and due to the apparent lack of contract enforceability within the sample countries. This provides further scope to investigate on how capital structure decisions in certain African countries are impacted by the combination of demand side and supply side factors.

Given that no specific study known to the researcher has attempted to examine the effects of various macroeconomic variables on the capital structure of companies operating in Botswana and Mauritius. This study's objective is to examine the relationship between macroeconomic variables and market capitalization and credit growth, therefore provide new evidence about capital structure theories. Market capitalization and credit growth are used as proxies for financial development of one can infer to capital structure. The assumption underlying the use of market capitalization as an indicator of stock market development is that the size of the stock market is positively correlated with the ability to mobilize capital and diversify risk (Levine, 1996). The reason why these economies were chosen is because they are each impacted differently by external shocks by virtue of Mauritius being more diversified then Botswana. Therefore, each country has unique opportunities and challenges with regards to the macroeconomic environment and how firms raise capital. Due to the many risks associated with being highly dependent on a limited number of resources, a diversified economic structure is something that in principle is desirable. To foster and maintain a diversified economy, mechanisms for efficiently allocating investment resources across and not merely within economic sectors are important. To allow for this process, it is crucial to set up a framework allowing the development of a sound banking sector and strong stock markets.

This study prompts the questions: what are the effects of GDP growth on market capitalization and credit growth in Botswana and Mauritius? What are the effects of interest rates on market capitalization and credit growth in Botswana and Mauritius? What are the effects of exchange rates on capital structures of firms in Botswana and Mauritius?

To this end, the purpose of this paper is to contribute to the studies aforementioned and test these theoretical formulations on Botswana and Mauritius capital markets. The study intends to act as a source of reference and information to other researchers to develop on the topic of macroeconomics and capital structure nexus. The ultimate goal of this study is to form an empirical reference on which firm managers and policy makers are able to lean

macroeconomic variables relate to capital markets and credit extension in Botswana and Mauritius.

1.2 Literature Review

The literature review will establish and the theoretical basis of the thesis. From this review, we will be able to identify how the macroeconomic environment and financial systems relate.

1.2.1 Capital Structure theories

In the modern sense, Modigliani and Miller (1958) instigated the capital structure debate, with the publication of their "irrelevance theory of capital structure" theory. Before their publication and findings, there had been no commonly accepted theory of capital structure. The theory brought to existence the well-known MM propositions I and II. Proposition I postulated that when a firm chooses a certain allocation of debt and equity to finance its operations, it divides its cash flows generated amongst its investors. It assumes that investors and firms have equal access to capital markets, allowing for homemade leverage therefore investors can make and remove leverage offered or not offered to them. As a result, the leverage of a firm has no effect on the market value of the firm. Proposition II postulates that the expected return on equity of a firm changes linearly with the firm's leverage ratio (i.e. measured by its debt to equity ratio). The expected return on equity is equal to the expected return on equity of an unlevered firm plus a premium related to the financial risk (which premium equals to the debt equity ratio times the spread between the return on equity of an unlevered firm). This proposition suggests that any substitution of debt with equity of the other way around should not affect the firm's cost of capital. The introduction of more debt in the capital structure to reduce the overall weighed average cost of capital (WACC) should increase the risk of financial distress and/or default risk. WACC is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted. All capital sources include- common stock, preferred stock, bonds and other long-term debt are included in the WACC calculation. Therefore, the increased financial distress will lead to equity capital providers demanding a premium for their capital and hence there is no reduction in the firm's WACC because of it raising more (less expensive) debt. Essentially, the use of leverage has no effect on the firms WACC, and an investment decision can be isolated from the firms financing decision.

Since the publication of this journal, research had been devoted to disapproving the theory and has shown that the MM-theorem fails under a variety of circumstances. Most commonly circumstances include the consideration of taxes, transaction costs, bankruptcy costs, agency conflicts, adverse selection, market timing and investor clientele effects. Alternative models using different elements from this list gave birth to different theories being proposed.

The trade off-theory which grew out of the debate over the MM theorem proposed that value maximizing firms choose appropriate levels of debt finance by balancing tax benefits of debt against financial distress related costs of debt, such as bankruptcy and agency costs (Berens and Cuny, 1995; Myers, 1984 and 2003). Debt has the advantage of a debt tax shield while

one of the disadvantages of debt is the cost potential financial distress especially when the firm relies on too much debt. However, there are more cost and benefits involved with the use of debt and equity. One other major cost consists of the agency cost. Agency costs arise from conflicts of interest between the different stakeholders of the firm because of information asymmetry (Jensen and Meckling, 1976 and Jensen, 1986). Therefore, incorporating agency costs into the trade-off theory implies that a firm determines its capital structure by trading off the tax advantage of debt against the cost of financial distress off too much debt and the agency cost of debt against the agency cost of equity.

The pecking order theory states that firms prefer using internal capital (such as retained earnings) instead of external finance. If internal funds are insufficient to finance investment opportunities, firms look for external financing and if when do they will look for external financing sources that minimize additional costs of information asymmetry. Myers and Majluf (1984) proposed that 'outside investors rationally discount the firm's stock price when managers issue equity instead of riskless debt and to avoid this discount, managers avoid equity whenever possible. In the absence of investment opportunities, firms retain profits and build up financial slack to avoid having to raise external finance in the future'. Empirical tests to see whether the pecking order or the trade-off theory is a better predictor of observed capital structures has found support for both theories of capital structure (Shyam- Sunder and Myers, 1999; Fama and French 2002).

Market timing theory of capital structure argues that firms time their equity issues in the sense that they issue new stock when the stock price is perceived to be overvalued and buy back its own shares when there is under valuation. Consequently, fluctuations in stock prices affect firm's capital structures. Baker and Wrugler (2002) argue that 'due to irrational behaviour there is a time varying mispricing of the stock of the company, and managers issue equity when they believe its cost is irrationally low and repurchase equity when they believe its cost is irrationally high'. The assumption 'is that managers believe that they can time the market'. Baker and Wurgler (2002) provide evidence that equity market timing has a persistent effect on the capital structure of the firm. They find that leverage changes are strongly and positively related to their market timing measure, so they conclude that the capital structure of a firm is the cumulative outcome of past attempts to time the equity market.

1.2.2 Economic Growth and the Financial system

Economic activity interacts with the financial systems via numerous functions in which it enables economic exchange. The financial system plays a critical role in mobilizing funds and transforming them into assets that can better meet the needs of investors. 'Financial intermediaries provide a way to transfer economic resources through time and across geographic regions and industries,' (Merton, 1995) thus allowing investors and firms to borrow against future income and meet current needs.

The growing importance of stock markets around the world has recently opened a new avenue of research into the relationship between financial improvement and economic growth, which focuses on the effects of stock market performance (Arestis, Demetriades and Luintel, 2001:16). The relationship between financial improvement and economic growth and has been debated quite extensively in the literature. Some argue that a well-functioning stock market can have a positive effect on economic growth by assisting in the mobilization of limited resources from the surplus units to the deficit units, thereby promoting efficient allocation of resources and thus lead other economic sectors in their growth process (Enisan and Olufisayo, 2009:16; Caporale and Spagnolo, 2011:870; Levine, 1991; Diamond, 1996; Greenwood and Smith, 1997). In contrast, others maintain that development of stock market is unimportant for econoimlic growth (Alghamedi, 2012; Levine and Zervos, 1996:6; Devereux and Smith, 1994; Wang, 2010).

Growing interest among scholars over the years in the area of the stock market in promoting economic activity has produced different results. The four main alternative perspectives on the relationship between stock market performance and economic growth. The supply-leading view supports that the causal direction goes from stock market development to economic growth. The demand following view supports that stock market development follows economic growth and demands of the real sector. Another view is that stock market development and economic growth have a mutual impact on each other.

Most of the theoretical studies attempt to explain the relationship between stock market performance and economic growth through which financial systems influence the development of the real sector from first view (Zegada, 2011). According to Levine (2005), stock market development is seen as contributing to economic growth through various channels: (i) produce information about possible investments and allocate capital, (ii) monitor investments and exert corporate control, (iii) facilitate diversification and management of risk, (iv) mobilize and pool savings and (v) facilitate the exchange of goods and services. Through changing the quality of these functions, a correctly functioning stock market can influence a steady state of growth by changing the rate of savings, technological progress, and economic efficiency (Alghamedi, 2012).

Atje and Jovanovic (1993) tested the hypothesis that the stock markets have a positive impact on economic growth on a sample of 94 countries for the period between 1970 and 1988. They find a positive relationship between stock market development and economic growth. Equally, studies from Levine and Zervos (1996) by means of using time series regression on 41 countries over the period 1976-1993 show that stock market development is positively related with economic growth. By using the Johansen cointegration technique, Cheung and Ng (1998) established that empirical evidence of a long run relationship between five national stock market indexes and measures of aggregate real activity including the real oil price, real consumption, real money, and real output. In another study, Levine and Zervos (1998)

established that countries with higher stock market capitalization were associated with faster growth of capital and output. Beck and Levine (2004) using GMM methodology in 40 countries between 1976-1998 indicate that stock markets and banks positively influence economic growth. Using a panel VARs for 47 countries over the period 1980-95, Rousseau and Wachtel (2000) showed that stock market liquidity and the intensity of activity in traditional financial intermediaries have a positive impact on per capita output. Boubakari and Jin (2010) explored causality relationship between stock market and economic growth based on time series data compiled from 5 Euronext countries (Belgium, France, Portugal, Netherlands and United Kingdom) for the period 1995:Q1 to 2008:Q4. The results of the study suggest a positive link between the stock market and economic growth for some countries for which the stock market is liquid and highly active.

1.2.3 Impact of Macroeconomic variables on capital structure choice theories.

Studies of the relationship between economic conditions and capital structure choices have produced some enlightening research. This includes, firms that are well positioned in a growing economy are expected to grow and generate profits. As profits grow and are converted into cash, the firm will be expected to fund itself from internally generated cash rather than raising capital externally. This assumption supports the pecking order theory. Understanding of the impact of macroeconomic conditions on the firm's basic capital structure decisions and analysing the impact of macroeconomic factors on the speed of adjustment to the firm's targeted capital structure is an important area of empirical study, as companies are not isolated from the macroeconomic conditions that they operate in.

Mokhova and Zinecker (2014) investigated the influence of macroeconomic factors on corporate capital structures in different European countries. Their sample consisted of corporates from seven European countries as Czech Republic, Slovakia, Poland, Hungary, France, Germany and Greece. Their sample is of interest as it includes both emerging and developed markets firms. The authors analyse the influence of external determinants on the corporate capital structure of non-financial manufacturing companies based on their mixed sample for the period 2006 – 2010, in order to compare the level of the impact on the capital structure according to the countries' specifics. For the authors, managers make their financial decisions according to the source of financing and capital structure based on the company's advantages and disadvantages, i.e. its internal characteristics, and doubtless on the macroeconomic conditions and country specifics, i.e. external factors. The results obtained by Mokhova and Zinecker (2014) vary across countries and depend on corporate debt structure. Thus, in Czech Republic there is a negative significant relation between inflation and total debt ratio and short-term debt ratio. The GDP growth has non-significant weak relation with all proxies of capital structure in all investigated countries, except Greece, where it has significant positive influence on short-term debt ratio. In Slovakia the inflation rate has weak non-significant relation with corporate capital structure, as well as in other countries except France,

where relations are significant but depends on debt structure, and Hungary, where its influence negative but non-significant (Mokhova and Zinecker, 2014).

Korajczyk and Levy (2003) found that target leverage is counter cyclical (i.e. there is a negative relationship between macroeconomic factors and the target capital structure) depending on the type of sample (i.e. constrained firms vs. unconstrained firms). Leveraged firms in the financially unconstrained sample vary counter-cyclically with macroeconomic conditions. Moreover, macroeconomic conditions account for 12% to 51% of the time-series variation in these firms' leverage. Also, Korajczyk and Levy (2003) found that firms in the financially constrained sample have pro-cyclical leverage with macroeconomic conditions accounting for 4% to 41% of the time series variation. This is consistent with balance sheet credit channel models in which constrained firms borrow more when collateral values are highest, that is, following high returns in the equity market or high profits corporates turned to be more attractive to lenders and hence they can take advantage of this window opportunity for borrowing more (Kiyotaki and More, 1997; Suarez and Sussman, 1999).

Gajurel (2005) in a study of the determinates of corporate capital structure of Nepalese companies examined the macroeconomic influences on debt equity ratio of Nepalese companies excluding firms in the finance and banking sectors the periods 1995 to 2004. He regressed capital structure against certain firm specific variables and the macro economic variables (GDP growth rate, inflation and market capitalization to GDP ratio). Results found that macroeconomic variables are significant for firm's capital structure choice specifically he concluded that GDP growth rate is negatively related to total debt ratio and short-term debt ratio and positively related to long term debt ratio. The results indicate that higher economic growth tends to cause firms to use more long-term debt and less short-term debt. These findings were consistent with results from emerging markets (Booth et al, 2001)

1.3 Research questions

Consistent with the research objectives, this research seeks to answer the following questions;

i. What is the relationship between macroeconomic indicators, stock market capitalization and credit growth in Botswana and Mauritius?
ii. Does a chosen set of macroeconomic variables (GDP growth, interest rates and exchange rate) influence market capitalization and credit growth?
iii. Do firms adjust their capital structures differently in Botswana and Mauritius, in response to the macroeconomic environment?

1.4 Hypothesis

- Null hypothesis (H_0): Botswana and Mauritian firm's do respond to macroeconomic variables.

- Alternative hypothesis (H_1): Botswana and Mauritian firm's do not respond to macroeconomic variables.

1.5 Objectives of the study

The proposed study's objectives are as follows:

i. To investigate the ways stock market capitalisation and credit growth respond to changes in certain macroeconomic variables in Botswana and Mauritius by means of cointegration analysis. Therefore, to determine the magnitude and direction of the relationships between the capital structure of firms, GDP, interest rates and exchange rates

ii. To determine whether there are differences as to how firms operating in different countries (namely Botswana and Mauritius) adjust their capital structures in response to the macroeconomic environment.

1.6 Methodology

This study expects to examine the influence of macroeconomic factors on stock market capitalization (MC) and credit growth of companies in Botswana and Mauritius. The empirical study intends to analyse and describe the magnitude and direction of the stock MC and credit growth and their relationship between and macroeconomic variables viz; GDP growth rate, inflation, interest rates and exchange rate, hence it will follow both analytical and descriptive research design. We will test each time series for a unit root test. Will then conduct a co-integration based on these results. Thereafter, we will estimate a VAR model.

1.7 Outline of the Study

The study will be structured in the following manner; Chapter 2 will provide an introduction and give context to the types of economies in Sub- Saharan Africa (SSA). Then Chapter 3 will look at a market research and analysis of the economies, stock markets and banking sectors of the countries chosen for this study. Thereafter chapter 4 will present applicable macroeconomic variables that have been seen to influence cash flows of a company and credit growth, theoretically and empirically. Then we will go on to establish an hypothesis on how macroeconomic variables influence MC and credit growth, while profiles of the economy, stock market and banking sector will be presented. Chapter 5 will outline the econometric model chosen for this study. We will use econometric models to test the hypothesis and then the empirical findings will be illustrated against the hypotheses and theory in Chapter 6. Then ultimately, the conclusion of the thesis will be presented in Chapter 7.

2. Introduction to Sub Saharan Africa Economies

This section is to familiarize ourselves to the SSA economies, stock market and credit market. Furthermore, we will present information on the background the SSA economies relevant for this study by distinguishing between resource-based economies and diversified economies. This allows us to comprehend the background of the macroeconomic and financial analysis that follows in other sections of the study.

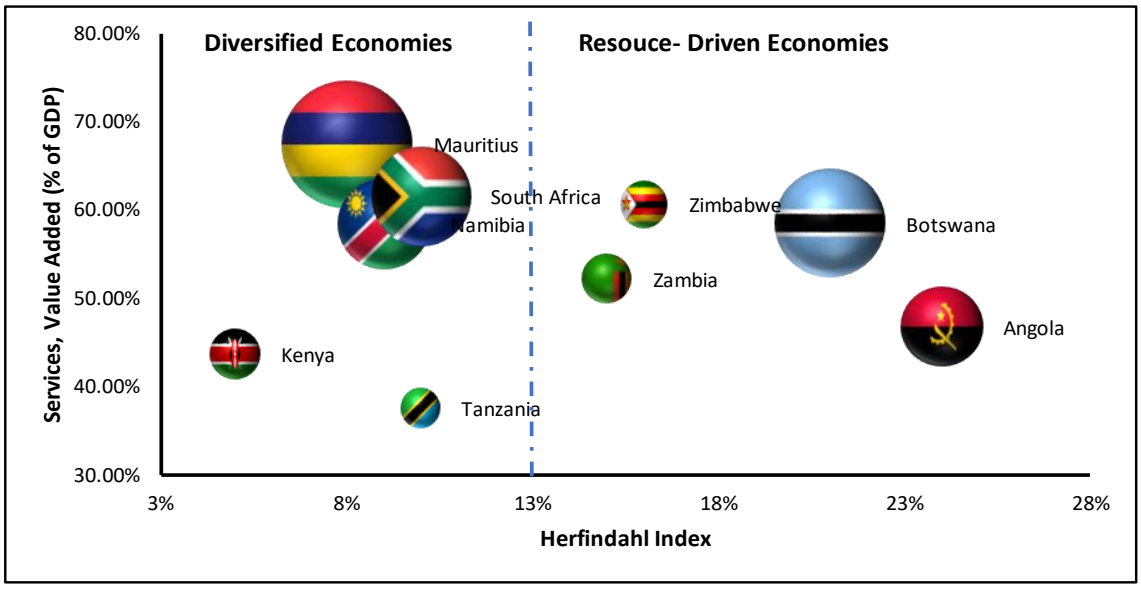
2.1 SSA Economies

SSA covers a very diverse group of economies. According to Leke (2010), SSA has generally two types of economies, namely; Diversified and resource based economies. There are unique opportunities and challenges in each type of economy which are discussed in the following section.

