THE FINANCIAL DEVELOPMENT AND INVESTMENT NEXUS: EMPIRICAL EVIDENCE FROM THREE SOUTHERN AFRICAN COUNTRIES

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I declare that the above thesis is my own work and that all the sources that I have

used or quoted have been indicated and acknowledged by means of complete

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ABSTRACT

The study examines the dynamic relationship between financial development and investment in three Southern African countries (Botswana, South Africa and Mauritius) during the period 1976 – 2014 using annual data. The motivation for selecting these countries is mainly based on their different characteristics in their economic and financial structure. Employing the Autoregressive Distributed Lag (ARDL) bounds test approach, the study examines the role of financial development in boosting investment; and the causal relationship between financial development and investment. The study makes use of composite financial development indices and divides financial development into bank-based and market-based financial development. In addition, both the impact of bank- and market-based financial development on investment, on the one hand; and the causality between bank- and market-based financial development and investment, on the other, were examined within the flexible accelerator model/framework. For both models, both bank-based and market-based financial development are assumed as having an accelerator-enhancing effect on investment. Empirical results show that, for Botswana, the impact of bank-based financial development on investment is positive in both the short run and the long run while no impact of market-based financial development is found for both periods. For South Africa, the effect of bank-based financial development on investment is found to be negative in the short run and has no impact in the long run. However, market-based financial development has only a positive effect on investment in the long run. For Mauritius, market-based financial development is the only type of financial development found to have a significant positive effect on investment, and only, in the short run. The results of the causality test show that: for Mauritius, both bank-based and market-based financial development tend to drive investment, both in the short run and in the long run; while- in South Africa, investment drives both bank-based and market-based financial development only in the short run. In Botswana, bank-based and market-based financial development and investment drive each other in the short run while investment tends to only drive bank-based financial development in the long run. Therefore, all three countries show differing results and tend to confirm that there are inter-country differences that determine the relationship between investment and financial development. The inter-country differences maybe as a result of the different stages of financial and economic development for each country.

KEYWORDS

DEDICATION

To my eternal Father even God, the Holy Spirit and my beloved Master and Lord, Jesus Christ; my father, the late Mr Henry Muyambiri and my mother, Mrs Danisile W. Muyambiri who through their hard work, support and advice have brought me this far. Dedications are further extended to my siblings and my friends, Maidei Grace Muyambiri, Dr Brighton Muyambiri, Henry Muyambiri and Memory Muyambiri.

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ACRONYMS

ABC	African Banking Corporation
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
ATM	Automated Teller Machine
Bank ROA	Bank Return on Assets
BBS	Botswana Building Society
BCB	Botswana Cooperative Bank
BNPI	Banque Nationale de Paris Intercontinentale Mauritius
BoB	Bank of Botswana
BoBC	Bank of Botswana Certificates
BOCODOL	Botswana College of Distance and Open Learning
BoM	Bank of Mauritius
BSE	Botswana Stock Exchange
BSM	Botswana Share Market
CDS	Central Depository System
CEDA	Citizen Entrepreneurial Development Agency
CPD	Corporation for Public Deposits
CPI	Consumer Price Index
CUSUM	Cumulative Sum of Recursive Residual
CUSUMQ	Cumulative Sum of Squares of Recursive Residual
DEM	Development and Enterprise Market
DF-GLS	Dickey-Fuller Generalised Least Square
DFI	Development Finance Institutions
ECM	Error-Correction Model
EPZ	Export Processing Zone
FIFA	Fédération Internationale de Football Association
FIU	Financial Intelligence Unit
FNBB	First National Bank Botswana
FSC	Financial Services Commission
GDP	Gross Domestic Product
GEAR	Growth Employment and Redistribution

GFCF	Gross Fixed Capital Formation
GLS	General Least Squares
GLS	Generalised Least Squares
GNP	Gross National Product
IFSC	International Financial Services Centre
IOIB	Indian Ocean International Bank
IPO	Initial Public Offering
IRF	Impulse Response Function
ISI	Import Substitution Industrialisation strategy
LADOFCA	Limitation and Disclosure of Finance Charges Act
LSE	London Stock Exchange
MBA	Mauritius Bankers Association
MCB	Mauritius Commercial Bank
MENA	Middle East and North African countries
MOBA	Mauritian Offshore Business Activities Act
MOBAA	Mauritian Offshore Business Activities Authority
MPC	Monetary Policy Committee
MPS	Monetary Policy Statement
MSE	Mauritius Stock Exchange
NBFI	Non-Bank Financial Institutions
NBFIRA	Non-Bank Financial Institutions Regulatory Authority
NDB	National Development Bank
NDP	National Development Plans
NFC	National Finance Committee
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OMAC	Open Market Auction Committee
OMCC	Open Market Coordination Committee
OMO	Open Market Operation
OTC	Over the Counter
PDC	Public Debt Commissioners
PDSF	Public Debt Service Fund
PP	Phillips-Perron

REPO	Repurchase Agreement
SADC	Southern African Development Community
SAMOS	South African Multiple Option Settlement
SARB	South African Reserve Bank
SBIIML	SBI International (Mauritius) Ltd
SEM	Stock Exchange of Mauritius
SEMATS	Stock Exchange of Mauritius Automated Trading System
SETS	Stock Exchange Trading System
SIC	Schwarz Bayesian Criterion
Stats SA	Statistics South Africa
UNCTAD	United Nations Conference on Trade and Development
US$/USD	United States Dollar
VAR	Vector Autoregressive
VECM	Vector Error-Correction Model
WDI	World Development Indicators

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 Background to the Study

The current debate on African economic development has devoted much attention to the role of financial development through financial liberalisation so as to increase financial sector performance, which in turn is thought to accelerate economic growth. The relationship between financial development and investment is taken as given, that is, financial development has a positive impact on investment, which in turn leads to increased economic growth. However, the theoretical and empirical investigation of the impact of financial development on investment and the causal relationship thereof, has not received as much attention as that commanded by the finance-growth relationship. Most of the research conducted on such has been mostly panel regression based and largely focused on the effect of bank-based financial development on investment.

Levine (1997) affirms the importance of financial development to investment and gives an implication of a positive causal effect from financial development to investment. Also Levine notes how development economists are sceptical about the role of the financial system and how they have ignored it in their scholarly articles. Despite the above arguments, Levine gives his conclusion on the matter hesitantly. He argues that

> '*the preponderance of theoretical reasoning and empirical evidence suggests a positive, first-order relationship between financial development and economic growth…There is even evidence that the level of financial development is a good predictor of future rates of economic growth, capital accumulation, and technological change*' (Levine, 1997:688)

Therefore, financial development is taken as a determinant of investment (capital accumulation). Levine (1997) stresses the primary function of financial systems as facilitating the allocation of resources, across space and time, in an uncertain environment. The motivation for these functions and their effect on economic growth are then extensively discussed using two channels. These channels are given as capital accumulation and technological innovation, in summary reinforcing the impact and causal effect between financial development and investment.

Furthermore, of the limited number of studies done on the finance-investment relationship, a considerable number has focused on either developed countries and/or were panel data studies for groups of countries. Therefore, the limitations associated with studies that investigated the impact of financial development on investment can be summarised in the following notions. Firstly, most of these studies were limited in that they over-relied on bank-based or market-based financial development proxies. The over-reliance on either proxies has led to conflicting results with investment (Adjasi and Biekpe, 2009). Secondly, the majority of studies have been based on panel data analysis that seems not to differentiate the different development stages of individual countries in empirical estimation. Arestis, Demetriades and Luintel (2001: 17), in their discussion of the role of financial development on growth, allude to the fact that time series methods can provide insightful outcomes in assessing the differences in a particular relationship across countries and may bring out the fundamental details that are normally hidden in cross country and panel estimation. So far, no attempt seems to have been made to use time-series methods to investigate the relationship between financial development and investment in specific countries on a country-by-country basis (especially for Southern Africa). Thirdly, the majority of studies have used residual-based cointegration tests or maximum likelihood tests, which are inappropriate if the sample is small. Fourthly, no study appears to have sought to evaluate the impact of financial development on investment and the associated causal relationship, especially for Southern African countries.

Given the formidable evidence on the validity of the finance-investment relationship and the little attention devoted to its study especially for African countries, this thesis investigates and provides insight into the impact of both bank-based and market-based financial development on investment in three Southern African countries – namely Botswana, South Africa and Mauritius, that are all members of the Southern African Development Community[1] (SADC). In addition, the study evaluates the causal relationship between bank-based financial development on the one hand, market-based financial development on the other, and investment. The study extensively discusses each country's experience with financial development and investment, the existing underlying factors that might have given rise to such an experience, examines the impact of

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[1] The Southern African Development Community is made up of fifteen member states, namely: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.

bank-based and market-based financial development on investment, and establishes the direction of causality, between bank-based and market-based financial development and investment.

Of the three countries selected, South Africa is the largest economy and has the most developed financial system in SADC (especially the market-based financial system). For Mauritius, the financial services sector is emerging as one of the most important contributors to the Mauritian economy, representing 13% of GDP and directly employing over 15,000 highly skilled professionals. Over 27,000 global business companies operate from Mauritius, which is increasingly being seen as a safe, trusted, and secure International Financial Centre (SADC, 2016). Botswana, on the other hand, has shown impressive economic performance over the past four decades and its financial sector has been one of the most stable in Southern Africa (SADC, 2016).

The motivations for selecting these countries are mainly their different characteristics in their economic structure, location as well as the total lack of empirical evidence on the relationship between financial development and investment for each of these countries. South Africa has established bank-based and market-based financial sectors. Though not at the advanced level of South Africa, Mauritius has a relatively better-established bank-based and market-based financial sector as compared Botswana. However, all three countries have relatively and historically stable economic environments and sustained improvements in financial development as compared to other Southern African countries (see Allen and Ndikumana, 2000). Not to mention, the sufficient availability of data in the chosen countries, their study offers richer inferences than the other SADC countries and they are a good representation of the financial sector in Southern African countries

1.2 Statement of the Problem

The relationship between financial development and investment is of particular significance to both developing and developed countries especially those that are struggling to improve their economic status. However, economic literature, both empirical and theoretical, has been more aligned to investigating the relationship between financial development and other variables such as economic growth, international trade or openness, institutional structure and political economy. Moreover, most studies have focused on the causal relationship between financial

development and economic growth (Nazlioglu *et al.*, 2009; Odhiambo, 2010). However, Levine (1997:688) argues that, '*There is even evidence that the level of financial development is a good predictor of future rates of economic growth,* **capital accumulation**, *and technological change'*. Therefore, *Levine* (1997) attests that financial development has some influence on investment (capital accumulation).

Nevertheless, a look at the empirical studies that have been conducted to investigate such a claim show rather a standardised approach to such an investigation; and in other cases, a partial investigation of the relationship between financial development and investment. The main approaches used in investigating the relationship focus mainly on assessing the causal relationships and the use of cross-country studies. The bulk of the studies on the relationship between financial development and investment have been more of cross-country panel data studies. More so, the number of causality studies on this thesis' subject matter has been very few. Notable examples of causality studies include Odhiambo (2010) and Nazlioglu *et al.* (2009). Alternatively, examples of cross-country panel databased studies include Fowowe (2013), Love (2003), Love and Zicchino (2006), Schich and Pelgrin (2002), Xu (2000), Benhabib and Spiegel (2000), Misati and Nyamongo (2011), Dutta and Roy (2009), Ndikumana (2000, 2005) and Carlin and Mayer (2003). Though these studies have demonstrated that financial development is an important factor in assessing investment trends, their conclusions are varied. In addition, the use of cross-country studies tends to have generalised the results, assumed homogeneity and 'masked important cross-country differences' (Levine and Zervos, 1996) presumably validating the notion that the relationship between financial development and investment may be either country specific or region specific, or both. In addition, the Granger-causality test is a statistical test for determining whether one time series is forecasting another (Granger, 1969). Therefore, causality on its own is dependent on the appropriate selection of variables and the variables that are not included in the causality regression model cannot be represented in the output. Hence, to alleviate the assumed omission of variable bias there is need to at least use a trivariate Granger-causality model over the traditional bivariate Granger-causality model. More so, the non-use of alternative measures of financial development is an additional weakness of some of the previous studies focusing on the finance-investment nexus.

Therefore, given the preponderance of studies emphasising the importance of financial development to economic growth rather than to investment and the assumed theoretical foundations for a finance-investment relationship, there is need for further investigative research

on the finance-investment nexus. Hence, this study gives a summative country-by-country assessment of the finance-investment nexus. In addition, it circumvents most of the weaknesses of earlier studies on the subject matter, that is, the lost country dynamics associated with cross country and panel data studies. Hence, the use of country case studies (that is, South Africa, Mauritius and Botswana) in this study. In summary, given the aforementioned background, this study attempts to answer the following critical questions a) Does financial development spur investment in South Africa, Mauritius and Botswana; b) Does financial development Granger-cause investment, in South Africa, Mauritius and Botswana; and c) Does the relationship between financial development and investment depend on the proxy employed for financial development.

1.3 The Objectives and Hypotheses of the Study

1.3.1 Objectives of the Study

The primary objective of the study is to analyse the dynamic relationship between financial development and investment in three Southern African countries, namely South Africa, Botswana and Mauritius during the period from 1976 to 2014. Specifically, the study seeks to:

1. empirically test the impact of bank-based financial development on investment in the study countries;

2. empirically test the impact of market-based financial development on investment in the study countries;

3. examine the causal relationship between bank-based financial development and investment in each of the study countries;

4. appraise the causal relationship between market-based financial development and investment in each of the study countries.

1.3.2 Hypotheses of the Study

The following hypotheses are tested:

1. bank-based financial development has a positive impact on investment in each of the study countries;

2. market-based financial development has a positive impact on investment in each of the study countries;

3. bank-based financial development Granger-causes investment in both the short-run and the long run;

4. market-based financial development Granger-causes investment in both the short run and the long run.

1.4 Significance of the Study

This thesis contributes to literature on the finance-investment nexus in several ways.

Firstly, it discusses, in depth, the chronological evolution of both bank-based and market-based financial development and investment dynamics in Botswana, South Africa and Mauritius.

Secondly, the study splits financial development into bank-based and market-based components and examines the impact of each component on investment. It also investigates the causal relationship between each type of financial development and investment. The few studies that have researched on the impact of financial development on investment have generally focused on the banking side of financial development while ignoring the market-based side of financial development.

Thirdly, the study constructs summative indices of bank-based and market-based financial development. This study, unlike the few previous studies on the same topic, constructs bank-based and market-based financial development indices from three different indicators of each type of financial development. The use of indices ensures that most characteristic aspects of each type of financial development are captured in one index. The division between bank-based and market-based indices sufficiently captures the breadth and depth of each sector and enables for well-directed policy implementation.

Fourthly, the study critically discusses all the underlying investment theories that connect investment with financial development or its components thereof. This is not to mention the summative evaluation of empirical methods used to evaluate the relationship under study.

Therefore, the general model used to evaluate the impact of financial development on investment is based on both sound theoretical and empirical backgrounds.

Fifthly, this study, in addition to using standard investment determinants, makes use of control variables to produce bias free estimates, unlike comparable studies that use financial development indicators as the only explanatory variables. Therefore, this study is relatively free from the bias stemming from omitted variables.

Sixthly, the study makes use of an underlying flexible accelerator-enhancing framework in modelling both the impact and the causality models used for assessing the financial development-investment nexus. The use of the flexible accelerator-enhancing framework enhances reliability of the results of the study by making sure that the relationship between financial development and economic growth is considered when explaining the finance-investment nexus.

In addition, this study makes use of time series analysis to carry out separate impact and causal studies in each of the study countries. Most previous studies have been based mainly on panel regression methods that tend to mask individual country characteristics and generalise the results for all countries. In addition, the few studies on the impact of financial development on investment have only focused on the causal relationship between investment and financial development. This study is the first of its kind, to examine in detail the dynamic impact of bank-based and market-based financial development on investment, and to test the causal relationship between both bank-based and market-based financial development and investment in a single study.

Furthermore, this study makes use of a trivariate Granger-causality model as compared to the use of the usual bivariate Granger-causality framework. The bivariate framework may produce invalid results due to the omission of intermitting variables that affect both financial development and investment in the causality model. Therefore, the introduction of a third intermitting variable has the potential to improve the precision of the direction of causality and the magnitude of the estimates.

Of note, instead of using the standard residual based cointegration or maximum likelihood tests, this study makes use of the unrestrictive autoregressive distributed lag model in both the impact

analysis and the causality tests. The autoregressive distributed lag model has also been found to be appropriate for small sample sizes that usually exist on financial development and investment data for countries in Southern Africa. Also, the use of the autoregressive-distributed lag modelling technique enables concurrent estimation of both short run and long run impact and causality relationships existing between financial development and investment.

Given the stable economic conditions in the selected study countries and their economic progress, the results of this study paint a fuller picture on the relationship between financial development and investment. A study of the three foremost well-off countries in the SADC region that have had relatively stable financial systems (market-based systems included) gives a summative and matured evaluation of the impact of, and the direction of causality between, financial development on/and investment.

The findings of this study will not only contribute to an understanding of the relationship between financial development and investment but could also provide policy guidance on finance-investment matters in Botswana, South Africa, Mauritius and SADC at large. It is also anticipated that this study shall serve as a 'spark' to investigate a topic that has been relatively under-researched in economics, especially in developing and emerging market economies. This study, therefore, stands to benefit the body of economic knowledge in more ways than one as it addresses the shortcomings of most related studies of the same nature.

1.5 Organisation of the Study

Apart from Chapter 1 which gives the introduction of the study, the rest of the study is organised as follows: Chapters 2, 3 and 4 discuss the chronological evolution of bank-based and market-based financial development and investment in the three selected Southern African countries – South Africa, Botswana and Mauritius, respectively. Chapter 5 reviews the related theoretical and empirical literature on the relationship between financial development and investment. Chapter 6 presents the models to be estimated, the estimation techniques used in the study and the choice of variables used. Chapter 7 reports on the results and the interpretation thereof while Chapter 8 concludes the study.

CHAPTER 2

FINANCIAL DEVELOPMENT AND INVESTMENT IN SOUTH AFRICA

2.1 Introduction

This chapter presents an overview of financial development and investment trends in South Africa. The chapter is divided into seven sections. Section 2.2 is an introduction to the South African economy, providing a brief overview of the macroeconomic history of South Africa and a discussion of South Africa's macroeconomic trends. Section 2.3 outlines how financial development has progressed in South Africa since the 1960s up to 2014. A discussion of the trends in financial development, the environment existing during the stipulated period and the various indicators of the bank-based side of the financial sector is elucidated in Section 2.4. Section 2.5 gives an overview of stock market development while Section 2.6 covers the trends in investment in South Africa. Section 2.7 concludes the chapter.

2.2 Factors Affecting Financial Development and Investment in South Africa

South Africa, with a gross domestic product (GDP) of $349.8 billion (current US$) in 2014, is one of the leading economies in Africa. As has been the case with many, if not all developing countries, South Africa has had its fair share of different policy periods (WDI, 2016). Financial development and investment have been amongst some of the elements focused on in policy. The main objective of all these policies has been, either to, increase economic growth, or to avert an economic slide, or both. The focus on financial development was mainly due to its postulated functions of enhancing economic growth through, largely, its influence on savings and investment decisions and technological innovations. However, the policy effect on financial development does not make it a natural phenomenon that comes about by the interplay of free market forces but rather an echo of political and property rights of institutions ensuring sound macroeconomic policies and strong legal protection for stakeholders in financing contracts (Marcelin and Mathur, 2014:26). Therefore, in discussing the relationship between financial development and investment, there is need to elucidate on the underlying macroeconomic conditions and specific legal frameworks that have been put in place over the years to enhance, or otherwise, financial development and investment.

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On the other hand, investment is a conduit to economic growth through its provision of speedy technological progress, increased human capital employment, higher multipliers and accelerators, increased production levels and a better balance of payments. Empirical and theoretical studies have shown evidence in this regard[2]. Differences among countries in financial sector development may have very important implications in assessing the impact of financial development on investment. Therefore, this chapter, in addition to understanding the South African economy, tends to identify the uniqueness of financial development and investment trends in South Africa before turning to the econometric analysis in Chapter 7.

A discussion of selected country-specific factors that affected financial development and investment in South Africa follows. Section 2.2.1 covers trends in real GDP growth; Section 2.2.2 trends in the budget deficit; Section 2.2.3 covers trends in the GDP per capita; Section 2.2.4 inflation trends and; Section 2.2.5 real effective exchange rate trends.

2.2.1 Real GDP Growth

Trends on factors to be discussed herein show a mixture of different pictures depending on the macroeconomic variable(s), and inherently, on the period, under scrutiny. The economic outlook, which is usually measured by the economic growth rate, of the economy tends to foster or to be fostered by financial development and/or investment. An examination of the percentage changes in growth rates of the GDP shows that the series' behaviour can be divided into two periods, the pre-independence period (before 1994) and the post-independence period (1994 onwards). Figure 2.1 shows the trends in real GDP growth in South Africa during the period 1961-2014.

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[2] See Chapter 5 for a detailed discussion of these studies.

Figure 2.1: Real GDP Growth
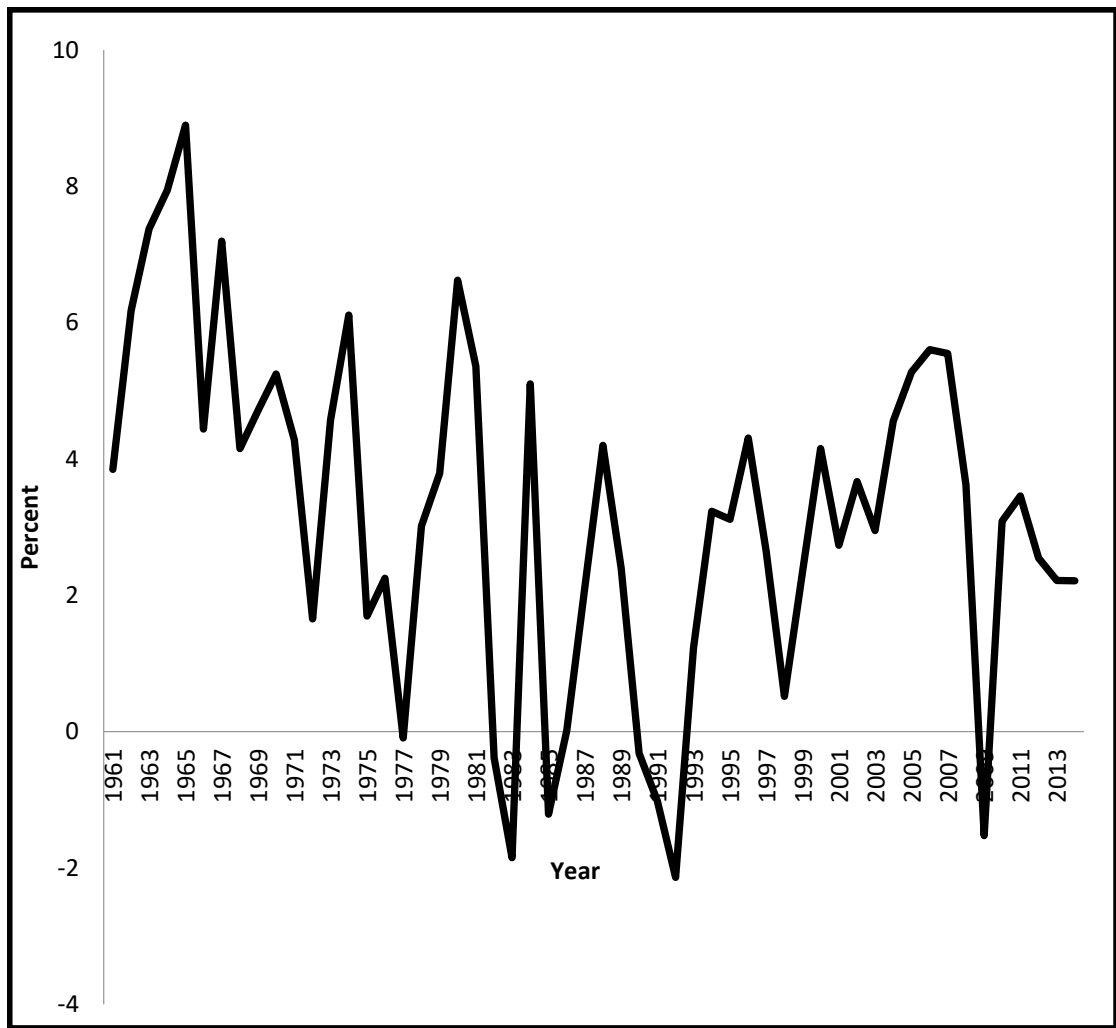
Despite the volatility in the GDP growth trends in both periods, there is a downward trend in the growth of the GDP for the period 1966 – 1993. From 1994 onward, there appears to be a gradual increase in the real GDP growth rates.

The downward trend in the pre-independence era is mainly explained by the high cost of apartheid, trade and financial sanctions, political unrest, the debt crisis, structural changes and, other external economic and military disruptions. During that period, there was an increased reliance on government intervention in the economy. Due to the ever-increasing domestic and international onslaught due to apartheid, the government of South Africa had no choice but to look within for solutions to all impending political, economic and defence concerns. Government expenditure increased as the country militarised itself and also engaged in military activities in

neighbouring countries (Dollery, 2003). Internal security policies led to an imposition of economic sanctions by the international community.

The only notable exceptions to the pre-independence trend are the high levels of GDP growth during the gold-related economic boom fully realised in 1980 and 1981, though it commenced its upward trend in 1977 (Mohr, 1999). The gold-induced economic boom saw the average price of gold boomeranging from R25.67 per fine ounce in 1970 to R257.71 by 1979. The revenue from the net gold output experienced the same effect, increasing from R837million in 1970 to R6 003million by 1979. South Africa was highly dependent on its gold as a source of highly needed foreign exchange earnings in the 1970s. Another exception is the near zero percent GDP growth in 1977, probably due to the Soweto uprising of 1976(Mohr, 1999). The whole period (1966 – 1993) despite being interspersed with partial recoveries had more years of decreasing than increasing growth trends.

From 1994 onwards, the growth rate in the GDP started to progressively rise due to changes in policy, international openness and economic liberalisation policies and structures. Economic recovery continued in 1996, and GDP grew by 4.3 % (IMF, 2016). However, the Asian crisis that began in late 1997, which consequently slowed down the global economy, impacted negatively on the South African economy as GDP growth rate declined from 2.65 % in 1997 to 0.52 % in 1998, reaching its lowest level during the phase of return to growth (Akinboade, and Kinfack, 2014). From 1999, the South African economic growth rate surged upwards. However, due to the global economic recession in 2008, GDP growth in South Africa decreased (2009 it was actually -1.5%), only to resurge once again to below 4% but above 2% levels. Solid contributions to overall growth were posted in recent years by service related sectors (IMF, 2016). These sectors have all benefited from progressively stronger domestic economic activity and rising income levels, particularly the growing black middle class, as well as South Africa's increasing attractiveness as an investment and tourism destination (Hanival and Maia, 2008). Moreover, the contribution of gold as a once major revenue contributor decreased immensely in the later years than it was in the decade beginning 1970. Figure 2.2 shows the trends on net gold output as a percentage of GDP from 1960 – 2014.

Figure 2.2 : Net Gold Output as a Percentage of GDP
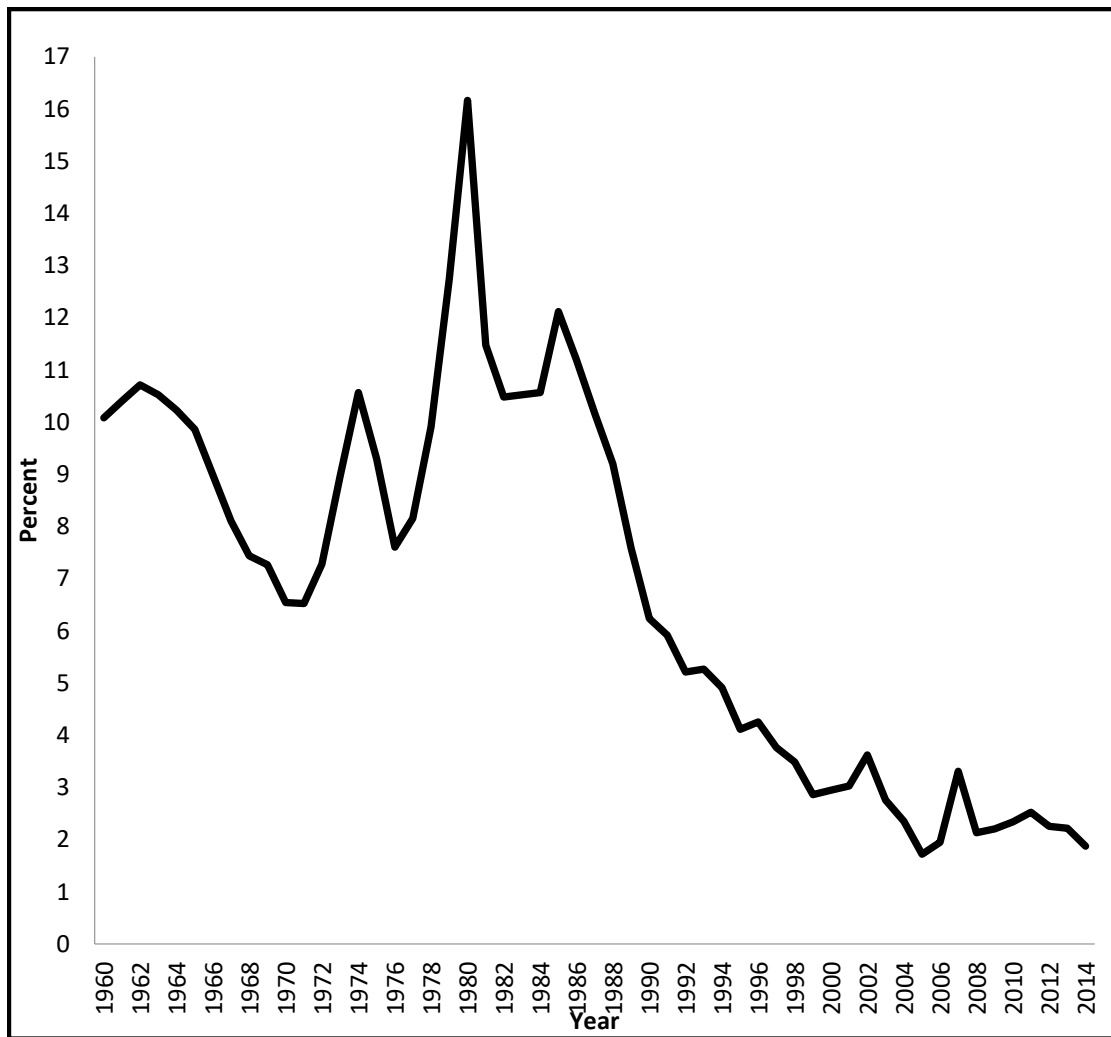
Notwithstanding the over 6% levels of net gold output to GDP from the period 1960 to 1989, the percentage contribution of gold has been on a downward trend with an average of 3% in the first decade of the 2000s. An analysis of the sectoral contributions to national income in the economy confirms the gold trends shown in Figure 2.2. The agriculture and fisheries sector has gradually decreased from an average 13% in the 1960s to below 5% in the 2000s. The same can be said for the mining sector, which decreased from an average of 10% contribution to an average of 5% by 2005. The manufacturing sector has remained relatively steady with a range of 17% to 25%, with the lower range being experienced from the year 2000 onwards. International trade and the imports sector have been steady maintaining above 10% and 7% contribution to GDP, respectively (IMF, 2016). Incidentally the only sector that has been on an upward trend

(especially since the 1990s) is the finance sector that has averaged 14% in 1990, 17% in 2000 and 20% in 2005 (Banda, 2007).

2.2.2 The Budget Deficit

The behaviour of the budget deficit and its financing casts a shadow on the credit market of a country, especially for a country like South Africa that had not-so-many options but to depend on itself during international restrictive policies during the pre-independence era. Figure 2.3 tracks the levels of the national budget deficit as a ratio of GDP for the period 1960-2014.