In distinguishing between the various types outlined above, we will use the Herfindahl Index and value added from services as a percentage to GDP is used. The Herfindahl Index is a measure of export concentration. The Herfindahl-Hirschman index (HHI) is a measure of the export concentration extent within an economy as a percentage. High HHI values show that exports are concentrated in fewer sectors. Fig.1 below illustrates that a diverse export pattern tends to be associated with a high value added from the services sector. Therefore, this model can be used to differentiate between economies with exports concerted on a certain commodity and with diversified exports and a significant and diverse service sector.

The average of Herfindahl Index of the economies below is 13% illustrated by the dotted vertical line in the graph. The size of each country/circle in Fig.1 is relative to the size of the economies GDP per capita of which Mauritius is seen to have the highest. The economies to the left of the dotted line are relatively more diversified and export a range of goods and services. In contrast, the economies to the right of the dotted line are primarily resource-driven and hence are mainly dependent on a small quantum of resources. More so, the economies on the left also demonstrate significant contribution from value added to the GDP from the services sector. Domestic services including; financial services, telecommunications, food, tourism and construction, to name a few. Fig.1 also demonstrates that the economies that have a high value added from services to its GDP also have a diverse portfolio of export products.

Fig.1 Value Added (Services) and the Herfindahl Index



Source: World Bank Data base

The purpose of this section was to differentiate some of the diversified economies and resource-driven economies in SSA. The next section will cover some of the important characteristics and features of resource-driven and diversified economies in SSA.

2.1.1 Resource Based Economies

In this section we will discuss some of the features and crucial challenges that resource-driven economies face.

As illustrated from Fig.1 above countries like Angola, Botswana, Zambia and Zimbabwe we see that the economies are anchored by limited resource (oil coal or diamonds). Effectively this implies some challenges for investors, firms and policy makers that they must be aware of. Economies that are resource-driven often are regarded as economies where typically 10% of GDP and 40% of exports are accounted for by natural resources.

Resource-driven economies are subject to increased vulnerability due to fluctuations in commodity prices and they also bear the risk of the 'Dutch Disease'. In the general sense, according to Ahrend (2006) the Dutch Disease "refers to a situation in which a country suddenly discovers large natural resources, the extraction of which increase the equilibrium exchange rate and/or general wage levels, thereby" exerting pressure on how competitive other sectors that are tradable in the economy.

As noticed in recent years, commodity prices are can be quite volatile and in instances where export revenues depend primarily on the development of commodity prices means that resource-based economies are susceptible to external shocks. Nonetheless, there are notable advantages to having a rich natural resource base. According to Ahrend (2006), natural resources offer an economy with goods to trade, if they well exploited. Therefore this will assure streams of revenue from exports. Ahrend (2006) further mentions that this is the case for undeveloped economies, as natural resource revenues permit the imports of some critical goods such as medicines, that they are unable to produce on their own, and hence (in theory)

they can be used to enhance the population's welfare. Developing a modern and successful economy driven by exports of natural resource is possible, with the adequate institutions and policies. OECD countries such as Australia, Scandinavian countries orCanada, according to Ahrend (2006) are good examples of this.

Narrain et al (2003) states that emerging market crises are commonly triggered by significant shocks in terms-of-trade caused sharp declines in the prices of the main commodity export of the country, and this exposes resource-based economies to such kind of risk. Sound macroeconomic management therefore becomes essential in attempting to reduce the vulnerability of resource-based economies to external shocks, and consequently for successful resource-based development.

Given the importance of ensuring fiscal balance across the commodity-price cycle, the creation of a stabilisation fund is generally a very important issue. Such a stabilisation fund accumulates windfall government revenues (Narraon et al, 2003). The stabilization fund becomes important because resource-based economies risk finding that their access to international credit is significantly reduced during periods when commodity prices are low. In this case these economies are likely to experience current account problems and attempts to borrow at this stage can be viewed as suspicious by financial markets. Moreover, if they should somehow be able to borrow on a sufficient scale, they risk paying a very high price to be able to do so (Ahrend, 2006). Henceforth that accumulating funds in a stabilization fund that can be used to finance government expenditure when commodity prices are low is a recommended option.

Evidence of the correlation between poor economic performance and natural resources is not conclusive. Recent research has pointed to the fact the challenge is not about the resources themselves, but rather the result of their mismanagement (Ramdoo, 2015).

2.1.2 Diversified Economies

Due to their relatively low Herfindahl Index and high valued added from services sector (as a percentage to GDP), it is evident from Fig. 2 above that Mauritius, South Africa, Namibia, Kenya and Tanzania are relatively more diverse than their SSA counterparts. As mentioned above, there are, however, risks associated with being highly dependent on a limited number of resource-based sectors. Therefore, a more diversified economic structure is something that in principle is desirable (Ahrend, 2006). It will, however, be important not to lose sight of what diversification policies can and cannot achieve. First, it must be clear that there is no miracle recipe to achieve diversification overnight and should hence be seen as a long-term goal (Ahrend, 2006). Unfortunately, there is less agreement among economists about what does work, as policies that work well in one place often fail dramatically elsewhere. Indeed, failures have been so common (and sometimes so spectacular) that, in recent years, economist have often preferred not to give advice at all with respect to diversification polices.

Nonetheless, in broad terms, polices that are helpful in fostering diversification consist of getting framework conditions for entrepreneurship right, making sure that the business environment is generally competitive and that there are enough incentives to invest in non-resource sectors. According to Ahrend (2006), another obvious conventional measure is to use the tax system to assist the development of the non-resource sector. In addition to tax policy, there is also a large list of structural reforms, including financial sector and administrative reform, which would be particularly important for facilitating the diversification of economic activity. Setting up framework conditions to allow the banking sector to develop, while making sure that it remains in good health is thus a key priority. At the same time, there often is a crucial need to improve basic framework conditions for business, particularly small and medium enterprises (SMEs). In many resource-based economies, there is large scope to reduce the burdens imposed by heavy regulation and an often-corrupt bureaucracy, which in addition to strengthening the financial system, would help to create a more level playing field and decrease barriers to entry (Ahrend, 2006).

For SSA, the regions most advanced economies are broadly diversified. Manufacturing and services together total approximately above 80% of their combined GDP. Domestic services, such as construction, banking, telecommunications and retailing have accounted for more than 70% of their growth since 2000. They are among the richest economies on the continent and have the least volatile GDP growth (Leke, 2010).

In this section we covered the features of a resource-based economy and diversified economy. In the following section we will analysis the stock markets, credit markets and the economic environment of the chosen countries for this study.

3 Profiles of Stock Market and the country

In understanding the context of SSA economies, a profile of the chosen economies for this thesis will be presented. Each of them will provide a brief overview to each country and cover the key features of the country's economy, stock market and credit market. Furthermore, perspective on the size and liquidity, the stock markets of each country will be compared to the Brazilian, Russian, Indian, Chinese and South African (BRICS) stock markets. BRICS stock markets were chosen because of their status as developing nations, as are the countries chosen for this thesis. It is therefore of interest to see how SSA compares to BRICS.

Fig.2 The business environment, Macroeconomy, Stock Market and Credit Market

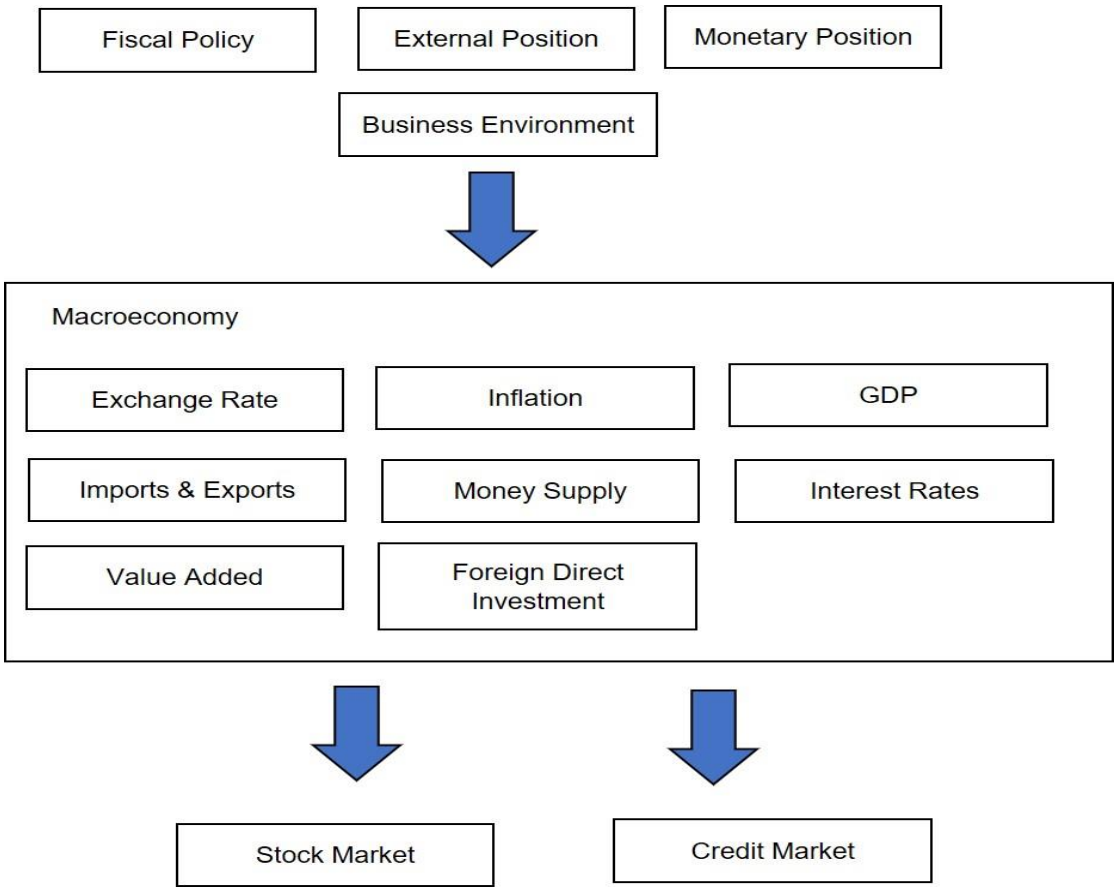


Fig.2 above, an economy's fiscal policy, monetary policy and the external environment affects macroeconomic variables in such a way that the macroeconomic indicators can be viewed as function of the business environment and vice versa. E.g. imports and exports can be seen as a function of the business environment, but imports are also impacted by all features of the economy such as the monetary policy. Accordingly, we will now present country profiles on the chosen countries for this thesis, which introduces the stock market and credit markets, and discusses the economic environment which in turn will form a basis for the behaviour of the macroeconomic indicators. After the country profiles, we will conclude by mentioning the common challenges and opportunities across these economies. The profiles are based on synthesized information from the World Bank (WB), African Development Bank.

3.1 Botswana

According to the World Bank, since gaining its independence in 1966, Botswana has been one of the world's fastest growing economies, averaging 5% per annum over the past decade. The economic growth is, however, strongly linked to revenues from diamond mining making it vulnerable to international market fluctuations. Mining has, since the discovery of diamonds, contributed on average 40% to total GDP and accounts for more than 70-80% of export earnings and about half of government revenues. Botswana's heavy reliance on a single luxury export was a critical factor in the sharp economic contraction of 2009 during the global financial crisis. Through fiscal discipline and sound management, Botswana transformed itself from one of the poorest countries in the world to a middle-income country with a GDP/Capita of $13,100 in 2010.

Even though Botswana has shown impressive economic development, driven by its mining sector, it has also generated strong state-dependence (as both the main investor and employer) and little in the way of innovative value-added manufacturing or services in the economy. More importantly, the model has not facilitated private sector-led job creation, which in turn has exacerbated national inequality. Botswana's extraordinarily high inequality is holding the country back, making it difficult for sustained growth to lead to rapid poverty reduction.

3.1.1 Stock Market

The Botswana Stock Exchange (BSE) is Botswana's sole stock exchange given the responsibility to operate and regulate the securities market in Botswana. The formation of the BSE can be traced back to 1989 when it was then known as Botswana Share Market (BSM). At that time, there were only 5 listed entities with a single broking firm. The BSE continues to be pivotal to Botswana's financial system and the capital market, as an avenue on which government, quasi government and the private sector can raise debt and equity capital. The BSE plays host to blue-chip companies doing business in Botswana. These companies represent a spectrum of industries and commerce; being Banking, Financial Services, Wholesaling & Retailing, Tourism, Energy, Mining & Materials, Property & Trust, Security and Telecommunications. The number of listed companies has grown steadily over the years, helped by the introduction of a venture capital board and a foreign board comprising secondary (dual) listings of companies in other jurisdictions. As of December 2017, there were 35 companies on the BSE which comprised of 24 domestic companies and 11 foreign companies. Further, the BSE had 43 listed bonds and 4 Exchange Traded Funds.

The Domestic Board is dominated by financial institutions (mainly banks) which account for 80% of the total market capitalisation. The foreign board comprises mainly mining and resources companies. Other dual listed mining companies all have prospecting or mining operations in Botswana.

Fig.3 Market Capitalisation (%of GDP) and Turnover Ratio

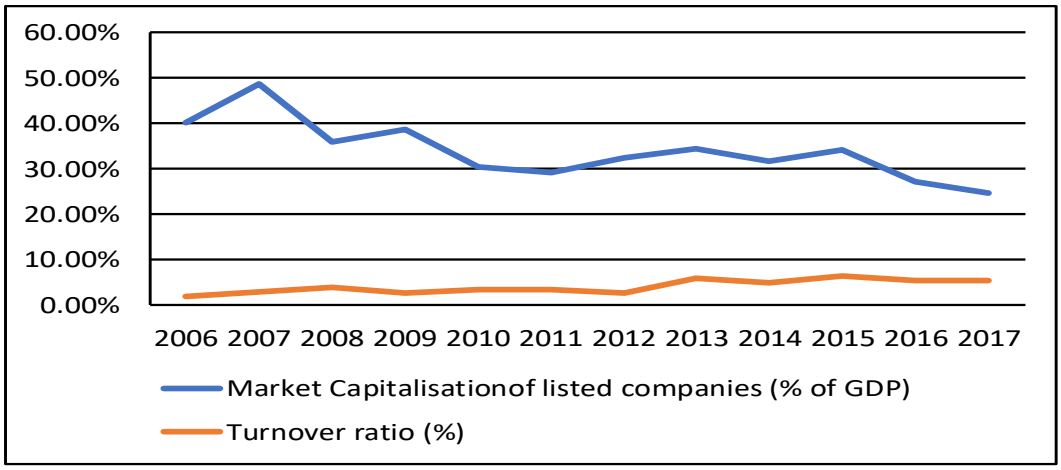
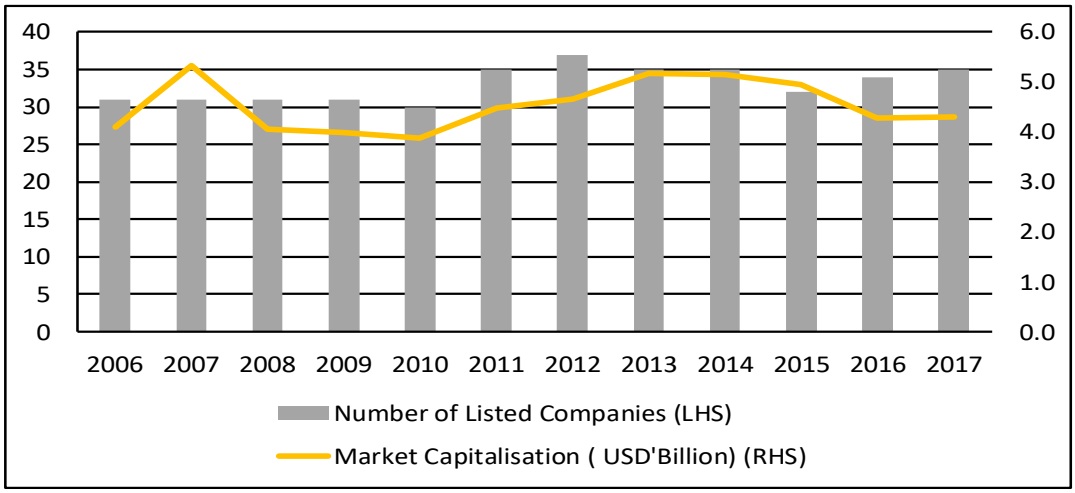


Fig.4 Number of Listed Companies and Market Capitalization (USD 'Billions)



As depicted in Fig. 3 and Fig. 4, the market capitalisation development has been positive until 2008, when the global financial crisis set in. From 2007 to 2008, the market capitalisation fell by USD 3.2 billion and since then it has struggled to return to its pre-2008 levels of USD 95 billion. The market capitalization was 25%of GDP (MC/GDP) in 2017 which compares to 117% of the average for BRICS countries. The turnover ratio was 5.4% in 2017 is comparatively low as the average turnover ratio for BRICS countries was 73% in 2017. In this light, it stands out clearly that the BSE's liquidity is extremely low.

3.1.2 Banking sector

The Botswana banking sector has been dominated by Barclays and Standard Chartered banks since the 1950s, having originally operated as subsidiaries of South African operations and becoming independent entities in the 1970s. In 1982, a third bank entered the market, the Bank of Credit and Commerce Botswana (BCCB), but it was unable to challenge the duopoly of its more established rivals. Other financial institutions were state-owned, namely the Botswana Savings Bank, which began in 1911 as a subsidiary of South Africa's Post Office Savings Bank; the National Development Bank, which was established in 1964 to lend to the

agricultural sector; the Botswana Development Corporation (BDC), which was established in 1970 to lend to the business sector; the Financial Services Company (FSC) that dealt primarily in mortgages; and the Botswana Building Society (BBS), which was a South African subsidiary until it was locally incorporated in 1977. However, the government has never owned a commercial bank.

High levels of liquidity in the economy due to the growth of the mining sector and artificially low interest rates were coupled with low levels of competition. As a result, the banking system became narrow and inefficient. The government responded with a liberalisation of banking licensing, a reduction of the government's role in lending to state-owned enterprises and commercialising government-owned financial institutions. It also promoted the development of the capital market, implemented a monetary policy that introduced real positive interest rates, an end to controls on bank interest rates and sought to absorb excess liquidity through the issuance of Bank of Botswana Certifications.

As a result of these reforms, several new banks were formed, including Zambian Botswana, First National Bank Botswana (FNBB), which went on to take over the BCCB, ANZ-Grindlays and Union Bank. In order to attract this growth, the government dropped the requirement to establish a nationwide branch network, including rural banking. Consolidation saw ANZ-Grindlays taken over by Union Bank, which became Stanbic Bank, while Zambian was taken over by FNBB. Banking licences were subsequently awarded to the Bank of Baroda, Bank Gaborone, Capital Bank and the African Banking Corporation (ABC) (which evolved from a credit institution, ulc, to become a merchant bank and later a commercial bank).

The Botswana Banking industry is an increasingly important sector of the economy, both and in terms of the supporting role it plays in the development of other sectors of the economy. The growth of the sector has been good – over the period from 2006 to 2017 it grew in real terms by 12% a year on average, while overall real economic growth averaged only 5% a year over this period (Fig.1). Over that period, the banking sector’s share of GDP has doubled, from 4% to 8%.

Fig.5 Banking Sector Total Assets vs GDP

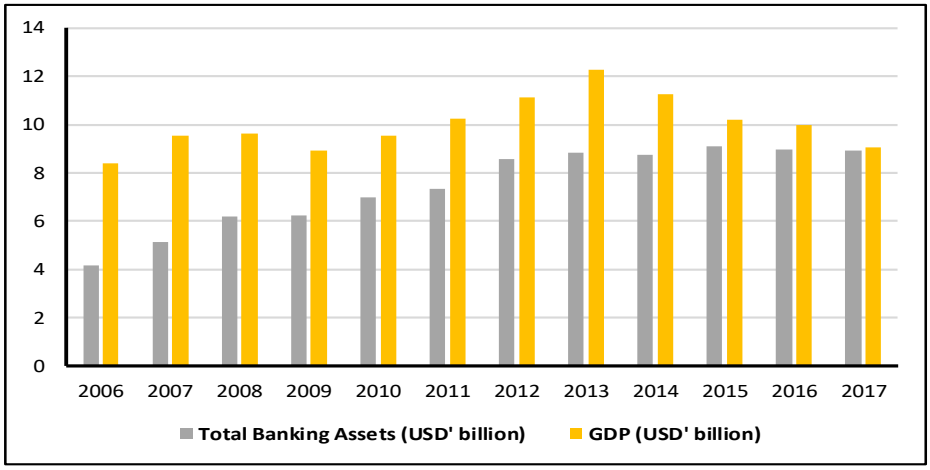
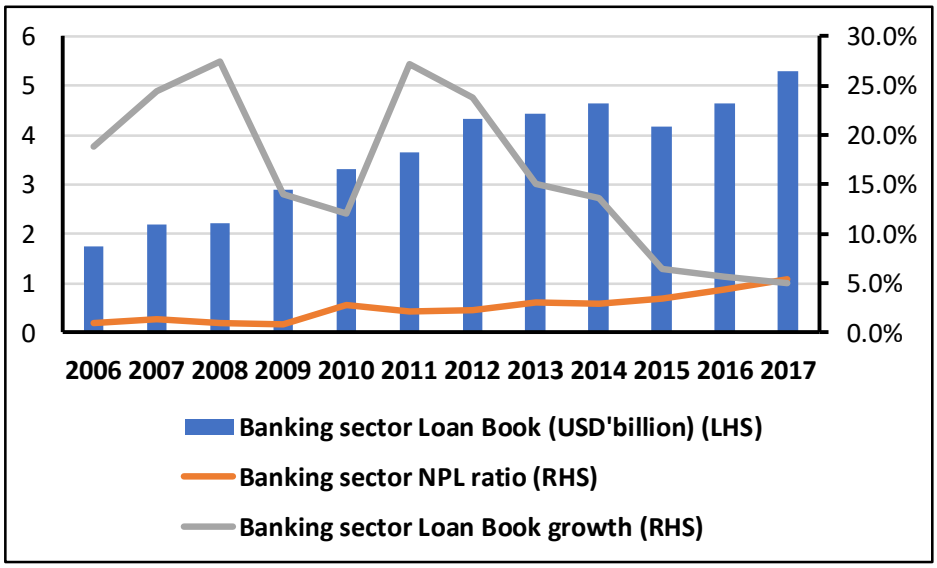


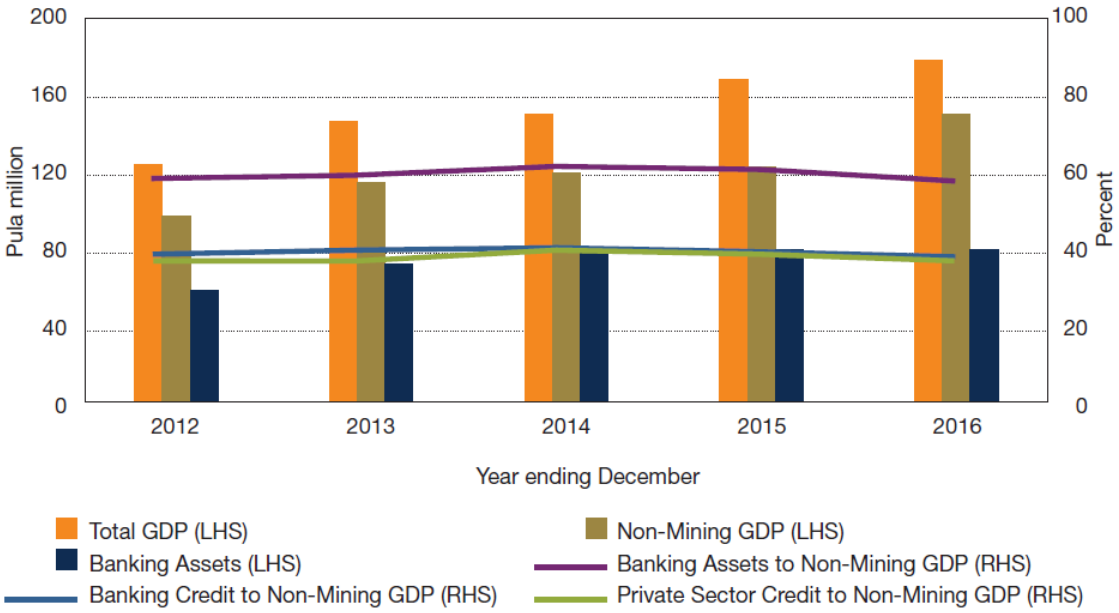
Fig.6 Banking sector: Loan Book (USD'billion) vs NPL ratio vs Loan Book Growth



The ratio of banking assets to GDP, a measure of financial sector size, declined to 46% in 2017 compared to 47% in 2016 (Fig.5). Correspondingly, the ratio of banking assets to non-mining GDP decreased from 59% in 2016 to 57% in 2017. This was mainly on account of slower growth in the banking industry, compared to the recent past, and faster expansion of other sectors in relation to total GDP. Banking credit as a portion of total GDP, was unchanged at 30%. Considering a longer time perspective, over the five-year period, the trend is generally downwards for all the financial sector depth indicators, suggesting that the pace of growth of the financial services sector has been slower than that of the country's GDP.

Botswana's banking sector is faced with the problem of, a declining proportion o loans to the private sector and business, this despite the sector showing signs of health and growth. This is an indication of resources shifting more towards consumption as opposed to productive investment and this usually corresponds to difficulty in diversifying the economy.

Fig.7 Financial Sector Size and Depth Indicators



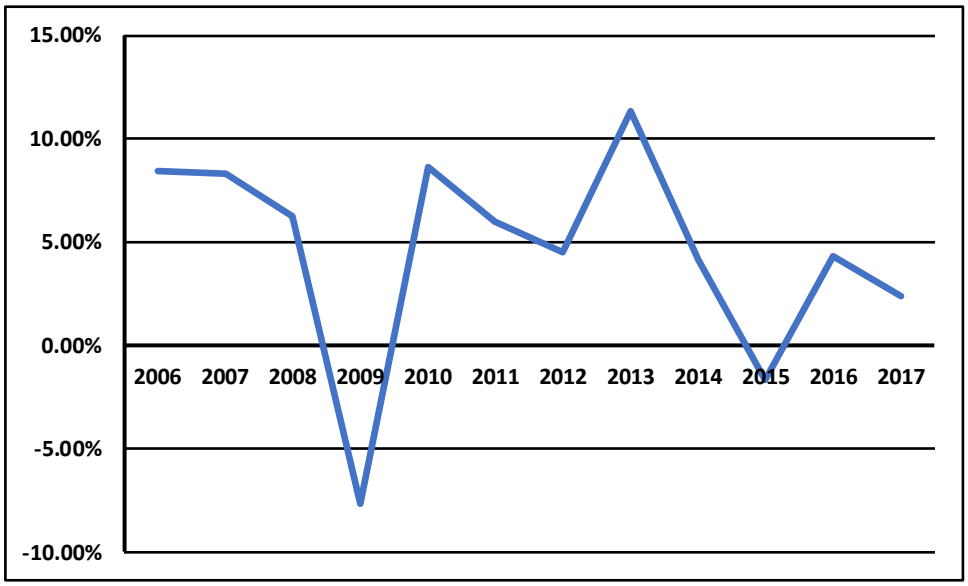
3.1.3 The Economy

According to the African Development Bank, the economy of Botswana has experienced rapid growth in per capita income as a result of effective economic management and prudent management of the country's resource wealth. The country's GDP per capita rose from USD 80 at the time of its independence in 1966 to USD 6 924 in 2016. However, despite efforts to diversify the economy, the economic base remains narrow and growth has not been sufficiently inclusive. Botswana's main growth driver remains the extraction and processing of diamonds for export. It provided 88% of the country's exports in 2016, even though the mining sector's contribution to gross domestic product (GDP) has fallen sharply, from 47% in 1986 to about 20% in 2017. Some structural transformation of the economy has occurred, albeit limited. Agriculture's contribution to GDP declined to 2.2% in 2017 from a peak of 3.4% in the 1990s. Manufacturing has not developed much; its share of GDP has remained between 5% and 6% since the 1990s. The fastest growing sector has been services (including Government services); their overall contribution to GDP has increased from around 45% in 1986 to 69% in 2017 (African Development Bank, 2017).

Botswana's economy suffered a setback when economic growth dipped into negative territory in 2015, arising from weak demand for diamond exports, severe El Niño-induced drought conditions, and persistent electricity and water supply shortages. After rebounding to 4.3% in 2016, economic activity slowed again; real GDP growth was estimated to be about 2.4% in 2017. The increase in domestic output was mainly driven by expansion in non-mining activities, notably in trade, hotels and restaurants (which grew by 7.3%), finance and business services (5.0%), and transport and communication (4.7%). Growth in non-mining sectors was underpinned by improvements in downstream diamond industries and the continuation of accommodative fiscal and monetary policies. Despite their performance, overall domestic growth was weighed down by the sluggish performance of other sectors. Agricultural output contributed 2.0% to GDP in 2017 (mainly from beef exports) and remained subdued, as crop production continued to be hampered by recurrent drought, erosion, disease, traditional farming methods and inadequate infrastructure (African Development Bank, 2017).

Though diamond prices gradually recovered, reflecting a rebound in the global diamond market, mining sector output contracted by about 11% in 2017. This was more than the decline of 3.5% in 2016 and lowered real GDP growth. After sustained high growth for more than 40 years, Botswana has experienced boom-bust cycles in recent years because the country is vulnerable to external shocks as a result of its heavy reliance on exports of diamonds and other mining products (African Development Bank, 2017).

Fig.8 Real GDP Growth

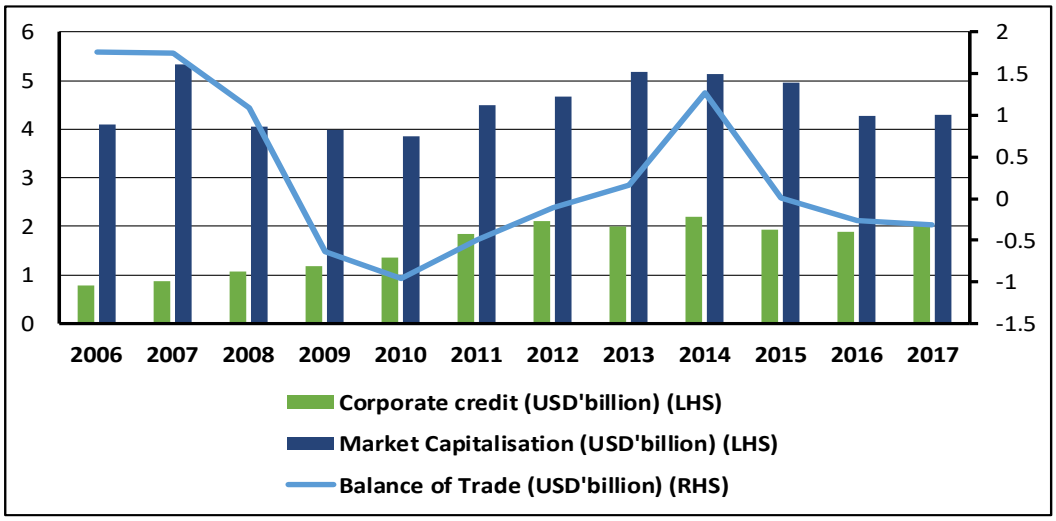


3.1.4 External Position

Botswana's trade balance is largely tied to the global demand for diamonds, which represent approximately 85% of the country's export revenues. Customs revenue from the Southern African Customs Union (SACU) and diamond revenue each contribute about one-third of total revenue. As a result, two-thirds of the country's income is largely outside of the government's control, placing pressure on policy makers to plan conservatively.

From Fig.8 we see that the trade balance recorded a lower surplus in 2017 compared to the previous year. The lower surplus was largely the result of a decrease in total exports of goods and an increase in total imports. South Africa is the main source of Botswana's imports, accounting for over 60%. The main imports are vehicles, fuel, and consumer goods. The Africa Regional Integration Index Report for 2016 ranked Botswana the second most integrated country in the SADC region, after South Africa. The real exchange rate has remained relatively stable and competitive against major currencies. Trends in bilateral nominal exchange rates show that, on an annual basis (twelve months to December 2017), the Botswana pula (BWP) depreciated by 1.8% against the South African rand but appreciated by 2.0% against the SDR (the IMF's reserve currency). The appreciation of the pula against the SDR is explained by the stronger rand and depreciation of the US dollar in 2017 (African Development Bank, 2017).

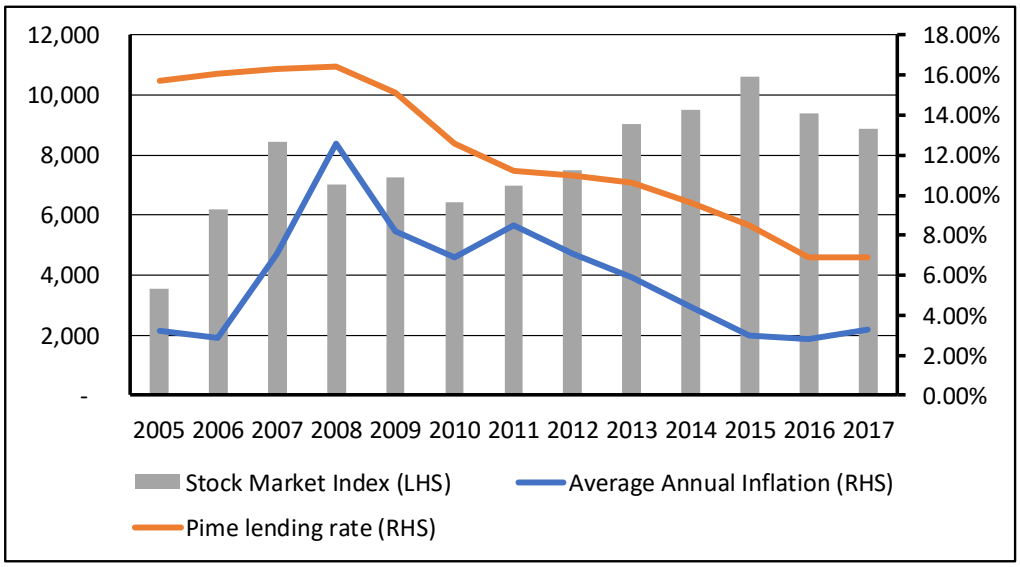
Fig.9 Trade Balance vs Market Capitalisation vs Corporate Credit



3.1.5 Monetary Policy

The Bank of Botswana (BoB) has pursued an accommodative monetary stance in order to support economic activity, taking advantage of prevailing low inflation. Annual inflation amounted to 3.3% in 2017, within the BoB's medium-term objective range of 3% to 6%, after breaching the lower end of the target range in 2016. Inflation is expected to remain within the target range in the medium term. Key factors that have helped keep inflationary pressures in check include low domestic demand and subdued foreign price developments. Botswana's inflation tracks that of South Africa because of the very close trade links between the two countries. Since 2015, the BoB has gradually reduced the bank rate by a cumulative 100 basis points to 5.0% in October 2017. Despite the loose monetary policy, credit to the private sector decelerated from 6.2% in 2016 to 5.6% in 2017. The slowdown in credit expansion was mainly due to a decline in growth of lending to businesses, from 4.2% in December 2016 to 3.2% in December 2017 (African Development Bank, 2017).