Figure 2.3: National Budget Deficit (% of GDP)
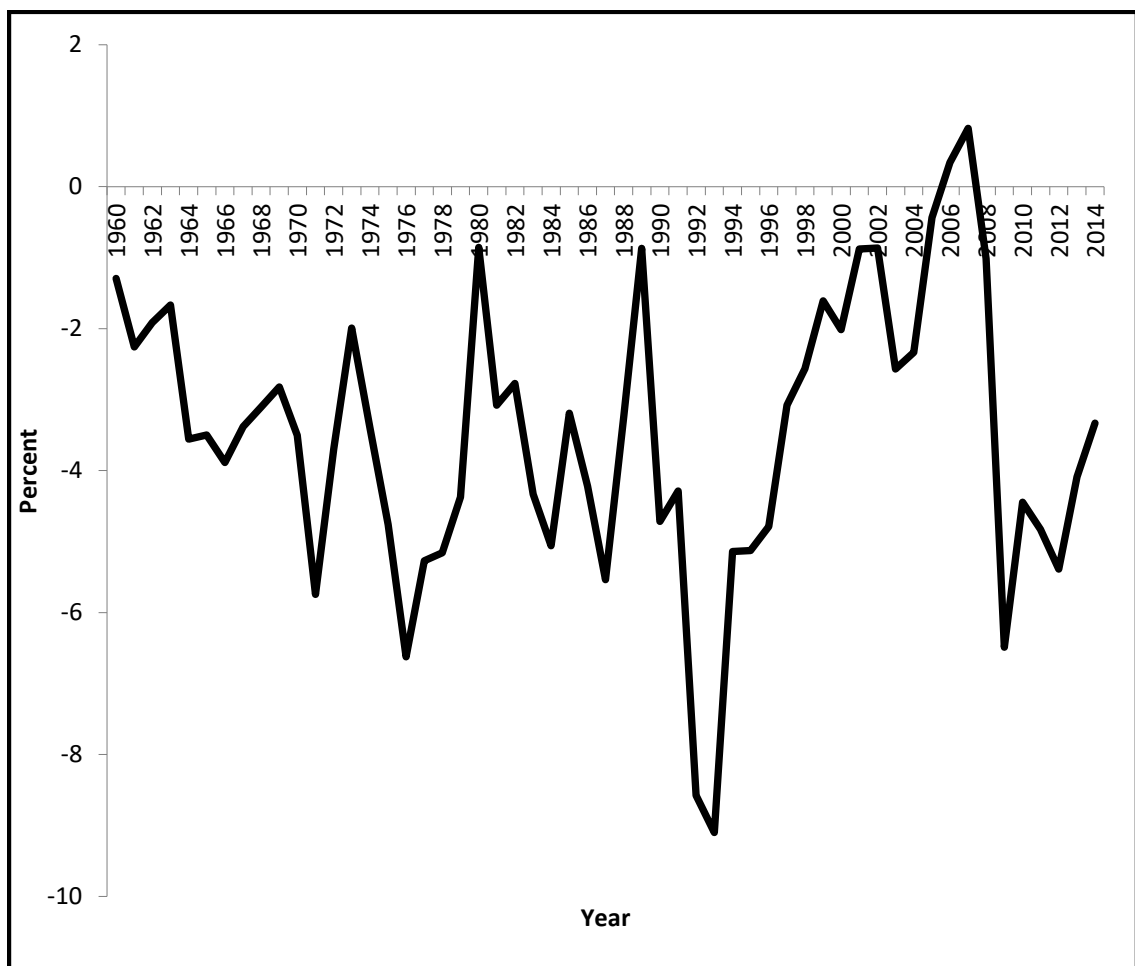
Indications from budget deficit trends show that the economy was always financed above government revenue earnings. On the average, trends show an improved average budget deficit. Exceptions are the surpluses experienced in the period - 2005 to 2007. From the below 8% deficit

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in 2003, the deficit has been generally decreasing. Notably, the recent year trends (2009 – 2014) show an average 5% deficit. The pre-independence period had higher than 1% deficit levels mainly due to apartheid-related expenditure, increased dependence on domestic government expenditure arising due to increased international sanctions (IMF, 2016).

Given the trend on the budget, deficit there is need to look at government consumption expenditures vis-à-vis the trends in GDP growth so as to have a better understanding of the behaviour of the South African economy. Despite the incidence of budget deficits, government consumption expenditures have been on a steady state growth from the 1960s to the twentieth century. Starting at 9% of GDP in 1960, government consumption ended at 23% in 2012. For the period 1995 to 2008, government consumption expenditure remained on average at 18% of GDP. In the same period (1995 to 2008), the budget deficit started to decline implying that the maintenance of government consumption expenditures at 18% (Figure 2.4) had a direct effect on the budget deficit (IMF, 2016). Figure 2.4 gives the percentage levels of government consumption in relation to GDP for the period 1960-2014.

Figure 2.4: Government Consumption (% of GDP)
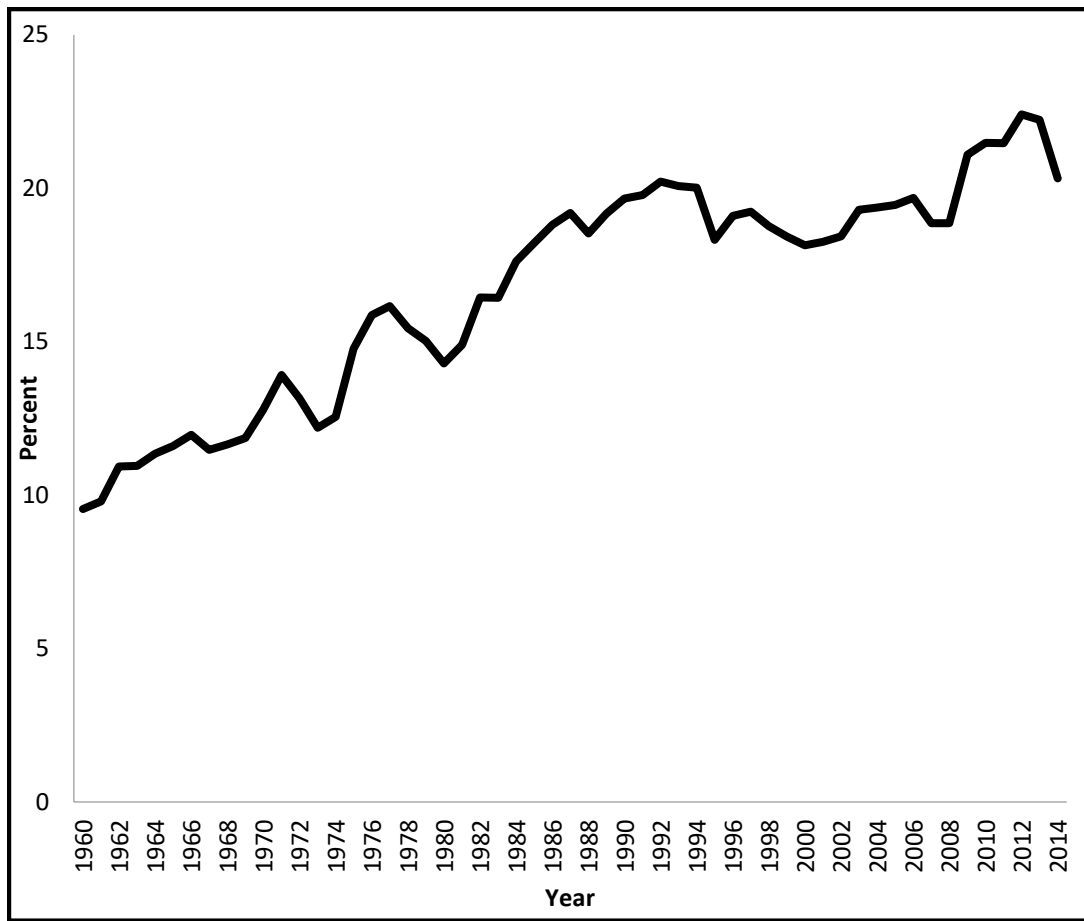
Incidentally, the budget deficit had increased in the preceding years (1991-1993) despite the maintained percentage levels of government consumption that implies lower government revenues. During this period, the country was under severe internal and external pressure to disregard its apartheid policy. Furthermore, the connection of the budget deficit to government expenditures is also implied after 2008 when the former increased as the latter also increased.

2.2.3 GDP per Capita

Trends on the GDP per capita in South Africa show, on the average, an increasing inclination. From 1961 to 1974, GDP per capita was steadily rising starting from USD3416 ending at USD 5109 in 1974. From 1974 to 1979, it remained relatively unchanged averaging USD5100. In 1981, GDP per capita increased to USD5487 only to start decreasing gradually until 1994 when the trend changed. The 1981 level of GDP per capita was only realised again in 2006. The 1981 upsurge in GDP per capita may have been due to the increased net gold output of 1980 (World

Bank, 2016). Figure 2.5 shows trends in the real GDP capita measured using constant 2005 US$ prices for the period 1961 – 2014.

Figure 2.5: Real GDP per Capita (Constant 2005 US$)
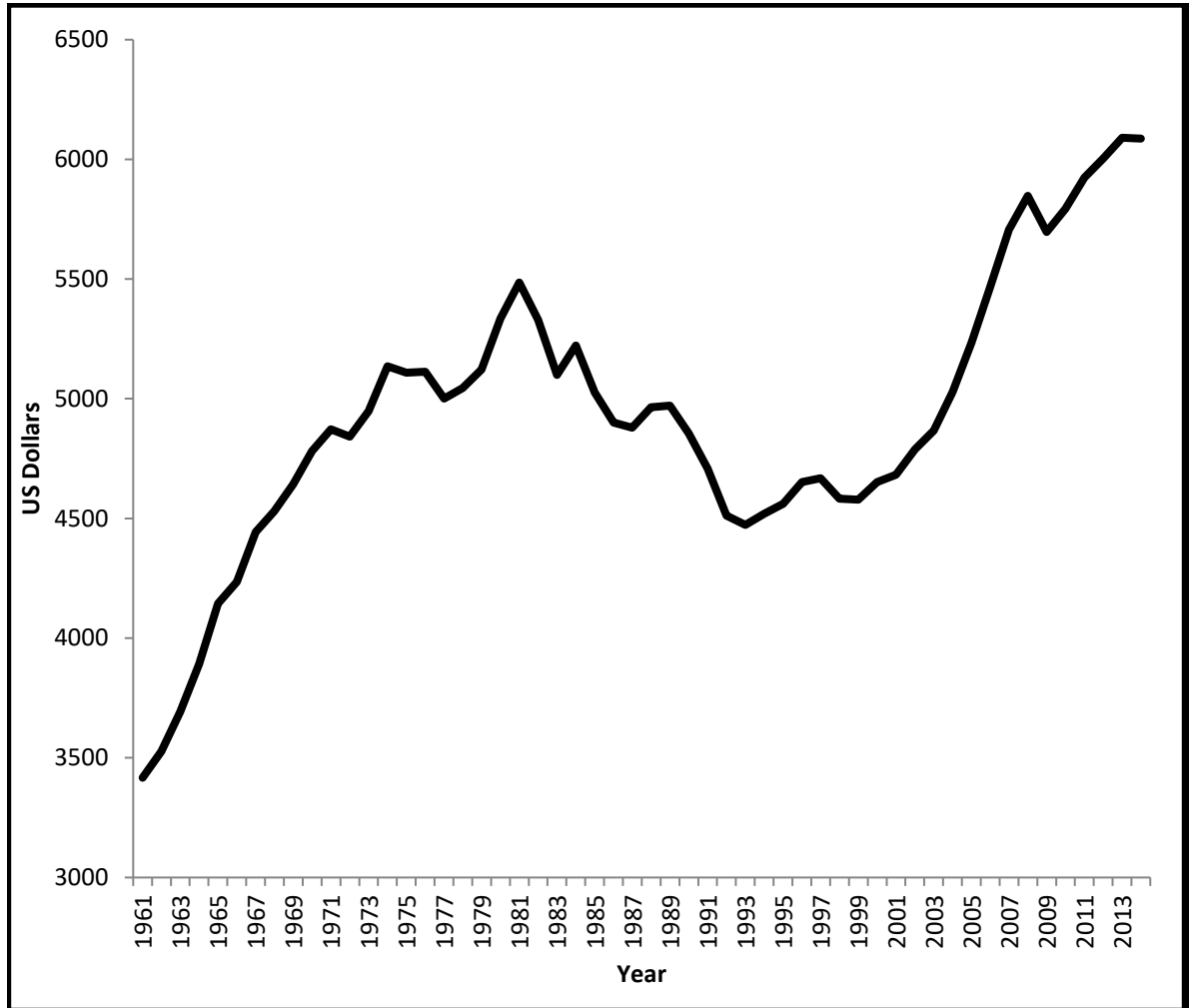
A look at the rate of growth of GDP per capita (Figure 2.6) shows that it has been highly volatile. Figure 2.6 gives the annual percentage growth of the GDP per capita for South Africa for the period 1961 – 2014.

Figure 2.6: GDP per Capita Growth
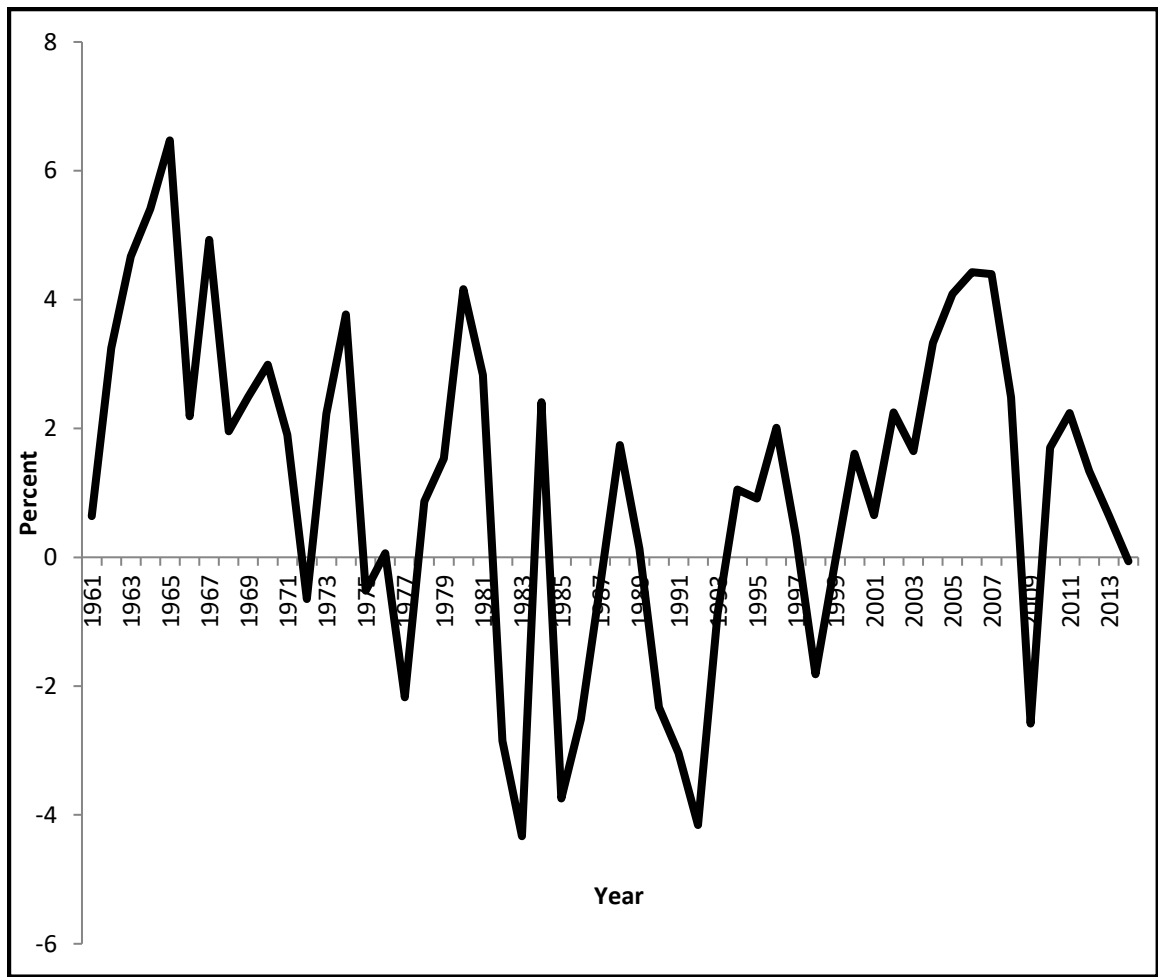
Though GDP per capita was at its maximum in 1981 for the period 1961 to 1993, it achieved the highest growth rate in 1965 at 6.5%. In the period starting from 1994, per-capita GDP grew at an average rate of 1.2 % per annum — a rate that is comparable to that of sub-Saharan Africa (1.1 %) and Latin America (0.8 %), and considerably below that of South Asia (3.7 %) and East Asia (6.2%) (Rodrik, 2008). The global financial crisis induced a negative GDP per capita growth of -2.6% after a sustained increase that had begun in 1999.

2.2.4 Inflation

A discussion of the financial development and the macroeconomic environment in South Africa will be of no effect if inflation is left out especially in a study that is focusing on financial issues. An analysis of the trends in year-on-year inflation is therefore discussed herein. Inflation in South Africa, like all other economies as theory postulates, tends to have a negative effect on economic development or is it the other way round, poor economic development fosters inflationary

pressures? It seems when the economy was struggling, inflation was increasing and when the economy was faring well inflation was relatively stable. Figure 2.7 traces the trends in year-on-year inflation in South Africa for the period 1961-2014.

Figure 2.7: Year on Year Inflation
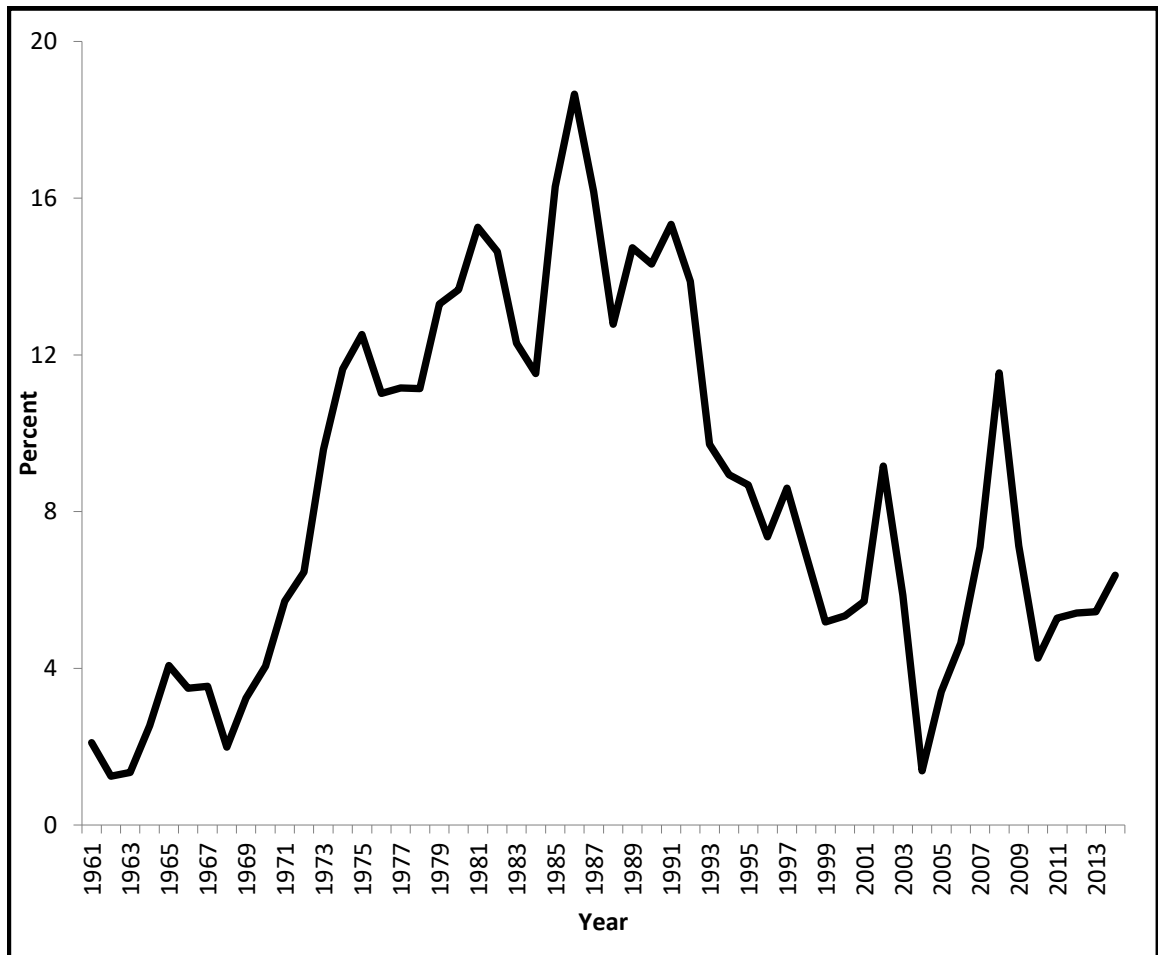
According to Figure 2.7, from 1961 to 1993 inflation levels increased from below 4% levels to higher than 10% levels attaining a maximum of 19% in 1986. During the 1970s, the main cause of inflation appeared to be excess demand while the authorities responsible for monetary policy did not believe the cause as such but took inflation as a worldwide problem (Gidlow, 1995a). Therefore, the policies put in place to combat increasing inflation (that is, reductions in indirect taxes, relaxation of import controls, appreciation of the rand, varying liquid assets and bank credit ceilings) were relatively inefficient. After 1992, inflation subsided to below 10% (with the exception of 2008 which was 12%) hitting a minimum of 1.4 % in 2004. The period 2005 – 2008 saw a steep increase in inflation only to subside again to 6% in 2014 (IMF, 2016).

2.2.5 Real Effective Exchange Rates

One of key determinants of financial development is the real effective exchange rate. This is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs (World Bank, 2016). It gives the state of the economy's currency vis-à-vis other currencies. In other words, it is a measure of the financial worth of the rand in the world market. Figure 2.8 traces the trends in the real effective exchange rate for the period 1975 to 2014.

Figure 2.8 : Real Effective Exchange Rate (2005 = 100)

As far as exchange rate matters were concerned, the economy contended with intermittent crises in major international foreign exchange markets, for example, the 1967 sterling devaluation, the 1971 Smithsonian currency realignment, the 1973 breakdown of the Bretton Woods system, delinking from the sterling in 1972 and linking to the dollar and the 1974 policy of independent managed floating of the rand (Gidlow, 1995a). Trends on the real effective exchange rate show

a gradually decreasing value of the rand in the latter years as compared to the former years. Of note, the rand was at its strongest during the period 1979 -1984. Before 1979, it always had to be linked with another currency or a basket of currencies and transactions of the Reserve Bank in the foreign exchange market were largely aimed at strengthening the foreign reserves whenever possible. The exchange controls, coupled with other financially repressive measures, led to financial disintermediation and the formation of grey markets in which a substantial amount of transactions was performed off-balance sheet (Banda, 2007). The increase in the value of the rand, despite the institution of a floating rate policy, can be explained by the increased international gains from gold revenues and the opening up of the financial sector through removal of repressive policies.

2.3 Overview of the Financial Sector in South Africa

The financial sector in South Africa is made up of two main distinguished markets. These are: the financial intermediaries' market and the stock market. As at January 2014, South Africa had 17 registered banks, 3 mutual banks, 2 co-operative banks, 14 local branches of foreign banks and 43 foreign banks with approved local representative offices (South African Reserve Bank, 2014). The Finance, real estate and business services sector has increased with an average of 6.5% from 2003 to 2008, decreased by -0.9% in 2009 (probably due to the international financial crisis), and it has been improving positively ending at 3.4% growth rate in 2012 (Statistics South Africa, 2014). A brief but concise discussion of the financial sector in both the pre- and post-independence eras follow.

The bank-based financial intermediaries' market is made up of the central bank of the country, (the South African Reserve Bank), depository corporations like commercial banks and non-bank financial institutions. Deposit corporations comprise of commercial banks and any other financial institutions that are in the business of accepting transferable deposits. Non-bank financial institutions include those institutions that do not accept transferable deposits but are involved in financial intermediation through issuing securities, accepting unique deposits and dealing in different types of liabilities that are close substitutes for deposits (World Bank, 2016). Examples of non-bank financial institutions include building societies, savings and mortgage institutions, Post Office Savings Bank, deposit-accepting finance companies, development banks, and offshore banking institutions. The largest industries, as measured by their nominal value added in 2013, were finance, real estate and business services (21,5 %), general government (17,1 %), the wholesale, retail and motor trade; catering and accommodation industry (16,6%); and the

manufacturing industry (11,6%) (Statistics South Africa, 2014). Table 2.1 gives a summary of sectorial contributions from 2002 to 2013 using real prices.

Table 2.1: Percentage change in the value added by industry at constant 2005 prices

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Agriculture, forestry and fishing	6.5	0.7	0.9	2.8	-5.5	2.7	16.1	-1.6	0.4	-0.1	2.0	2.3
Mining and quarrying	1.0	3.4	1.5	1.0	-0.6	0.0	-5.6	-5.4	5.7	0.3	-3.6	3.1
Manufacturing	2.8	-1.5	4.9	6.2	6.4	5.2	2.6	-10.1	5.5	3.3	2.1	0.8
Electricity, gas and water	3.5	3.0	6.8	5.3	3.4	3.4	-3.1	-1.4	2.5	1.5	-1.6	-0.4
Construction	5.8	7.7	9.1	11.9	10.4	15.0	8.5	7.8	0.7	0.3	2.3	2.8
Wholesale, retail and motor trade; catering and accommodation	2.3	2.7	5.4	7.0	6.0	5.3	1.0	-1.2	3.8	4.4	3.8	2.2
Transport, storage and communication	9.0	6.3	4.9	5.3	5.1	6.6	4.0	0.9	2.0	3.1	2.4	1.9
Finance, real estate and business services	6.3	4.8	7.1	5.7	9.6	7.9	7.4	1.0	2.2	4.7	3.7	2.4
General government services	0.7	2.8	1.9	4.3	3.1	3.9	4.5	3.9	3.1	4.2	2.8	1.5
Personal services	2.5	5.6	1.7	3.8	5.2	5.6	3.9	-0.9	0.4	2.3	2.1	1.8

Source: Statistics South Africa (2014:9)

The share of the financial sector in total value added to GDP is a measure of the size of the financial system relative to other sectors (Beck, Degryse and Kneer, 2014). Trends reveal that

from 2002 to 2009, the value added by construction was unmatched to any of the other sectors (i.e. despite the intermittent rise of the agriculture, forestry and fishing sector in 2008). However, the finance sector maintained its second position throughout the period though it suffered a decline in 2009, most probably due to the global financial crisis. Otherwise, all sectors' value-added levels converge towards 2% after 2009, i.e. after the 2008/2009 global financial crisis.

The financial sector has played a dominant role in South Africa under the guidance and astute supervision of the South African Reserve Bank (SARB). The SARB, like all other central banks, protects the value of the rand, controls inflation, regulates money supply and, assists in the formulation and implementation of macroeconomic policy. A fourteen-member Board of Directors including one governor and two deputy governors, all of whom are responsible for the day-to-day affairs of the Bank and are appointed to five-year terms by the President of South Africa, governs the Bank. The stakeholders of the Bank elect eleven additional directors for three-year terms (Allen, Otchere and Senbet, 2011).

Table 2.2 summarises the composition of the South African banking sector and the number of approvals for local and international expansions granted by the SARB from 2003 to 2012. The number of banks has gradually decreased from 22 in 2003 to 17 by 2014. Most (all for 2012) approvals for local and international expansions granted by the SARB have been submitted by the five largest banking groups in South Africa and these submissions have been mostly for foreign expansions except in 2005 and 2006 where on average two thirds of submissions were local. Moreover, the South African banking sector has remained relatively unchanged in 2012 (when compared to the previous years) with on average 44% being foreign shareholders (mainly diluted by ABSA Bank Limited's big foreign shareholding), 27% being domestic shareholders and 29% being minority shareholders who hold less than 1% of the total value of shares. The total banking assets, the bulk of which are loans and advances (at least 70% share through the years) amounted to R3 650 billion in 2012 (SARB, 2015).

Table 2.2 gives a summary of the number of registered banking sector entities and the number of approved international expansions for the period 2003 to 2012.

Table 2.2: South African banking sector: Number of entities registered or licensed and International Expansions

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Banks	22	20	19	19	19	19	18	17	17	17
Mutual Banks	2	2	2	2	2	2	2	2	2	3
International Bank Branches in South Africa	15	15	15	14	14	14	13	13	12	14
Representative offices	44	43	47	43	46	43	42	41	43	41
Controlling Companies	19	16	15	15	15	15	15	15	15	15
Banks under Curatorship	1	0	0	0	0	0	0	0	0	0
Banks in receivership	2	0	0	0	0	0	0	0	0	0
Banks in liquidation	1	2	2	2	2	2	2	2	2	2
Number of approvals for local and international expansions granted										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Local	28	16	29	16	12	15	10	16	19	12
Foreign	31	20	17	8	25	19	26	22	27	14
Total	59	36	46	24	37	34	36	38	46	26
% local	47%	44%	63%	67%	32%	44%	28%	42%	41%	46%

Source: SARB (2013:28)

2.3.1 Summary of the South African Financial Sector and Reforms

A look at the history of the South African financial sector shows that it started to show evidence of diversification in the 1950s. Up until that stage, the banking sector was dominated by commercial banks and these institutions had a limited product range. Discount Houses, merchant banks and other general banks increased the competition and there was an expansion of the product range offered by the financial sector. A summary of the historical background of the South African financial sector and its legal reforms from 1964 onwards is given in the Tables 2.3, 2.4 and 2.5. Table 2.3 and 2.4 provides a summary of the process of financial development in South Africa before independence in 1994. However, there were two regimes that existed during

the said period, that is, the financial repression era (Table 2.3) and the beginning of financial liberalisation era (Table 2.4). Table 2.5 summarises the evolution of financial development after independence in 1994 onwards.

Table 2.3: Summary of Financial Development and Financial Policy in South Africa (1965 – 1980)

1964	- Commercial banks had dominated the economy and had avoided services such as personal loans, property leasing, and credit card facilities. - Appointment of the Technical Committee on Banking and Building Society legislation in 1961. The Report of this Technical Committee was published in 1964, and most of the recommendations of this Committee were embodied in a new Banks Act in 1965. - The Bank Rate was raised in July 1964, and again in December 1964. - The advent of discount houses, merchant banks and other financial institutions forced commercial banks to diversify - The central bank made use of direct measures to control overspending and inflation, that is, credit ceilings, high cash reserves and varying liquid asset requirements, dual exchange rates, ceilings on advances and consumer credit controls. A period of financial repression.
1965	- The Banks Act in 1965 was issued. This Act laid down one uniform set of legal requirements for all banking institutions which included commercial banks and other 'monetary' banking institutions, differentiated only with respect to the banks' 'short term', 'medium term' and 'long term' liabilities. In this manner the 'near' banks were brought more directly within the ambit of the policy operations of the Reserve Bank - Though the 1965 Banks Act formally recognised other deposit-taking institutions as banks, because of withdrawal restrictions on their clients, their money multiplier was small as compared to commercial banks. - In terms of the Banks Act of 1965 monetary banks were obliged to keep 8 % of their short-term liabilities in cash at the Reserve Bank. The Act also empowered the Reserve Bank to vary the percentage of liquid

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	assets to be held by all classes of banking institutions, and not only commercial banks
	• Credit ceilings were imposed - October 1965, a credit-ceiling was imposed upon the so-called "monetary" banks, i.e. those banks with short-term liabilities of 8 500 000 Rands or more which, according to the Banks Act, had to maintain a cash reserve at the central bank.
	• Upper limits on deposit rates payable on banks and building society imposed.
	• Exchange control maintained.
	• Increase in Bank Rate to 5 per cent was announced on March 5, 1965.
	• Commercial bank liquidity ratios in respect of short- and medium-term liabilities were raised to 34 and 24 per cent, respectively. These ratios were subsequently increased, in successive monthly stages of 2 per cent each, to the legal maxima of 40 and 30 per cent.
	• In November 1965, credit control in terms of the new Banks Act was replaced by the credit ceiling method. Banks were requested, first on a "voluntary" and later on a mandatory basis (1967), to limit the total of their discounts and advances, and later also their private sector investments, to the level of such credit as at a stipulated date. This control was imposed in terms of a proclamation issued under the 1933-Currency and Exchanges Act.
	• The Reserve Bank issued a proclamation, in virtue of the powers conferred upon it under the Currency and Exchanges Act of 1933, laying down maximum rates for deposits of varying maturities at banking institutions and building societies, effective from March 22, 1965.
1966	• Minimum and prime overdraft lending rates were set by agreement with the Reserve bank at 1.5% and 2% above Bank rate, fixed exchange rate remained in operation, credit ceiling was reduced to 92.5%.
• Bank rate increased to 6% from 5%.

1967	- Proclamation R184 of 1967 conferred powers upon the Reserve Bank to call for supplementary cash reserve requirements. 'Voluntary' control over credit extended by the banks made mandatory in terms of a special proclamation issued under the Currency and Exchanges Act of 1933.
1968	- Directive issued (in March) requiring monetary institutions to invest 32% of any increase in short tem liabilities, 12% to be maintained with the Reserve Bank and 20% with the NFC. Supplementary cash reserve requirements introduced. - Ceilings on the lending of banks extended to specific investments of the banks (private sector securities). - Bank rate increased to 6.5%.
1969	- Easing of the directive of March 1968 as part of efforts to relieve upward pressure on interest rates. - Deposit rate control was withdrawn in July 1969, as part of a new multi-faceted attack on inflationary pressures, which also included the raising of the Bank Rate. - Liquid asset requirements increased. - December - the Reserve Bank obtained an agreement from the commercial banks to limit their interest rate on 12 months' deposits to 7 per cent per annum. This arrangement was subsequently rescinded in August 1970.

1970	• Government decides to subsidise certain interest rates and the maximum interest rate on deposits of 1969 abolished.
	• August - Reserve Bank placed the so-called "non-monetary" banks under the credit and investment ceilings.
	• The December arrangement of 7% interest rate rescinded in August 1970.
	• By the end of 1970 then, all registered banking institutions, except discount houses, subject to
	(a) Ceilings on certain loans made by them to the private sector and on certain kinds of investments in the private sector;
	(b) Supplementary cash reserve requirements (over and above the statutory requirement of 8 per cent of their short-term liabilities to the general public) based on the increase in their short-term liabilities, after March 1968, and
	(c) Additional liquid asset requirements against their short-term liabilities. Significantly, none of these control measures was provided for in the present Banks Act.
1971	• The rand devalued by 12.28%.
1972	• Financial Institutions Amendment Act introduced.
	• Amendments to Banks Act empowered the Reserve Bank to increase the minimum cash reserve of 8% against short term deposit liabilities and impose a cash reserve against medium term bank liabilities.
	• Bank Rate decreased to 6%.
1973	• Open market operations introduced in September.
	• Bank rate decreased to 5.5% in March.
	• In September, the use of the bank rate as a reference point for setting the rate of accommodation for discount houses is terminated.
1974	• June - Managed independent float of the rand introduced.

1975	• February – abolishment of fixed pattern of interest rates for transactions in government securities.
	• July - Agreement between Reserve Bank and clearing banks that the banks' prime rate would in future be the lowest overdraft rate charged to their best customers and that it would maintain a fixed relationship with the Bank Rate (between 2-3% difference).
	• The rand was devalued by 4,76 per cent on 27 June 1975, and 17,9 per cent on 22 September 1975.
1976	• Rondalia and Rand banks forced into curatorship
1977	• Due to small bank-crisis, the five largest banks then (Barclays, Standard, Nedbank, Volkskas and Trost) with the Reserve Bank opened a special Fund through the NFC called the 'lifeboat' to support banks being weakened by a run on their deposits
	• The fund dissolved by September.
1978	• Rediscounting of bankers' acceptances introduced.
1979	• August 1979 – Credit ceilings applicable to banking institutions' discounts and advances, and to their investments were raised by 4%.
	• LADOFCA Amendments - important amendments made to the Limitation and Disclosure of Finance Charges Act, 1968 (Ladofca). Henceforth all money lending, credit and leasing transactions involving amounts in excess of R100 000 were exempted from the provisions of the Act and finance charge rates prescribed in terms of the Act will be market-related.
1980	• Beginning of free enterprise and market-oriented economic policies by moving towards deregulation and privatisation.
	• Deposit rate controls abolished.
	• August 1980 - Credit Ceilings abolished.

Source: Banda (2007), Franzsen (1983), Boreham (1971), Gidlow (1995a,b), SARB, (1976-1994)

Table 2.4: Summary of Financial Development and Financial Policy in South Africa (1981 – 1993)

1981	- Abolishment of credit and interest rate ceilings, reduction in cash reserve and liquid asset requirements. - Increase in intra-financial institution competition.
1982	- A number of new banks entered the market. - The rand allowed to fall against the dollar by 36%. - Prime rate limits abolished but all banks had to inform the Reserve Bank of any intended prime rate changes.
1983	- The rand allowed to float - Termination of the Registrar of Corporation in 1983 which led to increased entry into the financial intermediation sector.
1984	- Reserve Bank Act amended, and the Reserve Bank was authorised to pay interest on reserve balances. - The Public Debt Commissioners (PDC) was renamed the Public Investment Commissioners. - CPD (Corporation for Public Deposits) established as the NFC was dissolved. The CPD'S main purpose was to rationalise investments in short term surplus funds belonging to the public sector and to enable monetary authorities to control investment of these funds more efficiently - The 2% of medium-tem liabilities held by the NFC abolished.
1985	- The Financial Institutions Amendment Act of 1985 introduced – banks were permitted to include their holdings of bank notes, coin and gold coin in vaults, tills and automated teller machines in their holdings of cash reserves for meeting the cash reserve requirements. - The power of the Reserve Bank to impose supplementary liquid asset requirements revoked. - Bank rate reintroduced. - Passing of the Stock Exchanges Control Act. - the country experienced a foreign debt crisis when a consortium of foreign banks led by Chase Manhattan withdrew credit facilities.

1986	• Reduction of the cash reserve requirement against banks' short-term liabilities to the public from 8% to 5%. • The Building Society Act phased out.
1987	• The responsibility for banking supervision was transferred from the Department of Finance to the Reserve Bank.
1988	• Cash and liquid asset requirements made the same for banks and building societies under amendments to banking and building society legislation enacted in 1988.
1989	• Financial Services Board established. • Bond markets (informal and formal) combined into the Bond Market Association. • Bank mergers of Nedbank and the South African Permanent Building Society into NedPerm Bank.
1990	• Deposit-taking institutions Act was passed. • South African Futures Exchange licensed as a financial exchange. • The Deposit Taking Institution Act of 1990 issued.
1991	• Building societies, commercial banks, discount houses, general banks and merchant banks grouped together to form banking institutions. • Bank merger of Untied, Volkskas and Allied to ABSA. • there were 51 banks.
1992	• Usury Act, 1992 passed. • ABSA took over Bankorp.
1993	• The reserve requirement lowered from 1.5% to 1.0%. • The Mutual Banks Act, 1993 (Act No. 124 of 1993). • There were now 40 banks due to realignments and mergers.

Source: Banda (2007), Franzsen (1983), Boreham (1971), Gidlow (1995a,b), SARB (1994-2014)

Table 2.5 : Summary of Financial Development and Financial Policy in South Africa (1994 – 2012)

1994	• The SARB became an active contributor and effector of the Basel Bank Supervision standards and a signatory to the Core Principles for Effective Banking Supervision of 1997. • The financial sector became open to the world. The number of foreign banks authorised to establish offices rose from 31 to 46 by 2004.
1995	• The expansion of the JSE rules to permit corporate membership, brought with it foreign ownership, increased equity to the securities firms and increased liquidity on the exchange.

1996	• Tight requirements established for foreign institutions that aim to enter the banking sector i.e. the Government Gazette, No. 17115 of 1996.
	
	• In June 1996, the South African government thus announced the Growth Employment and Redistribution (GEAR) macroeconomic and social development policy framework, whose key strategic goals included –
	  ➢ Fast-tracking economic growth in order to generate formal employment for work-seekers;
	  ➢ Redistributing income and generating opportunities for the poor;
	  ➢ Creating a society in which sound health, education and other services are available to all; and
	  ➢ Enabling an environment in which homes are secure and places of work are productive.

1998	• A third system of monetary accommodation was introduced from March 1998, with the repurchase (repo) interest rate being market-determined in daily tenders of liquidity through *repurchase transactions*. • The South African Multiple Option Settlement ("SAMOS") system, was implemented. • Twelve banking institutions appointed as primary government bond dealers - six branches of foreign banks and six local banks. • Islamic Bank Limited liquidation order given. • The objectives of GEAR were adversely impacted by external events associated with the East Asian crisis in 1998. • The rand depreciated considerably (about 28% in nominal terms against the US dollar from April to August 1998), prompting a monetary policy response that resulted in short-term rates soaring 700 basis points.
1999	• FBC Fidelity Bank Limited put under curatorship.
2000	• Inflation targeting framework introduced. • Government Gazette No. 21936 of 28 December 2000 issued.
2001	• The rand depreciated by 21% in nominal terms against the US dollar between September and December 2001.
2002	• Inflation targeting strategy introduced in an endeavour to bring consumer prices under control, thus wishing to provide more stability in the overall economy. • On the fiscal front, government improved its tax collection and widened the tax base, all the while keeping its expenditure in check.
2004	• Regal Treasury Private Bank Limited liquidation order given.
2007	• Rennies Bank Limited changes name to Bidvest Bank Limited.
2008	• The Banks Act was last amended on 1 January 2008, mainly to comply with the requirements and principles of the Basel II framework.
2009	• 2 Bank Registrations cancelled - Commerzbank Aktiengesellschaft and Meeg Bank Limited.

2010	• The South African Postbank Limited Act, 2010 (Act No. 9 of 2010) (the Postbank Act) is aimed at transforming Postbank from a division of the South African Post Office to a separate entity registered in terms of the new Companies Act.
	• ABN AMRO Bank NV changes name to The Royal Bank of Scotland NV and Teba Bank Limited to UBank Limited - During the year, ABN AMRO Bank NV, Johannesburg Branch, was acquired by The Royal Bank of Scotland NV and its name was changed to The Royal Bank of Scotland NV South Africa Branch.
	• Imperial Bank Limited's registration is cancelled.
	• South African Postbank Limited Act, 2010 (Act No. 9 of 2010) (Postbank Act) was passed by Parliament and the President assented to it on 1 December 2010 and it was published in Government Gazette No. 33835 of 3 December 2010 so as to cater for discrepancies between the Postbank Act and the Banks Act.
2011	• The Royal Bank of Scotland NV registration cancelled.
2012	• November – Banks Amendment Bill (Republic of South Africa, 2012) published – so as to 'amend the Banks Act, 1990, so as to define certain expressions and to amend certain definitions; to bring certain provisions in line with their practical application; to update references to legislation and institutions; to extend the use of the name bank to representative offices; to provide that a contravention of the Financial Intelligence Centre Act, 2001, is a cause for suspension or cancellation of registration as a bank; to align the Banks Act, 1990, with the Companies Act, 2008; and to comply further with the requirements of the Basel Committee of Banking Supervision; and to provide for matters connected therewith'. Effective January 2013.
	• Credit Agricole Corporate and Investment Bank – South Africa Branch registration cancelled.

Source: Hanival and Maia. (2008), Falkena *et al.* (2001), Falkena *et al.* (2004), *Banda (2007), Aron and Muellbauer (2000a, 2000b, 2000c, 2007), SARB (1994-2014)*

The advent of financial liberalisation was only realised after the De Kock Commission reports of 1978 and 1985 that recommended the opening up of the financial sector and also a more market-oriented monetary policy (Republic of South Africa, 1985). Abolishment of repressive policies and procedures began in 1980 starting with interest and credit controls in 1980. Eventually, with the passage of time, financial liberalisation had a major impact on the debt to income ratio as more once-excluded households (because of apartheid) were exposed to the growing credit provision market (due to increased bank competition). Even pensions were progressively more accepted to provide additional collateral for housing loans; while access bond accounts allowed households to borrow and pay back flexibly up to an agreed limit set by their housing collateral from 1995 (Hanival and Maia, 2008).

2.3.2 Trends in Financial Sector Development in South Africa

A number of financial development indicators are employed in this section as a discussion of the trends in financial development in South Africa is clarified. By 2014, the financial sector in South Africa had 22% (increased from 18% in 1994) of all banks being foreign banks and these foreign banks account for the same percentage share among total bank assets (SARB, 2016). The following is a discussion of the financial indicators for the financial intermediaries (banking and deposit taking sector) development.

2.3.2.1 Monetary Aggregates (M1, M2 and M3)

The first indicators to be discussed are the ratio of M1, M2 and M3 to GDP. Financial deepening is usually measured by relating monetary measures such as M1, M2 and M3 to the Gross Domestic Product (Nzotta and Emeka, 2009). Generally, an increase in any of these ratios indicates that financial assets are growing. M3 represents the sum of currency and deposits in the central bank, plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travellers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents (World Bank, 2016). Figure 2.9 gives a summary of the trends in the M1/GDP, M2/GDP and M3/GDP ratios for the period 1965 to 2014.

Figure 2.9: Ratio of M1, M2 and M3 to GDP
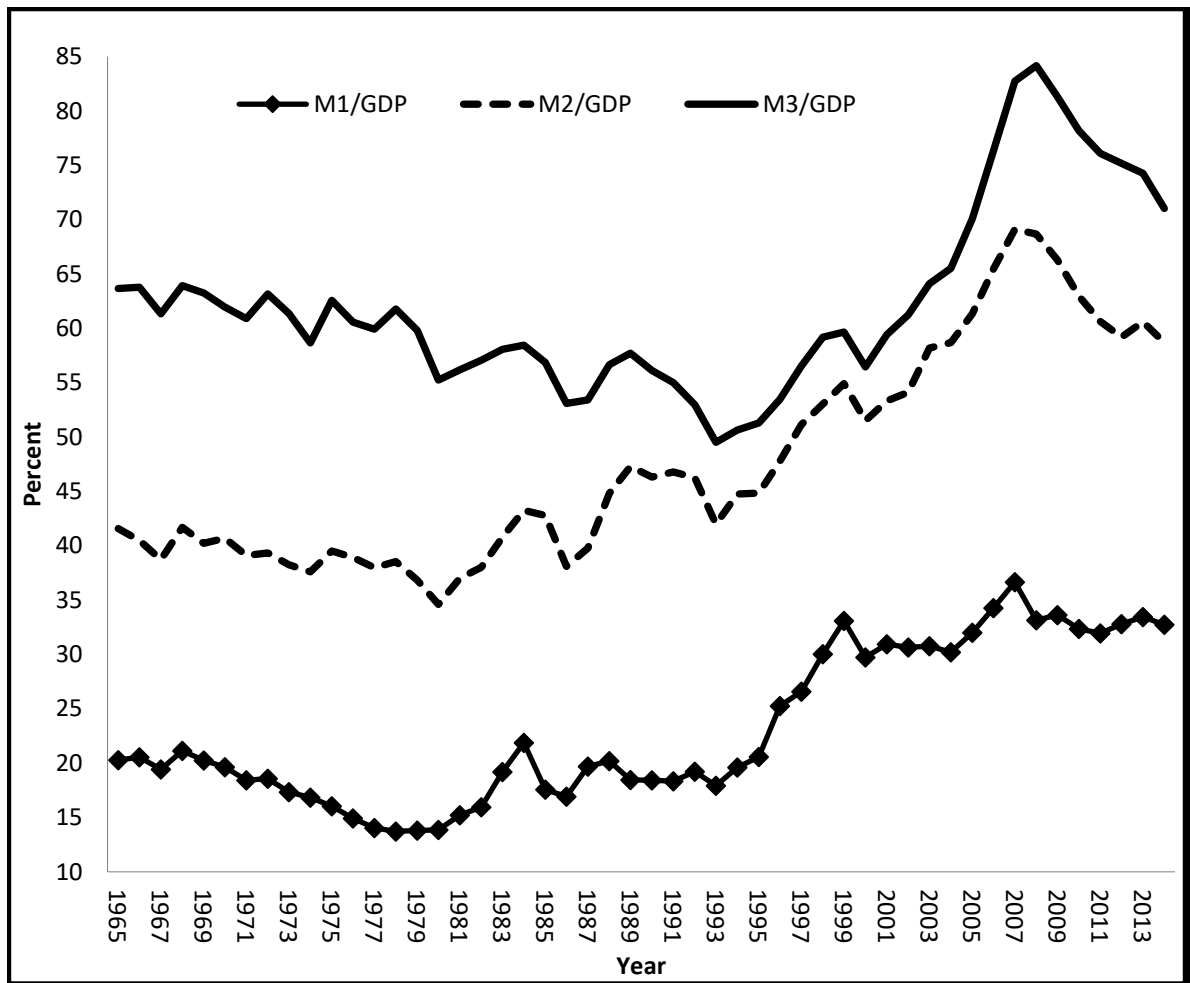
Figure 2.9 shows that the level of financial development in South Africa has been generally improving since the advent of the 1980s. All the ratios increased sharply during the period after 1994. The M1/GDP ratio increased from 19.61% in 1994 to 33% by 1999 to an all-time high of 37% in 2007 culminating into an average of above 30% thereon (IMF, 2016). The increased M1/GDP ratio, a measure of the degree of monetisation of the economy, shows that there was an increased confidence in the financial sector for payments and the ratio was increasing with the increase in economic transactions. The M2/GDP ratio tends to measure the size and depth of the financial sector and its development. However, the M2/GDP ratio usually decreases as non-deposit-based forms of savings instruments are increased in the market. The M2/GDP ratio generally increased from below 40% levels before 1983 to above 50% levels after 1994 (IMF, 2016). The M2/GDP trend is very closely mirrored by the M3/GDP trend though at slightly higher

percentage levels. However, the spread between the M3/GDP and M2/GDP ratios decreased in the post-independence years as compared to the pre-independence years.

The gap between M3/GDP and M2/GDP closed from 25% in 1965 to an average of 10% after 1994. The decrease in the M2/GDP and M3/GDP ratio gap can be explained by looking at a number of factors. Firstly, the financial sector was opened up to international players and the increase in investor confidence after independence had a positive effect on deposits. Secondly, there was relatively a trend of positive real interest rates (as compared to the pre-independence period) (IMF, 2016). These positive interest rates (see Figure 2.10) encouraged savings in the form of bank deposits. In addition, given the increasing GDP per capita trends, households had more money to spare for savings. Also, the year-on-year inflation trends showed a general continued decline and as such promoted savings. The spike in the year on year inflation rate in 2008 to 12% from 7% in 2007 seems to have had a negative effect on expectations in the market such that the M1, M2 and M3 ratios started to gradually decrease. Real interest rate in the same year was also slightly below 0% and this also may have contributed to a decrease in M1/GDP, M2/GDP and M3/GDP.

2.3.2.2 Real Interest Rate on Short Term Deposits

Real interest rate trends show the same picture as the other variables discussed earlier. Before the 1990s the real interest rates with the exception of 1984 were generally below 3%. From 1971 to 1981 real interest rates were below 0% with an all-time low of -9% in 1980.

Indeed, during most of this period (1965 – 1980) interest rates in general played a relatively minor role in monetary policy, and were at times kept below their natural market levels by means of such measures as direct deposit and lending rate controls, and the Reserve Bank's fixed pattern of rates for the different maturities of government stock. Figure 2.10 gives a summary of the trends in real interest rate on short-term deposits for the period 1961 to 2014.

Figure 2.10: Real Interest Rate on Short Term Deposits
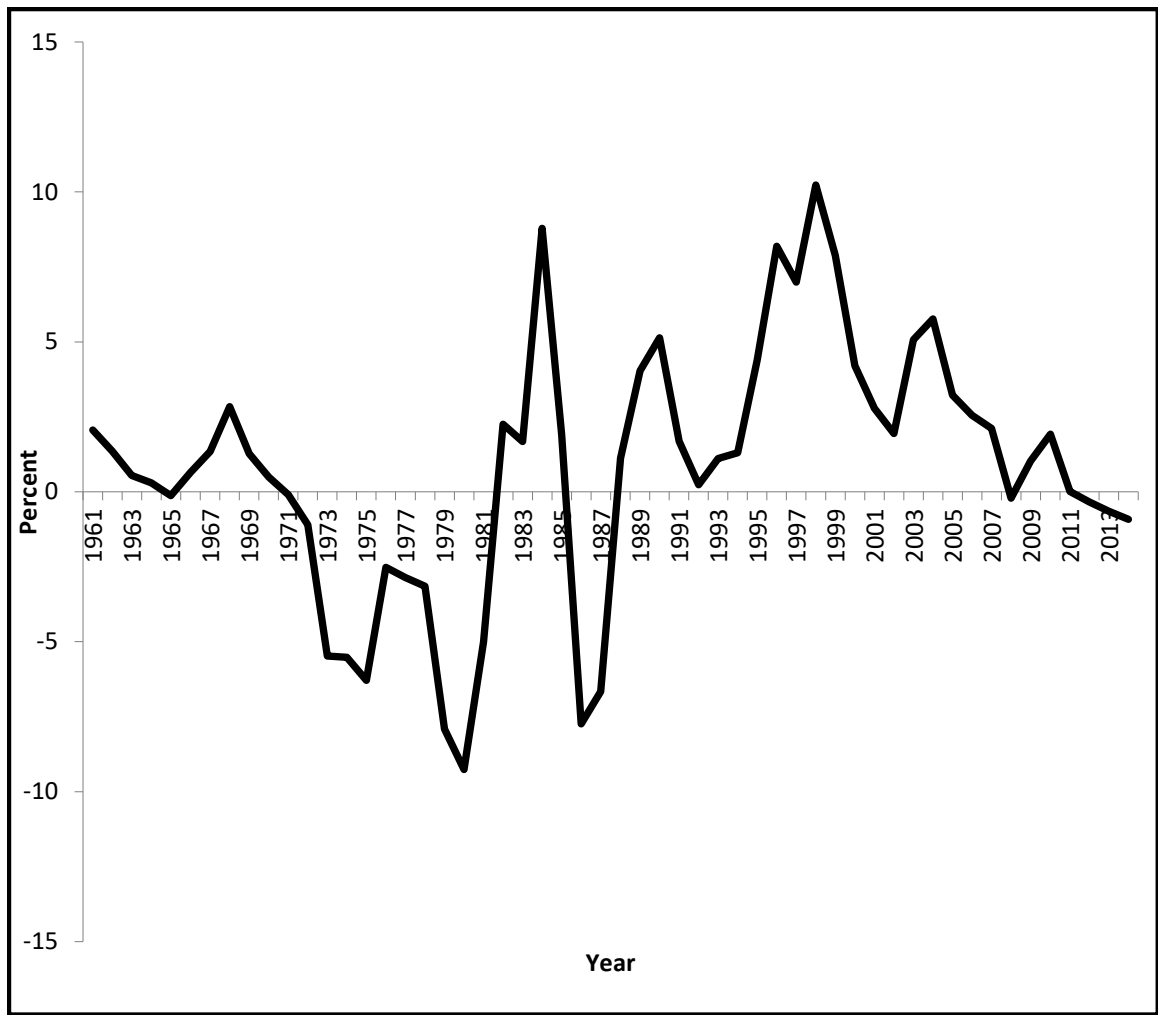
From 1981 to 1992, real interest rates were volatile with many ups and down with no clear trend as the trend changed every two years. However, after 1992, real interest rates tended to increase until 1998 when they hit a plateau of 10% and from then on started on a stepped decrease that ended at below 0% levels in 2014. The explanation of the trends in the real interest rate needs an understanding of the interest rate policy in South Africa. During the 1970s and the 1980s South Africa was using fixed interest policy as interest rates were heavily relied upon in the conduct of monetary policy (Akinboade and Makina, 2006). The control of interest rates, a characteristic of financial repression, had a negative effect on the real interest rate in the period before 1994. Inflation was increasing while interest rates were not reactive to market play hence the below 3% levels (and a period of negative real interest). The trend after 1994 is best explained by the change in the political environment, increased financial liberalisation, openness to

international and local financial sector investment, low inflation rates, increased savings or deposits and increased private sector credit.

2.3.2.3 Interest Rate Margins

A look at the bank rate (central bank policy rate) and the lending rate brings about an understanding of the accounting for transaction costs by the financial sector and the interest rate policy of the nation as a whole. Figure 2.11 gives a summary of the trends in the bank rate and the lending rate for the period 1960 to 2014.

Figure 2.11: Bank Rate and Lending Rate
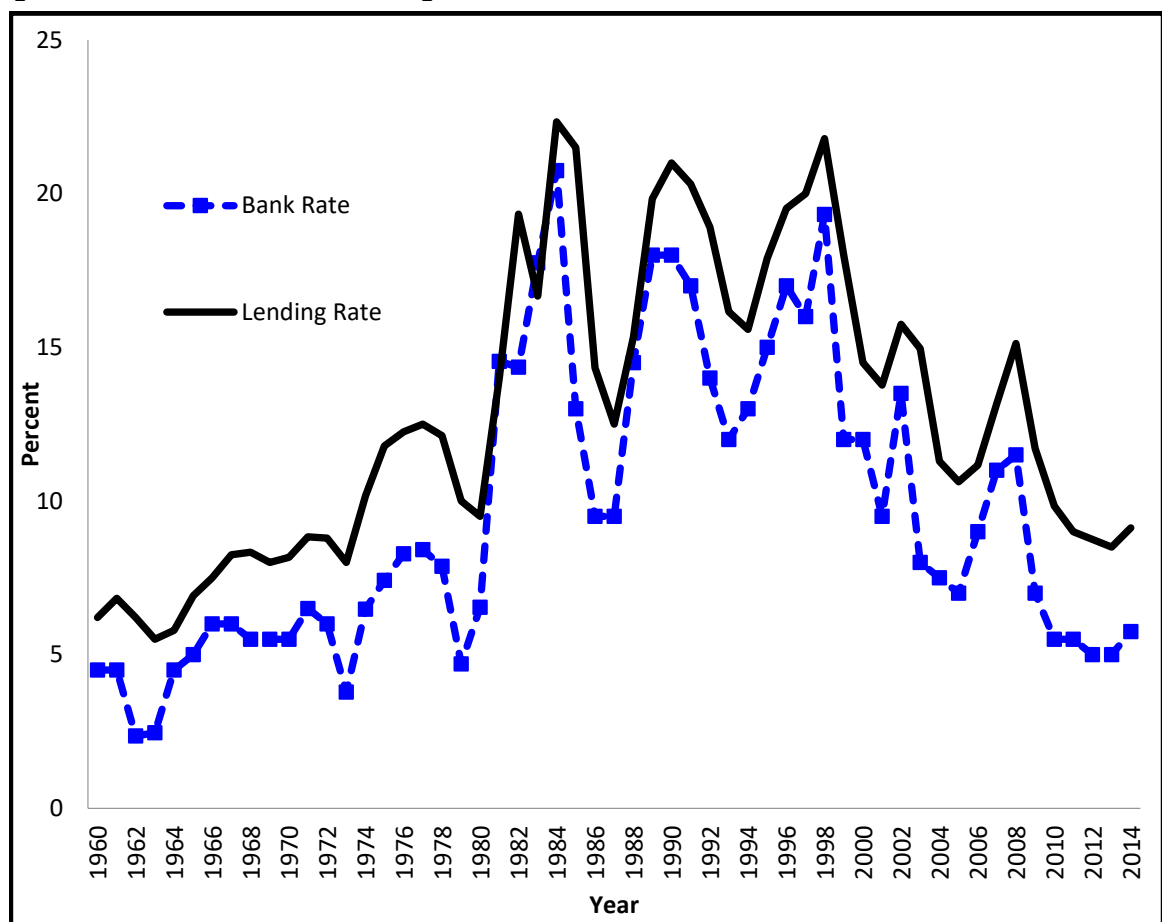
The expectation is for the lending rate to always be above the bank rate because the former usually covers for the costs of borrowing money from the central bank (the bank rate), the cost of borrowing money from other banks or financial institutions and the costs of all lending transactions in any financial institution. As expected, trends on the bank rate and the lending rate show a situation where both variables moved in unison throughout. However, there were years

in which trends were not different from each other during the decade from 1980. Also, from 1980, the bank rate was volatile and increasing, and eventually started to decrease from 1998 onwards. Abolishment of credit and interest rate ceilings, reduction in cash reserve and liquid asset requirements accounted in part for the trend after 1980. Figure 2.11 gives the notion that some semi-formal link between the Reserve Bank's discount rate (Bank rate) and the prime rates of clearing banks for lending on overdraft, which ensured that changes in Bank rate would be passed on to the borrowing clients of banks, was traditionally observed by the South African commercial banks. To assess the lending margins more accurately a look at the five-year average rates for the bank rate, the lending rate and the margins are illustrated in Figure 2.12.

Figure 2.12: Lending Margins
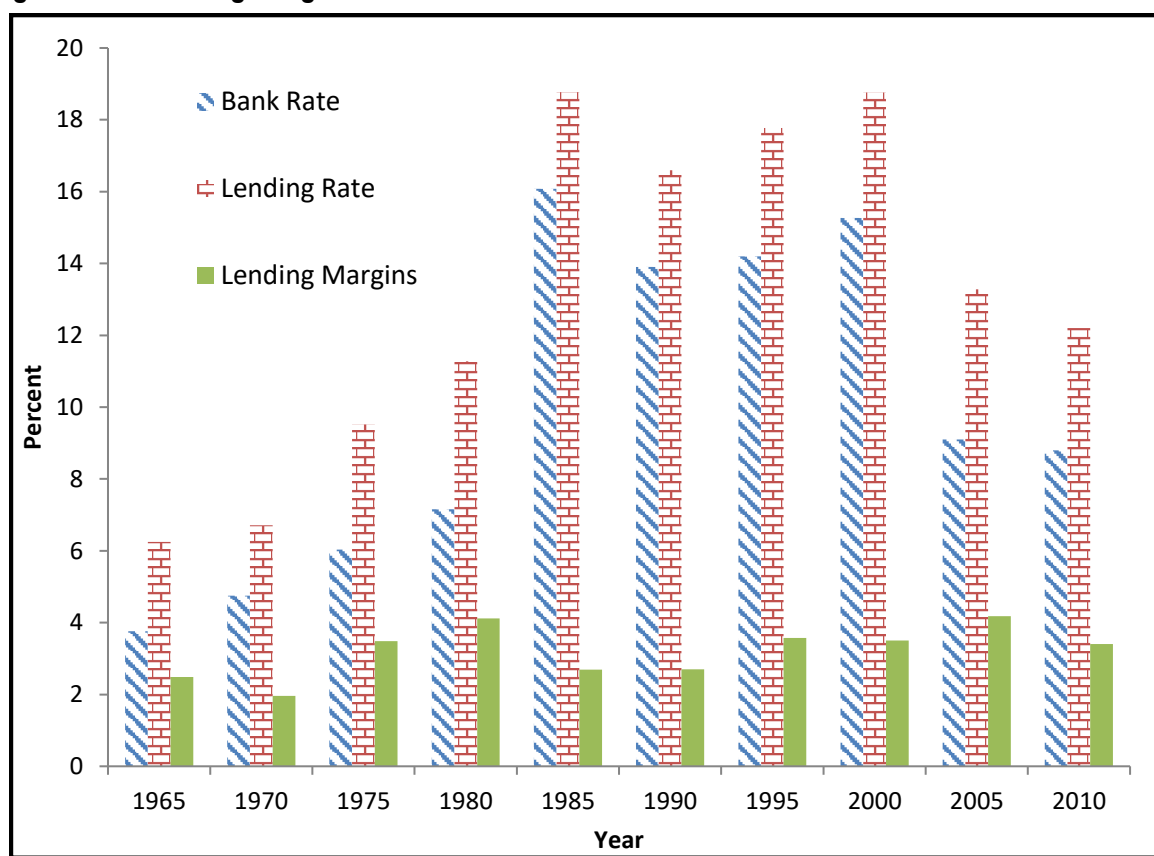
On average, despite the abolishment of credit and interest ceilings, it appears the lending margins were and are always between 2% and 4% throughout. This was rather planned than circumstantial because the monetary authorities had a hand in the determination of lending margins especially before 1980. Examples of such repressive intrusions, in the ways that banks did business, is the maintenance of the margins between the clearing banks' 'minimum' and

prime overdraft lending rates and the bank rate at 1% and 2% respectively until 1966, and then setting them at 2% and 2.5% from 1967 to 1975. However, due to inflationary pressures, the lending rate and the bank rate after 1980 have never reached the same levels as those before 1980, though they seem to be on a downward trend in the decade starting 2001.

2.3.2.4 Savings Mobilisation

Bank-based financial development functions as a mobiliser of savings, which in turn can be translated into higher domestic investment. Therefore, a discussion on the efficiency of savings mobilisation in South Africa is detrimental to understanding the impact and causal effect of bank-based financial development on investment. Trends in savings show higher savings rate before 1990 that were higher than 20% as compared to the period after 1990. Relatively, as also confirmed by Odhiambo (2010), the savings rate of South Africa has dwindled significantly since the 1980s. In 1980, savings were 34% of GDP and they have gently declined until in 2014 they were 14% of GDP. The decrease in savings may be attributed to the rapid rise in credit-financed consumer spending, switching from financial savings into non-financial savings and weakened corporate savings rates since 1995 (Aron and Muellbauer, 2000c). Figure 2.13 shows trends in gross savings as a percentage of GDP in South Africa for the period 1961 to 2014.

Figure 2.13: Gross Savings as a Percentage of GDP
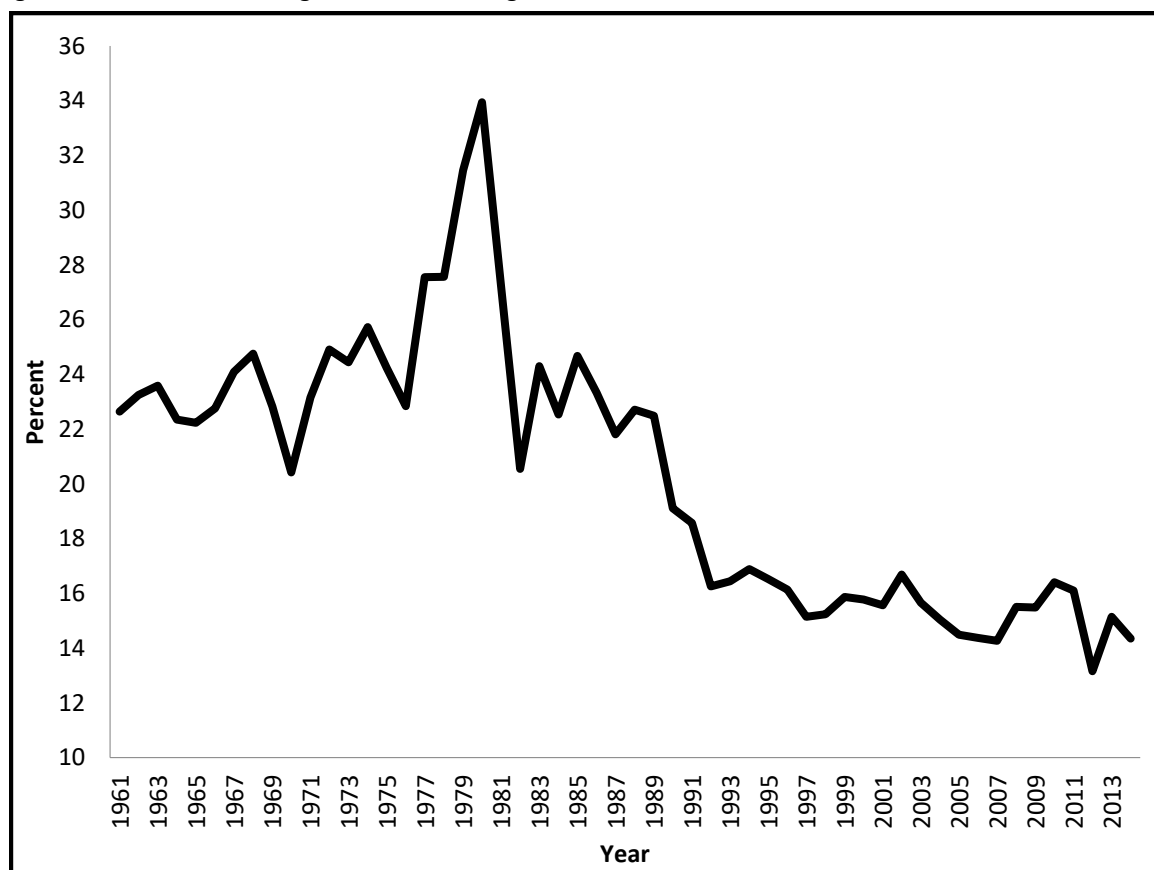
Returning to the personal sector, it is clear that despite the direct and indirect effects of positive real interest rates in the 1990s, net household saving had fallen to very low levels. The cause of these low savings might be attributed to the open hand that has been extended to all financial institutions through financial liberalisation. The financial system instead of encouraging saving, due to increased competition that came about through financial liberalisation, ended up encouraging borrowing by households. It should be noted that before 1994, most of these households had no, or limited, access to such borrowing facilities and hence were not financially literate enough to jostle the wind of readily available financing options that led into more debt. The high interest rates that can be used as a necessary tool to restrain and control consumer credit might also lead to restrained investment and economic growth (Aron and Muellbauer, 2000c).