Fig.10 Average Annual Inflation vs Prime lending rate vs Stock Market Index



3.1.6 Business Environment

In the World Bank's 2017 Doing Business report, Botswana ranked 86th out of 190 countries, the fourth highest ranking in Africa after Mauritius (20th), Kenya (61st) and South Africa (82nd). Considering these relatively favourable ratings, Botswana is well positioned to attract foreign direct investment (FDI). According to the Botswana Investment and Trae Centre (BITC), Botswana offers many incentives for investors, including; No foreign exchange controls (remittance and full repatriation of profits and dividends), no restrictions on business ownership, liberal tax regime, negotiable tax holiday of up to 10 years maximum and customs duty exemption on raw materials for goods going outside of Southern African Customs Union (SACU). However, despite the reform attempts and favourable ranking in the doing business compared to other countries, according to the Botswana Institute for Development Policy Analysis (BIDPA), among the challenges faced by local companies include lack of finance, prohibitive costs in acquiring and effectively utilizing appropriate technology and limited managerial skills as well as little or no business acumen.

In Botswana, the public sector institutions which support SMEs include the Citizen Entrepreneurial Development Agency (CEDA), the Local Enterprise Authority (LEA), the Youth Development Fund (YDF), and Young Farmers Fund (YFF). The private sector institutions include commercial banks, microfinance institutions and nongovernment organizations (such as Women in Business Association Botswana [WIBA]). CEDA was established by the Government of Botswana as a company limited by guarantee on April 12, 2001 to provide financial and technical support for business development with a view of promoting viable and sustainable citizen owned SMEs (Okurut & Ama, 2013). CEDA provides different lines of credit to SMEs which include debt finance for retail operations, debt finance for services operations, the credit guarantee scheme, and invoice discounting (Okurut & Ama, 2013). The Local Enterprise Authority (LEA) was established by the Small Business Act, Number 7 of 2004 as a Statutory Authority of the Government of Botswana to build the capacity of entrepreneurs to develop sustainable SMEs (Okurut & Ama, 2013). LEAs mandate includes provision of highly specialized development and support services which include facilitation of business planning; providing training, mentoring and advisory services; identifying business opportunities for existing and future enterprises; facilitating access to markets; facilitating exploitation of government and large firms' procurement opportunities by enterprises; facilitating access to finance; facilitating technology adoption and diffusion; promoting general entrepreneurship and SME awareness (Okurut & Ama, 2013).

3.2 Mauritius

According to the Central Intelligence Agency, Mauritius has gone through incredible economic transformation since its independence in 1968. The economy transformed from a low-income country to a diversified upper middle income economy through growing its financial and tourism sectors. Over the years the country has achieved steady growth and has resulted in

more equitable income distribution and an improved infrastructure (Central Intelligence Agency).

Currently the economy relies on the tourism, financial services and textiles sectors but other sectors such as ICT and fish processing have been showing signs of growth. The banking sector has managed to attract over USD 1 billion in investment into the sector while the the textile sector has tken advantage of the Opportunity Act and the Africa growth Act, which are preferential trade programs that allow free duty free exports to the US market, therefore causing significant growth of Mauritian exports to the US (grew 40% from 2000-2014) (Central Intelligence Agency).

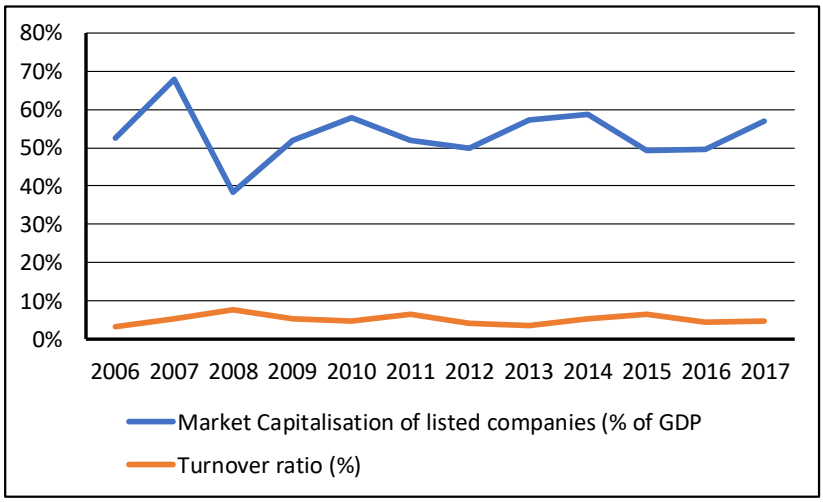
Furthermore, Central Agency states that negative effects of the global financial crisis in was mitigated by sound economic policies in the Mauritian economy. Economic growth registered a 3-4% annual growth rate from 2010 to 2016 and the country continues to expand its investment outreach and trade globally (Central Intelligence Agency). Growth in the US and Europe fostered goods and services exports, including tourism, while lower oil prices kept inflation low in 2016. Mauritius continues to rank first in sub-Saharan Africa on the World Bank's Doing Business Report (Central Intelligence Agency).

3.2.1 Stock Market

Mauritius boasts one of Sub Saharan Africa's most developed equities markets, ranking among the six markets classified as a 'Frontier Market' by MSCI. Two bourses operate in the country: The Stock Exchange of Mauritius (SEM) and Bourse Africa. The SEM was incorporated in 1989 and operates two equity markets: The Official Market, which services larger firms, and the Development and Enterprise Market (DEM), which comprises small and medium enterprises. Bourse Africa was founded in 2010 and operates a multi-class exchange that trades in commodity derivatives, currency derivatives and equities. The relative sophistication of the country's stock markets makes it an attractive locale for international firms to list, particularly mutual funds drawn to the country's favourable regulatory environment. Since 2011, the Stock Exchange Mauritius has maintained a multi-currency listing and trading technology platform, which is open for dual-currency trading and can list, trade and settle equity and debt products in USD, EUR, GBP, ZAR besides the local currency MUR.

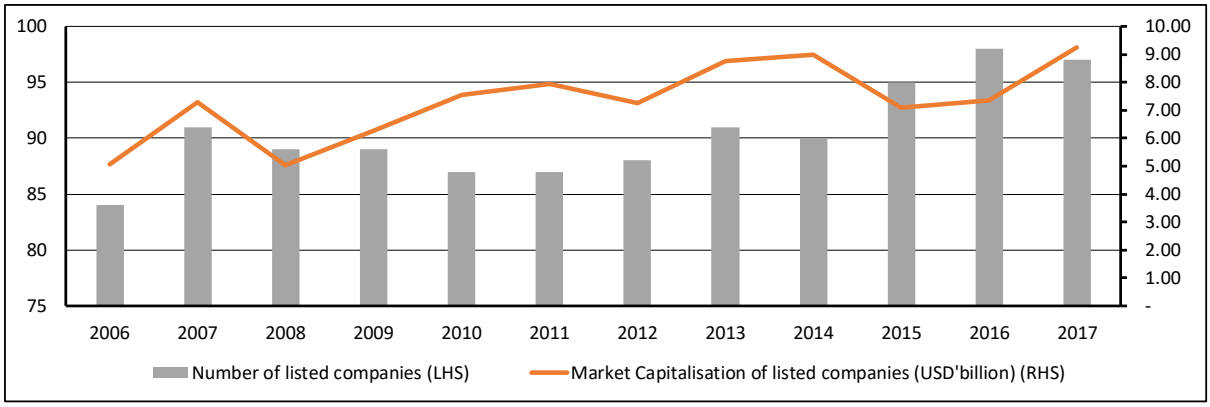
As of January, 31 2018, there were 51 companies listed on SEM's Official Market, representing a market capitalisation of nearly USD10.3 billion. The DEM listed 43 companies with a market capitalisation of USD1.6 billion. Data from Bourse Africa were unavailable.

Fig.11 Market Capitalisation (%of GDP) and Turnover Ratio



In Fig.11, shows that after a high MC/GDP in 2006, effects of the global financial crisis resulted in a significant drop in MC/GDP to 38% in 2008 from 68% in 2007. As depicted above, the MC/GDP has struggled to recover to its pre global financial crisis levels and has averaged at 54% from 2009 – 2017. This is below that of the average BRICS MC/GDP of 116% in 2017. The combined MC for the SEM and DEM was USD 9.26 billion (see Fig.10) which is approximately 0.33% of that of the average of BRICS countries, more so the number of listed companies in Mauritius is also far below than that of BRICS countries, Again we find that the turnover ratio is low at 5% vs that of the BRICS average of 73% however comparable to that of the BSE.

Fig.12 Number of Listed Companies and Market Capitalization (USD 'Billions) (Combined SEM and DEM)



3.2.2 Banking sector

The Mauritian banking sector is well-developed relative to the size of its domestic economy, underpinned by its status as an international financial centre. There are no specific restrictions on foreign banks or on foreigners opening accounts at Mauritian banks, which significantly expands the sector's pool of business. The sector also benefits from high participation rates. According to the World Bank, 82.2% of Mauritians aged 15 or older had an account at a financial institution in 2015, the latest data available. At end-2016, total assets in the banking sector equalled USD 34.7 billion, equal to 294.3% of GDP. According to the Mauritian Banking Association, there are 22 banks operating in the country: five locally-owned, 10 foreign-owned

subsidiaries, four branches of foreign banks, two private banks, and one conducting Islamic banking exclusively. All are licensed by the Bank of Mauritius to conduct business locally and internationally.

Fig.13 Banking assets (% of GDP) vs Bond (% of GDP)

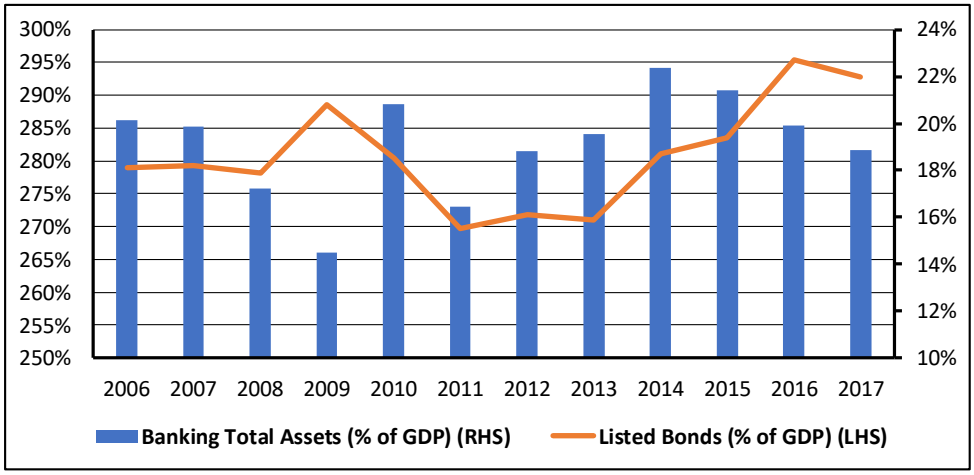
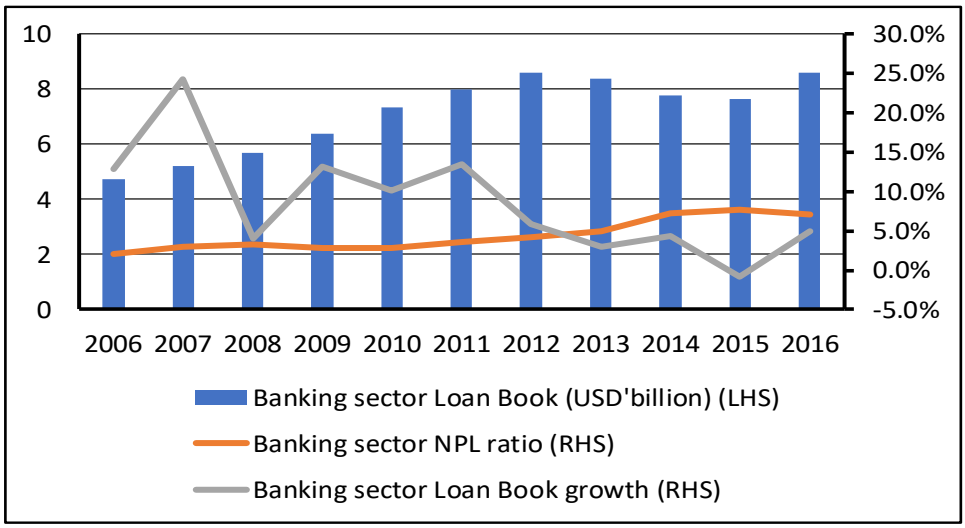


Fig.14 Banking sector: Loan Book (USD'billion) vs NPL ratio vs Loan Book Growth



The sector has seen some movement over recent years. In January 2016, Mauritius Post & Cooperative Bank and National Commercial Bank merged to form Maubank, which is the ninth largest by total assets, according to BMI calculations. In September 2016, the Bank of China began operations. Acquisitions or liquidations could reshape the sector over the coming years, as overall economic slowdown weighs on asset quality and undermines the health of some smaller local banks, and as banks reorient away from India and towards Sub Saharan Africa.

The two largest banks in the country, MCB and SBM, are locally-owned and hold approximately 45.0% of assets in the sector. However, foreign-owned banks benefit from access to sophisticated management and technology, as well as capital, which mitigates risks.

In terms of their overall profitability, bank returns on assets and on equity improved from 1.4% and 13.8% at end-December 2016 to 1.8% and 14.7% at end- December 2017 (African Development Bank, 2017). The capital adequacy ratio of banks stood at 18.3% at end-

December 2017, well above the regulatory requirement of 10%; more banks had also phased in Basel III requirements. However, asset quality deteriorated during the period under review. The ratio of non-performing loans (NPL) increased from 6.8% to 7.2% due to credit that was extended to the construction sector and pressure on the global businesses sector following adoption of the revised Mauritius-India Double Tax Avoidance Agreement in April 2017 (African Development Bank, 2017).

3.2.3 The Economy

As depicted in Fig.12, although showing less volatility that MC and total banking loan book growth, GDP has not shown the same recovery from the 2008 financial crisis in comparison to the banking sector loan book growth (averaged 6% from 2009-2017) and the MC (averaged 8.2% from 2009-2017) as real GDP growth averaged 3.5% over the similar period. Mauritius has recorded moderate but steady real GDP growth in recent years (African Development Bank, 2017). GDP growth rose from 3.8% in 2016 to 3.9% in 2017, mainly supported by an expansion in financial services, ICT and manufacturing output. Mauritius' GDP per capita also trended upwards in the same period, at an average annual rate of 3.6%, reaching an estimated USD 9 672 in 2017 (African Development Bank, 2017). This is the third highest per capita income in Africa (after Equatorial Guinea and the Seychelles), placing Mauritius firmly in the category of an upper middle-income country (African Development Bank, 2017). Mauritius' economy remains predominantly based on services (74% of GDP in 2017). The next largest sectors are industry (22%) and agriculture (4%) (African Development Bank, 2017). Over the years, Mauritius has successfully managed to transform and diversify its once sugar-centred monoculture economy into manufacturing activities and services (African Development Bank, 2017).

Mauritius has one of the best-developed financial services sectors in SSA. The sub-sector grew by between 4.3% and 5.2% between 2014 and 2017, assisted by Mauritius' favourable tax status, and attracted substantial financial resources that pass through the country before being reinvested in markets including countries in SSA and India (African Development Bank, 2017).

Fig.15 Nominal GDP vs Total Banking Loans vs Market Capitalization (USD'billion)

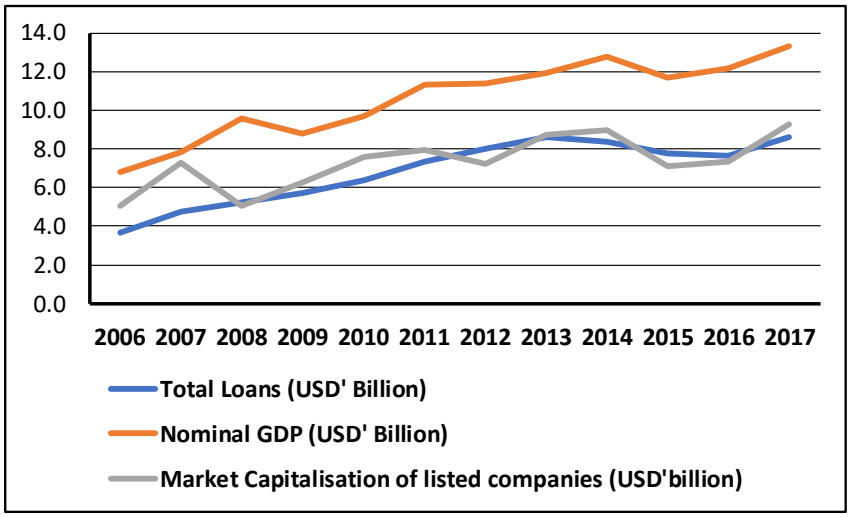
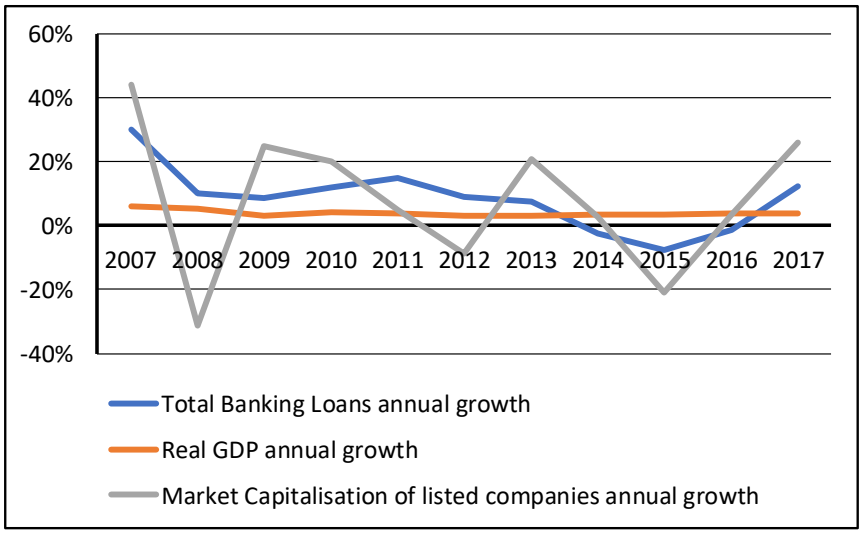


Fig.16 Growth: Real GDP vs Total Banking Loans vs Market Capitalization (%)



3.2.4 External Position

In terms of international trade, Mauritius' principal export market is Europe, led by France and the United Kingdom, which respectively absorbed 14.8% and 12.0% of the island's total exports in 2016; other key export destinations include the United States (11.4%), South Africa (8.2%), and Madagascar (7.3%) (African Development Bank, 2017). South Africa and Madagascar account for the highest share of Mauritius' exports to fellow SADC member States, representing about 85% of total regional exports (African Development Bank, 2017). The bulk of Mauritius' imports originate from markets in Asia, which account for 57.4% of the country's total imports. Other principal sources of imports are South Africa (7.5%) and Germany (3.1%) (African Development Bank, 2017). Mauritius' main export products include sugar cane (15% of total exports), processed fish (12%), clothing (7.1%) and cut flowers (5.5%) (African Development Bank, 2017). The export of services also continues to rise, driven by tourism and financial services. Regarding imports, Mauritius' import basket is characteristic of a small island developing country (African Development Bank, 2017). It is heavily reliant on raw materials and food products. The main imports are refined fuel (10.9% of total imports), food and beverages (8.5%), and machinery and construction materials (6.8%) (African Development Bank, 2017). The current account deficit is expected to widen to 5.8% of GDP in 2018 and 6.2% of GDP in 2019, mainly driven by the strong import component of mega infrastructure projects and improved private investment (African Development Bank, 2017).