Since the 1980s, the ratio of savings as a percentage of GDP has been steadily declining (as is also with domestic investment). It stood at 14.4% in 2014, compared to 16.8% in 1994 and 24.7%

in 1985. During 2006, government recorded its first contribution to overall saving since 1981, when it recorded a surplus on the fiscal account for the first time (World Bank, 2016). The largest and most consistent saver in the economy remains the corporate sector with its savings following the movements of the economy closely, with higher savings when the economy is performing well and declining when the economy slows down (Aron and Muellbauer, 2000b). The South African Reserve Bank has continuously made cautionary statements aimed at deterring consumers from borrowing excessively for consumption purposes. However, credit extension by banks to the household sector has certainly been extremely high, perhaps irresponsibly so (Hanival and Maia, 2008).

2.3.2.5 Credit, Deposits and Broad Money

Figure 2.14 shows that the level of financial development in South Africa has been improving since the early 1990s. However, not all financial indicators increase sharply during the period 1990 – 2014. Only domestic credit and private credit increase sharply from below 100% levels to more than 120% levels. The M2/GDP ratio increased from 40% in 1965 to 60% in 2014. The government credit over GDP ratio increased from 11% in 1965 to 17% in 2014. However, the share of total deposits as a percentage of GDP decreased from 60% in 1965 to 42% in 2014 (IMF, 2016). Figure 2.14 gives a summary of the trends in credit, deposits and broad money for South Africa for the period 1965 to 2014.

Figure 2.14: Trends on Credit, Deposits and Broad Money
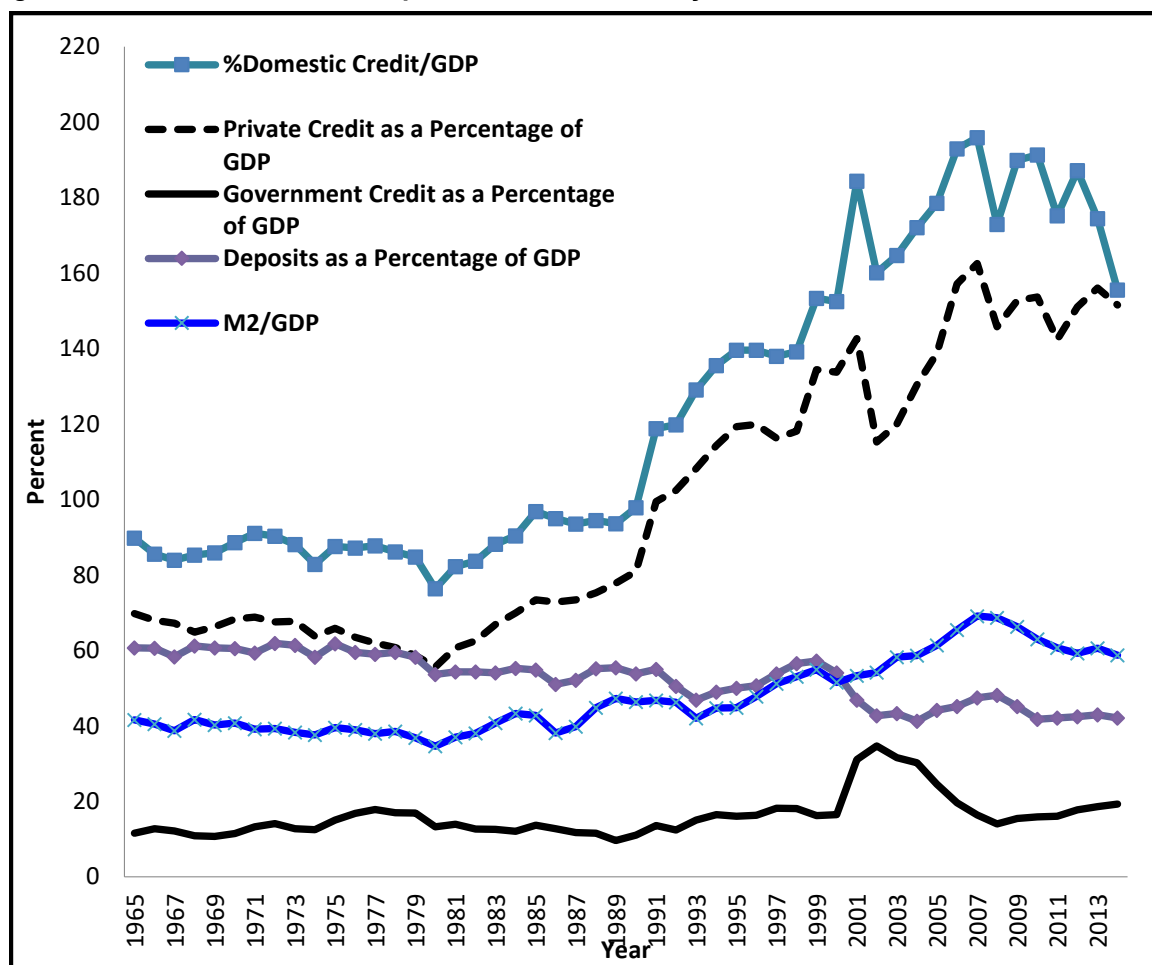
To understand the fuller picture illustrated in Figure 2.14 it is necessary to analyse, individually, all the financial development indicators in detail during this period and all the other indicators other than those already discussed.

2.3.2.6 Trends in Domestic Debt

The ratio of domestic credit to GDP is an indicator of financial depth and development. The ratio of domestic credit to GDP and the ratio of private credit to GDP appear to closely mirror each other which tends to imply that private credit forms a greater part of all domestic credit. Figure 2.15 confirms the notion that most of the credit in the economy from the financial sector was to the private sector. From 1965 to 2014, the ratio of private credit to total domestic credit remained above 68%. It appears government competes with the private sector in the debt market. The share of private credit in domestic credit took a slump in the periods 1974 to 1982 (below 75%

levels – lowest was 69% in 1979) and in 2001 – 2003. Inherently, during the same periods of the slump in the private sector share of domestic debt, the government credit share of domestic debt was relatively at its peak (IMF, 2016). Figure 2.15 shows trends in the private credit to domestic debt ratio in South Africa during the period 1965-2014.

Figure 2.15: Private Credit/Domestic Debt Ratio
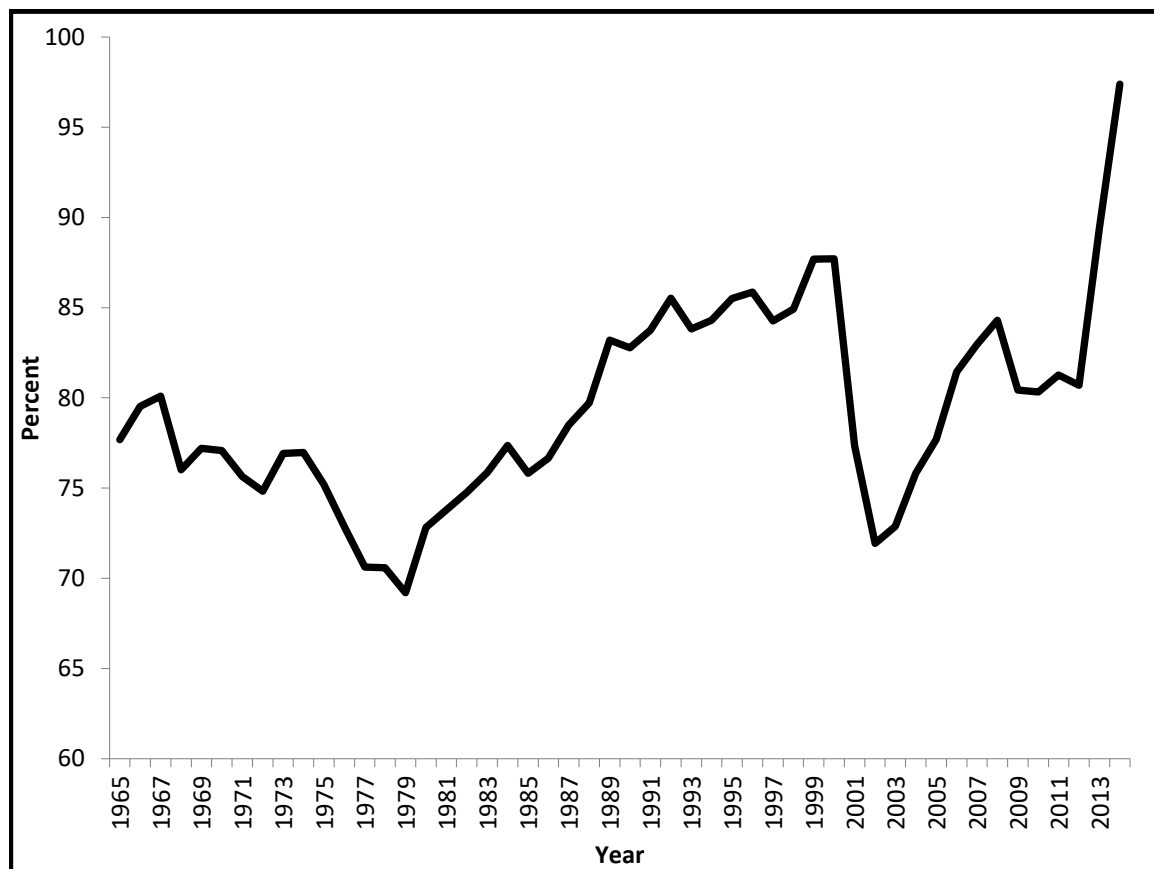
From the above-illustrated trends, it is imperative to state that the main upshot of regime change and financial liberalisation (after 1994) has been more easily obtained credit. While under the apartheid system, rural and urban black households, the majority of the population, had highly constrained access to formal saving and credit opportunities (Aron and Muellbauer, 2000b). After the 1994 elections, more black South Africans obtained formal employment, particularly in the public sector, gaining access to credit that they previously had been denied hence the increase in credit (Aron and Muellbauer, 2000a). Notwithstanding that, it appears as if the extension of credit by financial intermediaries is based on the demand by the clients, the affordability of the loans and the client's own risk appetite. Instead of income-based deposits being used as a

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source for credit creation, debt that has been turned into deposits seems to be financing the extension of private sector credit.

A comparison of the private credit to domestic debt ratio and the government credit to domestic debt ratio shows that the two ratios have been relatively divergent throughout the period under study. The period from 1965 to 1979 saw the private credit/ domestic credit ratio gradually decreasing from 77.7% to 69.2%. In the same period, the government credit/domestic debt ratio increased from 12.8% to 19.9%. The same behaviour can be deciphered for all the periods after that leading to the conclusion that the government and the private sector appear to be competing for domestic credit. Nevertheless, the composition of the private sector credit in 2012 was mostly home loans (residential mortgages) (30%) with term loans (secured and unsecured loans to wholesale, and retail clients with a fixed-term structure and a final repayment date) and other loans accounting for 21% and 22%, respectively (IMF, 2016). 'Other' loans are composed of loans granted/deposits placed under resale agreements, redeemable preference shares, factoring accounts, trade - other bills and bankers' acceptances, bank intra-group balances and other small types of loans (SARB, 2012). The composition of the private sector credit might explain the high dependence on debt by households. The term loans imply a propensity by households to use debt rather than savings as a means to acquire property. The increased trade-off between private credit and government credit during the period 2002 – 2010 and the subsequent increase in domestic investment during the same period might be attributed to the hosting of the FIFA World Cup. Figure 2.16 shows trends in the government credit to domestic debt ratio in South Africa during the period 1965-2014.

Figure 2.16: Government Credit as a Percentage of Domestic Debt
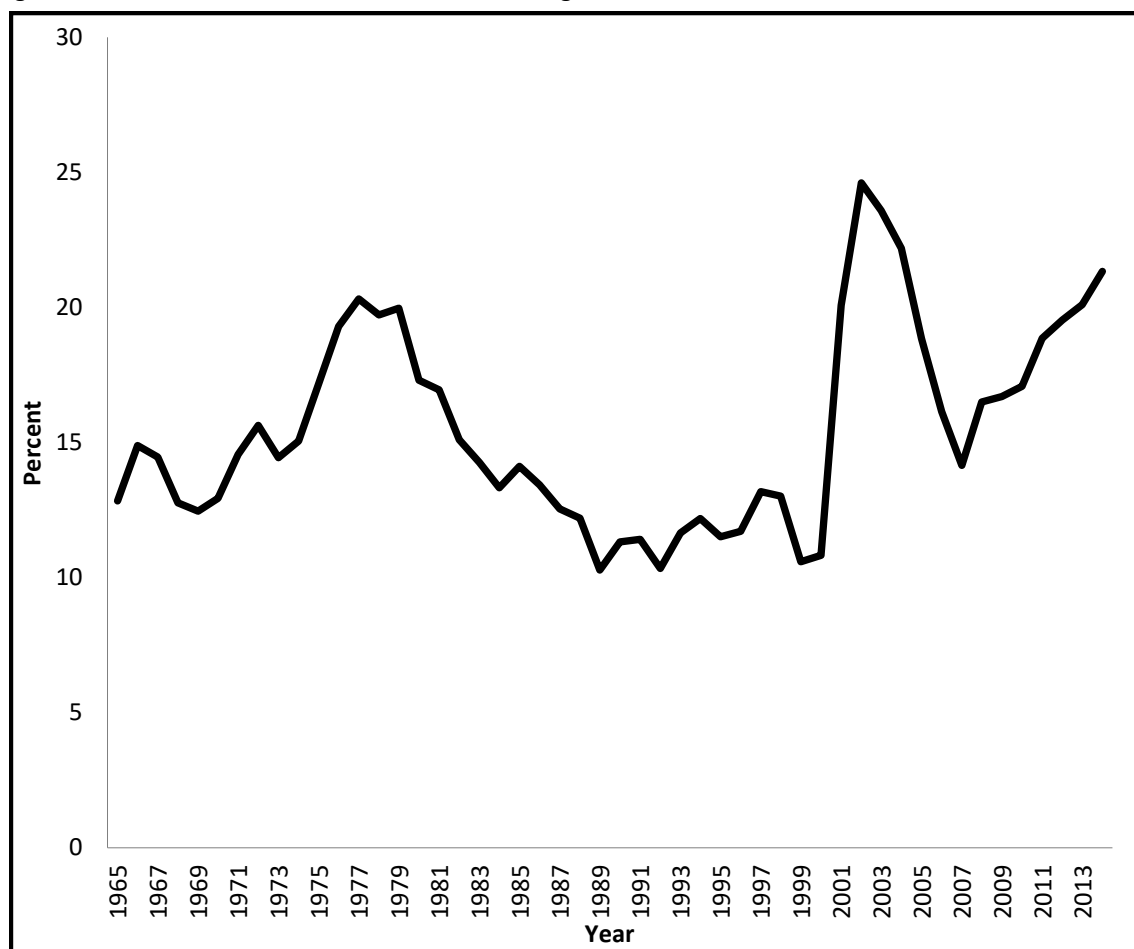
2.3.2.7 Deposits

On the other hand, deposits as a share of GDP in South Africa have decreased from 60% in 1965 to 42% by 2014 (Figure 2.14). Deposits act as a proxy for the supply of loanable funds available to the banks for lending purposes (Dutta and Roy, 2009). A look at the deposits to domestic credit ratio shows an increase in the efficiency of financial intermediaries in credit creation and shows evidence of financial development in the South African economy especially in the period starting in 1990. Presumably, due to credit ceilings and tight monetary controls, efficiency in the financial sector appears to have been hampered as the ratio of deposits to total domestic debt remained generally constant at around 1.5 in the period 1965 – 1989. After 1989, with increased bank competition, mergers and acquisitions, the change in the political environment and the imposition of a number of financial liberalisation policies and interventions, the deposit to credit ratio increased to more than 3.5 by 2001. On the average, the deposit to credit ratio has remained above 3.5 in the period 2001-2014 (IMF, 2016). The sustained increase

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in the deposit to domestic credit ratio implies an increased efficiency and performance of the financial sector and ever-developing financial intermediation systems. Figure 2.17 shows trends in the deposits to domestic credit ratio in South Africa during the period 1965-2014.

Figure 2.17: Deposits to Total Domestic Credit Ratio
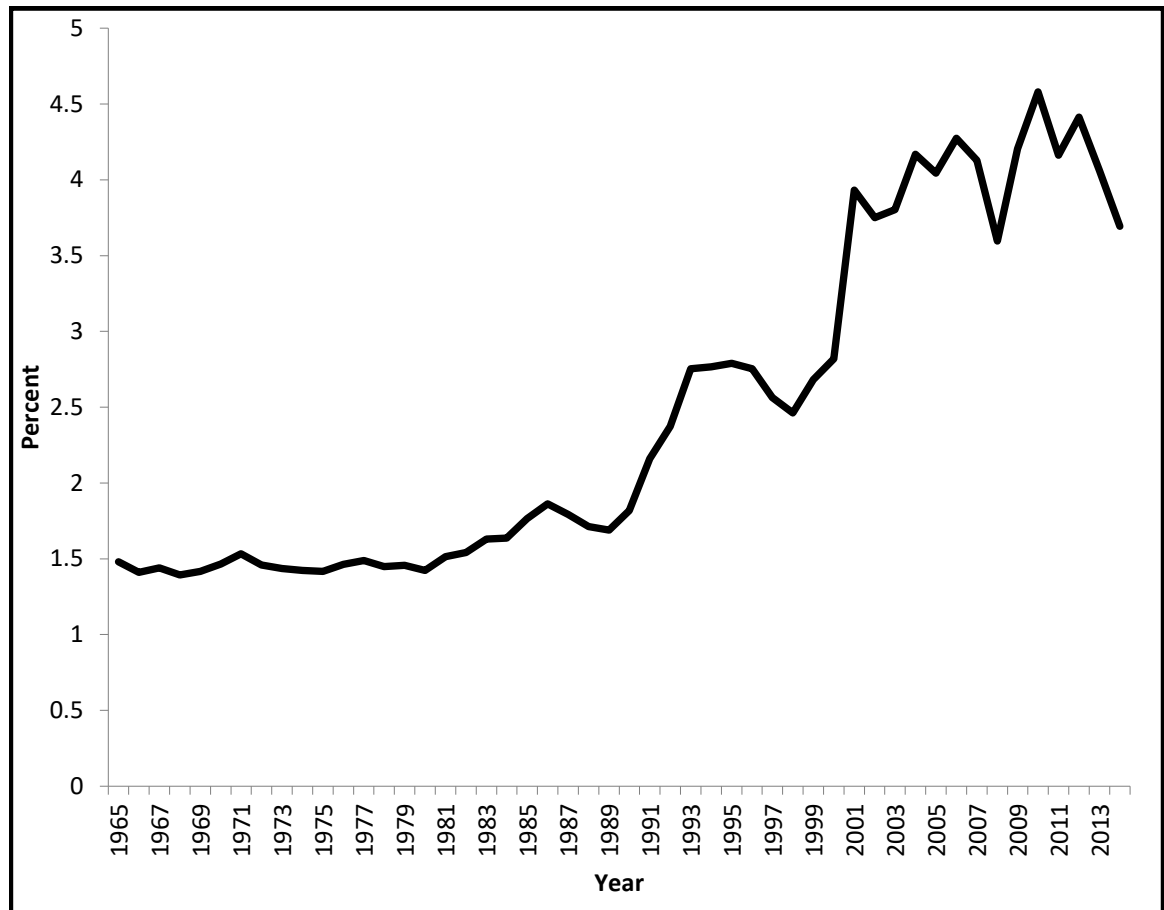
2.3.2.8 M1 to Deposits Ratio

The notion of increased financial development in South Africa is supported by the ratio of M1 to deposits (see Figure 2.18). M1 is a proxy for the use of notes and coins, and also for short-term deposits. The ratio of M1 to deposits shows, to a particular extent, the ratio of all deposits that are short term and as this ratio decreases it shows that more deposits are long-term deposits. The contrary is also true, as the ratio of M1 to deposits increases overtime that shows an increased preference for short-term deposits by economic agents. In other words, financial systems are valued mostly in the economy as better facilitators of exchange than mobilisers of savings and, allocators and channels of resources to resource-deficient economic agents. A look

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at the South African M1 to deposits ratio shows that it has progressively decreased in the later years (1994 onwards) as compared to the 1960s and 1970s. The high levels of the M1 to deposits ratio before 1994 may be attributed to the financial repressive policies that existed then, the increasing inflation rate and the political environment which did not offer much security for savings. Nevertheless, after 1994 with the coming of the new government, decreasing inflation rates and progressive financial sector liberalisation, the share of short term or sight deposits in total deposits continued to decrease. By 2014, it was 1,3 as compared to 2.5 in 1994 and 3 in 1965. In other words, by 2014, 57% of all deposits were sight deposits as compared to 71% in 1994 and 75% in 1965. The decreased share of sight deposits is evidence of increased financial development and confidence in the money market (IMF, 2016). Figure 2.18 shows trends in the M1 to deposits ratio in South Africa during the period 1965-2014.

Figure 2.18: Ratio of M1 to Deposits

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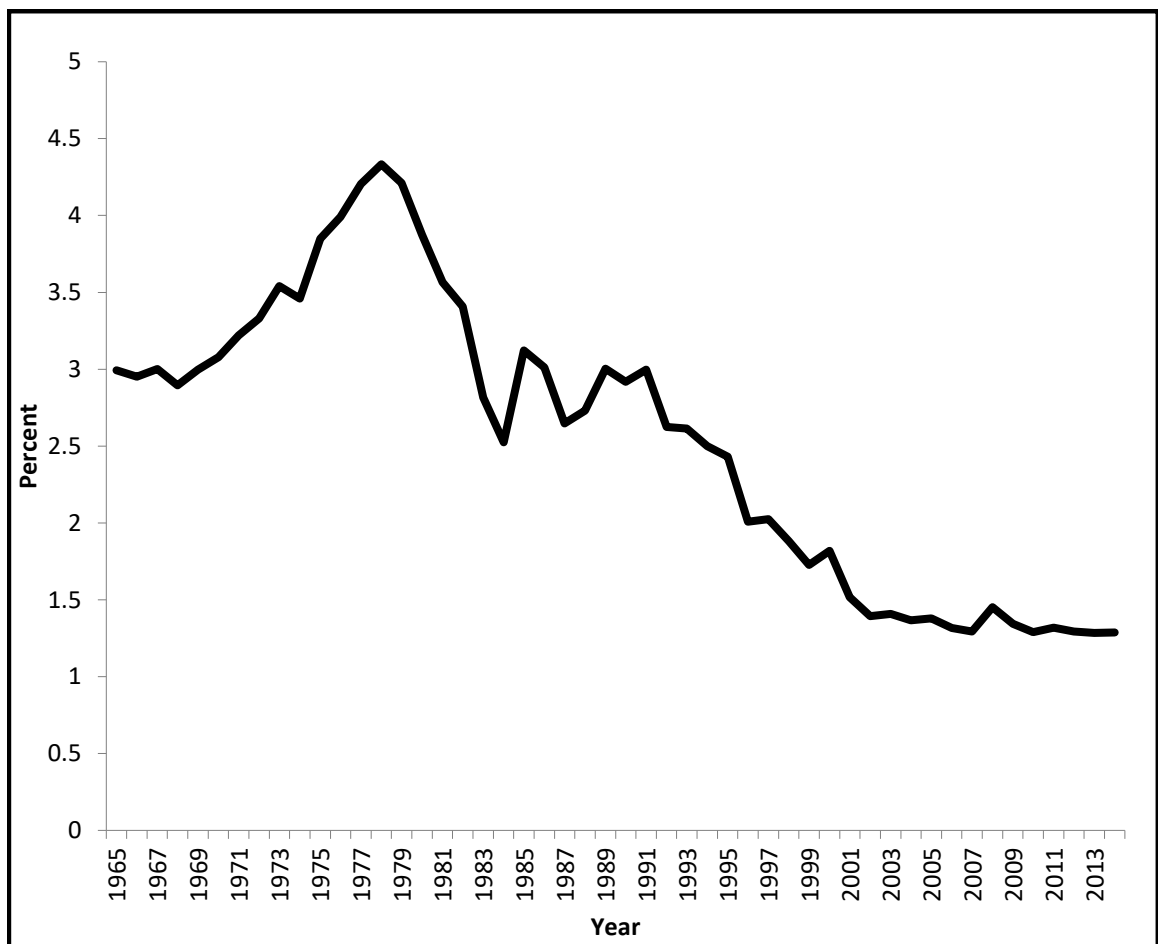
2.3.2.9 M1 to M2 Ratio

The ratio of M1 to M2 is examined in Figure 2.19. Comparing this ratio to the trends seen so far especially those of M1 to deposits, expectations are that the M1 to M2 ratio should be decreasing as was the trend in the M1 to deposits case. Like the M1 to deposits ratio, as the M1 to M2 ratio decreases, that means financial sector development is increasing. That is, savings deposits will be increasing more than transaction balances. The closer the M1 to M2 ratio gets to 100% the more sight balances the economy has as deposits. The M1/M2 ratio for South Africa has remained between 36% and 60% with an average ratio of 48% for the period under study (IMF, 2016). Trends show that the M1/M2 ratio, though volatile, has marginally increased over the whole period, which is contrary to expectations. The main reason for such a difference is the exclusion of other deposits from the calculation of M2 that are included in the total deposits figure used to calculate the M1 to deposits ratio[3]. However, the near 50% average M1/M2 ratio reflects the difficulty faced by the South African financial sector to attract financial savings and hence promote capital accumulation. Figure 2.19 shows trends in the M1 to M2 ratio in South Africa during the period 1965-2014.

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[3] See the IMF –IFS CD supporting documents that show the existence of other deposits that cannot be classified as broad money (M2) therefore they are excluded from such. Line 36B

Figure 2.19: Ratio of M1 to M2
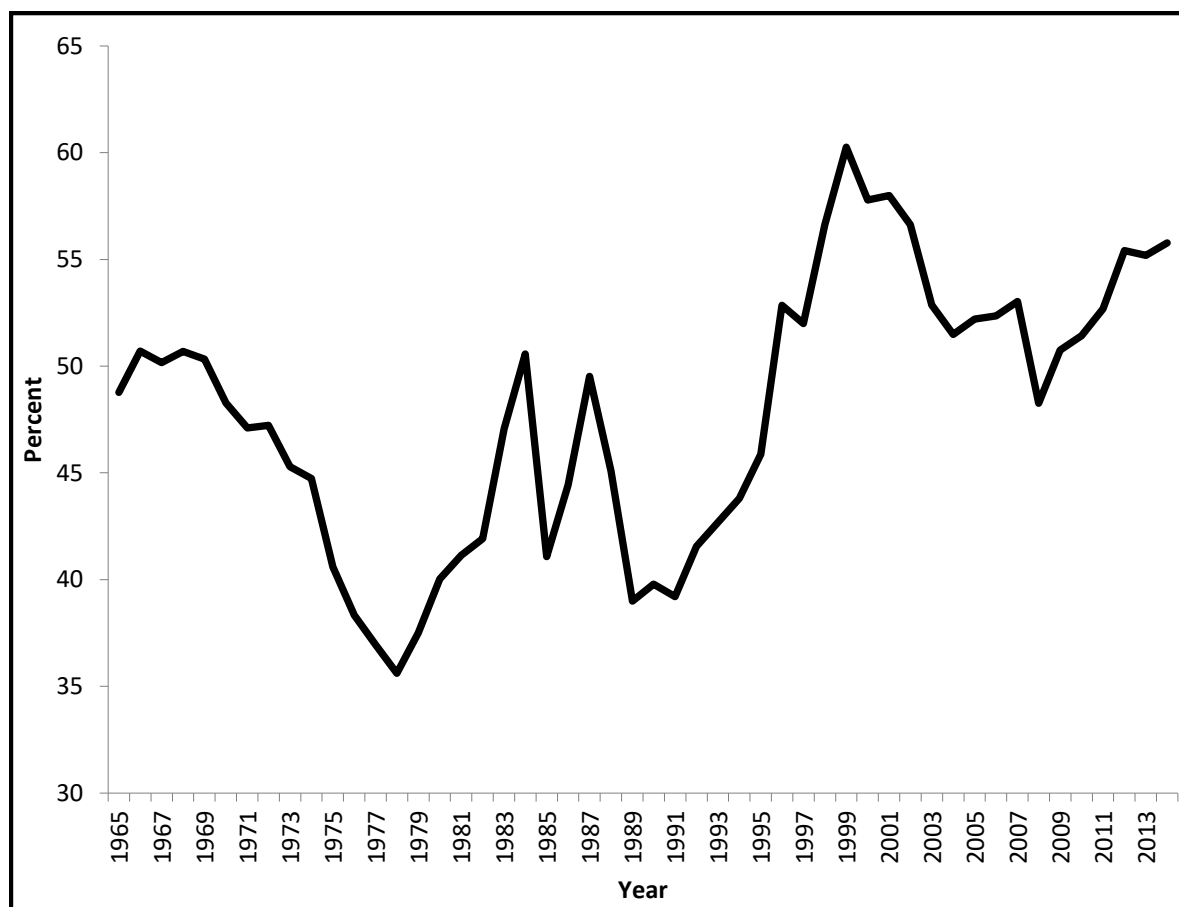
2.3.2.10 Other Banking Sector Performance Indicators

Other bank-based financial development measures are employed to complement the already discussed financial depth ratios elucidated on in the previous sections. These include net interest margin, bank overhead costs to total assets, the bank average return on assets (Bank ROA), the bank z-score, bank concentration, bank return on equity (Bank ROE) and bank cost to income ratio. The trends on these indicators are illustrated in Figures 2.20 and 2. 21.

Figure 2.20: Bank Performance Indicators
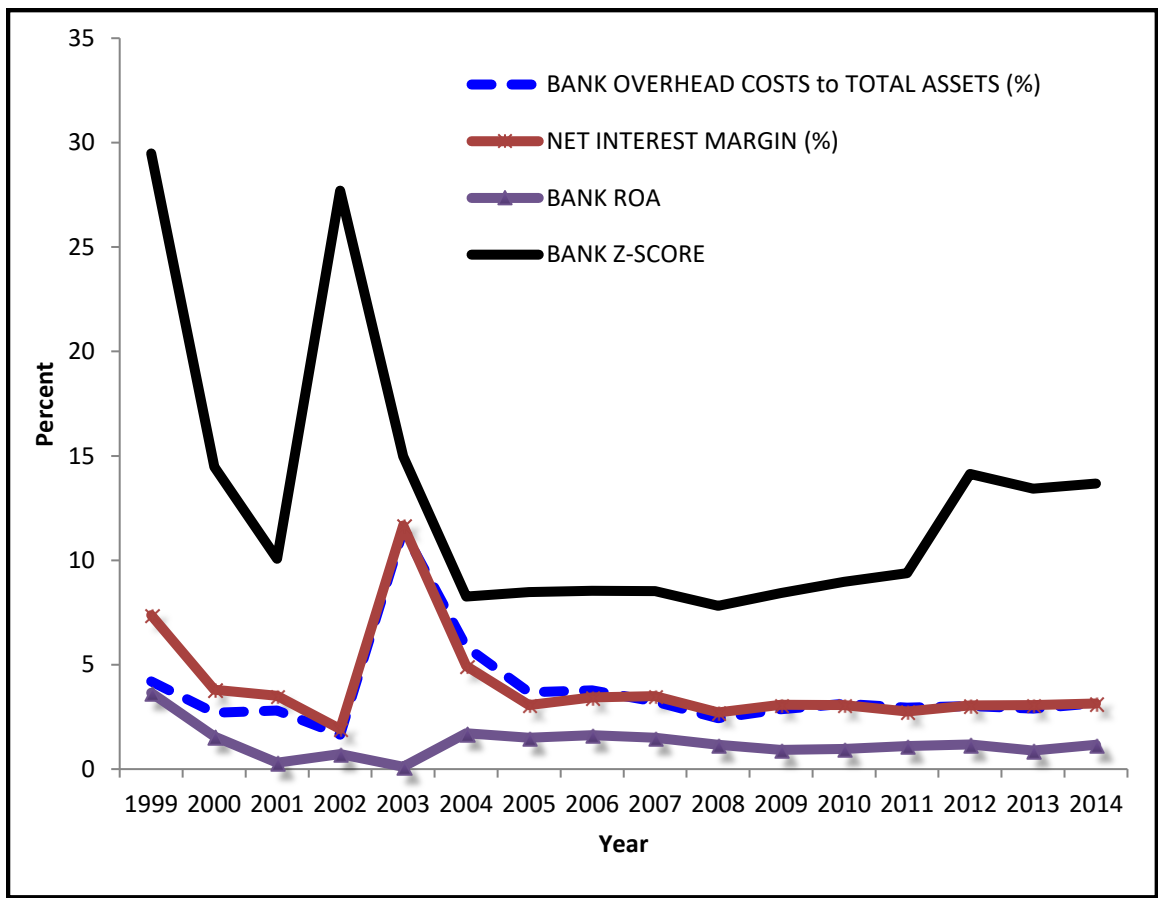
Figure 2.21: Other Bank Performance Indicators
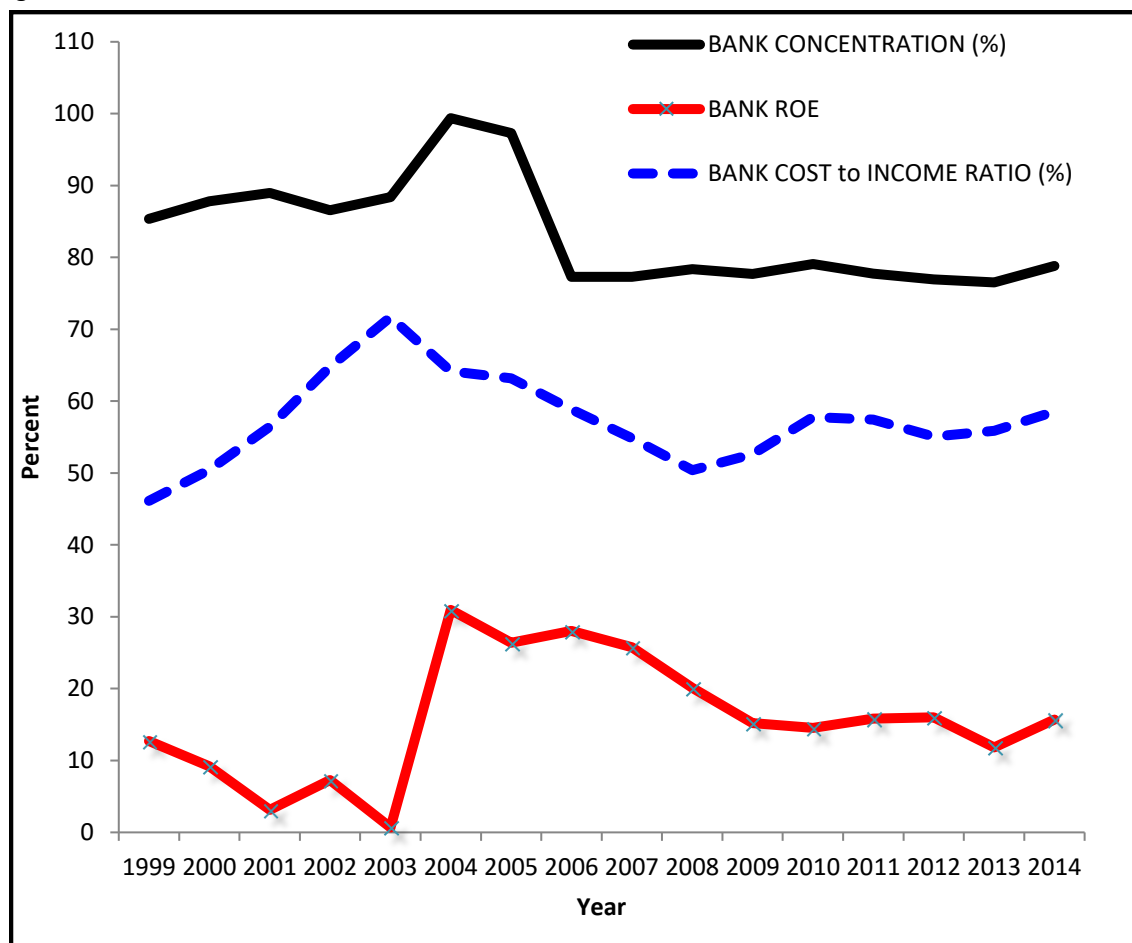
To assess profitability, operating efficiency and the overall performance of South African banks, a look at the most recent trends in the net interest margin, bank overhead costs to total assets, the bank average return on assets (Bank ROA), the bank z-score (Figure 2.20), the bank concentration, the return on equity and the bank cost to income ratio are discussed.