Fig.17 Balance of trade Total Banking Loans vs Market Capitalization (USD'billion)

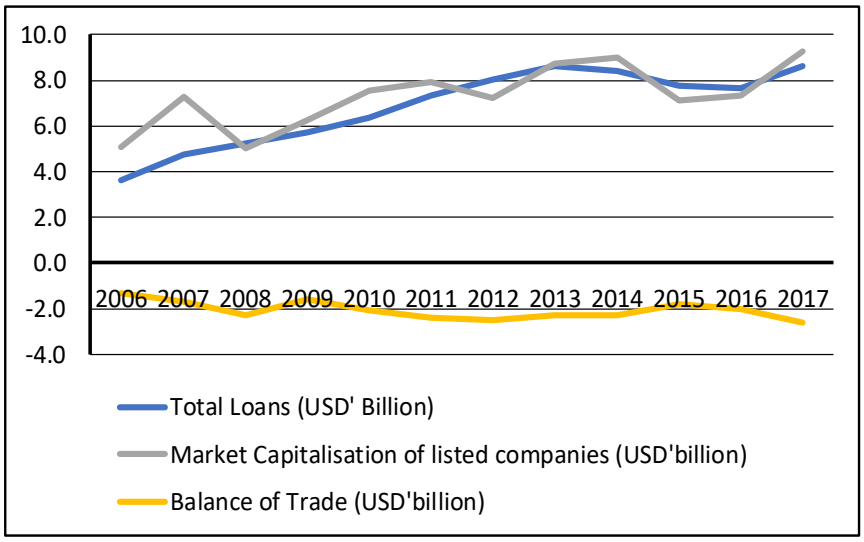
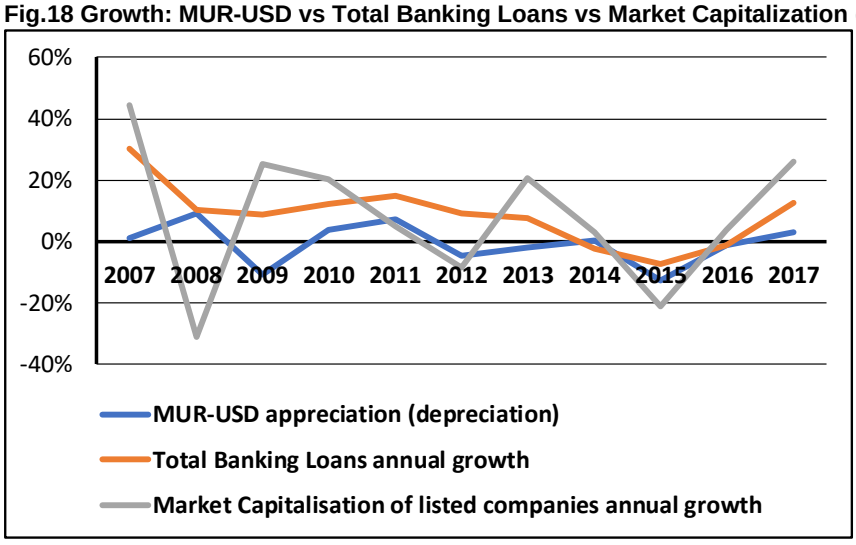


Fig.18 Growth: MUR-USD vs Total Banking Loans vs Market Capitalization (%)



3.2.5 Monetary Policy

The Bank of Mauritius (BoM) maintained its loose stance for most of 2017, while growth remained moderate and inflation levels subdued. In November 2017, it further reduced its key policy rate by 25 basis points from 4% to 3.75% in order to support domestic economic activity and encourage private sector investment (African Development Bank, 2017). The domestic economy experienced generally low inflationary pressures throughout 2015-2017 on account of subdued demand and declining international commodity prices. The main factor that has underpinned a persistent drop in inflation since 2015 is a fall in food prices (accounting for 27.3% of the CPI basket) as a result of improved weather conditions and a recovery in production. In nominal effective terms, the Rupee (as measured by the BoM's Mauritius Exchange Rate Index) depreciated by 10.2% against the US Dollar between 2014 and 2016 but made some gains in the course of 2016-2017. The Rupee (MUR) also weakened against the Euro throughout the period under review. However, measures currently being implemented by the BoM to reduce high excess liquidity in the banking system, combined with the central bank's sterilization measures in the foreign exchange market, are expected to help support the currency in the short to medium term (African Development Bank, 2017).

Broad money supply maintained a healthy pace of expansion in 2016 in contrast to private sector credit growth which remained subdued (Bank of Mauritius, 2017). The annual growth rate of Broad Money supply increased from 109% of GDP to 111% of GDP in December 2016 backed by positive contributions in net foreign assets and domestic credit. M2 money was supported chiefly by its most liquid components. The annual growth rate of banks' credit to the private sector fell by 1%, reflecting ongoing deleveraging by the corporate sector (Bank of Mauritius, 2017).

Fig.19 M2 Supply vs Market Capitalisation vs Total Banking Loan book (as % of GDP)

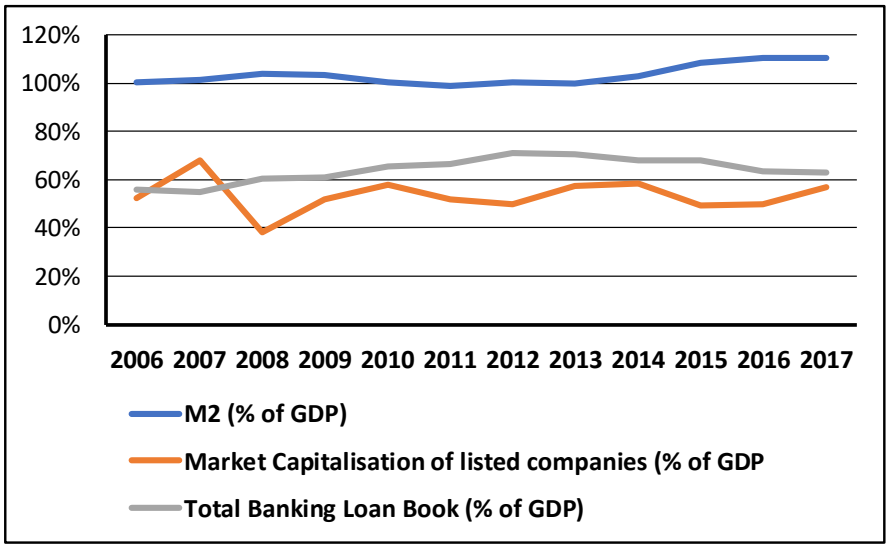
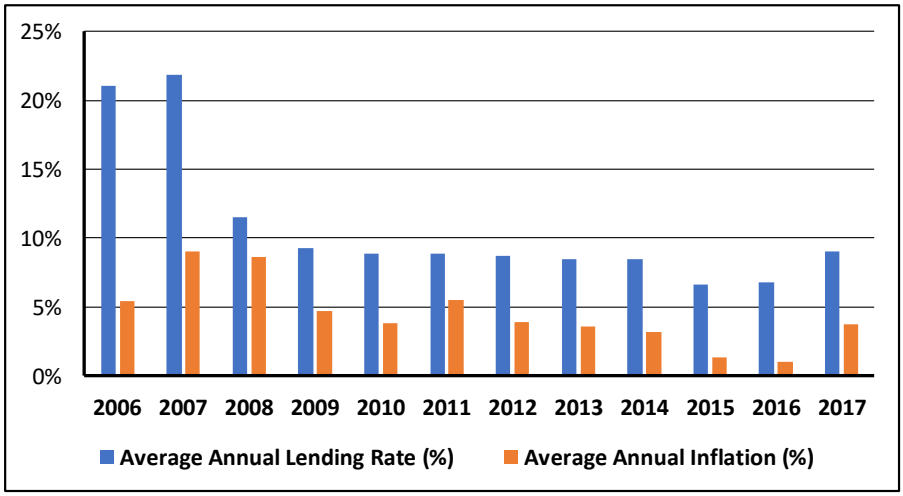


Fig.20. Average Annual Lending Rate vs Average Annual Inflation (%)



3.2.6 Business Environment

Mauritius' private sector remains among the most vibrant in Africa and features large companies as well as a robust small and medium-sized enterprises (SME) sector (African Development Bank, 2017). Large private sector entities operate mainly in financial intermediation services, retail and wholesale, tourism and hospitality, real estate, and sugar production (African Development Bank, 2017). The SME sector contributes 40% to GDP and employs 55% of the workforce. Most SMEs are engaged in the wholesale and retail trade, transport logistics, manufacturing, and ICT. In recognition of the importance of SME

development to overall socio-economic development and job creation, the Government announced a 10-year master plan for SME development in March 2017, which aims by 2017 to raise the contribution that SMEs make to GDP to 52% (from 40%), and their contribution to national employment to 64% (from 55%) (African Development Bank, 2017). The strategy focuses on supporting SMEs that operate in activities that add high value, such as healthcare, bio-farming, green energy, ICT and knowledge and technology-intensive businesses. Mauritius' private sector has the potential to grow further and become even more vibrant, thereby advancing structural transformation, creating high value wage employment, and supporting the country's ambition to achieve HIC status by 2025 (African Development Bank, 2017).

To unlock the private sector's full potential, however, several bottlenecks will need to be addressed. It will be necessary to improve Government efficiency, increase the capacity to innovate, address the economy's skills mismatch, and provide SMEs with adequate access to finance (African Development Bank, 2017). In addition, the country's infrastructure needs significant upgrading to meet the requirements of a highly sophisticated economy (African Development Bank, 2017). Mauritius continues to be among the freest and most business-friendly countries in Africa, according to several global surveys (African Development Bank, 2017). The 2018 edition of the World Bank's Doing Business Index ranked Mauritius 25 out of 189 economies (African Development Bank, 2017). The sharp improvement on its position in 2017 (47) was attributed to significant reforms under 4 indicators: 'starting a business', 'dealing with construction permits', 'registering property' and 'trading across borders'. Mauritius retained its first place in Africa for the 12th consecutive year (African Development Bank, 2017). The latest Doing Business Survey nevertheless identified a few areas of weak performance, notably 'labour market flexibility' and 'insolvency' (African Development Bank, 2017). In addition, innovation remains limited due to a shortage of scientists and engineers, as well as weak research and development capacity (African Development Bank, 2017).

Robust supervision by the Mauritian authorities supports stability and investor confidence in the financial services sector broadly, underpinning the island's position as an international financial centre. Regulations are in line with international norms and best practices and Mauritius is widely considered to be among the freest and most business-friendly countries in Africa. In indices of economic freedom, Mauritius regularly ranks among the top African countries and is competitive among global economies. For example, Mauritius ranks first among Sub Saharan African countries and 25th worldwide in the World Bank's 2018 Doing Business report, the tenth consecutive year in which it placed first in Africa.

3.2.7 Similarities in the chosen Markets

From the profiles of each economy, we have learned that each market has generally experienced decent growth over recent years. The 5-year average GDP growth rate for the

countries in this study was 3.8%, which is respectable in comparison to the SSA 5-year average of 3.6%. Both the countries are increasingly moving towards more diversified economies, more so for Botswana which is somewhat more dependent on primary resources through exports of diamonds, which has resulted in economic volatility due to commodity boom-bust cycles. As for Mauritius, which depicts less export concentration of a single product and having more value added from its services sector and has served the economy as GDP growth has been more stable over the years.

It is shown that generally the macroeconomic and fiscal management in these countries has improved during the last decade, and these countries are managing in controlling inflation levels and making sure that reforms are in place to allow for sturdy and healthy growth. For both these economies, it has been seen that a strong commitment to improving infrastructure and enhancing the business environment through more effective public administration.

Regarding the financial services sector, the stock exchanges are generally for below that of BRICS countries. If we look at MC/GDP, both the countries are significantly below that of BRICS at 117%, with Botswana at 25% and Mauritius at 54%. The number of listed companies are also insignificant in comparison to its BRICS counter parts. Regarding banking sector, both economies have well developed and functioning banking sectors however rising NPL's have triggered a slowed in lending.

We will now move on to form the hypotheses regarding the influence of macroeconomic variables on stock market capitalization and credit growth.

4 Conceptual Framework

In order to fully understand what drives market capitalization and credit growth, it is crucial to first understand the concepts relevant for this thesis.

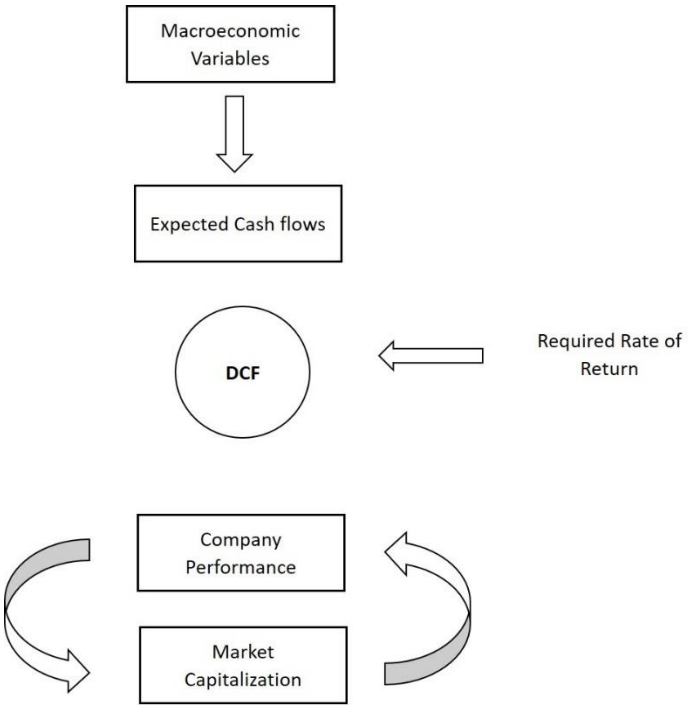
4.1 Stock Market Capitalization

Market capitalization is the aggregate individual firms market values. It is derived from the number of shares issued and the daily market prices. The assumption underlying the use of market capitalization as an indicator of stock market development is that the size of the stock market is positively correlated with the ability to mobilize capital and diversify risk (Levine, 1996). Market capitalization stems from changes in stock markets growth, backed by apt and adequate regulation and legal framework it assists drive and sustain economic growth (Mishkin, 2012). The mentioned regulations enable an encouraging environment for economic growth. Endogenous growth theory supports this perspective of market capitalization and economic growth relationship.

Stock markets are essential in providing support to notable monetary proficiency through transferring reserves from financial specialists with excess to those with the opportunities to utilize. Hence market capitalization is mainly affected by activities in stock markets, which then have a direct impact of economic growth, firm performance and cyclical performance of the economy. Low market capitalization stemming from underdeveloped stock markets leads to low states of economic development and economic growth; efficient flow of funds at low costs is hindered (Mishkin, 2004).

This section analyses how MC is affected by different macroeconomic variables. The discounted cash flow model is most likely the best way to illustrate the relationship between stock prices and macroeconomic variables. The discounted cash flow model implies that the current price of a listed company’s share is equal to the present value of all future cash flows to the share.

Fig.21. Macroeconomic Variables and the Discounted Cash Flow Model



Thus, the determinants of share prices are the required rate of return and expected cash flows (Gan, 2006; Humpe, 2008; Oyama, 1997). Hence the share price will effectively be influenced by macroeconomic variables which influence expected future cash flow and the required rate or return.

According to the DCF model, the price of a financial asset is equal to the discounted value of all the future cash flows expected from the asset;

$$P = \sum_{t=1}^{n} \frac{CF_t}{(1+RRR)^{t}} \quad (1)$$

P: Price of the asset**, CFt:** Cash flow of the asset at time t**, RRR:** Required rate of return

Asset prices are essentially derived by the future cash flow generated from the underlying asset and the discount rate. As these two factors are quite sensitive to changes in macroeconomic conditions, it is reasonable to assume a close relationship between changes in asset prices and changes in macroeconomic variables (Oyama, 1997). The relationship show be more explicit for stock prices as future cash flows of listed companies is influenced by the general economic activity, discount rates which are dependent on current prevailing interest rates and investors' concerns about volatility of future income streams.