Trends in net interest margin, the ROA and the overhead costs to total assets show that banks in South Africa exist in a relatively stable market as compared to most African countries and even developed nations. Net Interest margin is the difference between interest income and interest expenses expressed as a percentage of average total assets. The ratio identifies the major income generating capacity of the banks, i.e., the ability to use assets to generate income (the core earnings capability of the bank). In addition, the net interest margin can also be used as an indicator of the financial sector's competitive structure, although many factors may influence interest margins (Beck, Demirgüç-Kunt and Levine, 2000).

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The implications on the financial sector's competitive structure from the stable net interest margin seem to point to an oligopolistic competitive structure in which banks are more inclined to non-price (interest rate) competition. The oligopolistic market is made up of a few large banks. This is because such banks are very large, and their actions will affect the market conditions. This is due to the fact that in the oligopoly market, there are a small number of banks, but each bank is large enough to affect the market conditions. However, in other cases of oligopoly, there will be lead firms or, in this case, banks that dominate the market despite the existence of many other small banks. Therefore, the structure in the market (the existence of dominant banks) tends to determine the conduct of the whole banking market and inherently the performance of the industry. A look at the concentration level is required so as to validate the existence of oligopoly and its extent thereof.

The z-score reflects the extent to which banks are able to absorb losses and is, therefore, an indicator of banking stability. It is the ratio of return on assets plus capital-asset-ratio to the standard deviation of return on assets. The higher the z-score the more stable the bank. The z-score shows that, for South Africa, the has experienced a decline in stability from 28 percent in 2002 to 14% in 2014. Figure 2.21 shows the trends in other bank performance indicators.

The stability of the South African banking sector is also proven by the unchanging trends on the average of the bank overhead costs to total assets and the bank return on assets.

Financial development can also be analysed using measures of concentration in the banking system. It is assumed that a less concentrated (and presumably more competitive) banking system reflects a greater level of financial development which is better suited to serve the diverse and emergent needs of a growing economy (Beck. et al., 2000, 2010, Cîhák. et al., 2012). In addition, access to financial sector products can be either improved or decreased by, among other things, the concentration levels in the economy. For example, a very high concentration of banks that are against lending to small to medium enterprises (because they are a high risk client than household consumer credit) might stifle the growth of domestic companies and economic growth. However, the effect of concentration levels in the financial sector is also highly dependent on other aspects of the economy including the economy's development plans, the banking environment being promoted and the openness of the financial sector to international players.

The degree of concentration in the banking sector (Figure 2.21) as measured by the three- bank concentration ratio, which measures the market share of the largest three banks in the economy, shows a marginal decrease from 85% in 1999 to 79% by 2014(Beck. et al., 2000, 2010, Cĭhák. et al., 2012). The trend in the concentration ratio confirms the existence of an oligopolistic market as already implied by the stable net interest margin.

The bank's return on equity ratio measures the amount of a bank's income that is returned as shareholder equity. Therefore, higher ROE ratios are preferred to low ones. The bank's ROE ratio for South Africa shows a sharp increase in the year 2003 (from 0.68% in 2002 to 30.96%). However, in the later years it subsided to eventually reach 16% by 2014. The trend of the bank ROE shows that the return on equity for the South African banking sector has relatively improved in the later years (after 2003) than in the former years (before 2004). This trend is echoed in the trend for the bank cost to income ratio. This ratio is a measure of a bank's ability to turn its resources into revenue. An increase in the bank cost to income ratio indicates either increasing costs or decreasing revenues. Before 2004, the bank cost to income ratio was increasing. This had a negative effect on the bank ROE which was decreasing. Noticeably, the bank cost to income ratio is at its maximum ever value (72%) when the bank ROE ratio is at its minimum (0.68%). As the bank cost to income ratio starts to decrease in 2004 the bank ROE starts to increase. Despite the confirmed existence of an oligopolistic market, the bank cost to income ratio and bank ROE seems to have stabilised to relatively unchanging levels.

2.4 Stock Market Development

The Johannesburg Stock Exchange (JSE) is one of the oldest stock exchanges in Africa. It first came into being in 1887. Currently, the JSE has seen improved trading performance due to substantive technological improvements. In 1997, an electronic news service was introduced, which reported price-relevant information in real time. The Johannesburg Stock Exchange (JSE) incorporated the SETS system from the London Stock Exchange in 2002. The introduction of the London Stock Exchange's SETS system in 2002 enabled the development of the South African economy overall by instituting high investor protection, trade anonymity, by accommodating a higher than the usual number of listed companies, high transaction speeds, high number of market participants, and high volumes which, in turn, increase market efficiency (Dicle and Levendis, 2013).

The indicators of stock market development to be discussed in this section are the total value of shares traded as a percentage of the gross domestic product, the turnover ratio of stocks traded, the market capitalisation of listed companies as a percentage of GDP and the number of listed domestic companies on the Johannesburg stock exchange. Stock market development though enhancing economic growth may interrupt savings activities because it focuses on higher returns, additional liquidity and real capital (Kim, Shin, Kim, and Lee, 2014). This in turn may explain the lower than 20% gross savings in South Africa after 1990 given the inroads in automation and efficiency of the JSE.

Market capitalisation (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. This indicator does not include investment companies, mutual funds, or other collective investment vehicles. Stocks traded refer to the total value of shares traded during the period. This indicator complements the market capitalisation ratio by showing whether market size is matched by trading (Beck, Demirgüç-Kunt and Levine, 2010). Turnover ratio is the total value of shares traded during the period divided by the average market capitalisation for the period, a measure of the activity or liquidity of a stock market relative to its size (World Bank, 2014). The turnover ratio is a measure of liquidity with higher levels of the ratio being interpreted as indicating more efficiently operating equity markets.

2.4.1 Stocks Traded, Total Value and Turnover Ratio

Figure 2.22 below gives the total value of stocks traded as a percentage of GDP (measures trading relative to the size of the economy) and the turnover ratio (measures trading relative to the size of the market) of stocks traded for the period 1988 - 2012.

Figure 2.22: Stocks Traded – Total Value and Turnover Ratio
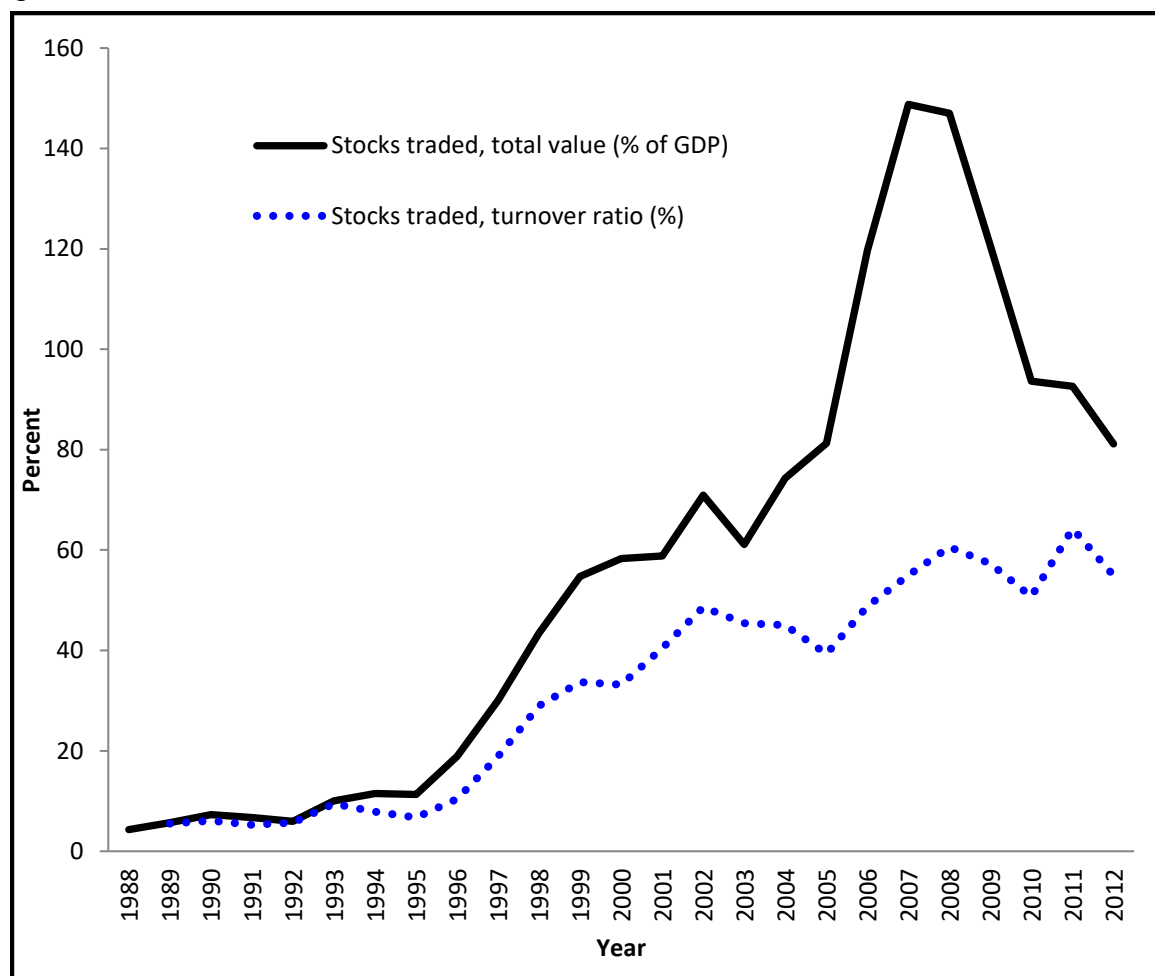
During the period 1965 – 1993, the value of shares traded as a percentage of GDP and the turnover ratio maintained near-stagnant levels at approximately 5.3%. The main reasons being economic sanctions and financial repressive policies that discouraged both foreign and domestic investment. Nevertheless, from 1994 onwards the two ratios under discussion have been on a constant stepped improvement with each year. The value of shares traded over GDP ratio increased gradually from about 12% in 1994 to above 80% levels from 2005 onwards. After 2005, the ratio was above 100% reaching its maximum in 2007 i.e. 148%. It decreased to below 100% levels but above 80% in the period 2010 – 2012. Economic and financial liberalisation after the change in the political environment enhanced stock market development as the value of shares traded on the stock exchange and the stock traded turnover ratio increased substantially after 1994. The stock traded turnover ratio increased from 5.6% in 1989 to above 40% levels by 2005 (World Bank, 2016).

2.4.2 Market Capitalisation

Trends on the market capitalisation of listed companies as a percentage of GDP show the same behaviour as the total value of stocks traded as a percentage of GDP. Like total value of stocks traded/GDP, the market capitalisation of listed companies/GDP starts to gradually increase in 1994, reaches its maximum in 2007 (291%) and gradually decreases in the following years as shown in Figure 2.23 below (World Bank, 2016).

Figure 2.23: Market capitalisation of listed companies (% of GDP)
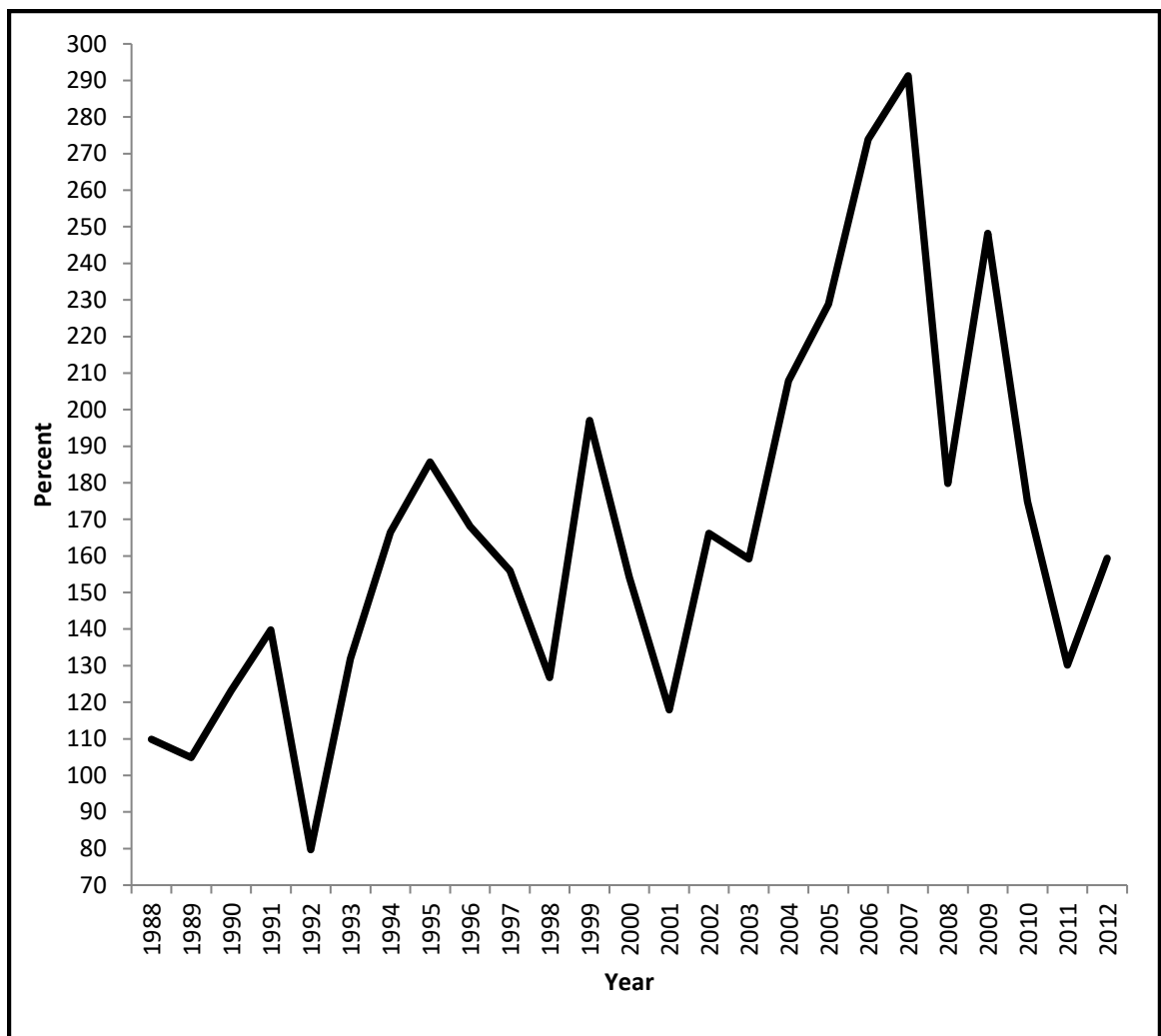
In addition to increased efficiency in trading on the Johannesburg Stock Exchange (JSE), the usual reasons (economic and financial liberalisation, and the change in the political environment) can be attributed to the increased capitalisation of listed companies.

2.4.3 Listed Domestic Companies

A look at the number of listed domestic companies on the JSE shows a contrary trend to the usual indicators discussed above. Trends show significant decrease in the listed domestic companies on the JSE. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed domestic companies decreased from 754 in 1988 to 348 in 2012. There was a steep decrease in listed domestic companies from 668 in the year 1999 to 388 by year 2005. Thereafter, though decreasing, the number of listed companies has decreased at a decreasing rate (World Bank 2016). Reasons for the increased decrease in the number of listed domestic companies in the period 1999 to 2002 include movement of primary listings from the JSE to other stock exchanges like the LSE, mergers and acquisitions of already listed companies, market unattractiveness and others delisting. Of note, five big companies[4] moved their primary listing from the JSE to the LSE. Since there was a change in the centre of interest of the head offices of the companies concerned from South Africa to London, they essentially became non-resident companies. Trends in the total number of listed companies on the JSE are given in Figure 2.24.

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[4] Billiton, the South African Breweries, the Anglo-American Corporation, the Old Mutual Life Assurance Company (SA) Limited, and Dimension Data

Figure 2.24: Listed Domestic Companies, Total
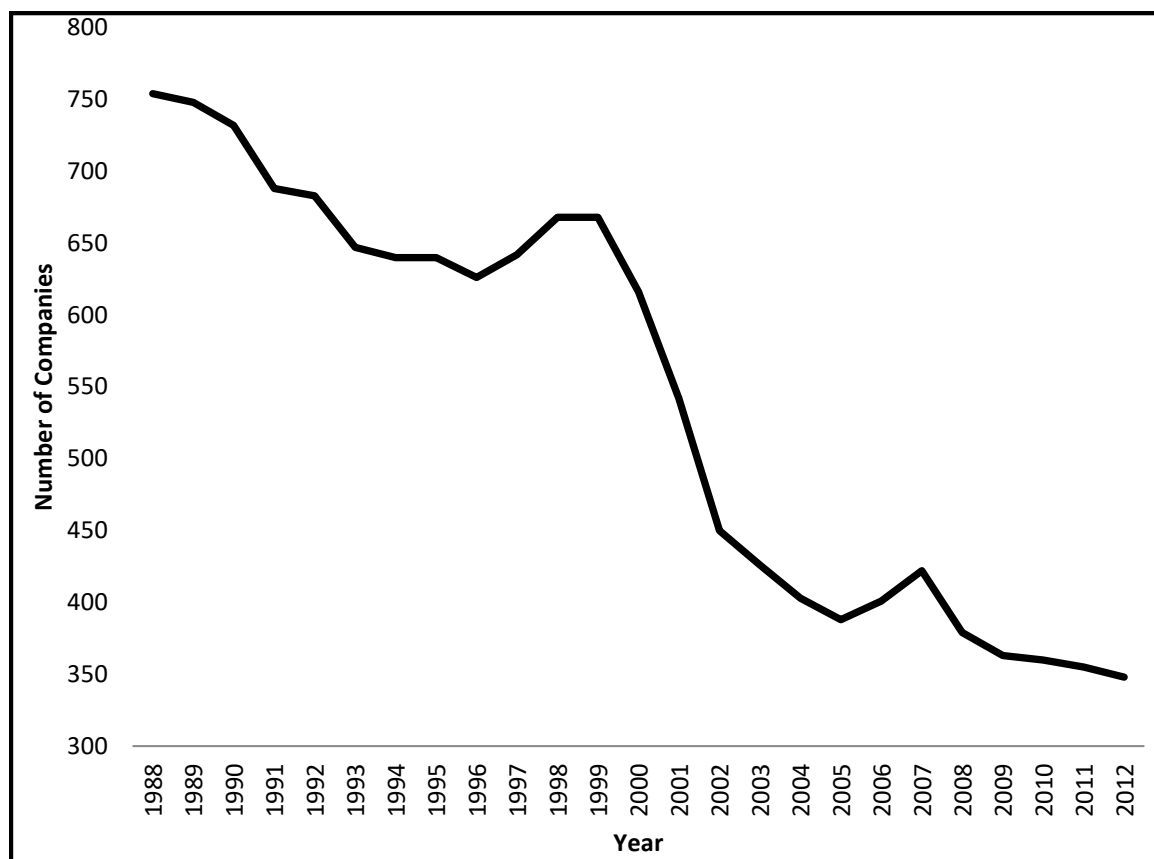
In other words, the gradual decrease in domestic listed companies translates to a prognosis of increased competition that arose due to the removal of exchange controls and a greater level of efficiency in the market. The opening up of the economy to the international market and the introduction of electronic trading systems on the JSE might have led to the pruning out of less performing companies. As the market capitalisation rate was significantly increasing, the number of domestic listed companies was decreasing implying either takeovers by foreign non-resident firms or international primary listing of domestic companies, or both. However, the JSE has significantly developed especially after 1994.

2.5 Dynamics of Domestic Investment

Domestic investment trends, proxied by the ratio of gross fixed capital formation (GFCF) over GDP, show decreasing levels in the later years than in the former. From 1960 to 1982, the level of domestic investment was increasing. Investment levels increased from 20% in 1960 to 28% in 1982. From 1983 to 2002, investment has been decreasing hitting 15% in 2002 and eventually

increasing from 2003 onwards. The gradually increase from 2003 lasted until the level of investment reached 22% in 2008, after which there it started to slump again until it reached 20% by 2014 (IMF, 2016).

Before the late 1980s, capital investment and employment creation accounted for most growth. In the 1990s, a decline in employment and low investment meant labour augmentation contributed negatively and capital investment contributed only weakly to growth (Ramachandran, Clarke, Kaplan, Habyarimana, and Ingram, 2007). The strongest contributor to growth in the 1990s was productivity growth due to technological change (Fedderke, 2005).

The trend in investment spending tends to partially follow that of savings as a percentage of GDP. It is probable that these declining annual investment rates from 1980 onwards may well be ascribed to the low and declining savings rate. Figure 2.25 shows the trends in investment in South Africa during the period 1960-2014.

Figure 2.25: Trends in Investment

Despite, some improvements in the investment climate, that is, decreased interest and inflation rates, reduced corporate tax rates and generally increasing profits, the investment rates, though increasing, have failed to exceed 24% of GDP in the period 1994 to 2014. The probable causes of such below expectation investment rates maybe the unstable exchange rate which tends to impose high costs on exporters; the high skilled worker labour cost, burdensome labour regulations and the high cost of crime (Ramachandran, *et al*, 2007). However, the bulk of the overall decline in the investment effort since 1970s is due to the reduction in public investment (Rodrik, 2008).

2.6 Conclusion

In this chapter, macroeconomic experiences, financial reforms and financial sector development in South Africa during the period 1965 to 2014 have been discussed. A number of

macroeconomic and financial indicators have been analysed. Inclinations show increased financial development mainly explained by increased private sector credit, financial deepening and stock market activity. The behaviour of savings vis-à-vis the performance of the stock market seems to postulate that, when it comes to investment, the banking sector and the stock market are more of substitutes rather than complements as normally postulated in theory. Deductions from the above discussion also show that the regulation of the financial sector of South Africa by the SARB has aided in its development and healthy upkeep. The conformance to many world-standards in supervision and regulation has brought about an accentuated and steady growth in the standards of financial intermediation in South Africa. Nonetheless, the ever-increasing personal credit has to be checked if the economy's savings rate vis-à-vis investment thresholds are to be realised. The current stance followed by monetary authorities of only encouraging consumers to avoid financing consumption with debt has to be complemented by particular methods or instruments that appeal to the providers of such credit facilities. For example, the SARB can appeal to the moral responsibility of all financial institutions in tackling the personal credit problem. However, in coming up with corrective measures, precaution must be taken to avoid steering the economy back towards financial sector repression.

The issue of the optimal financial structure vis-à-vis the planned economic development plans needs to be fully appreciated. The mixture of banks and markets changes as the economy develops, then policy and institutional impediments to the evolution of the financial system may lead to significant costs for economic development and therefore negatively affect investment trends. (Cull, Demirgüç-Kunt, and Lin, 2013). Therefore, the evolution of the financial system needs to be matched by reactive and responsive policy, and institutional changes so as to not stifle each other in their achievement of a common goal.

When compared to all the countries in Southern Africa, South Africa's financial development is comparable to none though Mauritius and Botswana have had their own unique successes. Several historical milestones contributed to the success story of South Africa. These include the gold-related economic boom of 1980, financial liberalisation which started in 1980, the change of government in 1994, international acceptance, opening of the economy, purposeful management of monetary policy, decreased inflation levels and increased banking supervision and regulation standards.

In summary, the financial sector in South Africa is much more developed than most African countries. Furthermore, despite the repressive regime prior to 1981, the issue of financial disintermediation was avoided. However, the question of what the optimal financial structure in South Africa is an area that needs to be fully explored especially if the main goal is to expand domestic investment expenditure to above 25% of GDP.

CHAPTER 3

FINANCIAL DEVELOPMENT AND INVESTMENT IN BOTSWANA

3.1 Introduction

This chapter presents an overview of financial development and investment trends in Botswana. The chapter is divided into seven sections. Section 3.2 is an introduction to the Botswana economy giving a brief overview of the macroeconomic factors that affect financial development in the country. Section 3.3 outlines how monetary policy, financial sector legislation and national policy progressed in Botswana. Section 3.4 gives a summary of the financial intermediaries' market in Botswana, the enacted financial sector and its reforms. It ends with a discussion of the trends in financial sector development. Section 3.5 gives an overview of stock market development while Section 3.6 looks at the trends in investment in Botswana. Section 3.7 gives the concluding remarks.

3.2 Factors Affecting Financial Development and Investment in Botswana

Botswana, a landlocked Southern African country, just north of South Africa bordering Namibia to the West and Zimbabwe to the Northeast, has strived for, and thrived in, attaining economic stability since its independence in 1966. Despite its population being less than 10% that of South Africa and being largely an arid and desert country, Botswana has maintained an international and regional outlook next to none in the SADC Region. The country has managed to have a higher than usual GDP per capita as compared to most African countries. The discovery of diamonds in the early 1970s acted as a much-needed boost in macroeconomic and financial sector planning and policy (Okeahalam, 2004). The following section outlines the dynamic macroeconomic factor trends that characterised Botswana's position.

3.2.1 Gross Domestic Product

Botswana's gross domestic product (GDP) stood at $15.8 billion[5] (current US$) in 2014. Figure 3.1 shows the trends in the GDP for Botswana during the period 1961-2014.

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[5] World Development Indicators (2016), World Bank

Figure 3.1 : GDP (Constant 2005 US$)
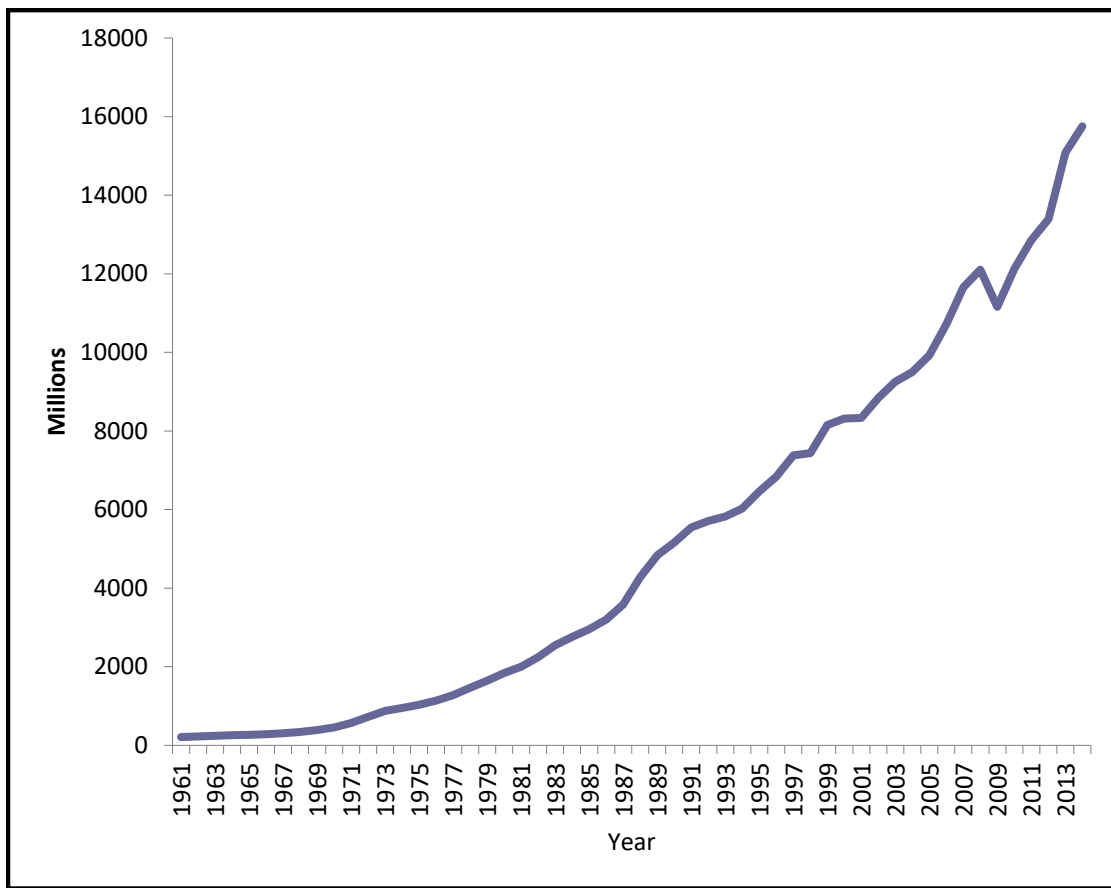
GDP trends show a relatively ever-increasing phenomenon that is best explained by well-maintained fiduciary management principles and other industry-specific policies that were and still are of great importance in maintaining such growth. Though far below South Africa's $300billion GDP, Botswana has managed to be one of the model economies in Southern Africa. Its GDP has exponentially grown from a mere US$211million in 1961 to more than US$12 billion in 50 years (World Bank, 2016). The advent of the growth in GDP started in the 1970s mainly due to the formalization of all sectors of the economy, setting up of most of the government structures and increased government revenue. A look at the year-on-year changes in the GDP gives a fuller picture of the GDP growth rates.

3.2.2 GDP Growth

Botswana's GDP growth after the 1980s has been rather unchanged and low as compared to the former years. Figure 3.2 shows the trends in the GDP growth rate for Botswana during the period 1961-2014.

Figure 3.2: GDP Growth (annual %)
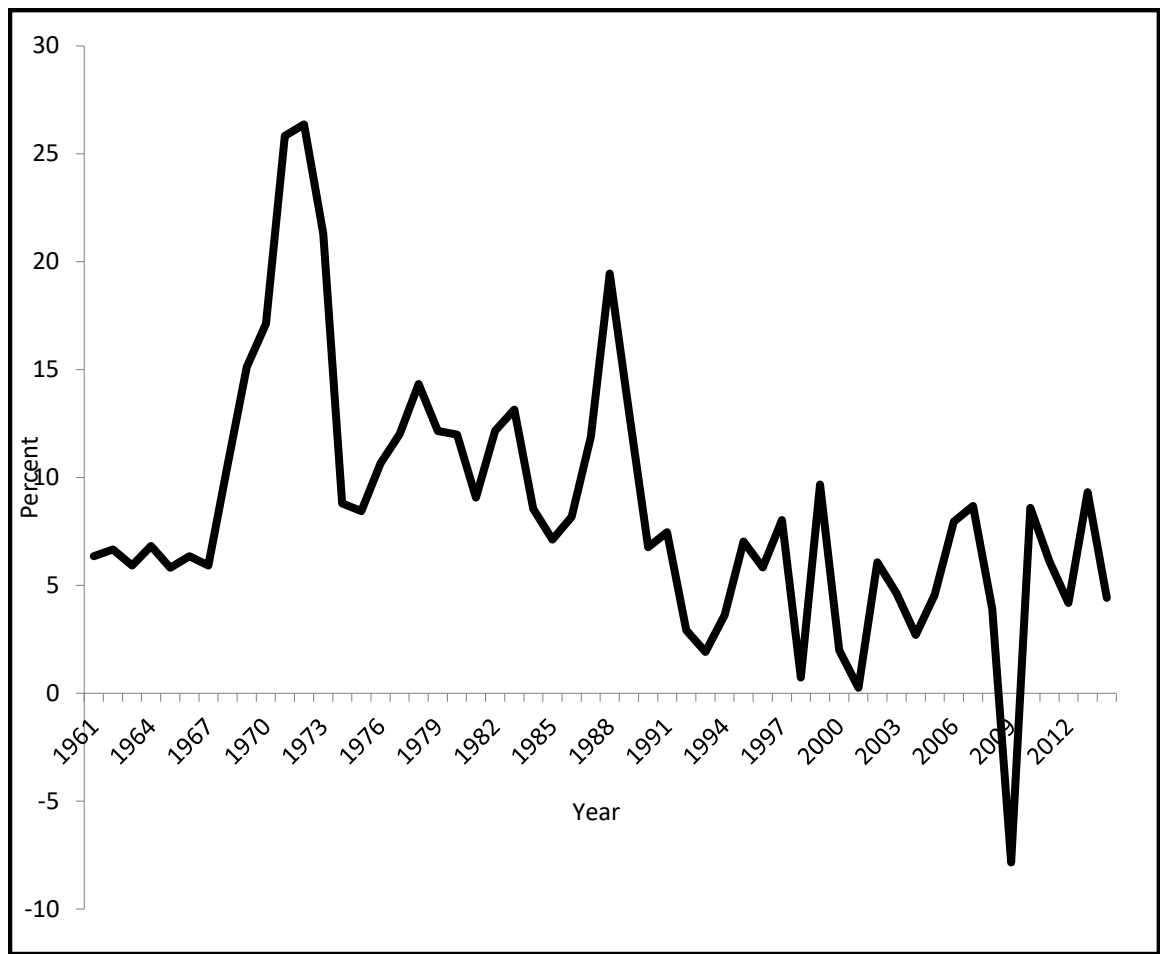
From the 1960s to 1990, GDP growth, though fluctuating, was always above 5%. The fluctuating but greater than 5% GDP growth was a result of mainly the discovery of diamonds, nickel and copper. Most significantly kimberlitic diamond pipes having diamonds of industrial and gem quality were discovered at Orapa and Letlhakane and later at Jwaneng. Copper and nickel deposits were discovered at Selebi-Phikwe and coal at Marupule. In addition, the conscious management and use of all government revenues was one of the factors that enabled the country to have higher than usual growth rates (Ahmed and Mmolainyane, 2014).

Notable policies put in place include a series of development plans that emphasized investment in infrastructure, health and education, delaying localization/indigenization of the public service, nationalization of the beef market (starting with the only abattoir at Lobaste upon gaining independence), investment of all rents from state projects rather than squandering them. From the 1990s onwards, the country's GDP growth rates have been highly volatile though they

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maintained above 0% levels for most of the period. The 2008 worldwide financial crisis appears to have had a substantial negative effect on the country's growth rates as it experienced its first ever negative growth rate of -7.8% in 2009 only to jump back up to the average 5% growth rates. The same can be deciphered for the GDP per capita trends.

3.2.3 GDP per Capita

In 2009, the GDP per capita had its first ever decrease, that is, from US$6261 in 2008 to US$5716 in 2009. Figure 3.3 shows the trends in the GDP per capita for Botswana during the period 1961-2014.

Figure 3.3: GDP per Capita (Constant 2005 US$)
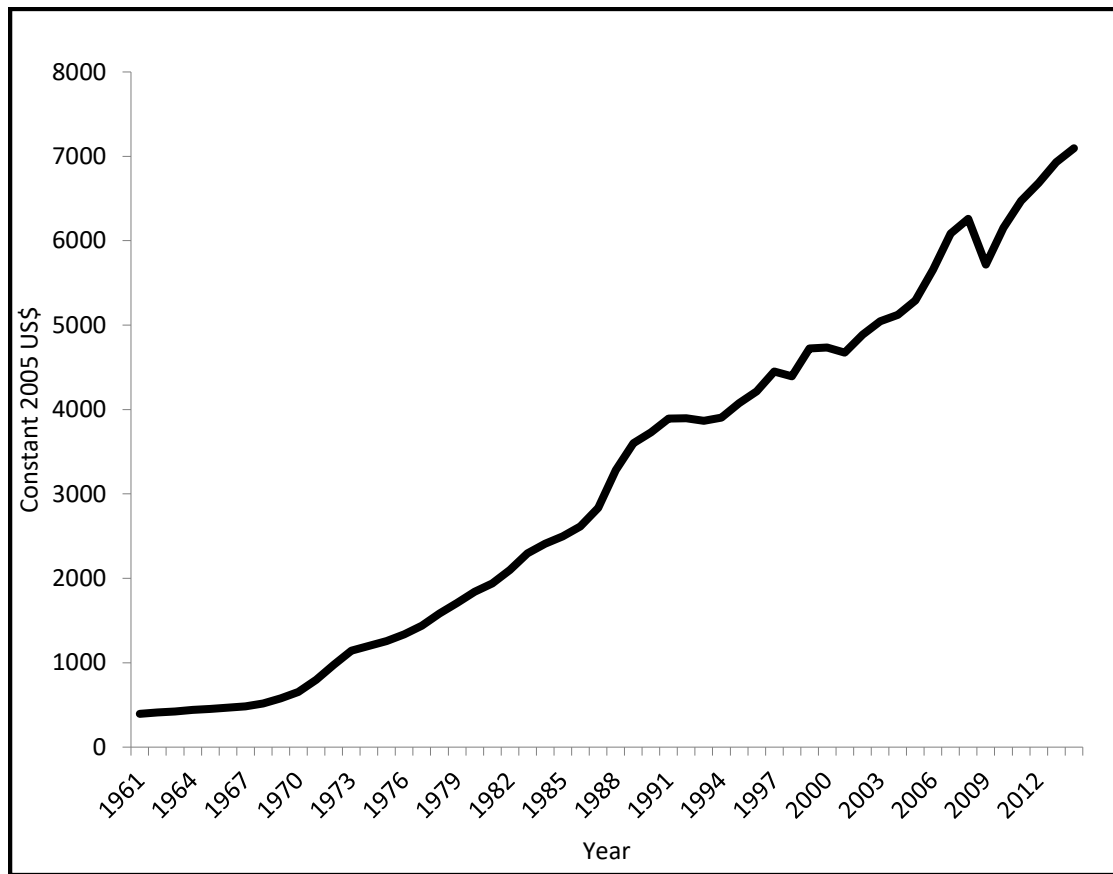
Trends in GDP per capita mirror those of GDP, gradually ascending from the 1970s onwards. The growth in GDP has outpaced population growth and the result is an ever-increasing GDP per capita over the years. The key drivers of such growth, when segmented into sectors over the period 1975 to 2005 show the following picture.

3.2.4 Economic Sector Contributions to GDP

The bulk of the share of GDP has mostly been attributed to the mining sector followed by the general government, the financial sector and, the trade, hotels and restaurants sector respectively. Figure 3.4 shows the trends in economic sectorial contributions to GDP for Botswana during the period 1975-2005.

Figure 3.4: Economic Sector Contributions to GDP
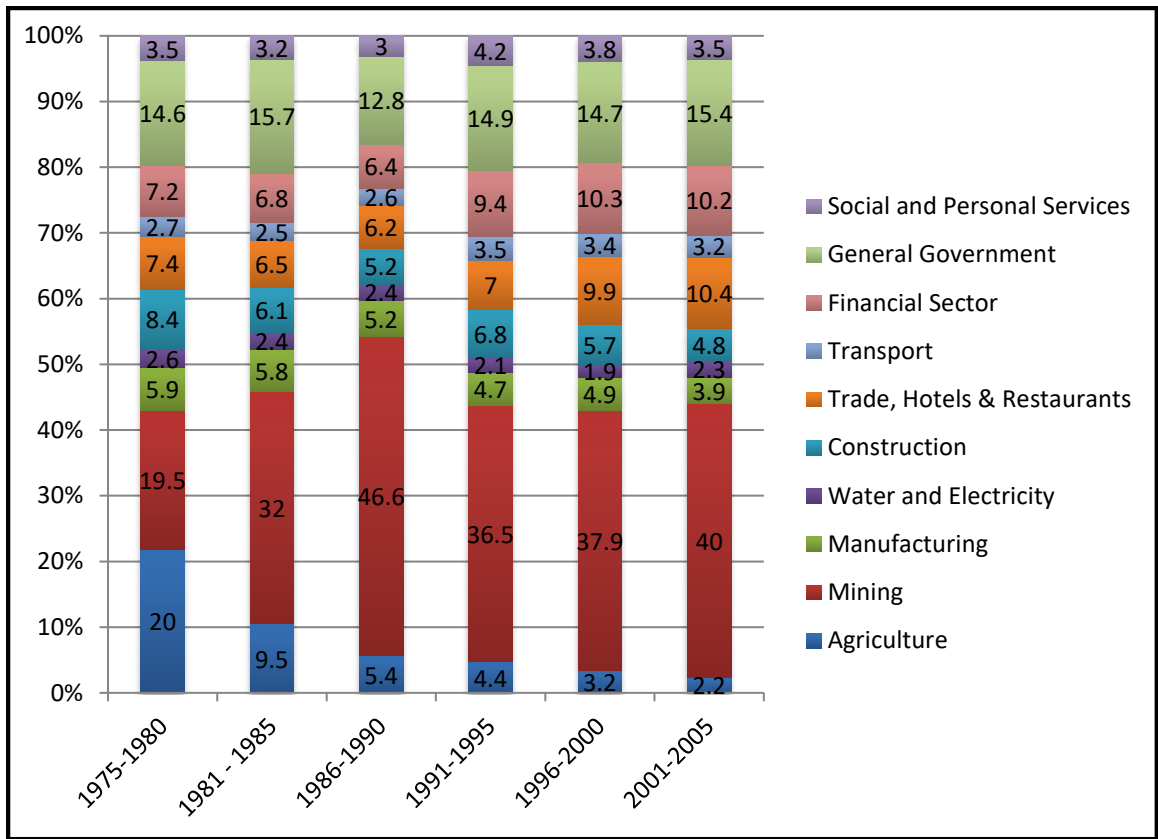
Source: Bank of Botswana, 2013

The faster growth in the mining sector, driven mainly by diamonds, led to its share in GDP rising from virtually zero in 1966 to 12 percent in 1972 and further to 40 percent by 2005. Meanwhile, the contribution of agriculture to GDP declined from 39 percent in 1966 to 19 percent in the latter half of the 1970s; it fell further to 6 percent in the late 1980s and averaged just above 2 percent by 2005. This is indicative of sustained stagnation over a long period, despite substantial assistance to farmers by the Government. Apart from the more substantial changes in the shares of mining and agriculture in GDP, there has been an increasing importance of financial and business services and a modest rise in government participation in the economy, while the share of manufacturing in the country's output has declined (Poteete, 2009). The financial sector gained

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GDP share (almost doubled) from the onset of the 1990s maintaining at least 10% contribution to GDP. The increase in the share of the financial sector can be attributed to changes in financial sector policy by the government; notable among them is the 1989 Financial Sector Development Strategy that was jointly developed by the Government of Botswana and The World Bank. Its main emphasis was on better financial sector regulation, product innovation and increased competition as well as enhanced financial access and inclusion (Bank of Botswana, 2013). The share of trade, hotels and restaurants also increased though marginal as compared to earlier levels due to government efforts to diversify the economy so as to reduce the economy's dependence on the mining sector (Hillbom, 2008).

3.2.5 External Balance

Despite Botswana having above-average income per capita levels, it started, after independence, with a near non-existent manufacturing sector. Furthermore, the agricultural sector was mainly livestock rearing because Botswana is mostly arid and the bulk of land (excluding the desert areas) is only suitable for seasonal grazing. Therefore, the country's economy depended mostly on imports of both goods and services. In the earlier years of its independence, whilst the government was being set up, the country experienced extended periods of negative external balances as imports were greater than exports from 1961 until 1983.

From 1961 to 1983 the ratio of imports to GDP increased from 44% to 63%, at least 10% of these were food. Imports even reached an all-time high of 72% of GDP in 1982. On the other hand, exports only started to steadily rise in the 1970s when they hit above 30% of GDP levels. The main reason for the increase in the exports was the discovery of much needed mineral resources and the sale of livestock to the lucrative EEC market at prices far above world levels (Acemoglu, Johnson and Robinson, 2002). Notably, from independence, in 1966, Botswana was part of the Rand Monetary Area (RMA), which comprised of Lesotho, Swaziland, Namibia (South West Africa) and South Africa (Eita and Jordaan, 2010). All these countries used the South African Rand as their currency and their monetary policy was conducted from South Africa. In addition, Botswana was also a member of the South African Customs Union, which was made up of the same above-mentioned countries. In 1969, the government of Botswana renegotiated the Customs Union with South Africa and secured a greater share of the revenues than before.

In 1975, the government also invoked a clause in the original mining agreement it had with De Beers that enabled it to receive a 50% share of diamond profits. On the livestock front, the only

abattoir in the country in Lobatse was nationalised and the Botswana Meat Commission (BMC) was founded. The BMC became a monopsony purchaser of cattle and with the aid of the government managed to substantially increase the country revenues from exports. In addition to the increased exports, the manufacturing and the financial sectors saw a number of localised investments, which aided in bringing the level of imports to below 50% of GDP (Acemoglu, Johnson and Robinson, 2002). Despite the increase in exports and the gradual decrease in imports after independence, the external balance on goods and services, after 1987, has remained below 20% and has even been negative from 2009 to 2012. Figure 3.5 shows the trends in the external balances for Botswana during the period 1961-2014.

Figure 3.5: External Balance Trends
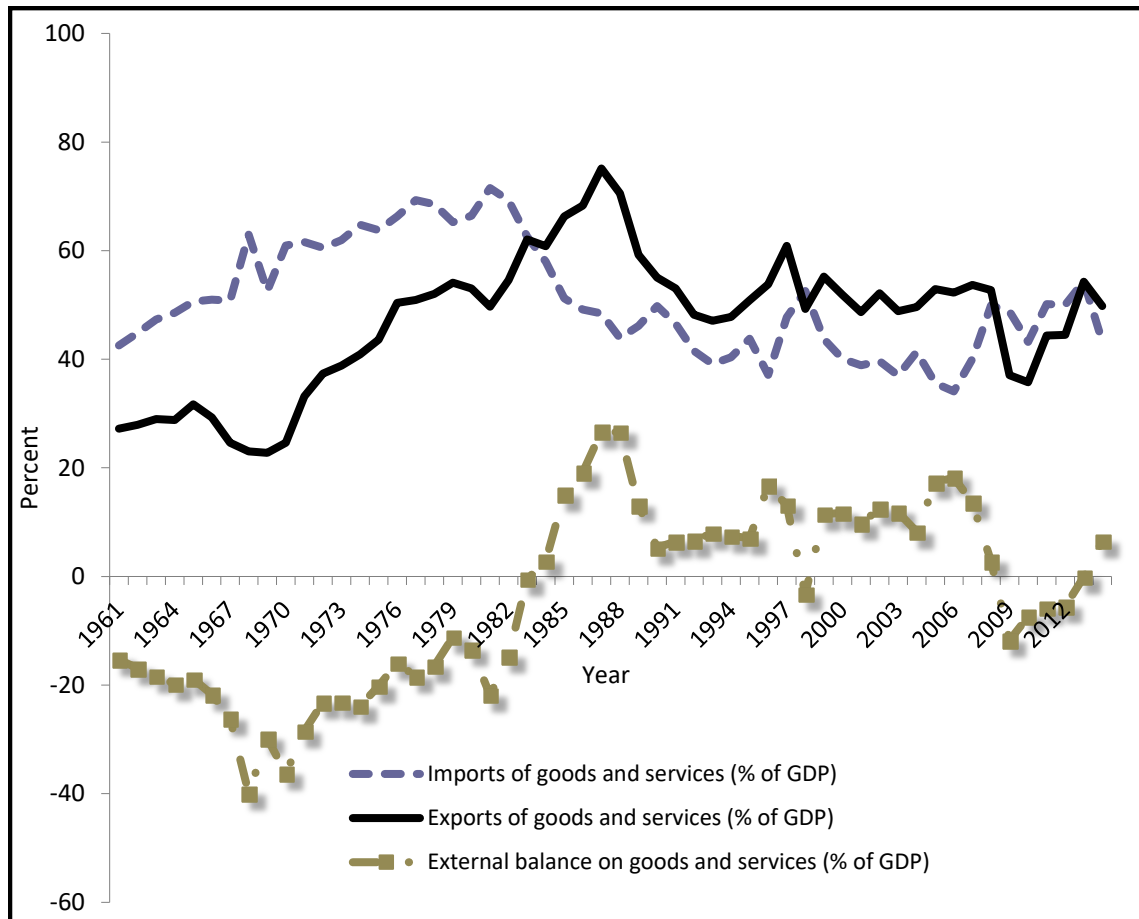
3.2.6 The Budget Deficit

Given the diamond and cattle revenues, the government budget for Botswana moved from deficits to surplus by the mid-1970s. However, the magnitude of the surplus vis-à-vis the GDP has been on a downward trend since 1985. The notion of a sustained budget surplus in general might have an effect on the performance of the financial sector. The financial sector might end up being debtors to the government and/or need to be efficient enough to attract private funds since there is no competition for debt from the government. The bulk of Botswana's fiscal policy has been largely financed with more of surpluses remaining after expenditure than deficits. The notable deficits seem to follow international crisis trends. The highest deficit of 12% was in the year 2009, i.e., after the global financial crisis and the year 1998 after the Asian crisis. Figure 3.6 shows the trends in the national budget deficit for Botswana during the period 1979-2014.

Figure 3.6: National Budget Deficit (% of GDP)

Source: IMF (2016)

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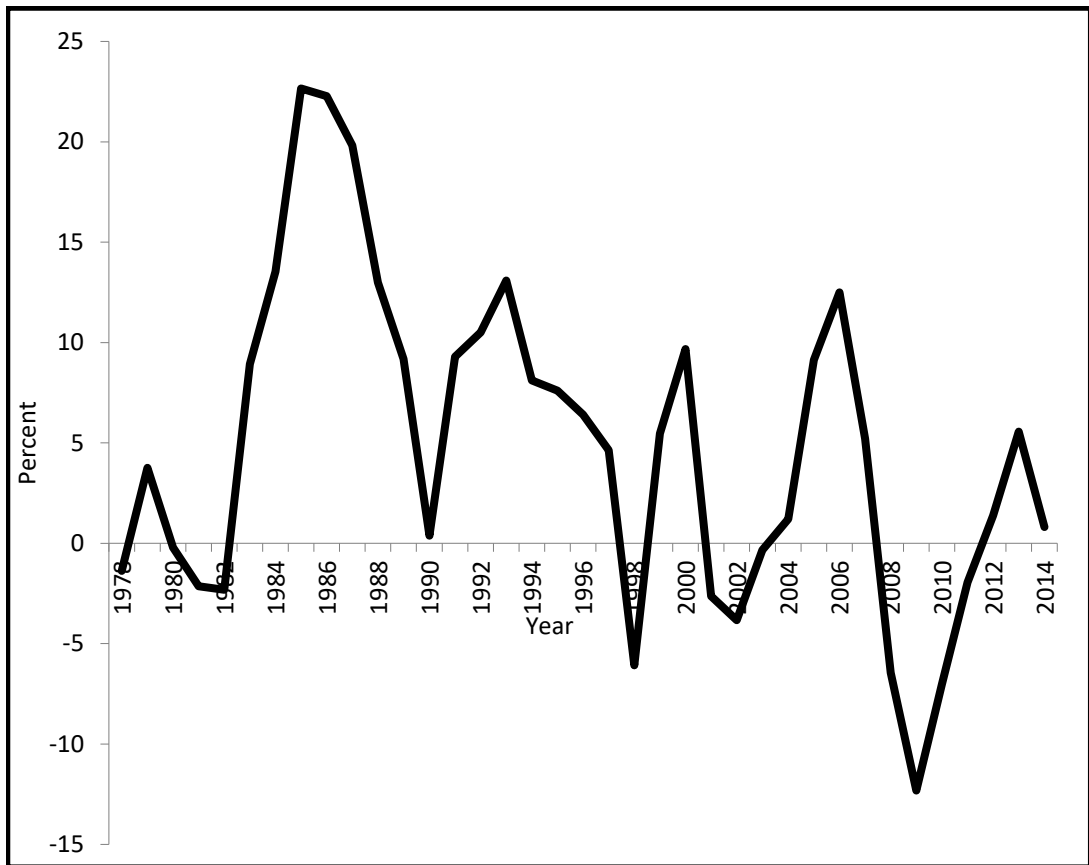
3.2.7 Inflation

Inflation trends in Botswana show a general decreasing phenomenon throughout the period 1975 to 2014. However, the inflation targets of the Bank of Botswana have never been achieved (3 to 6%). Figure 3.7 shows the trends in inflation for Botswana during the period 1975-2014.

Figure 3.7: Year-on-Year Inflation
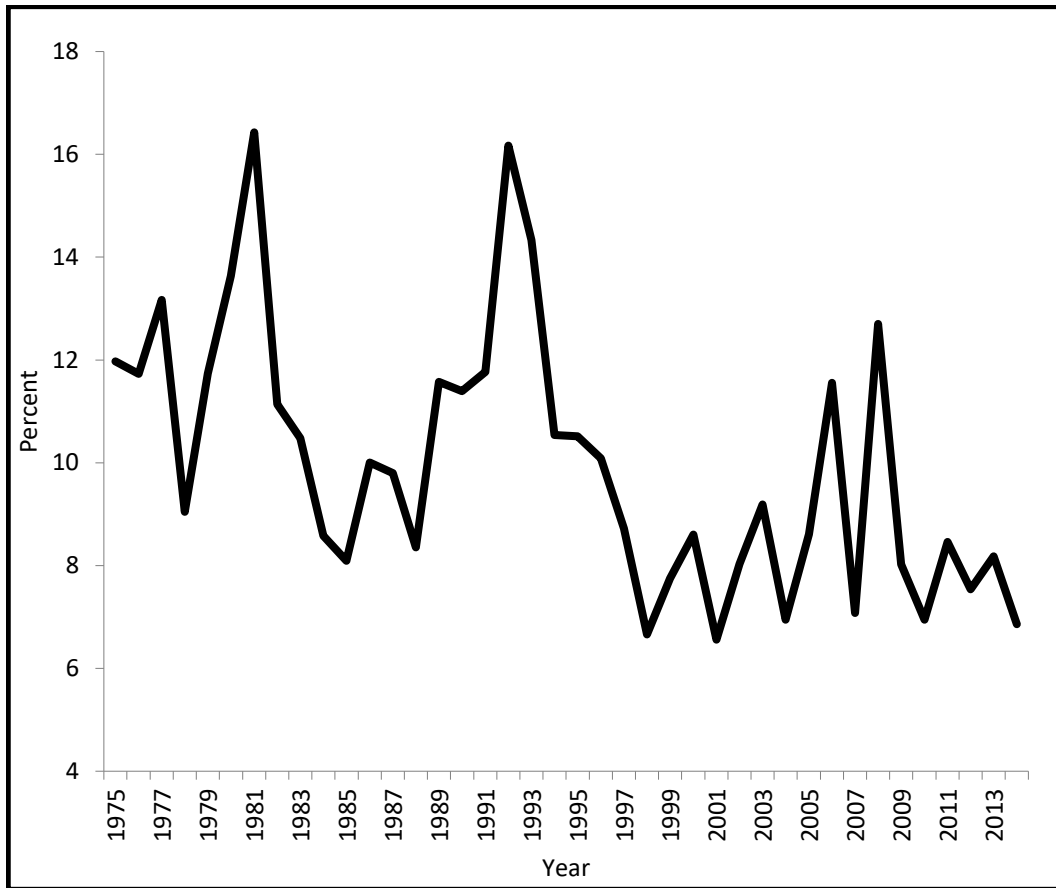
Inflation levels appear to only have spiked during the periods, 1979 - 1981 and 1991 – 1993 reaching above 12% levels. However, inflation has never reached the markedly high levels seen in some other developing countries (Atta, Jefferis and Mannathoko, 1996). The largely one-digit inflation figures after 1996 might have been due to the adoption of sound monetary policy frameworks as well as the exercise of fiscal prudence (Muzenda, 2011).

Given the above brief discussion on the advent of the Botswana economy and its financial sector, a more detailed sequential analysis of the financial system of Botswana follows.

3.3 Monetary Policy and Financial Sector Legislation in Botswana

Preceding the establishment of the Bank of Botswana in 1975, Botswana had been part of the Rand Monetary Area since independence. Therefore, due to the use of a common currency (the South African Rand), monetary policy was conducted from South Africa. Due to increased revenues from exports and the increasing sense of autonomy in Botswana there was need for the country to propagate its own monetary policy, hence the founding of the Bank of Botswana in 1975 (Eita and Jordaan, 2010: 73).

The fundamental objectives of the Bank of Botswana, according to the Bank of Botswana Acts (1975, 1996) were (and are relatively still the same) the maintenance of monetary and price stability, a sound banking and financial system, and an efficient payments mechanism. However, over time the monetary policy framework has evolved to align the interpretation of these objectives with the transformation of the economy, including regional and international linkages, as well as improvements in institutional and operational capacity (Bank of Botswana, 2010). According to the Bank of Botswana, the history of monetary policy can be studied in five separate periods starting from the introduction of the Pula as the national currency to replace the South African Rand. Table 3.1 below, culled from the BOB Annual report 2010 shows these periods.

Table 3.1: Progression of the Monetary Policy Framework in Botswana

Period	Primary Objective of Monetary Policy	Operational Methods/ Instruments of Monetary policy
Pre-1991	To resolve anomalies in · the banking system caused · by rising excess liquidity, · including commercial banks' unwillingness to take deposits from certain large depositors · and a shift out of longer-term interest bearing deposits into shorter-term deposits (current and call deposits).	Direct tools of monetary control. Major policy instrument: regulated interest rates for deposits and lending. Other policy instruments (primary reserve requirements and Bank Rate) also existed, but were not effective due to excess liquidity. Bank of Botswana call account was used to absorb excess liquidity from commercial banks and certain large depositors.

1991 - 1998	The principal objective was to · maintain real interest rates in · line with those prevailing in major international markets to ·stabilise capital flows, while price stability was increasingly · emphasised.	Commencement of financial liberalisation. Indirect monetary policy tools: Bank of Botswana Certificates (BoBC) introduced in 1991 to absorb excess liquidity. The call account facility at the Bank of Botswana was discontinued. Major policy instrument: Bank Rate became relevant as a signalling device. Determination of auction amounts and pricing of BoBC and the Bank Rate through monthly meetings of the Open Market Coordination Committee (OMCC), which included representation from the Ministry of Finance and Development Planning.

1998-2001	Promoting and maintaining · monetary stability (as reflected in low and stable rate of inflation) and maintaining · positive real interest rates as measured by short-term effective yield on three-month BoBCs.	The annual Monetary Policy Statement (MPS) was introduced in 1998, and became an important pillar of monetary policy. However, the Monetary Policy Statement (MPS) did not initially specify price stability in terms of a numerical objective. Repos and reverse repos were introduced in 1998 to supplement use of Bank of Botswana Certificates (BoBCs) in money market operations. The delineation of responsibilities was clarified with the Monetary Policy Committee (MPC) (which comprises Bank of Botswana senior management staff) setting the Bank Rate and giving guidance on the pricing of BoBCs to the Open Market Auction Committee (OMAC), which also determines auction amounts.
2002-2007	To achieve a sustainable, low and predictable level of inflation.	An annual objective for inflation was introduced in 2002, initially at 4 – 6 percent. A rolling medium-term (3-year) objective was introduced in 2006, initially running concurrently with the annual objective. Growth in commercial bank credit used as an intermediate target, consistent with economic growth, the inflation objective and taking into account financial deepening. The increase in government spending was also monitored for consistency with expected output and credit growth and the inflation objective.

Year	Nature of Changes	Objective
2008 -	To achieve a sustainable, low and predictable level of inflation.	Annual objective and credit growth target dropped. Medium-term objective maintained, with an enhanced role for the medium- term inflation forecast in guiding policy decisions. The inflation forecast effectively becomes the intermediate target, although other factors are also considered.

Significant Changes in Monetary Operations and Objectives

Year	Nature of Changes	Objective
1991	Introduction of BoBCs with varying maturities of up to 12 months.	Liquidity absorption measure.
1994	Change from multiple reserve requirements to a single reserve requirements based on total deposits of 3.25 percent.	Efficiency measure.
1996	Streamlining of disbursement arrangements between Bank of Botswana and Government of Botswana.	Cost cutting measure on monetary operations.
1998	-Repos and Reserve Repos introduced. -Secured Lending Facility (set at 6 percent above Bank Rate).	-Short-term liquidity management. -Bridging commercial banks' overnight liquidity shortages.

2001	3-month BoBC (91-days) used as the primary instrument.	Effectiveness of OMOs and development measure.
2002	Annual inflation objective introduced and set at 4 – 6 percent.	Anchoring inflation expectations.
2004	-Inflation objective 4 – 7 percent. -Outright purchase of BoBCs between Bank of Botswana and commercial banks discontinued. -14-day BoBCs introduced. -BoBC auction changed from fixed to uniform price auction.	-Accommodation of inflationary effect of 7.5 percent Pula devaluation. -Secondary market development measure -Efficiency measure.
2005	Inflation objective of 3-6 percent and mid-year adjustment to 4-7 percent.	Accommodation of inflationary effects of 12 percent Pula devaluation.
2006	-Medium-term (3-year rolling horizon) inflation objective set at 3-6 percent. -Participation of BoBCs auctions confined to commercial and merchant banks. -Reserve requirement adjusted upward to 5 percent. -Introduction of Intra-Day Lending Facility.	Price stability objective can reasonably be achieved in the medium-term • Efficiency and international best practice • Liquidity control measure • Promote efficient settlement
2008	Annual inflation objective dropped.	Price stability objective can reasonably be achieved in the medium-term.

2010	Upward adjustment of reserve requirements to 6.5 percent.	Liquidity control measure.

3.3.1 Financial Sector Legislation

The financial system comprises a number of interrelated components including the legal infrastructure, the markets and the institutions and a disturbance in any one of these areas can affect the stability of the system, and risks may arise in any one of these areas (Hawkins, 2006). Therefore, there is need to assess the development of the legislation relating to the financial sector in Botswana so as to fully appreciate the happenings in the sector. Table 3.2 below gives us the sequence of financial sector legislation in Botswana.

Table 3.2: Financial Sector Legislation in Botswana

Year	Legislation	Description
1959	The Botswana Development Corporation was set up under the Companies Act, 1959, as amended in 1995.	Its Memorandum and Articles of Association guide its operations. Of the Non-Bank Financial Institutions (NBFIs) in Botswana, the BDC has the widest investment and borrowing mandate. It can engage in any business as a sole proprietor, in partnership or joint venture, with local or foreign investors, in all kinds of activities across all economic activities: can provide financial and management assistance to subsidiaries and associated companies: can borrow in any manner it considers necessary, which could include issuing all kinds of securities.
1961	The Building Societies Act, 1961.	Provides for the establishment of building societies, such as the Botswana Building Society(BBS). It empowers the BBS to invest in bills, certificates, debentures, stock and municipal loans.

1964	The National Development Bank Act, 1964	Establishes the NDB and governs its operations. The Act empowers the bank to borrow money as necessary to meet obligations, including bond issuance. It further empowers the bank to lend to and own equity in business undertakings across all sectors; manage, operate or control any property, enterprise or undertaking on behalf of any person in connection with any loan or guarantee given by it; and to operate any savings scheme or any combined life assurance and savings scheme approved by its board. However, the bank may not provide financial assistance for building or public works in Botswana.

1975	The Bank of Botswana Act, 1975 and its Amendments in 1996 and 1999.	Established the Bank of Botswana as the central bank, and mandated it to ensure soundness and efficiency of financial markets.
1987	Insurance Industry Act, 1987.	Applies to insurance business (life and non-life) and reinsurance. The Act prohibits simultaneous transacting of both general (short term) and life (long-term) insurance business by a single company.
1987	Pension and Provident Funds Act, 1987.	Applies to approved private Pension and Provident Funds. The public service has a separate act, the Pensions Act, for its pensions arrangements. During 2001, the Government transformed the civil service pension arrangements, from a non-funded defined benefit scheme operating under the Pension and Provident Funds Act.

A Fund may not i) engage in or carry on any business undertaking licensed under the Trade and Liquor Act or any other business unless approved by the Registrar and ii) invest more than 5% of the aggregate value of its assets in Botswana in the business of a participating employer or of an associate of a participating employer, unless exempted by the Registrar. A fund may invest up to 55% of its moneys accruing from contributions made in Botswana in Government or other securities. |
| 1992 | The Botswana Savings Bank Act, 1992. | Established the Botswana Savings Bank and regulates the conduct of its operations. While the act empowers the bank to issue financial instruments, such as bonds, certificates and notes, or offer other visible banking and financial services, it is silent on specific prohibitions. |

1994	Botswana Stock Exchange Act, 1994, Botswana Stock Exchange Regulations, 1995, Botswana Stock Exchange Listing Requirements, 1999, Botswana Stock Exchange Members' Rules 1996.	Apply to the Botswana Stock Exchange.
1995	The Banking Act, 1995 and The Banking Regulations, 1995.	Apply to the Banking industry, including commercial banks, credit institutions, investment banks and discount houses. Provide for the prudential regulation and supervision of banks, as well as timely exit of failing institutions. Banks are generally prohibited from engaging, directly or indirectly, in the merchandise, wholesale or retail business, including import and export trade; acquiring or holding, directly or indirectly, any part of the share capital of any financial instruments, such as bonds, certificates and notes, or offer other viable banking and financial services, it is silent on specific prohibitions
1999	The Collective Investment Undertakings Act, 1999 and Collective Investment Undertakings Regulations, 2001.	Apply to Collective Investment Undertakings, which include investment companies and unit trusts or mutual funds. The Act and Regulations compare very favourably with modern legislation for such undertakings found in other countries.

	International Financial Services Centre (IFSC)	Provides for the establishment of IFSC companies in the following activities: exempt companies, trusts, registries of ship and aircraft, international banking and financial services (which includes deposit-taking, foreign exchange services, custodial functions), and investment business (including collective investment undertakings, personalized investment or private banking management and captive insurance).

Source: Bank of Botswana

3.3.2 National Development Plans and the Financial Sector

After the formation of the Bank of Botswana, the BOB followed a protective regulatory stand towards the domestic banking system so as to restrict competition since there was the notion that Botswana was overbanked. However, by 1987, due to excess liquidity resulting from rapidly increasing foreign exchange reserves and the direct financing of parastatals by government, the restrictive policy had to be abolished and a market-oriented policy was instituted (Moffat, 2008). The change in policy orientation was due to particular changes in national development plans that began to have a separate chapter on the financial sector from 1985/86 NDB 6 plan onwards. A summary of the financial sector strategies instituted through the national development plans is given in Table 3.3.