The next section describes how macroeconomic variables are assumed to affect MC based on the DCF model, common macroeconomic theories and empirical evidence.

4.1.1 GDP

- GDP is hypothesized to have a positive relation with MC.

Following among others Chen (1986), Geske (1983) and Mukherjee (1995), a positive relation between stock market prices and GDP is hypothesized. Along the lines of Miller & Modigliani (1961) an increase in economic output may increase future cash flows and, hence, lead to an increase in stock prices. Vis-à-vis, during a recession, stock prices are expected to fall.

4.1.2 Interest rates

- A negative relationship between interest rates and MC is hypothesized.

An increase in interest rates will also lead to an increase in the required rate of return, which in turn inversely affects the value of the asset. Furthermore, the resulting rise in the opportunity cost will motivate investors to substitute stocks for other assets like bonds in their portfolio. Hence, a higher interest rate will have a negative effect on stock prices from the perspective of portfolio allocation. The following simple example will illustrate the effect. When the interest rate goes up, it will become more expensive for banks to borrow money from the central bank. Therefore, banks will also increase the interest rates that they charge their customers. This means that interest rates on e.g. mortgages and credit cards will go up, leaving individuals with less income to spend on discretionary goods and services. In turn, revenue and profit of the companies will deteriorate and the incentive to invest in stocks will fade away.

4.1.3 Inflation

- CPI is hypothesized to have a negative relation with MC.

An increase in CPI has generally been theorized as having a negative effect on stock prices (Chen, 1986; Fama, 1977; 1981). The logic behind the argument is that in a competitive economy, inflation will raise the firm's production costs, decrease future cash flows and lower revenue. DeFina (1991) argues that the negative effect of the aggregate price level on stock prices is due to nominal contracts that disallow immediate adjustments of the firm's revenue and costs. In other words, DeFina (1991) shows that costs of the firms increase immediately with inflation. However, the price reflection in output is a slower process (Humpe, 2008). Economists often refer to this concept as sticky prices or 'menu costs'.

4.1.4 Exchange rate

- An appreciation of the local currency is hypothesized to have a positive relation with MC and credit growth.

Among others, Solnik (1987), Ma (1990) and Mukherjee (1995) show that both exchange rate levels and changes in the exchange rate affect the performance of the stock market. When e.g. the South African ZAR depreciates against the USD or Euro, South African products will become cheaper in the US and EU. Under the condition that demand for these South African products is elastic, the volume of South African exports should increase (McConnell, 2008).

This leads to higher ZAR-denominated cash flows to South African companies. This will, in turn, move stock prices up (Ma, 1990).

4.2 Macroeconomic Transmission channel to bank lending

According to Steven Kamin and Philip Turner (1999), who conducted a study titled “The transmission mechanism of monetary policy in emerging market economies”, the most conventional model of monetary transmission, a shift in policy leads to a change in the money supply that, for a given money demand, leads to a change in money-market interest rates. Changes in policy and interbank rates lead, in turn, to changes in bank loan rates for borrowers, which may affect investment decisions, and in deposit rates, which may affect the choice between consuming now and later (Steven & Philip, 1999). Schematically, the impact of monetary policy on bank lending can be represented as:

$\downarrow$interest rates $\rightarrow \uparrow$bank deposits $\rightarrow \uparrow$bank loans $\rightarrow \uparrow$Investment spending, $\uparrow$Output

Reserve Bank of South Africa summarises that ‘an important implication is that monetary policy through this channel will have a greater effect on those more dependent on bank loans, such as smaller firms, since larger firms have recourse to obtaining funds by issuing new share capital.’ ‘As circumstances and restrictive regulatory frameworks change to allow banks greater ability to raise funds, the potency of this channel will be reduced’ (Mishkin, 1995).

4.2.1 GDP

- GDP is hypothesized to have a positive relation with credit growth.

Tecles and Tabak (2008) estimated the empirical relationship between credit and GDP using a Vector Error Correction model applied to Brazilian data. The study of the effect of GDP on demand for credit was carried by the assumption that better economic conditions increase the consumer and investor optimism. With higher expectations on future income, they tend to smooth consumption by increasing borrowing. Their findings indicate a significant impact of credit supply on future income, which corroborates the credit view hypothesis that financial development has an important role in economic growth.

4.2.2 Interest rates

- A negative relationship between interest rates credit growth is hypothesized.

The companies also borrow money from banks to run and expand their operations. When banks make borrowing more expensive, companies might not borrow as much and will pay a higher rate of interest on their loans. Less business spending can slow down the growth of a company, resulting in decreased profit.

4.2.3 Inflation

- CPI is hypothesized to have a negative relation with credit growth.

Gupta, (2010) who carried out a study on the impact of inflation on homes loans, notes that inflation is a major causes of fluctuating interest rates and increase in homes loans interest rates. This means that a rising inflation rate tends to increase the rates on loans and therefore the cost to the bank go up which eventually results to an increase in home loan interest rates, among other loans rates.

4.2.4 Exchange rate

- An appreciation of the local currency is hypothesized to have a positive relation with credit growth.

If an appreciation happens, it will lead to a relative increase in the price of South African products in foreign markets. Hence, we will see a decrease in demand for South African exports and lower cash flows into the country. However, a stronger currency will also lower the cost of imported production inputs (McConnell, 2008). The effect of exchange rates on MC therefore depends on to what degree a country imports its production inputs or not. It is thus crucial to understand whether a country has an economy that is dominated by exports or imports. Nevertheless, since it was shown in the country analysis that exports contribute strongly to GDP in the economies of this thesis, it is hypothesized that there is a positive relationship between an appreciation in the exchange rate and MC.

4.3 Conclusion of the Macroeconomic Analysis

Based on theory and empirical work of scholars, we have attempted to describe and analyse what effect macroeconomic variables might have on MC and credit growth. The next section is on the empirical analysis on our chosen economies. Here, a deeper understanding will be gained of how these macroeconomic variables interact with MC and credit growth in Botswana and Mauritius.

5 Methodology for the Econometric Analysis

5.1 Data limitations

Notwithstanding the thoroughness of this study and the use if representative samples, there are some crucial limitations which should be kept in mind.

This study uses yearly data, therefore detailed changes in the economy from, for example month to month are not considered. Hence, the study is mainly focused with long-term macroeconomic effects on MC and credit growth, thus cannot be used in a short-term context. The study takes a panel data approach. Consequently, it can be challenging to infer single-country effects from the results. However, panel data should give an advantage of filtering out individual and ambiguous effects in each country. Therefore, in the results of the panel data analysis, relationships that are significant across both economies is likely to emerge, making the conclusions more robust.

The data is sourced from BMI Fitch Solutions, a leading international provider of financial and economic market data. Due to the availability of some of the given variables, the data is analysed on a yearly basis, from January 2005 to December 2017.

5.2 Unit Root Analysis

Unit root analysis is a test for stationarity or non-stationarity of a time series. Results obtained by using non-stationary time series may be spurious in that they may imply a relationship between two variables where one does not exist.

5.2.1 Augmented Dickey Fuller Unit Root Test

The estimation method is based on the condition that at level form the variables are non-stationary and are integrated of order [I(1)]. Integrated of order one means that when non-stationary variables are differenced once, they then become stationary. At first testing for stationarity and order of integration is done which is done by using the Augmented Dickey-Fuller (ADF) (Fuller, 1976; Dickey and Fuller,1979) unit root test. The equation for the test is given by:

$$\Delta y_t = \theta y_{t-1} + \sum_{i=1}^{p} \omega_i \Delta y_{t-i} + u_t \quad (2)$$

Where yt is the variable being tested, ∆yt is the first difference and ut are the errors. The first difference is considered to allow for autocorrelated errors. The hypotheses of the test are as follows

$$H_0: \theta = 0$$

$$H_1: \theta < 0$$

Here the null hypothesis states that the series has a unit root and thus is non-stationary while the alternative states that it is stationary.

According to Dejong et al, 1992 & Harris, 2003, the ADF test is not reliable for a small sample data set due to their size and power properties. Therefore, for small sample data sets, ADF tends to over-reject the null hypothesis when it is true and accept it when it is false.

5.3 Lag Length

After determining the order of integration, the appropriate lag length necessary for the Vector Autoregressive Model (VAR) needs to be established. A VAR model is a multivariate time series specification where lagged values of all the variables appear on the right-hand side on all the equations of the unrestricted model (Brooks, 2014). A suggested method to identify the lag length is through visual analysis of graphical plots such as the autocorrelation function (ACF) or partial auto correlation function (PACF). The ACF is a set of estimated values showing the strength of association between a variable and its previous values as the lag length increases (Brooks,2014). The PACF measures the correlation of a variable with its value k periods ago, (e.g. K=1,2….-,) after removing the effects of observations at all intermediate lags. This however, has proven to be insufficient when 'messy' real data is used, and it rarely exhibits simple patterns of figures (Brooks, 2014). Methods that have been used to avoid this are information criteria such as the Akaike's (1974) information criterion (AIC), Schwarz's (1978) Bayesian information criterion (SBIC) and the Hannan-Quinn criterion (HQIC). When using this criterion, the point is to choose the number of parameters which minimizes the value of the information criteria. In terms of which criteria is better, SBIC is strongly consistent but inefficient, whilst the AIC is inconsistent but generally more efficient, overall then, no is superior to others (Brooks, 2014). This means that SBIC will asymptotically deliver the correct model order whilst the AIC will deliver on average a model that is too large and on other hand, the average variation in selected model orders from different samples within a given population will be greater in the context of SBIC than AIC (Brooks, 2014).

5.4 Granger Causality

This test is a measure of whether a certain event (xt) occurs before another event (yt) and it also assists in predicting it. In most instances the reciprocal relationship is found that xt granger causes yt and the vice versa. The feedback system is referred to in this case. It is interpreted by many economists that the feedback system shows that the variables are related.

In the deep sense of the word It should be noted that granger causality is not causality. It is simply a detection of whether there is a linear prediction between the two variables therefore it only makes sense if one event happens before another (i.e. if granger causality is only found in one direction). Sometimes in economics it may happen that all economic variables respond to some un-modelled factor (such as the Hiroshima attack) and if the response of xt and yt is

time staggered then the granger causality between x and y can be used although the real causality is caused by something different. Since experimenting with the economy is not possible, there is no remedy for this. The granger test is generally hypothesised by the following:

H0: No causality

Ha: The independent variable Granger causes the dependent variable.

Existence of a co-integrating relationship among variables suggests that there must be Granger causality in at least one direction, but it does not indicate the direction of the temporal causality between the variables. Granger causality is, therefore, used to uncover the direction of the temporal causality, if such causality exists (Eviews, 2007; Granger, 1969).

5.5 Vector Autoregression (VAR)

The vector autoregression (VAR) is commonly used for forecasting systems of interrelated time series and for analysing the dynamic impact of random disturbances on the system of variables. The VAR approach sidesteps the need for structural modelling by treating every endogenous variable in the system as a function of the lagged values of all the endogenous variables in the system. The mathematical representation of a VAR is:

$$y_t = A_1 y_{t-1} + \cdots + A_p y_{t-p} + B x_t + \varepsilon_t \quad (3)$$

where yt is a vector of endogenous variables, xt is a vector of exogenous variables, A1,…,Ap and B are matrices of coefficients to be estimated, and εt is a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right-hand side variables. Since only lagged values of the endogenous variables appear on the right-hand side of the equations, simultaneity is not an issue and OLS yields consistent estimates. Moreover, even though the innovations εt may be contemporaneously correlated; OLS is efficient and equivalent to generalized least squares (GLS) since all equations have identical regressors (Eviews, 2007).

The coefficient measures the speed of adjustment of the ith endogenous variable towards the equilibrium (Eviews, 2007). The optimal lag length for each VAR model is selected using Wald lag exclusion tests and Akaike, Schwarz, and Hannah-Quinn Information Criteria.

An impulse-response function describes the evolution of the variable of interest along a specified time horizon after a shock in a given moment. From the impulse response plots, it becomes evident whether the effect is positive or negative and it is possible to observe if the effect diminishes or strengthens with time. In this study, the Cholesky factorization is chosen

for the shocks. The Cholesky decomposition uses the inverse of the Cholesky factor of the residual covariance matrix to orthogonalize the impulses. This option imposes an ordering of the variables in the VAR and attributes all the effect of any common component to the variable that comes first in the VAR system (Gujarati, 2003). To give a simple example, assume y is contemporaneously affected by z but not vice-versa. Thus, y is affected by structural innovations of both y and z, while z is affected only by its own structural innovation. This is a triangular decomposition of the covariance matrix known as the Cholesky decomposition.

Regarding variance decomposition, it shows us the strength of the shock. In this sense, variance decomposition can be used to observe how much influence one variable has on another variable. Furthermore, we see how the sources of variation underlying a variable's movements move through time. We will now move on to apply the econometric theories and tools introduced in the methodology.

6 Econometric Analysis of Macroeconomic Environment on Market Capitalization and Credit Growth

The model estimation and evaluation is conducted in this chapter. Section 6.1 provides descriptive statistics to relevant economic and financial data in the countries chosen for this study. Section 6.2 conducts a unit root tests on the variables of interest in this study of each country whilst section 6.3 conducts VAR models for each country as well as diagnostic testing. Section 6.4 conducts impulse response function, variance decomposition analysis and granger causality testing. Finally, section 6.5 summarizes the findings of the chapter.

6.1 Descriptive Statistics

Botswana

Table.1 Botswana Descriptive Statistics

	Years	Observations	Mean	Median	Max	Min	St.Dev	Skewness	Kurtosis
Market Capitalization of listed companies (% of GDP	2005-2015	13	34.4	34.2	48.7	24.7	6.4	0.7	0.8
Market Capitalization of listed companies (USD'billio	2005-2016	12	4.5	4.3	5.3	3.8	0.5	0.4	-1.3
Bank Loan Books (USD'billion)	2005-2017	13	3.5	3.6	5.3	1.6	1.2	-0.2	-1.4
Bank Loan Books (% of GDP)	2005-2017	13	25.7	26.4	32.2	17.6	5.2	-0.4	-1.4
Bank Loan Book Growth (%)	2005-2017	13	15.4	14.0	27.4	5.0	8.2	0.2	-1.4
Bank Loan Book NPLs (%)	2005-2017	13	2.5	2.3	5.5	0.9	1.4	0.8	0.1
GDP (USD,billion)	2005-2017	13	13.3	14.4	17.4	9.9	2.6	-0.1	-1.6
Consumer Price Index	2005-2017	13	106.2	108.5	141.2	64.2	26.1	-0.2	-1.4
Inflation (Annual Average) (%)	2005-2017	13	7.0	7.1	12.6	2.8	3.1	0.3	-0.5
MONEY SUPPLY: M2, % of GDP (%)	2005-2017	13	44.1	44.3	52.7	28.9	6.3	-0.9	1.9
Lending Rate (%)	2005-2017	13	12.1	11.2	16.4	6.9	3.6	-0.1	-1.5
Real Effective Exchange rate Index	2005-2017	13	97.5	98.4	100.6	91.8	2.7	-1.1	0.6
USD/BWP	2005-2017	13	7.8	7.2	10.9	5.1	1.8	0.5	-0.9

Mauritius

Table.2 Mauritius Descriptive Statistics

	Years	Observations	Mean	Median	Max	Min	St.Dev	Skewness	Kurtosis
Market Capitalization of listed companies (% of GDP)	2005-2015	13	53.1	51.9	67.8	38.5	7.0	0.1	1.7
Market Capitalization of listed companies (USD'billion)	2005-2016	12	7.1	7.3	9.3	4.5	1.5	-0.4	-0.7
Bank Loan Books (USD'billion)	2005-2017	13	6.6	7.3	8.6	3.4	1.9	-0.6	-1.1
Bank Loan Books (% of GDP)	2005-2017	13	63.4	63.5	71.2	54.9	5.7	-0.3	-1.1
Bank Loan Book Growth (%)	2005-2017	13	9.2	10.0	24.3	0.8	6.3	1.0	1.3
Bank Loan Book NPLs (%)	2005-2017	13	4.4	3.6	7.8	2.8	1.8	1.1	-0.4
GDP (USD,billion)	2005-2017	13	10.3	11.3	13.3	6.5	2.3	-0.5	-1.1
Consumer Price Index	2005-2017	13	102.5	105.5	124.3	73.7	16.7	-0.5	-1.0
Inflation (Annual Average) (%)	2005-2017	13	4.4	3.8	9.0	1.0	2.3	0.7	0.6
MONEY SUPPLY: M2, % of GDP (%)	2005-2017	13	83.9	83.5	88.8	77.9	3.8	-0.2	-1.2
Lending Rate (%)	2005-2017	13	11.6	8.9	21.9	6.6	5.7	1.3	-0.1
Real Effective Exchange rate Index	2005-2017	13	100.8	102.6	107.5	90.7	5.5	-0.9	-0.4
USD/MUR	2005-2017	13	31.4	30.8	35.6	28.5	2.3	0.7	-0.4

6.2 Unit Root Tests

Unit root tests were conducted for the purpose of determining the order of integration of the variables we are interested in. These variables were first converted to their first logs for the purpose of scaling and smoothing the series. Because log transformations of negative values are undefined, the log-modulus transformation was used under this context. The log-modulus transformation is a technique that can be used to smooth data when variables have negative values, and the usual transformation cannot be used. The transformation takes the logarithm

of the absolute value of the variable plus 1. The purpose of the Augmented Dickey-Fuller (ADF) test is to test for stationarity, as mentioned in section 5.3.1 above.

Table.3 Botswana variables Unit Root Test: ADF

Variable	ADF Unit Root Test		Order of Integration
	Without Trend	With Trend	
Market Capitalisation	-2.585 [0.122]	-3.57 [0.087]	neither
∆ Market Capitalisation	-2.584 [0.124]	-3.603 [0.084]	I(1)
Banking Sector Loan Book Growth	-1755 [0.382]	-2.956 [0.186]	I(1)
∆ Banking Sector Loan Book Growth	-1281 [0.60]	-2.931 [0.188]	neither
GDP	-0.565 [0.837]	-2.601 [0.286]	I(1)
∆ GDP	-0.842 [0.769]	-2.391 [0.365]	I(1)
Lending Rate	-0.465 [0.861]	-3.875 [0.059]	
∆ Lending Rate	-0.793 [0.784]	-3.147 [0.140]	I(1)
USD/BWP Exchange rate	-0.55 [0.848]	-2.782 [0.232]	neither
∆ USD/BWP Exchange rate	-1.168 [0.650]	-2.71 [0.252]	neither
M2 money to GDP	-3.485*** [0.029]	-3.909 [0.048]	I(1)
∆ M2 money to GDP	-4.233 [0.008]	-4.648 [0.016]	I(1)

***indicates significance at the 5%level

Table.4 Mauritius variables Unit Root Test: ADF

Variable	ADF Unit Root Test		Order of Integration
	Without Trend	With Trend	
Market Capitalisation	-0.988 [0.712]	-3.295 [0.114]	I(1)
∆ Market Capitalisation	-1.090 [0.674]	-3.353 [0.105]	I(1)
Banking Sector Loan Book Growth	-0.897 [0.748]	-4.281 [0.028]	I(1)
∆ Banking Sector Loan Book Growth	-0.307 [0.895]	-4.28109*** [0.028]	I(1)
GDP	-2.78*** [0.010]	-0.236 [0.977]	I(1) with trend
∆ GDP	-3.907*** [0.018]	-0.828 [0.922]	I(1) with trend
Lending Rate	-1.758 [0.381]	-1.228 [0.855]	neither

∆ Lending Rate	-1.722 [0.397]	-1.042 [0.895]	I(1) with trend
USD/MAU Exchange rate	-1.485 [0.507]	-2.154 [0.469]	I(1) with trend
∆ USD/MAU Exchange rate	-1.562 [0.470]	-2.226 [0.436]	neither
M2 money to GDP	-1.509 [0.492]	-1.819 [0.623]	neither
∆ M2 money to GDP	-1.54 [0.477]	-1.896 [0.584]	neither

***indicates significance at the 5%level

Table 3 above reports the obtained results from the ADF unit root test on the variables under study for Botswana whilst Table 4 reports the ADF unit root test on the variables under study for Mauritius. Because the results are sensitive to whether a trend term is contained or not, tests were conducted with and without a trend term. For Botswana, only Lending Rate is I(0) stationary without a trend. I(1) stationary variables without a trend included MC, GDP, Banking Sector Loan Book Growth and M2 money supply – GDP. Non-variables was the USD/BWP Exchange rate. For Mauritius, M2 Money Supply- GDP were non-stationary. USD/MAU exchange rate and GDP were (1) stationary with a trend, while MC and Banking Sector Loan Book Growth were I(1) stationary without a trend.

6.3 Vector Autoregressive Modelling (VAR)

In earlier chapters we mentioned that small sample sizes due to data limitations used in this study imply that the results of the unit root tests are not too robust in nature. Thus, this means that the unit root conditions that are necessary for us to estimate cointegration relationships are not satisfied. Because these conditions are not satisfied, the relationship of how the macroeconomic variables of interest interact with MC and Banking Sector Loan Book growth shall be studied using the VAR model in first differences. As mentioned in earlier sections, VAR modelling is appropriate regardless of whether the regressors of interest are I(0) or (1). It allows for all variables in the model to be endogenous and explains how the evolve during the periods under review. This will satisfy the objective of this study although though the long run relationships cannot by studied. More so, estimating VAR will allow the study of how variables react when a shock is applied. Therefore, as the relationship of study is between MC and macroeconomic variables, the impulse response functions and variance decomposition of these variables with respect to each other will be examined.

6.3.1 Optimal Lag Length

As mentioned in chapter 5, once we have found the order of integration, the lag length that is most appropriate to use in the VAR model needs to be established of which these results will be subject to the lag order. As mentioned in chapter 5, this is done using information criterion.

Table 5 Botswana MC and GDP Lag Order Selection

Lag	AIC	SC	HQ
0	-1.998	-1.926	-2.044
1	-2.705*	-2.488*	-2.842*
2	-2.487	-2.125	-2.715

*indicates lag order selected by the criterion

Table 6 Mauritius MC and GDP Lag Order Selection

Lag	AIC	SC	HQ
0	-1.677	-1.605	-1.723
1	-3.282*	-3.066*	-3.420
2	-3.269	-2.907	-3.497*

*indicates lag order selected by the criterion

Table.7 Botswana Banking sector loan book growth and GDP Lag Order Selection

Lag	AIC	SC	HQ
0	1.190	1.262	1.144
1	-0.837	-0.620	-0.974
2	-1.348*	-0.986*	-1.576*

*indicates lag order selected by the criterion

Table.8 Mauritius Banking sector loan book growth and GDP Lag Order Selection

Lag	AIC	SC	HQ
0	1.883	1.955	1.837
1	0.612	0.829*	0.475
2	0.502*	0.863	0.274*

*indicates lag order selected by the criterion

Table.9 Botswana MC and Lending rate Lag Order Selection

Lag	AIC	SC	HQ
0	-0.016	0.056	-0.062
1	-0.585	-0.368	-0.722
2	-0.858*	-0.497*	-1.086*

*indicates lag order selected by the criterion

Table.10 Mauritius MC and Lending rate Lag Order Selection

Lag	AIC	SC	HQ
0	0.014	0.086	-0.032
1	-2.606	-2.389	-2.743
2	-3.249*	-2.887*	-3.477*

*indicates lag order selected by the criterion

Table.11 Botswana Banking Sector Loan Book Growth and Lending rate Lag Order Selection

Lag	AIC	SC	HQ
0	1.815	1.887	1.769
1	1.463*	1.680*	1.326
2	1.544	1.906	1.316*

*indicates lag order selected by the criterion

Table.12 Mauritius Banking Sector Loan Book Growth and Lending rate Lag Order Selection

Lag	AIC	SC	HQ
0	3.102	3.174	3.056
1	2.489*	2.706*	2.352*
2	2.688	3.050	2.460

*indicates lag order selected by the criterion

Table.13 Botswana MC and USD/BWP exchange rate Lag Order Selection

Lag	AIC	SC	HQ
0	-1.740	-1.668	-1.785
1	-4.756*	-4.539*	-4.893*
2	-4.560	-4.199	-4.788

*indicates lag order selected by the criterion

Table.14 Mauritius MC and USD/MAU exchange rate Lag Order Selection

Lag	AIC	SC	HQ
0	-2.887	-2.814*	-2.932
1	-2.625	-2.408	-2.762
2	-2.939*	-2.578	-3.167*

*indicates lag order selected by the criterion

Table.15 Botswana Banking Sector loan book growth and USD/BWP exchange rate Lag Order Selection

Lag	AIC	SC	HQ
0	0.314	0.387	0.269
1	-2.421*	-2.204*	-2.558*
2	-2.176	-1.815	-2.404

*indicates lag order selected by the criterion

Table.16 Mauritius Banking Sector loan book growth and USD/MAU exchange rate Lag Order Selection

Lag	AIC	SC	HQ
0	-0.214	-0.142*	-0.260
1	-0.277*	-0.060	-0.414*
2	0.018	0.380	-0.210

*indicates lag order selected by the criterion

Tables 5 – 15 above aid in choosing the suitable lag length for the VAR estimates in accordance with the information criteria, for MC and Banking Sector's relationship between GDP, Lending rate and the exchange rate. For Botswana the general optimal lag length for MC and GD, Banking Sector Loan Book Growth, MC and exchange rate, and Banking sector Loan Book Growth and Exchange rate have an optimal lag length of 1. Banking Sector Loan Book Growth and GDP, and MC and Lending rate have an optimal lag length of 2.

For Mauritius the general optimal lag length for MC and GDP, Banking Sector Loan Book Growth and Lending rate, and Banking Sector Loan Book Growth and Exchange rate have an optimal lag length of 1. Banking Sector Loan Book Growth and GDP, MC and Lending rate, and MC and Exchange Rate have an optimal lag length of 2.

6.3.2 Vector Autoregressive Models

For Botswana, the estimates from the VAR model were insignificant for the following relationships;

- Exchange rate and MC
- Lending Rate and MC
- Exchange rate and Banking Sector Loan Book Growth

This therefore means that the null hypothesis of there being a relationship between Exchange rate and MC, there being a relationship between Lending Rate and MC are rejected and there being a relationship between Exchange rate and Banking Sector Loan Book Growth. This therefore implies that Lending rate and exchange rate have no influence on MC while the exchange rate has no influence on Banking Sector Loan Book Growth. However, the VAR model was significant for the following relationships;

- Lending rate and Banking Sector Loan Book Growth
- GDP and MC
- GDP and Banking Sector Loan Book Growth

This therefore implies that we fail to reject the null hypothesis of there being a relationship between Lending rate and Banking Sector Loan Book Growth, GDP and MC, and GDP and Banking Sector Loan Book Growth. Thus, this implies that Lending rate and GDP have an influence on Banking Sector Loan Book Growth while GDP has an influence on MC.

For Mauritius, the VAR model was significant for the following relationships;

- GDP and MC
- GDP and Banking Sector Loan Book Growth
- Lending rate and Banking Sector Loan Book Growth
- Exchange rate and MC

This therefore implies that we fail to reject the null hypothesis of there being a relationship between GDP and MC, GDP and Banking Sector Loan Book Growth, Lending Rate and Banking Sector Loan Book Growth, and Exchange rate and MC. Consequently, this implies that GDP and Lending rate have an influence on Banking Sector Loan Book Growth while GDP and Exchange rate have an influence on MC. However, the estimates for the VAR models were insignificant for the following relationships;

- Exchange rate and Banking Sector Loan Book Growth
- Lending rate and MC

This therefore means that the null hypothesis of there being a relationship between exchange rate and Banking Sector Loan Book Growth and Lending rate and MC. This therefore means Exchange rate has no influence on Banking Sector Loan Book Growth while lending rate has no influence on MC.

Notwithstanding the results, too many coefficients and parameters were displayed for the above VAR tests, thus making validity and robustness of the results of the model questionable.

This may have stemmed from the data limitations subjected to the study. Therefore, by diagnostic testing in the next section, the issue of the validity and the robustness of the results found is further investigated.

6.3.3 Diagnostic Testing

The fitness and validity of the given models is tested via diagnostic testing. We will test whether the residuals from the VAR tests are serially correlated or not. Serial correlation exits when a variable is correlated with its lags. This is a problem in any regression model, because it means that the variables in the model do not fully explain each other and that there are variables missing in the model, thus meaning the model does not have a proper fit. The use of the Breusch-Godfrey serial correlation LM test will be used, where the null hypothesis states that there is no serial correlation.

Table.17 Botswana LM Test

Relationship	LM-Stat	Prob
GDP and MC	1.571	0.814
Lending Rate and MC	5.816	0.213
Exchange rate and MC	2.606	0.626
GDP and Banking Sector Loan Book Growth	2.819	0.589
Lending Rate and Banking Sector Loan Book Growth	10.035	0.040
Exchange rate and Banking Sector Loan Book Growth	0.455	0.978

Table.18 Mauritius LM Test

Relationship	LM-Stat	Prob
GDP and MC	8.418	0.077
Lending Rate and MC	5.935	0.204
Exchange rate and MC	5.847	0.211
GDP and Banking Sector Loan Book Growth	4.706	0.319
Lending Rate and Banking Sector Loan Book Growth	7.963	0.093
Exchange rate and Banking Sector Loan Book Growth	1.735	0.784

Tables 16 and 17 above show the tests for serial correlation within the residuals of the various VAR models of this study. For Botswana and Mauritius, we fail to reject the null hypothesis of no serial correlation for all relationships. This therefore means that the validities and fits for VARs are appropriate and the results are robust. In the next section, impulse response functions together with variance decomposition and granger causality will be used to address the research questions.

6.4 Impulse Response Functions and Variance Decomposition

6.4.1 Impulse Response Functions

The impulse response functions of the relationship between the economic variables chosen for this study and MC and Banking Sector Loan Book Growth can be used to augment the

results of VAR models in section 6.3.2. Impulse response functions assist us to examine the response of one variable when a shock is added to another. They provide information on whether changes in the value of a certain variable will have a positive or negative impact on other variables, therefore allowing us to study the research question regarding the nature of the relationship between macroeconomic variables and MC and Banking Sector Loan Book Growth during the periods under review. VAR residuals are inducing these shocks. If the error terms in the VARs are correlated, then it is possible that a shock in one variable may be escorted by a shock to another variable, meaning that the reactive variable could be

Fig.22. Botswana MC and Banking Sector Loan Book Growth Impulse response to GDP

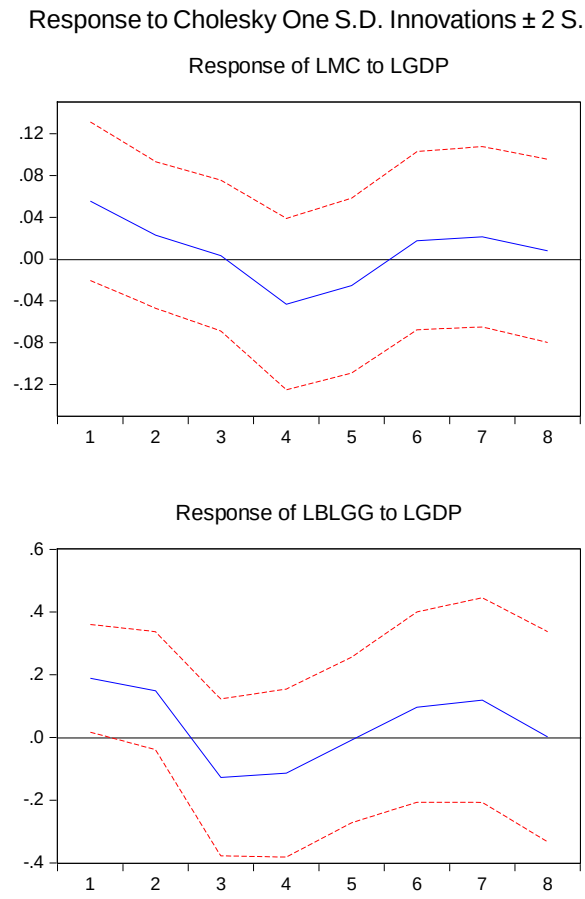
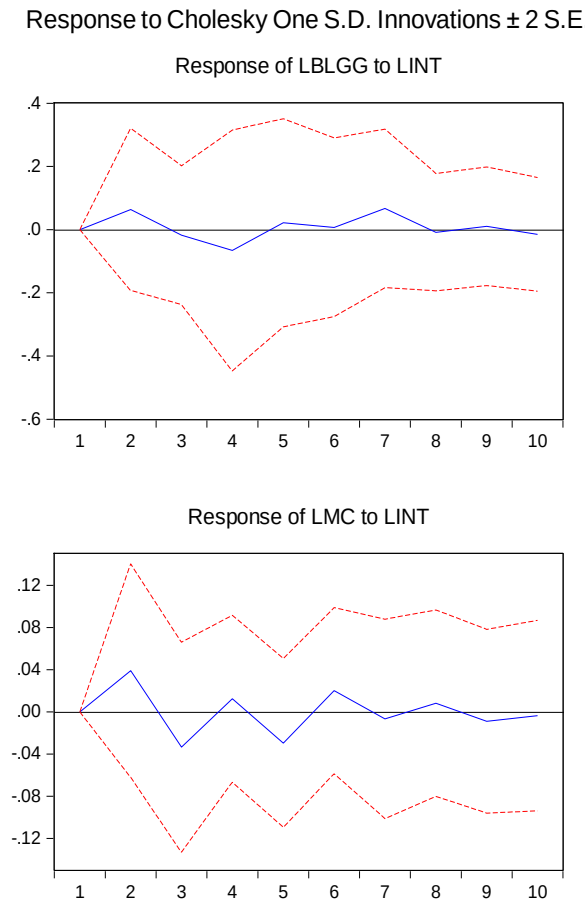


Fig.23. Botswana MC and Banking Sector Loan Book Growth Impulse response to Lending Rate



responding to shocks to either one or both variables with the implemented shocks. We will conduct Cholesky one standard deviation innovations, where the decomposition is such that changes in one variable have no effect on changes to other variables as the components are uncorrelated when using this method.