Table 3.3: Financial Sector Strategy in Various National Development Plans

NDB 6 (1985/86 – 1990/91).	NDB 6 was the first to include a separate chapter on the financial sector. This advocated improving the performance of banking sector operations, particularly with respect to access to credit facilities in support of development activities. At the time, the Government played a role of a major financial intermediary by making loans through the Public Debt Service Fund (PDSF) to parastatals and local authorities.

NDP 7 (1991/92 – 1996/97).	This plan coincided with the recommendations of Financial Policies for Diversified Growth, prepared in collaboration with the World Bank. Its main aims were stimulation of greater competition between commercial banks, improved operating procedures for DFIs, promotion of domestic money and capital markets, revision of the Government's financial management and development promotion roles in a way that would broaden the scope for anti-inflationary monetary and credit policies within a market-oriented environment.
NDP 8 (1997/98 – 2002/03).	It focused on increased financial openness and greater integration of the domestic and international economies. Furthermore, the strategy sought to encourage a greater diversity of financial instruments and institutions.
NDP 9 (2003/04 – 2008/09).	Emphasised the importance of continued stability and adaptability of the financial sector. The following areas of financial sector development were stressed: regulation and supervision of the financial system, development of financial markets, consumer protection, and improvement in payments and settlement mechanisms.
NDP 10 (2009/10 – 2015/16).	The plan addressed enhancing access to finance by households and businesses, including small and medium scale enterprises, and the rural population, promotion of financial innovation, sustaining capital market development, continuing improvements in the payment and settlement process to enhance efficiency and cost effectiveness of remittances, continuing review of relevant legislation and supervisory infrastructure to align it with domestic and global development and reducing opportunities for fraud and money laundering.

Source: The Bank of Botswana Annual Report 2011:100

3.4 The Financial Intermediaries Market in Botswana

The development of Botswana's financial sector has been different from most of the Southern African countries. Though Botswana has a fully functional financial sector at the moment, it was not the case in the early 1960s. As at January 2013, there were 11 registered commercial banks (9 operational), 2 offshore banks, 2 statutory banks, 1 building society and more than 60 Bureau de Changes (BOB, 2014). Given herein is the evolution of the financial sector in Botswana.

3.4.1 Summary of the Botswana Financial Sector and Reforms

Botswana has had its fair share of financial sector reforms when it started with a non-existent financial sector to an extension of the South African financial sector until it eventually established its own financial system when the BoB was established. Table 3.4 summarises the process of financial development in Botswana.

Table 3.4: Summary of Financial Development in Botswana (1897 – 2012)

1897	• Standard Chartered Bank (then the Standard Bank of South Africa) established its first branch in Francistown to become the first bank to operate in Botswana (Bechuanaland Protectorate but it only operated for a few years due to difficult trading conditions.
1911	• Post Office Savings Bank (a subsidiary of South Africa Post Office Bank) established.
1934	• Standard Chartered Bank opens other branches but these only operated for a few years.
1950	• Barclays Bank establishes full time presence in Botswana.
1956	• Standard Chartered Bank establishes full time presence in Botswana.
1962	• Bechuanaland Cooperative Development Trust established.
1963	• Post Office Savings Bank renamed Bechuanaland Post Office Savings Bank and incorporated locally.
1964	• National Development Bank incorporated and started operations.
1966	• Independence. • Two banks in existence, Barclays and Standard Chartered Bank, though they operated as branches of their respective head offices located in South Africa.

1970	• Botswana Building Society and Botswana Development Corporation commenced operations. The Botswana Building Society originally grew out of the United Building Society of Johannesburg, which had established itself in Gaborone in 1970. • Botswana Insurance Fund Management Limited locally incorporated and starts operations.
1973	• Public Debt Service Fund and Revenue Stabilisation Fund lending parastatals and local authorities established.
1974	• Botswana Cooperative Bank (BCB) established.
1975	• Bank of Botswana (the central bank) and Botswana Insurance Fund Management established. • Barclays and Standard Bank became locally incorporated firms.
1976	• The national currency – the Pula was introduced. • Banking regulation begins with the establishment of BOB with its legislative powers which it used to independently set interest rates on bank deposits and lending, fixed domestic liquidity requirements and implemented exchange control regulations (so as to curb imported inflation mainly from South Africa). • BoB adopted a restrictive monetary policy by setting the prime lending rate and the commercial bank interest rate for each class of deposits.
1977	• Botswana Building Society locally incorporated (it became a parastatal).
1982	• Bank of Credit and Commerce Botswana established. • Bechuanaland Post Office Savings Bank renamed the Botswana Savings Bank.
1984	• Tswelelo (Pty) Ltd established.
1985	• Botswana Savings Bank established.
1986	• Removal of controls on interest rates.

1989	• Botswana Share Market (subsequently the Botswana Stock Exchange) established. • Financial Policies for Diversified Growth document was completed and provided the basis for extensive policy reform from 1989 onwards – banking licenses would be issued to any banks, or group of investors, foreign or local as long as they met certain minimum requirements, including capital adequacy, proven managerial capabilities and willingness to provide further capital when the need arose. Banks were independent to determine their interest rates, fees and charges. • Zimbank (Botswana) Limited, a subsidiary of Zimbank Holdings (Zimbabwe) Limited granted a banking license.
1990	• Ulc commences operations, providing financial leasing services. • Liberalisation of commercial banking licensing requirements. • Zimbank commences operations.
1991	• First National Bank Botswana (FNBB) was established, subsequently taking over the Botswana operations of the Bank of Credit and Commerce (Botswana), a subsidiary of the Bank of Credit and Commerce International. • Union Bank Botswana Limited (a subsidiary of Standard Bank of South Africa) licensed. • ANZ Grindlays Botswana (a subsidiary of ANZ Grindlays of Australia) licensed. • Bank of Botswana Certificates (BoBCs) introduced, signifying a major change to monetary policy implementation through market forces rather than direct controls.

1992	• Standard Bank South Africa acquires the African business of ANZ Grindlays, merging its Botswana operations as Union Bank, Standard's subsidiary. The new entity was renamed Stanbic Bank Botswana. • Union Bank and ANZ Grindlays start operations. • Union Bank and ANZ Grindlays merged and subsequently became Stanbic Bank Botswana Limited (a subsidiary of Standard Bank South Africa.
1993	• National Development Bank restructured. The restructuring included writing off of bad debts, recapitalisation through Government equity injection, staff rationalization and revision in lending policies. • Financial Services Company, a leasing finance institution owned by BDC and NDB, sold to FNBB. • Zimbank (Botswana), a commercial bank, taken over by FNBB.
1994	• Establishment of the Botswana Stock Exchange (BSE); • Botswana Life Insurance also established.
1995	• Botswana Cooperative Bank (formerly Bechuanaland Cooperative Development Trust) was put under provisional liquidation and was subsequently liquidated.
1996	• Winding down of parastatals borrowing from PDSF. • Modernisation of legislation (Bank of Botswana Act, Banking Act).
1997	• Regent Life Botswana commences operations.

1998	• Metropolitan Life and Investec Securities Botswana commence operations. • Micro Credit Scheme (operated by NDB) introduced.
1999	• The first merchant bank, Investec Botswana (Pty) Limited (Investec), licensed.
2000	• African Banking Corporation (Pty) Limited (ABC), which had taken over Ulc (Pty) Limited, converting it from a leasing company, started operations as a merchant bank. • Capital Securities started operations. • Bank of Baroda is incorporated and started operations.
2001	• International Financial Services Centre (IFSC) commences operations as a division of BDC. • CEDA established. • African Alliance (a subsidiary of the Brait Group), an investment bank started operations.
2002	• IFSC established as a corporate entity.
2003	• Investec acquired by Stanbic Bank, with the two operations subsequently merging.
2005	• Bank Gaborone started operations.
2006	• NBFIRA Act passed by Parliament.
2007	• Capital Bank started operations.
2008	• NBFIRA commences operations – The Non-Bank Financial Institutions Regulatory Authority (NBFIRA) has supervisory responsibility over the non-bank financial sector comprising mainly the insurance industry, pension funds, stock exchange, fund managers and other investment advisory services, as well as micro-lending institutions.
2009	• ABN AMRO started operations.

Source: Bank of Botswana Annual Reports (2000- 2012), Moffat (2008), (2009), Ahmed and van Hulten (2014),

3.4.2 Trends in Financial Sector Development in Botswana

A number of financial development indicators are employed in this section as a discussion of the trends in financial development in Botswana is engaged in.

3.4.2.1 M2 to GDP

The M2 to GDP ratio, in addition to being a measure of financial deepening, is a measure of money supply relative to the size of the economy and is discussed in this section. In 1975, the M2 to GDP ratio was 10%, it increased to 27% by 1976 and maintained above 20% levels from then onwards. After 1996 it gradually increased hitting its maxima of 54% by 2009 and from then onwards has been on a steady downward trend though the ratio was still above 40% (World Bank, 2016). The trends before 1992 show stagnation in the advancement of the financial sector. The main reason for that being repressive policy tended to distract rather than promote financial sector investment and business initiatives. After the changes in policy (liberalisation) and a number of mergers, acquisitions and closures (in the period 1992 to 1996), the financial sector began to ascend in importance. Figure 3.8 shows the trends in the ratio of M2 to GDP for Botswana during the period 1972-2014.

Figure 3.8: Ratio of M2 to GDP
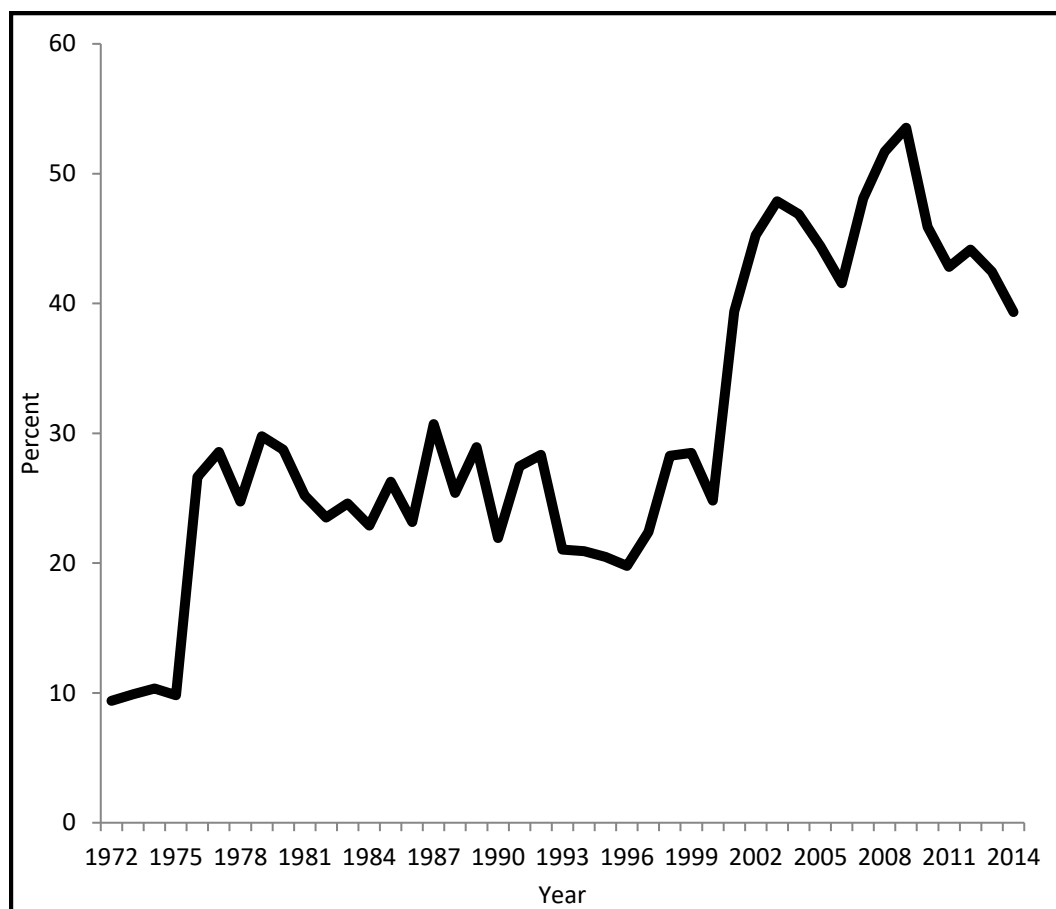
According to the M2/GDP ratio, the level of financial development in Botswana started to show extensive improvements from 1997 onwards. The level of the money supply relative to GDP increased from 10% to 54% by 2009. The M2/GDP ratio tends to measure the size and depth of the financial sector and its development. Therefore, with the resurgent increase in the M2/GDP ratio, it is safe to say the size of the financial sector also increased comprehensively. The increase was as a result of the opening up of the financial sector to both international and domestic players and the removal of restrictive policies.

3.4.2.2 Real Interest Rate

Real interest rate trends show the same picture as the other variables discussed earlier. Before the 1980s, real interest rates were generally negative. The same is true (negative real interest rates) for the bulk of the decade 1981 to 1990. The notion of negative real interest rates is expected given that the Bank of Botswana had a restrictive and a financially repressive monetary policy that had set the prime lending rate and the commercial bank interest rate for each class of

deposits. The BoB was trying to induce increases in investment by instituting low interest rates, which would in turn lead to economic growth. However, given the extensive earnings from diamond exports, gross domestic savings tended to accumulate into the commercial banking system. The BoB seeing that commercial banks were unwilling to finance long-term projects and also unwilling to accept large fixed term deposits, became a deposit taking institution of last resort which function led to a partial failure in the intermediation function of the banking sector (Brownridge and Harvey, (1998), Kayawe and Amusa, (2003)). There was excess liquidity in the financial sector and government had to intervene. Figure 3.9 shows the trends in the real interest rate for Botswana during the period 1981-2014.

Figure 3.9: Real Interest Rate
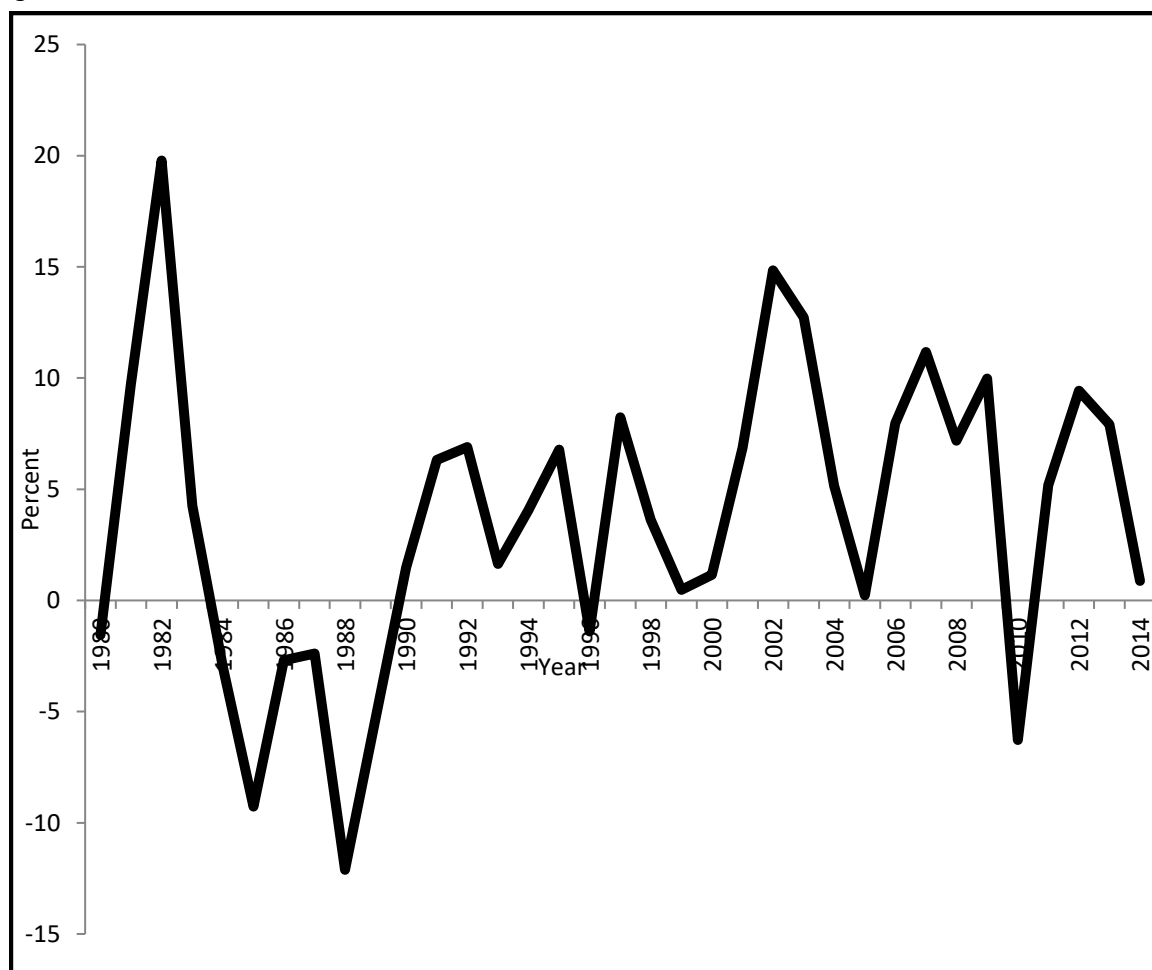
From 1991 onwards, real interest rates, though volatile, tended to increase to a maximum of 15% by 2002. However, in other years there were near zero (i.e. 1999 and 2005) and negative (i.e. 1996 and 2010). The change in the trend in real interest rate was mainly due to government

intervention through the enactment of the recommendations of Financial Policies for Diversified Growth, prepared in collaboration with the World Bank. The policy's main aims were stimulation of greater competition between commercial banks, improved operating procedures for DFIs, promotion of domestic money and capital markets, revision of the Government's financial management and development promotion roles in a way that would broaden the scope for anti-inflationary monetary and credit policies within a market-oriented environment. Hence, controls on interest rates were removed and commercial banks were independent to determine their interest rates, fees and charges. The call facility was discontinued, BoBCs were introduced, the bank rate, with the aid of moral suasion, was embraced as a key signal in setting commercial bank interest rates (Kayawe and Amusa, 2003).

Although the primary reserve requirements have also occasionally been adjusted to influence liquidity, the use of this instrument has been very rare. Open market operations (BoBCs) are used to manage liquidity in the banking system and maintain short-term interest rates at levels that are supportive of the monetary policy stance and consistent with the price stability objective. The current practice is to auction 14-day and 91-day (3-month) BoBCs on a weekly and monthly basis, respectively (Bank of Botswana, 2010).

3.4.2.3 Interest Rate Margins

A look at the difference between the lending rate and the deposit rate gives the interest rate spread in Botswana. Figure 3.10 shows the trends in interest rate margins for Botswana during the period 1980-2014.

Figure 3.10: Interest Rate Spread (Lending Rate minus deposit rate, %)
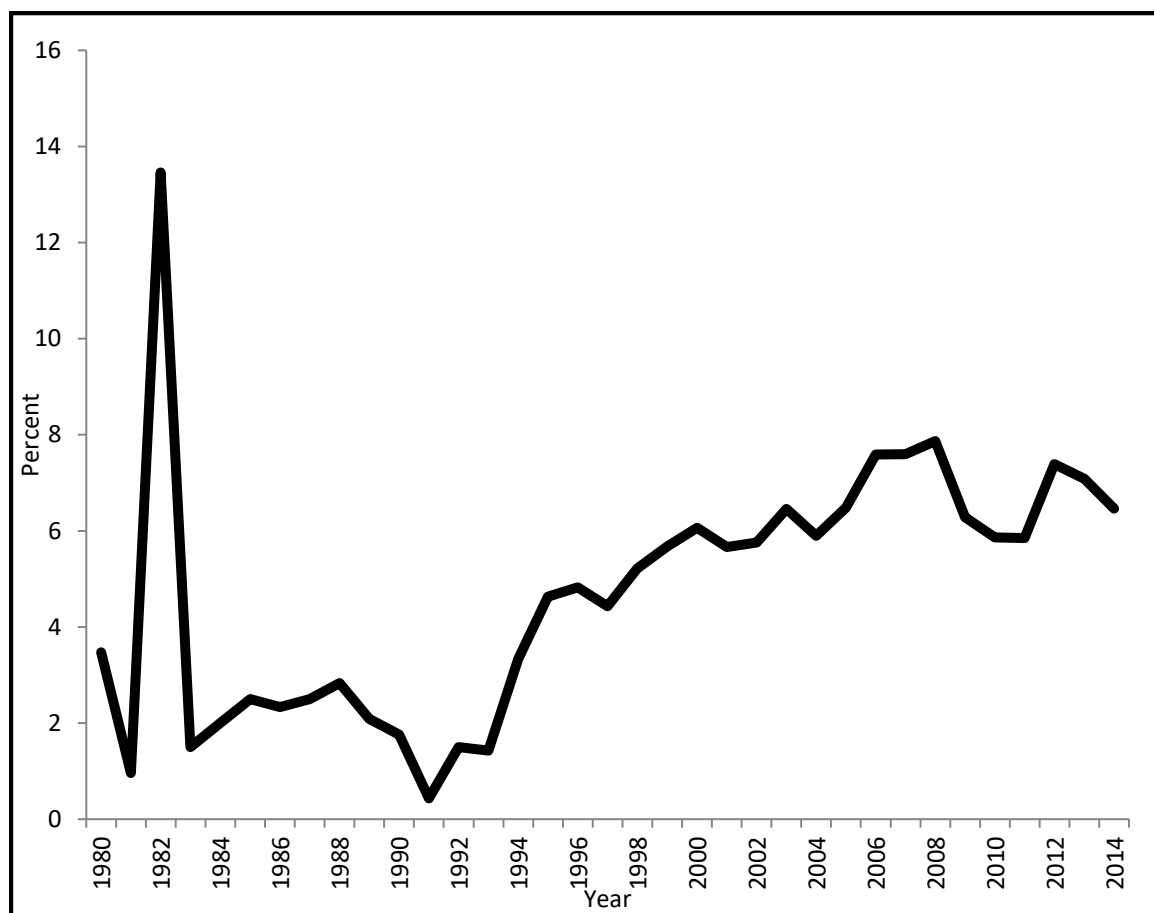
The anticipated expectation is for the lending rate to always be above the bank rate because the former usual covers for the costs of borrowing money from the central bank (the bank rate), the cost of borrowing money from other banks or financial institutions and the costs of all lending transactions in any financial institution. Therefore, expectations are on an always-positive interest rate spread and it is so for all the periods in Botswana's case. Despite the 1982 spike, interest rate spreads appear to have been unchanged before 1993. After 1994, there has been a gradual increase in the interest rate spread from below 2% to nearly 8%.

3.4.2.4 Savings

At independence, Botswana had had a negative domestic savings rate up to and until the country discovered diamonds and other mineral deposits. From 1970, gross savings as a percentage of GDP hit the 10% mark and has been increasing even reaching 50% of GDP in 1988. The bulk of these savings came from the government (revenue from diamonds). Since, for much of the

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1980s, interest rate policy was more concerned with the cost of borrowing than with remunerating deposits, policy attempted to encourage borrowing through keeping interest rates low and, as a result, real interest rates were negative most of the period up to 1990. The combination of low interest rates and exchange controls meant that financial assets yielding positive real returns to savers were virtually non- existent.

Trends in savings show lower savings rate after the 2008 financial crisis. The ratio of domestic savings to GDP for the years after 2008 has averaged 30%, which is relatively low as compared to the standard average of nearly 40% for the 1990 to 2007. Figure 3.11 shows the trends in gross savings as a percentage of GDP for Botswana during the period 1961-2014.

Figure 3.11: Gross Savings as a Percentage of GDP
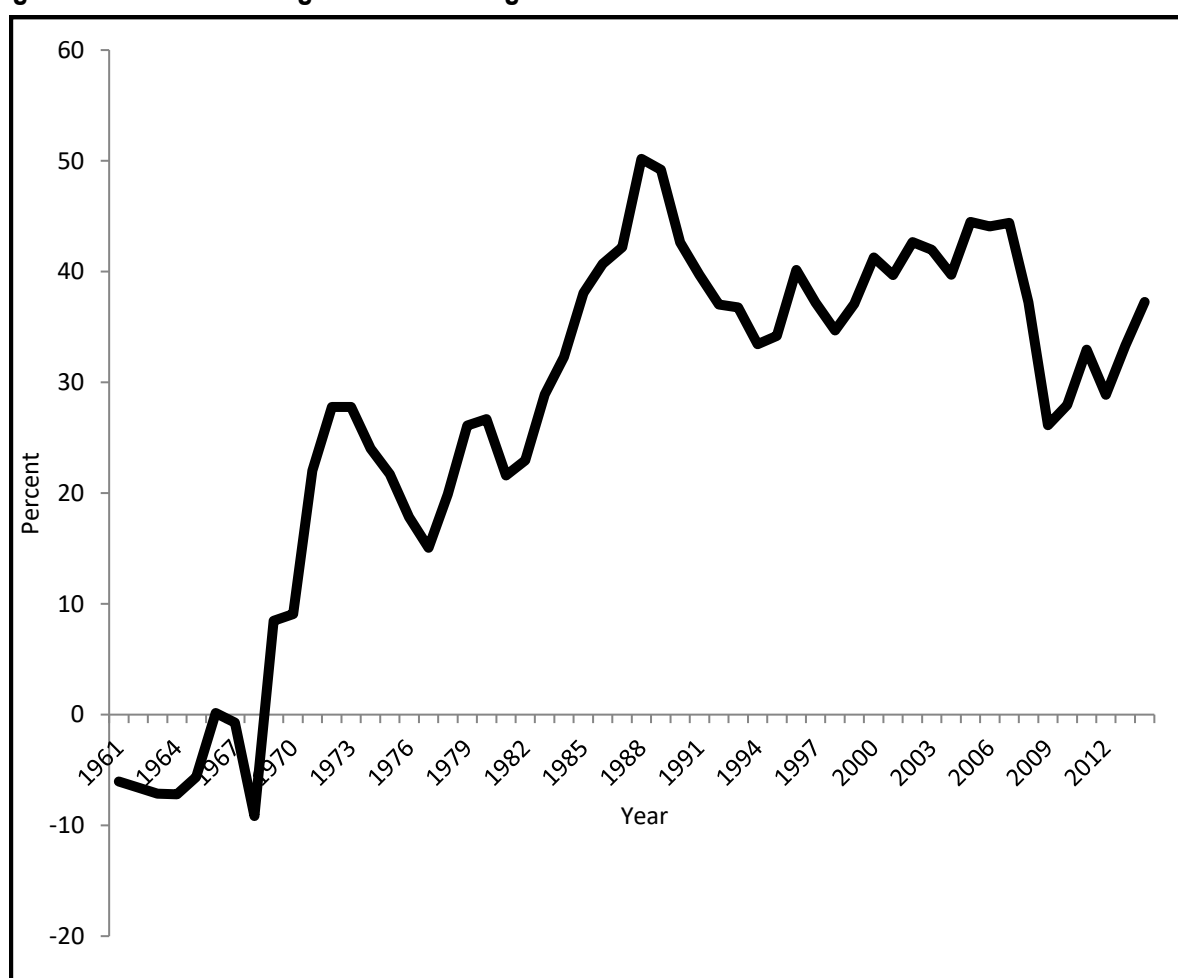
Source: World Bank, 2016

Returning to the personal sector, a further significant development in the financial sector during the 1990s has been the growth of pension and life insurance funds. Most large and medium-

sized companies in the private and parastatal sectors now have their own pension funds. The management of these pension funds is generally contracted out to professional fund managers. Correspondingly, pension and life fund assets have risen rapidly and were over P2 billion in 2000 (BoB, 2014). At least 30 percent of these assets must be invested domestically, while the remainder can be invested offshore. The main domestic assets held by these institutions are shares and bonds quoted on the Botswana Stock Exchange, commercial property and BoBCs. Contributions to pension and life funds are generally made through salary deductions on a contractual basis and have played an important role in sustaining the savings rate of the household sector. The funds represent an important pool of long-term savings, and one of the key tasks in developing the financial sector is to ensure that these savings can be applied to productive investments, which are generally in need of long-term funds, without exposing savers to excessively high risks (BoB, 2014).

3.4.2.5 Trends on Credit

The extent to which the financial sector is a provider of loanable funds to both the public and the private sector is a good measure of the level of financial development. The two measures of financial sector deepening and development to be discussed, as far as credit provision is concerned, are the net domestic credit to GDP ratio and the domestic credit to the private sector to GDP ratio. The net domestic credit to GDP ratio is the sum of net claims on the central government and claims on other sectors of the domestic economy expressed as a percentage of GDP. The domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable that establish a claim for repayment (WDI, 2014).

The domestic credit to the private sector to GDP ratio shows that it declined from 1976 onwards until 1989 when it started its gradual ascend. In 1976, it was 20%, decreased to 7% by 1988, and gradually increased to above 10% levels from 1998 ending at 32% in 2014(World Bank, 2016). The noted decrease in credit to the private sector before 1989 was mainly due financial institutions shying away from long-term investments, negative real interest rates and the existing repressive regulatory nature. After the 1989 amendments, banks had to a particular extent the mandate to choose the interest rates they were going to charge for both short term and long-term credit. The market was also open to competition, hence the escalation of private sector credit (BoB, 2003). However, the ratio of the net domestic credit to GDP shows a particularly

different but understandable picture. Though the private sector was increasing its borrowing from commercial banks, the government was earning more money than it could spend. This led to the overall domestic credit scene showing that there was excess liquidity in the market. Since commercial banks were focusing on giving largely short-term loans and financing for working capital this meant that the outflow of loanable funds did not match the inflow of savings, leaving commercial banks flooded with excess liquidity (holding reserves above the minimum legal reserve requirement at the BoB). The BoB tried to deal with the excess liquidity by using direct monetary controls but instead of improving the situation they tended to exacerbate the status quo. Figure 3.12 shows the trends in credit for Botswana during the period 1976-2014.

Figure 3.12: Trends on Credit
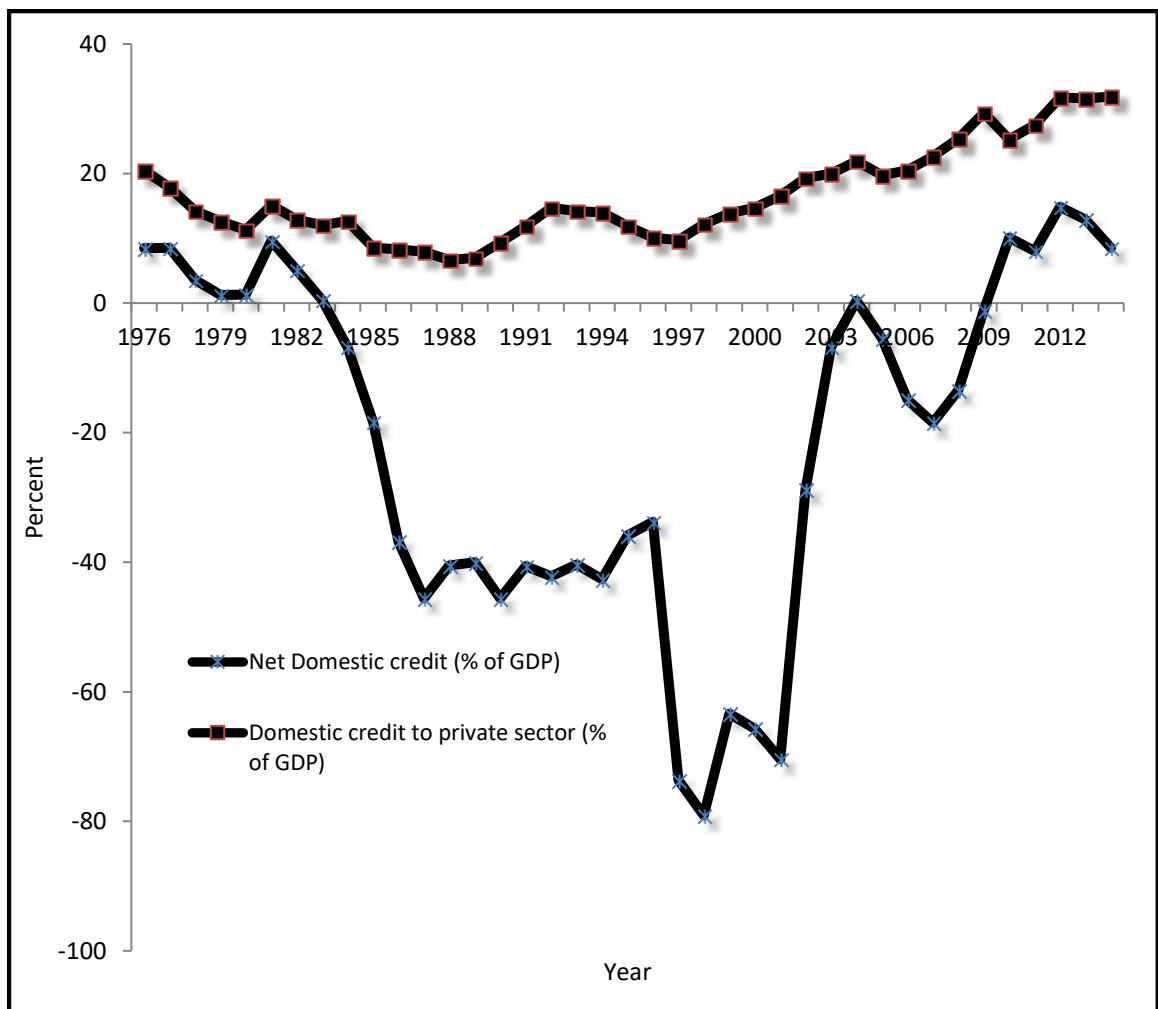
3.4.2.6 Trends on Deposits

A look at the liabilities of the financial sector, namely deposits, gives a somewhat similar trend as is the case with domestic credit to private sector to GDP ratio. The two ratios to be used to evaluate if the financial sector is an efficient mobiliser of deposits are the bank deposits to GDP ratio and the Bank credit to bank deposits ratio. Expectations on the bank deposits to GDP ratio are that it should be increasing so as to show that there is increased financial development in the economy. The bank credit to bank deposits ratio should also be increasing but it can also go above 100% as banks create money through giving out loans. Figure 3.13 shows the trends in bank deposits to GDP and bank credit to bank deposits for Botswana during the period 1972-2014.