Fig.24. Botswana MC and Banking Sector Loan Book Growth Impulse response to Exchange Rate

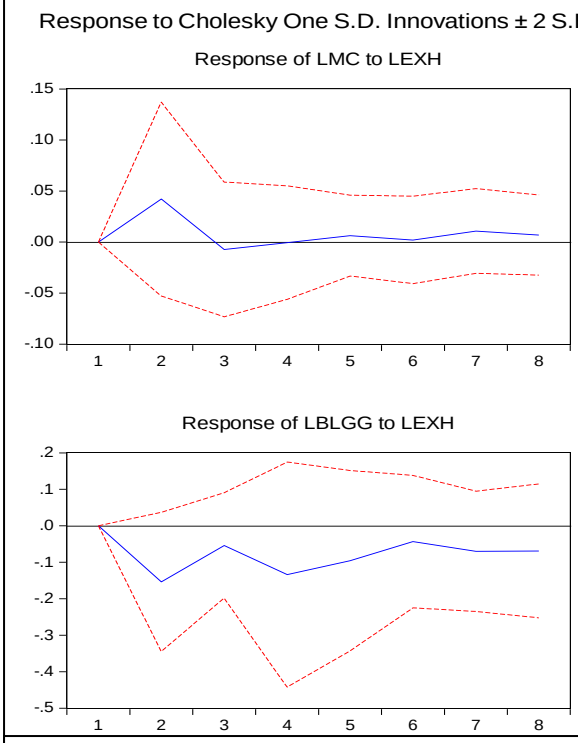


Fig.25. Mauritius MC and Banking Sector Loan Book Growth Impulse response to GDP

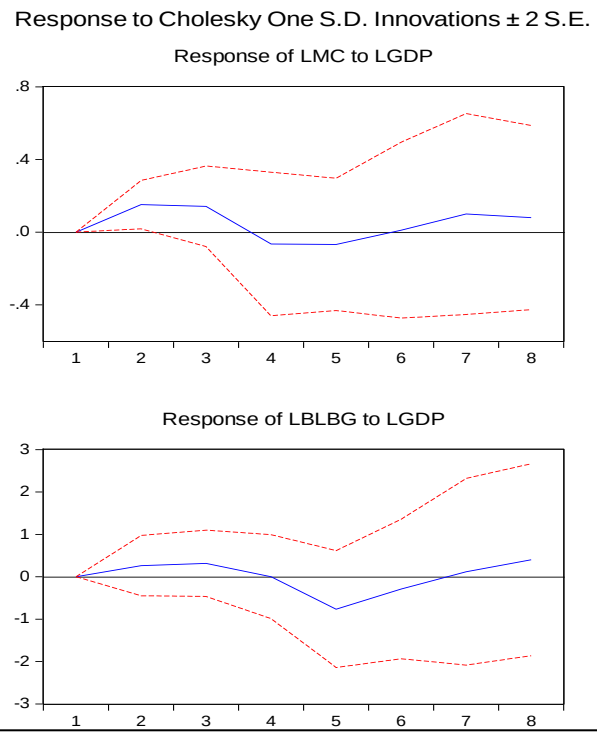


Fig.26. Mauritius MC and Banking Sector Loan Book Growth Impulse response to Lending Rate

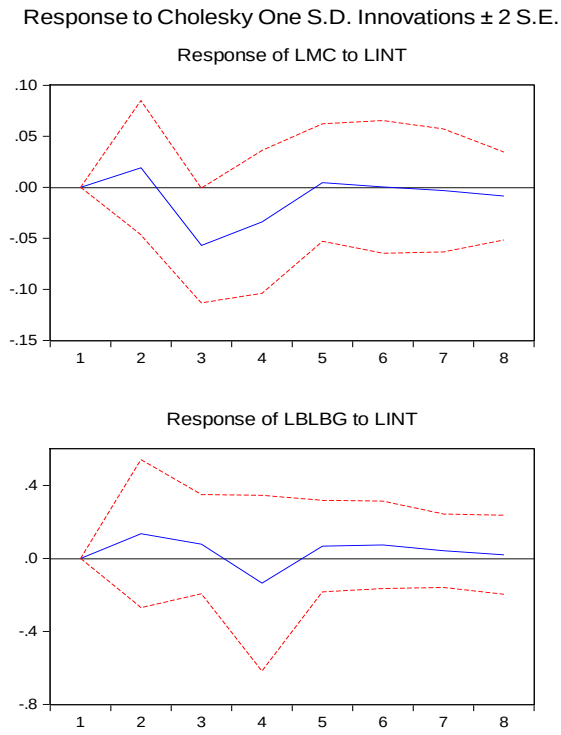
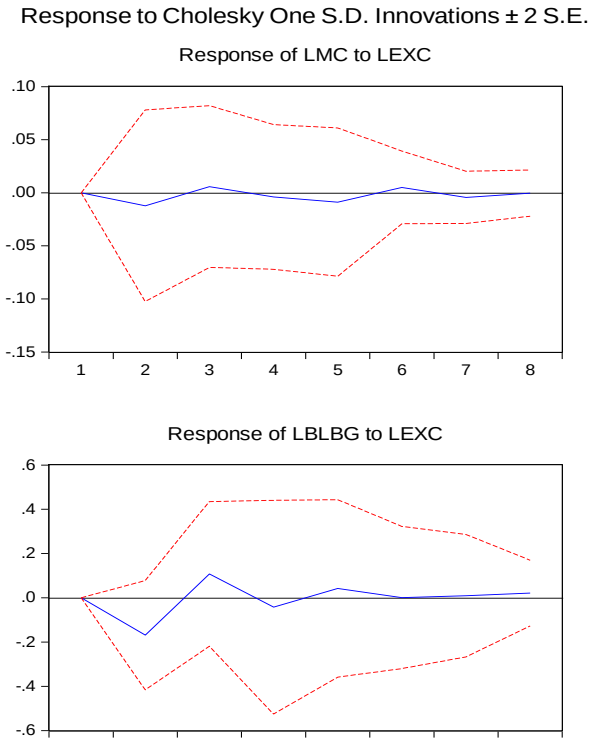


Fig.27. Mauritius MC and Banking Sector Loan Book Growth Impulse response to Exchange Rate



Figures 22 -27 above show the impulse response functions of the MC and Banking Sector Loan Book Growth shocks to GDP, Lending Rate and Exchange Rate for Mauritius and Botswana. Theoretically, according to Caporale et al, 2004, an organized and managed stock market stimulates investment opportunities by reorganizing and financing productive projects that leaf to economic activity, mobilize domestic savings, allocate capital proficiency, help to diversify risks, and facilitate exchange of goods and services (Caporale et al, 2004), stock markets are therefore expected to enable economic growth. From both directions, one would therefore expect a significant positive relationship between GDP and MC. For Botswana, from periods 1 to 3, the initial response of MC to GDP is positive, followed by a negative response from periods 3 to 6 then a recovery from periods 6 to 8 as the relationship is positive. For Mauritius, there was a positive initial response of MC to GDP from periods 1 to 4, followed by a negative response in periods 4 to 6 then a recovery illustrates by a positive response from periods 6 to 8. The results attained from the impulse response are in support of the theory as they show that in both Botswana and Mauritius there is an instantaneous positive response of MC to GDP. In answering the research questions with respect to the significance nature of the relationship between GDP and MC. Therefore, one can assume that the results of a positive response of MC to GDP confirms Baker and Wurgler (2002) market timing theory which postulates that firms time their equity issues in the sense that they issue new stock when the stock price is perceived to be overvalued and buy back its own shares when there is under valuation.

Similar results were obtained for the response of Banking Sector Loan Book Growth to shocks in GDP for both Botswana and Mauritius such that the immediate response positive. Therefore, one can conclude that like MC.

6.4.2 Variance Decomposition

To provide further support in answering the research question regarding the nature of the various relationships of this study, variance decomposition of MC, GDP, Lending rate and exchange rate are conducted. Variance decomposition informs us how much of the variability is explained by the variability due to shocks in the system. This therefore tells us the volume of information each variable contributes to the other variables in the VAR.

Table.19 Botswana MC Variance Decomposition

Variance Period	S.E	GDP	Exchange rate	Lending Rate	MC
1	0.108	7.364	7.010	50.658	34.968
2	0.127	30.547	6.293	37.431	25.729
3	0.133	35.520	6.175	34.274	24.032
4	0.134	35.020	6.082	34.085	24.813
5	0.135	35.303	6.250	33.750	24.697

Table.20 Mauritius MC Variance Decomposition

Variance Period	S.E	GDP	Exchange rate	Lending Rate	MC
1	0.048	12.924	11.943	73.276	1.857
2	0.063	34.758	19.956	43.764	1.522
3	0.074	31.192	35.719	31.665	1.424
4	0.080	26.657	42.609	29.134	1.600
5	0.085	23.588	48.245	26.437	1.730

Table.21 Botswana Banking Sector Loan Book Growth Variance Decomposition

Variance Period	S.E	GDP	Exchange rate	Lending Rate	Loan Book Growth
1	0.296	18.797	52.210	0.006	28.987
2	0.406	14.724	61.512	6.025	17.739
3	0.440	23.494	53.807	7.367	15.332
4	0.446	23.906	52.540	8.616	14.938
5	0.452	23.797	52.459	9.186	14.558

Table.22 Mauritius Banking Sector Loan Book Growth Variance Decomposition

Variance Period	S.E	GDP	Exchange rate	Lending Rate	Loan Book Growth
1	0.755	5.470	58.170	2.499	33.861
2	0.794	6.672	53.230	2.321	37.776
3	0.820	8.076	50.115	2.453	39.356
4	0.827	7.950	49.333	2.479	40.237
5	0.838	8.955	48.260	2.603	40.182

Tables 18 and 19 above illustrate the variance decomposition of MC in Botswana and Mauritius respectively, whilst Tables 20 and 21 display the variance decompositions of Banking Sector Loan Book Growth in Botswana and Mauritius respectively. For Both Botswana and Mauritius, Lending Rate has most of the variability in MC in the short-run (i.e. periods 1-2) then in the long-run (periods 3-5) GDP gradually increases its significance in variability as depicted in the increase in percentage error variance decomposition. Whilst regarding Banking Sector Loan Book Growth, Exchange rate has the most variability both in the short and long run for Botswana and Mauritius.

6.4.3 Granger Causality

For us to satisfy the research question regarding to causality and direction of causality, granger causality tests were conducted, and the results are shown in the tables below.

Table.23 Botswana Granger Causality: MC and GDP

Null Hypothesis	Obs	Chi-sq	Prob
GDP does not Grander Cause MC	12	1.247	0.264
MC does not Grander Cause GDP		1.001	0.317

Table.24 Botswana Granger Causality: MC and Lending Rate

Null Hypothesis	Obs	Chi-sq	Prob
Lending Rate does not Grander Cause MC	12	0.289	0.591
MC does not Grander Cause Lending Rate		0.122	0.727

Table.25 Botswana Granger Causality: MC and Exchange Rate

Null Hypothesis	Obs	Chi-sq	Prob
Exchange Rate does not Grander Cause MC	12	0.009	0.925
MC does not Grander Cause Exchange Rate		9.282	0.002

Table.26 Botswana Granger Causality: Loan Book Growth and GDP

Null Hypothesis	Obs	Chi-sq	Prob
GDP does not Grander Cause Loan Book Growth	12	5.547	0.062
Loan Book Growth does not Grander Cause GDP		7.736	0.021

Table.27 Botswana Granger Causality: Loan Book Growth and Lending Rate

Null Hypothesis	Obs	Chi-sq	Prob
Lending Rate does not Grander Cause Loan Book Growth	12	5.846	0.054
Loan Book Growth does not Grander Cause Lending Rate		1.122	0.571

Table.28 Botswana Granger Causality: Loan Book Growth and Exchange Rate

Null Hypothesis	Obs	Chi-sq	Prob
Exchange Rate does not Grander Cause Loan Book Growth	12	18.873	0.000
Loan Book Growth does not Grander Cause Exchange Rate		3.585	0.167

Table.29 Mauritius Granger Causality: MC and GDP

Null Hypothesis	Obs	Chi-sq	Prob
GDP does not Grander Cause MC	12	8.445	0.015
MC does not Grander Cause GDP		5.718	0.057

Table.30 Mauritius Granger Causality: MC and Lending Rate

Null Hypothesis	Obs	Chi-sq	Prob
Lending Rate does not Grander Cause MC	12	15.443	0.000
MC does not Grander Cause Lending Rate		23.287	0.000

Table.31 Mauritius Granger Causality: MC and Exchange Rate

Null Hypothesis	Obs	Chi-sq	Prob
Exchange Rate does not Grander Cause MC	12	0.843	0.656
MC does not Grander Cause Exchange Rate		9.686	0.008

Table.32 Mauritius Granger Causality: Loan Book Growth and GDP

Null Hypothesis	Obs	Chi-sq	Prob
GDP does not Grander Cause Loan Book Growth	12	0.633	0.729
Loan Book Growth does not Grander Cause GDP		5.188	0.075

Table.33 Mauritius Granger Causality: Loan Book Growth and Lending Rate

Null Hypothesis	Obs	Chi-sq	Prob
Lending Rate does not Grander Cause Loan Book Growth	12	5.956	0.051
Loan Book Growth does not Grander Cause Lending Rate		0.131	0.937

Table.34 Mauritius Granger Causality: Loan Book Growth and Exchange Rate

Null Hypothesis	Obs	Chi-sq	Prob
Exchange Rate does not Grander Cause Loan Book Growth	12	1.090	0.580
Loan Book Growth does not Grander Cause Exchange Rate		4.599	0.100

Tables 22 to 27 above show the granger causality results for MC and Banking Sector Loan Book Growth with; GDP, Lending Rate and Exchange Rate, for Botswana. In most instances, tests fail to reject the null hypothesis of no granger causality from either direction. Exceptions where we reject the null hypothesis of no granger causality include the following;

- MC does not Grander Cause Exchange Rate
- Loan Book Growth does not Grander Cause GDP
- Lending Rate does not Grander Cause Loan Book Growth
- Exchange Rate does not Grander Cause Loan Book Growth

For Botswana this means that during the period under review for this study, according to the Granger Causality test, MC causes a movement in Exchange Rate, Loan Book Growth causes a movement in GDP, Lending Rate causes a movement in Loan Book Growth and Exchange Rate causes a movement in Loan Book Growth.

While for Mauritius, Tables 28 – 33 above show the granger causality results for MC and Banking Sector Loan Book Growth with; GDP, Lending Rate and Exchange Rate, during the period under review in this study.

Instances where we reject the null hypothesis of no granger causality include the following;

- GDP does not Grander Cause MC
- Lending Rate does not Grander Cause MC
- MC does not Grander Cause Lending Rate
- MC does not Grander Cause Exchange Rate
- Lending Rate does not Grander Cause Loan Book Growth

Therefore, for Mauritius, the Granger Causality test results show that; GDP causes a movement in MC, Lending causes a movement on MC and the vice versa, MC causes a movement in the Exchange Rate and Lending Rate causes a movement in Loan Book Growth.

6.5 Summary of Chapter

This chapter we conducted the model estimation and evaluation. First, we conducted Unit root tests for us to be able to determine the order of integration of the variables of interest. All the variables were found to have different orders of integration, with some being I(0) which that cointegration could not be conducted . We therefore conducted VAR models as they were

also suitable in answering the research questions for the purpose of this study. The VAR models produced multiple coefficients and parameters and the residual tests showed that the model residuals were uncorrelated therefore implying that the models were efficient. Then research questions regarding the significance, and the nature of the relationship were tested using the impulse response function and the variance decompositions. Results from the impulse response functions were in support of the theory, as they showed that MC and Banking Sector Loan Book Growth instantaneously reacted positively response to a shock in GDP and Lending Rates in Botswana and Mauritius. Whilst the results for a shock in Exchange Rates there was only an instantaneously positive response from MC in Botswana, whilst the response was negative for Banking Sector Loan Book Growth in Botswana and Mauritius as well as the MC in Mauritius. In Addition, variance decompositions of the variables illustrated that Lending Rate and GDP were significant in explaining the variability in MC for both Botswana and Mauritius, whilst regarding Banking Sector Loan Book Growth, Exchange rate has the most variability both in the short and long run for Botswana and Mauritius. Finally, for us to answer the research questions pertaining to causality, we conducted granger causality tests where the results were mixed in both countries in this study.

7 Findings and Conclusions

7.1 Introduction

In this chapter we discuss the results and findings conveyed in chapter 6 as we conclude the given study. The next section focuses on the findings and conclusions reached.

7.2 Findings and Conclusions

The objective of this research was to study the relationship of certain macroeconomic variables on capital structure decisions in Botswana and Mauritius. Botswana has been seen to be a resource-based economy whilst Mauritius has been seen to been diversified economy. Through investigating past literature on capital structure, it was found that despite the extensive research done on how firms determine their capital structures, the studies on the impact of macroeconomic variables on capital structure have not been conclusive and different researchers have arrived at different conclusions while considering similar factors. More so, most capital structure determinants research had been conducted on developed countries meaning that more research was required for the developing economy context, especially in Africa. Therefore, the questions of this research paper attempted to answers some of the questions as well as contribute to previous studies and provide new evidence to this highly researched topic of the interaction between macroeconomic variables and capital structure.

The method that was chosen to examine this relationship was the cointegration analysis as it was found to be ideal in dealing with issues of stationarity regarding to time series data. Although this was the case, it was found that, from using the ADF unit root testing, not all variables were of the same order of integration in Botswana and Mauritius during the period under review. This meant that cointegration could not be used. We then conducted VAR modelling so that we could inspect the research questions and we found that the model residuals were uncorrelated, thus making the fit and validity of the models reliable. From there onwards, impulse response functions together with variance decompositions from the VARs were used to examine the research questions regarding the significance and nature of the relationships. The results found from the impulse response functions were both contrary to and in support of theory, as they showed that MC and credit growth both had a positive immediate response to GDP for both Botswana and Mauritius. From the equity perspective, one could postulate that the results were consistent with Baker and Wurgler (2002) market timing study which postulates that firms time their equity issues in the sense that they issue new stock the stock price is perceived to be overvalued and buy back its own shares when there is under valuation. From the credit growth perspective, this was consistent with Gajurel (2005) study of corporate capital structure of Nepalese companies, where he found that higher economic growth (i.e. GDP) tends to cause firms to use more long-term debt and less short-term debt. According to Booth et al (2001), these findings were consistent with results from emerging markets.

Additionally, variance decompositions of selected macroeconomic variables and MC and credit growth showed that the variability interest rates (in the short-run) and GDP (in the long-run) were significant in explaining the variability in MC for both Botswana and Mauritius. Whilst for credit growth, exchange rate was most significant in explaining credit growth in Botswana and Mauritius, both in the short and long run. Finally, for us to answer the research questions regarding causality, granger causality tests were done. We arrived various results, however, in support of the thesis questions we found that for Botswana interest rates and exchange rates bring about causality in credit growth. While for Mauritius we found that GDP and interest have causality in MC, while interest rate have causality in credit growth. Lastly, when analysing all the results obtained from the different models, it was found that because Botswana is a resource-based economy while Mauritius is more diversified economy means that there were some differences in the way that the various macroeconomic variables interacted with MC and credit growth. Therefore, one can arrive at the conclusion that because the countries chosen are subjected to having different economic dynamics (resource-based and diversified economies) it can be inferred that firms in the various countries will need to adjust their capital structures depending on how these variables interact within their respective economies.

8. References

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