Figure 3.13: Bank Deposits to GDP and Bank Credit to Bank Deposits (%)
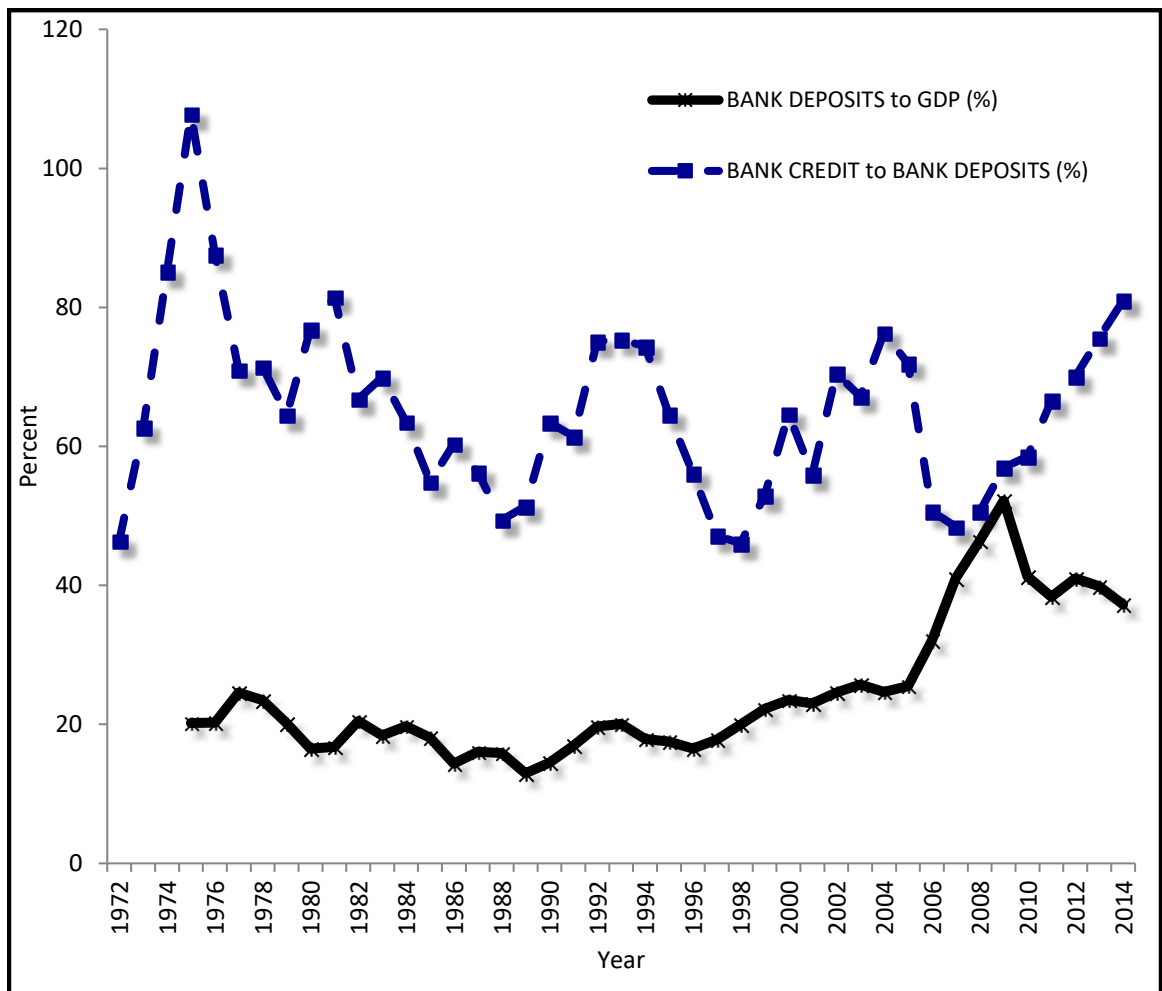
Source: Financial Structure Database- Beck. et al., 2000, 2010, Čihák. et al., 2012

From the above-illustrated trends, though the ratio of bank deposits to GDP started at 20% in 1976 it gradually descended to 13% by 1989. From 1989 onwards, the proportion of bank deposits steadily increased until 2005 from which it steeped up to above 40% levels only to stagnate back to the 40% range from 2010 and beyond.

An examination of the bank credit to bank deposits ratio reveals that the banking sector has been far more inefficient in converting deposits into credit. The maximum share of credit it managed to get was 106% in 1975 from thereon it has been having stretches of declines (than inclines) as the ratio of credit to deposits mostly averaged 50% to 70% for the whole period. However, it should be noted that the bank credit to bank deposits ratio contains demand deposits, that is, it is the private credit by deposit money banks as a share of demand, time and saving deposits in deposit money banks. The extent to which demand deposits account for the total deposits might be the reason why the ratio tends to show the inefficiency of money creation by banks.

A look at commercial deposits by type[6] shows that the bulk of the deposits (more than 65%) are short-term deposits, that is, mainly 6-month fixed deposits, call and current account deposits. Therefore from the deposit base that financial institutions have to create credit there is no room enough to accommodate such as expected since most of the deposits are relatively sight deposits. The other reason that might have significantly hampered the performance of financial institutions in the provision of credit is the existence of many 'similar' and large government agencies that are doing the same, and a significant number of micro lenders.

Given that laws affecting the banking system in Botswana provide for a whole separation of the activities of banks (commercial plus merchant/investment banking) and non-bank financial institutions, there is a grey area created by the legal frameworks of thrift institutions (BSB) and some non-bank financial institutions (NDB and BDC), which give these institutions the latitude to do banking business, directly through service provision within current structures or indirectly through equity ownership. Therefore, non-bank financial institutions can offer products and services that compete directly with those offered by banks, and also manage or own banks, in part or in whole (BoB, 2001). In addition, government is one of the largest financial intermediaries in Botswana through its accumulation of savings via budget surpluses and its lending to

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[6] See Bank of Botswana Annual Reports, several issues

parastatals through its Public Debt Service Fund (PDSF), and also by borrowing from international financial institutions such as the World Bank and onlending to parastatals (Jeffries, 1995).

3.4.2.7 Deposit Money Bank Assets To GDP

Deposit Money Bank Assets to GDP ratio is one of the indicators of financial development that can be used to assess the advancement of the financial sector. It gives evidence of the importance of financial services relative to the size of the economy (Beck, Demirgüç-Kunt and Levine, 2010). As the GDP expands, the deposit money banks assets to GDP ratio is also expected to expand. In other words, banks have to expand their asset base so as to cater for the increased financial business needs of the economy. For Botswana, with its unabated growth in GDP, the financial sector is expected to grow in the same way. However, trends show otherwise. From the establishment of the Bank of Botswana to the introduction of financial reforms in 1989 deposit money bank assets had shrinked from 23% to 7% of GDP. Government policy through the BoB was partly to blame and also the excess liquidity in the market. Figure 3.14 shows the trends in the deposit money bank assets to GDP during the period 1975-2014.

Figure 3.14: Deposit Money Bank Assets to GDP (%)
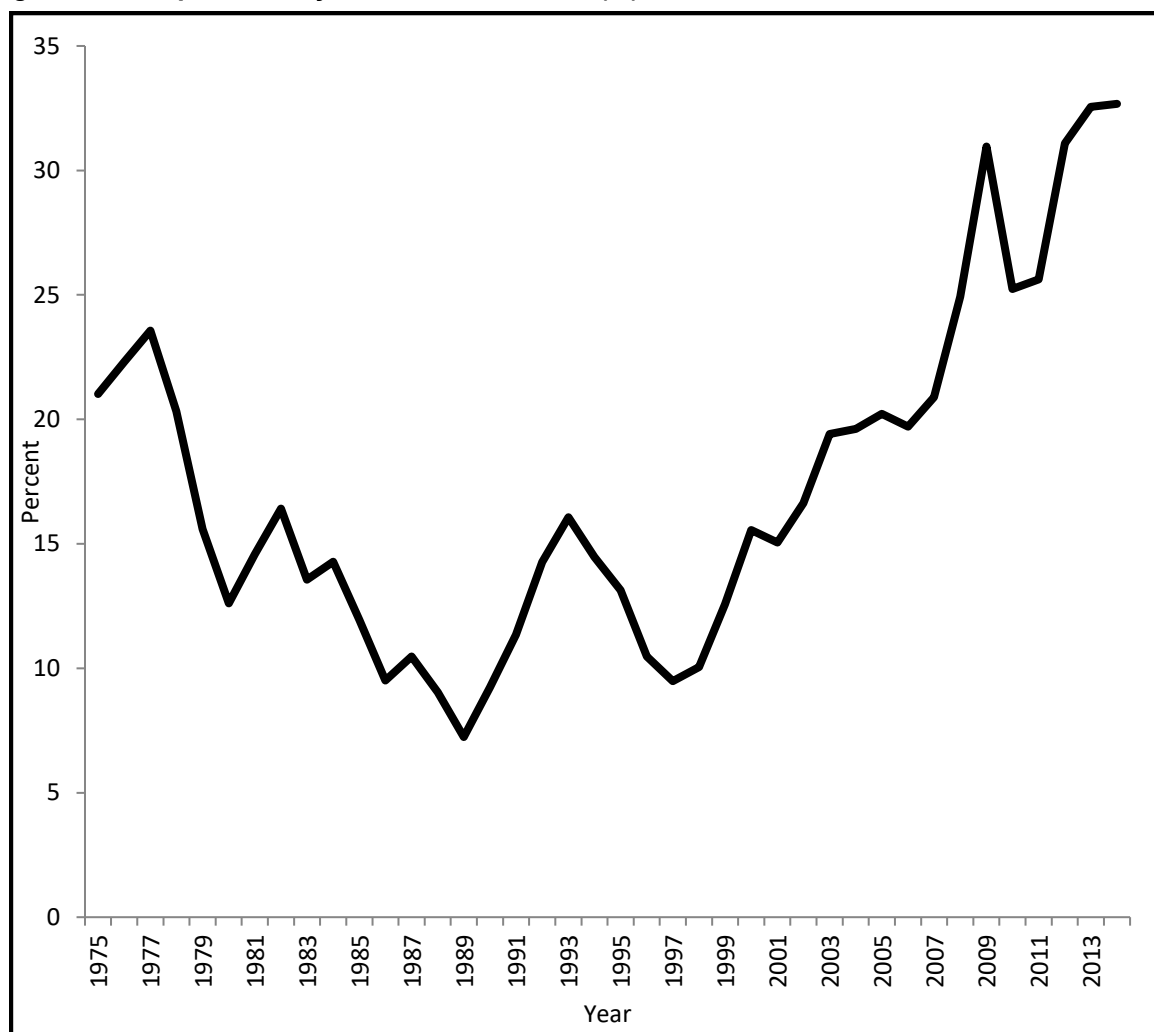
With the advent of financial reforms and liberalisation, bank assets began to steadily increase even surpassing the 25% mark by 2011. Financial liberalisation seems to have enhanced financial development and increased investment in the banking industry.

3.4.2.8 Other Banking Sector Performance Indicators

There are other banking sector performance indicators that can be employed to assess the profitability, efficiency and performance of the banking sector in Botswana. These include bank overhead costs to total assets, the net interest margin, the bank return on equity, the bank z-score, bank concentration, the bank return on equity, and the bank cost to income ratio. The most recent trends in the net interest margin, bank overhead costs to total assets, the bank average return on assets (Bank ROA), the bank z-score are illustrated in Figure 3.15, while those

for bank concentration, the return on equity and the bank cost to income ratio are illustrated in Figure 3.16.

Figure 3.15: Bank Performance Indicators
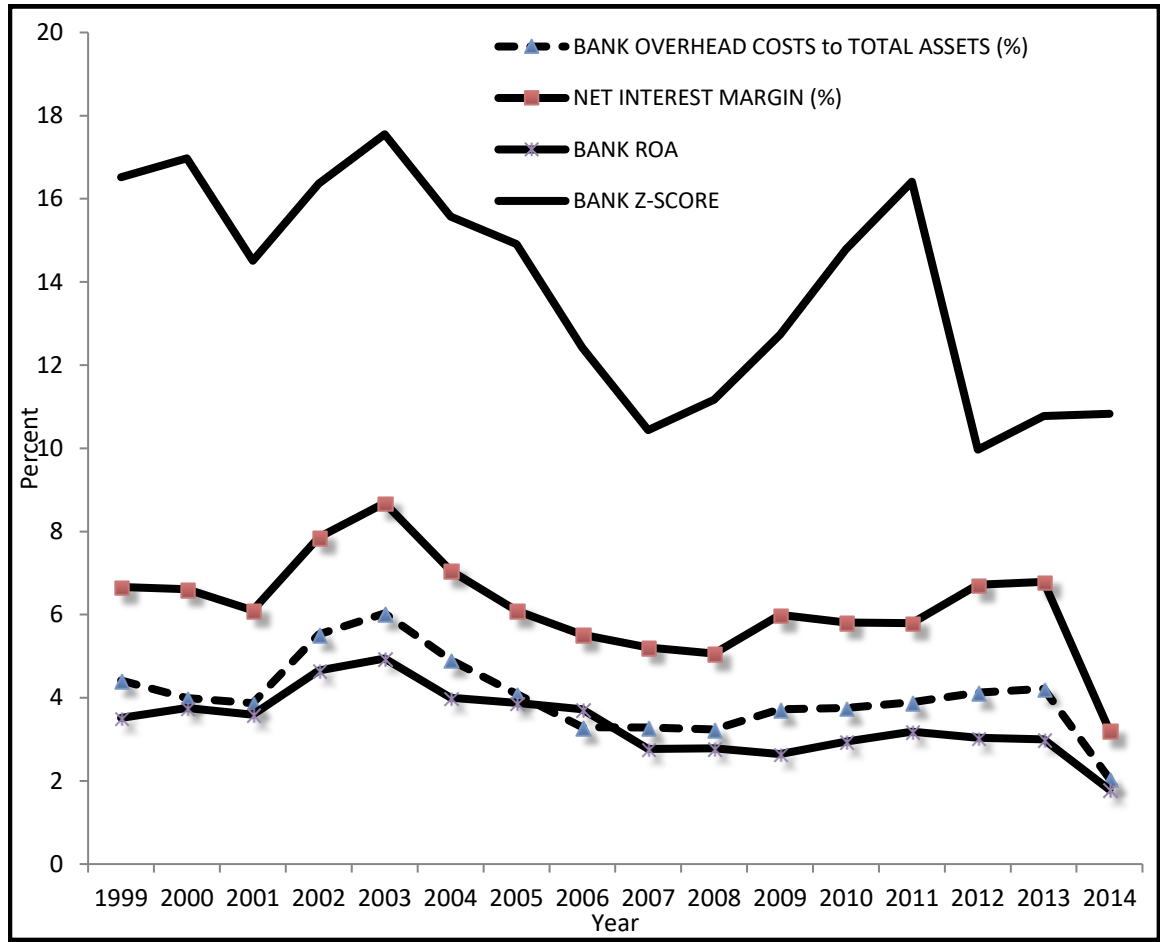
Source: Financial Structure Database- Beck. et al., 2000, 2010, Cĭhák. et al., 2012

Figure 3.16: Other Bank Performance Indicators
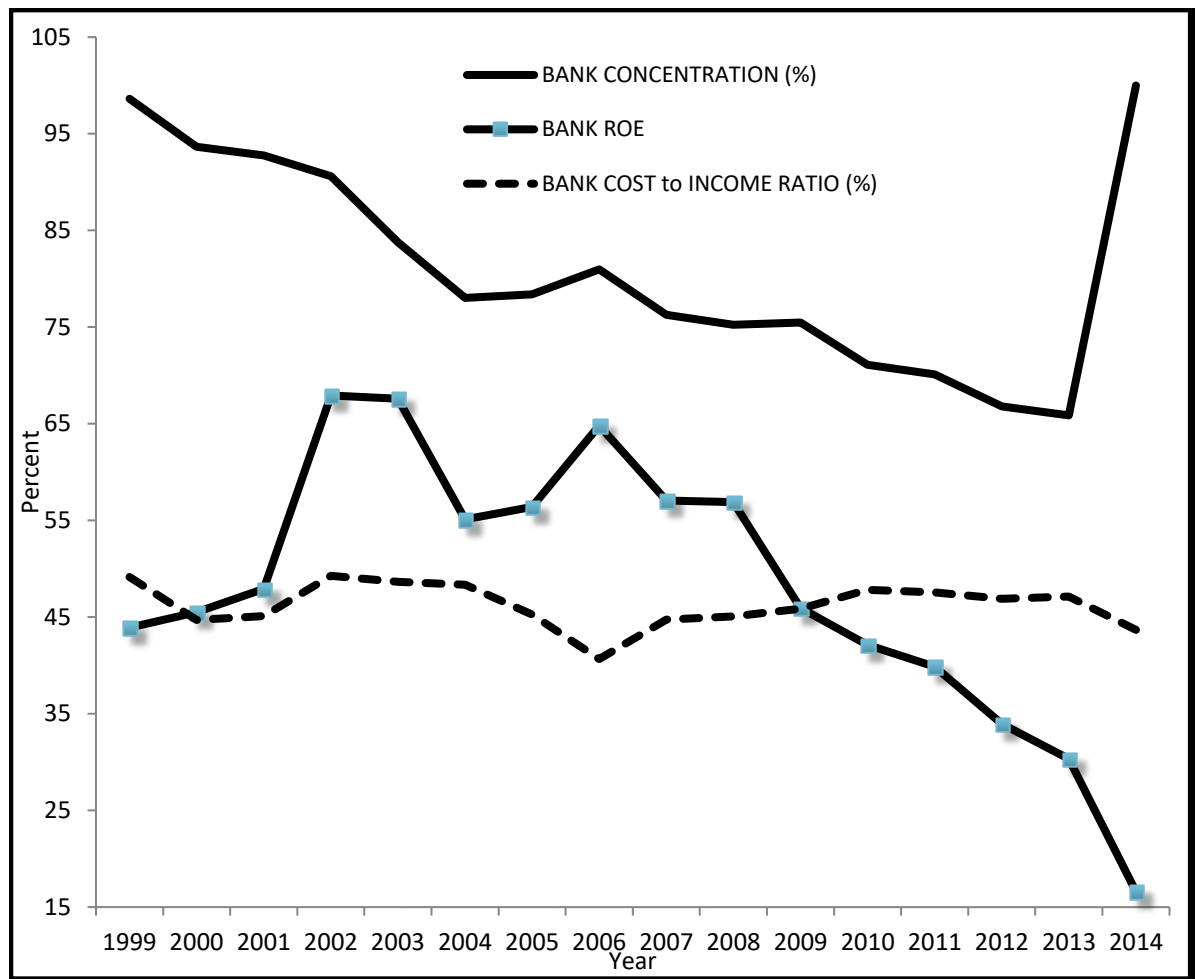
Source: Financial Structure Database- Beck. et al., 2000, 2010, Čihák. et al., 2012

An examination of the net interest margin, the ROA, the overhead costs to total assets and the z-score shows that banks in Botswana are earning unusually high profits as compared to most African countries, and some of the nations. Net Interest margin is the difference between interest income and interest expenses expressed as a percentage of average total assets. The ratio identifies the major income generating capacity of the banks, that is, the ability to use assets to generate income (the core earnings capability of the bank). In addition, the net interest margin can also be used as an indicator of the financial sector's competitive structure, although many factors may influence interest margins (Beck, *et al.*, 2000).

On average, the net interest margin for the Botswana banking sector has remained largely stable due, most likely, to the rising share over this period of BoBCs in total assets. As a result, lower-yielding BoBCs have accounted for an increasing proportion of interest income while interest

from higher-yielding advances has fallen (in percentage terms); hence the rise in interest yields on advances has not translated into higher interest income as a percentage of assets (BoB, 2003). The implications on the financial sector's competitive structure from the stable net interest margin seem to point to an oligopolistic competitive structure in which banks are more inclined to non-price (interest rate) competition. The attestation of Botswana being an oligopoly market has been postulated in a number of studies (BoB (2003), Jeffries (2008), Moffat (2008)) with the main implied cause for such market structure being the lack of vigorous competition and the small size of the market.

The z-score, an indicator of banking stability, is the ratio of return on assets plus capital-asset-ratio to the standard deviation of return on assets. The higher the z-score the more stable the bank. The z-score shows that Botswana's banking sector is more stable than that South Africa because it averages 14.1% while that of South Africa averages 8.1% for the same period (World Bank, 2014: 152). On average the bank overhead costs to total assets and the bank average return on assets appear to have not changed, averaging 3.5% for the whole period. Figure 3.16 shows the trends in other bank performance indicators.

Financial development can also be analysed using measures of concentration in the banking system. It is assumed that a less concentrated (and presumably more competitive) banking system reflects a greater level of financial development which is better suited to serve the diverse and emergent needs of a growing economy. The degree of concentration in the banking sector as measured by the three- bank concentration ratio, which measures the market share of the largest three banks in the economy, shows a marked gradual decrease from 99% in 1999 to 70% by 2011. This trend reflects the changes in the banking system, deriving from policy changes implemented since the early 1990s, which facilitated the entry of new institutions into the financial sector and the introduction of competitive new services (BoB, 2000). However, a look at the return on equity shows that the Botswana financial sector is in the top end of the market, above 40%.

The return on equity is the net income after tax as a percentage of total shareholders equity, and measures how well the bank's equity has been employed. Though it has decreased in the last three years, deductions are that banks have managed to maintain higher than 40% returns on shareholder's equity. Cost to income has decreased marginally suggesting that costs were increasing more slowly than both income and assets, which in turn suggests that banks were

able to contain costs and improve efficiency. Inherently, the entry of these new commercial banks has made a significant impact on the market structure and the competitiveness in the banking sector (Ahmed, 2006)

3.5 Stock Market Development

The Botswana Stock Exchange was established in 1989, originally known as the Botswana Share Market (BSM), with only five listed entities. Trading on the market was mainly done by matching orders through the only existing stockbroking firm, Stockbrokers Botswana Ltd. The Botswana stock exchange (BSE) was formally established in November 1995 after the BSE Act of 1994 (BSE, 2009).

Currently, the Botswana Stock exchange has 23 domestic companies, 14 foreign companies and more than 10 different private and government bonds listed. Trends on the Market Capitalisation, Stocks Total Value Traded, and Turnover Ratio show trends show a gradual increase in market capitalisation, a decrease in the turnover ratio, and an almost unchanged low total value traded as a percentage of GDP. Market capitalisation has increased tremendously from a mere 7% in 1993 to 43% in 2007 only gradually decrease to 25% by 2011(Beck. *et al.*, 2000, 2010, Cǐhák. *et al.,* 2012). Figure 3.17 shows the trends in market capitalisation, stocks total value traded ad the turnover ratio.

Figure 3.17: Market Capitalisation, Stocks Total Value Traded, and Turnover Ratio
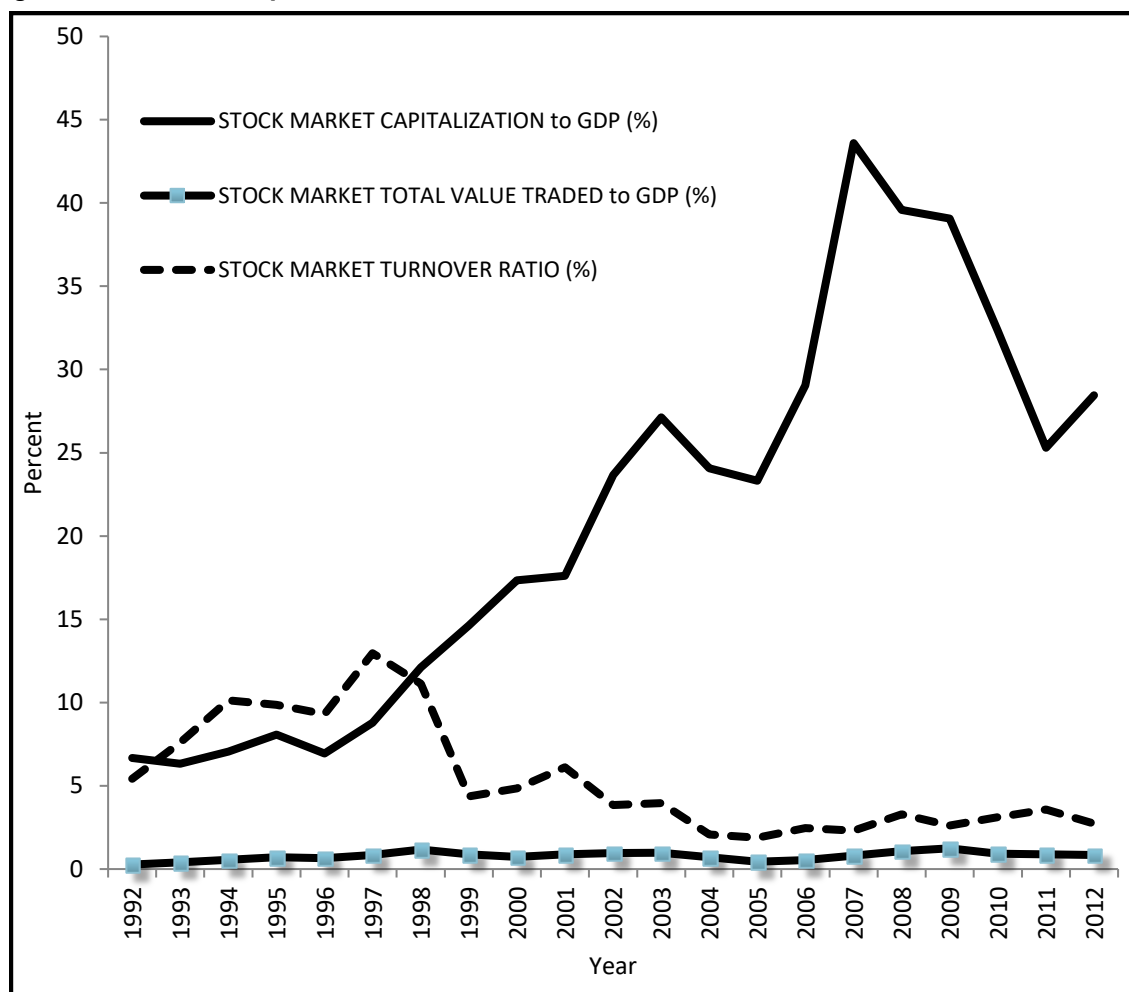
Since its establishment the BSM has developed significantly. As compared to other countries worldwide, the Botswana Stock Exchange is still a bit small (Bayraktar, 2014; Moshabesha, 2011).

3.6 Domestic Investment Trends vis-à-vis Savings

Domestic investment trends proxied by the ratio of gross fixed capital formation (GFCF) over GDP show an average rate of 30% of GDP throughout the period under study. The years 1971 and 1972 register the largest share of investment to GDP with at least 45% of GDP being investment expenditures. However, though intermittent, the rate of investment has gradually decreased to below 30% of GDP by 1992. By the year 2009 the level of investment had regained momentum being above 30% and has remained unabated until 2013. On the other hand, domestic savings have been on an upward trend since 1971. Savings only decreased after the

2008 financial crisis and were now at par with investment levels. Savings in Botswana are more than those of South Africa and Mauritius. This could be mainly due to high government saving. Figure 3.18 shows the trends in gross fixed capital formation vis-à-vis gross domestic savings.

Figure 3.18: Trends in Investment vis-à-vis Savings
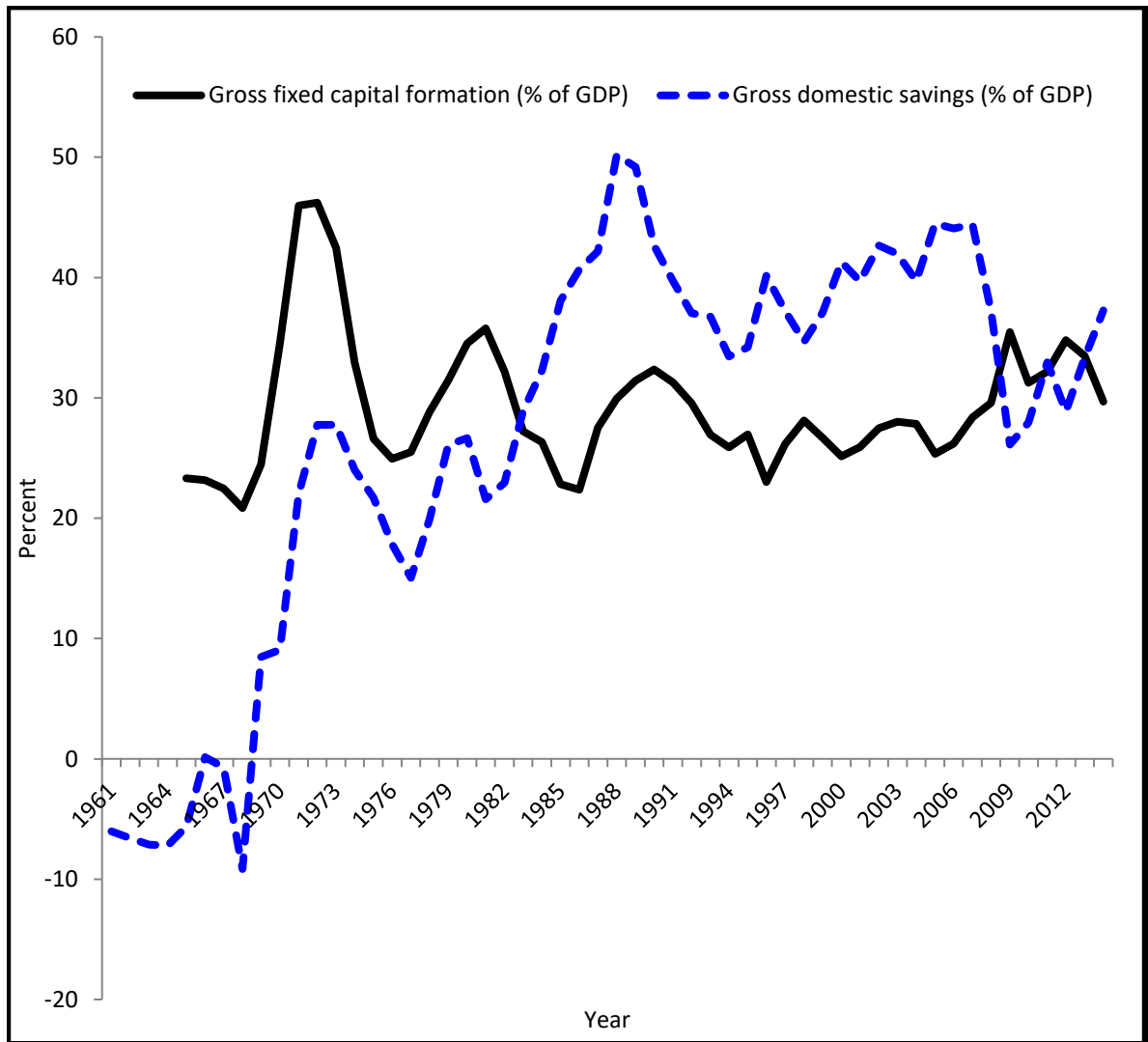
3.7 Conclusion

This chapter has demonstrated that Botswana has passed through numerous financial sector experiences; monetary policy, legislation, financial reforms and financial sector development trends. Though Botswana's financial sector eventually managed to overtake the agriculture sector, initially, the former was non-existent and was an insignificant contributor to GDP. More so, the progression of the financial sector, from its advent, was marred by the notion that it was

overbanked and hence the central bank instituted a financially repressive structure in the market so as to limit competition (Moffat 2008). However, by 1985, national planning had identified the need to enhance banking sector performance and advocated for liberalisation of the financial sector. National plans and several reforms were put in place, there was an increase in the number of banks in the market and increased competition which resulted in bank concentration significantly decreasing by 2011. Though the financial liberalisation stance, instituted by the Botswana government, managed to increase interbank competition, it did not lead to a higher than usual savings rate.

Trends in financial sector development have relatively shown an increase in financial depth and development. However, there is implied interference of the government through parastatals and the Public Debt Service Fund. In addition, savings have been spurred on by government savings and have, though initially being above investment levels, settled to investment levels in the last three years (2008 onwards).

CHAPTER 4

FINANCIAL DEVELOPMENT AND INVESTMENT IN MAURITIUS

4.1 Introduction

This chapter presents an overview of financial development and investment trends in Mauritius. The chapter is divided into six sections. Section 1 is an introduction to the Mauritius economy giving a brief overview of the macroeconomic factors that affect financial development in Mauritius. Section 2 outlines how monetary policy, financial sector legislation and national policy progressed in Mauritius. Section 3 gives a summary of the financial intermediaries market in Mauritius, the enacted financial sector and its reforms. It ends with a discussion of the trends in financial sector development. Section 4 gives an overview of stock market development while Section 5 examines the trends in investment in Mauritius. Section 6 gives the concluding remarks.

4.2 Factors Affecting Financial Development in Mauritius

Mauritius is a country in the Indian Ocean that is made up of four islands, that is, the island of Mauritius, Agalega, Rodrigues, and the archipelago of Saint Brandon. It has a population of about 1.295 million people and, in 2012, had an income per capita of US $6500 at constant 2005 prices, (about US$8120 at current prices) (WDI: 2014). Mauritius has a diverse history, which began with the Dutch, then the French and finally the British. The Republic of Mauritius gained its independence from the British in 1968.

Since its independence, Mauritius has made notable economic strides that have seen its development being relatively incomparable to most African countries. Starting as an economy mainly stirred by sugar production, Mauritius has grown into one of Africa's success stories.

Mauritius' exceptional growth was based on a number of economic stages and strategies that worked together to achieve the expected objectives. Furthermore, the commitment to achieving the stated objectives (fiduciary discipline) and regular monitoring and evaluation by the government aided the advancement of the economy. Mauritius, prior to its independence was a low-income plantation economy based, to a great extent, on one crop, i.e. sugar. Sugar was produced on a regular basis for supply to the colonizers of the day, Great Britain, and all other

manufacturing activities were centred on sugar production and its complement products like tea. Following independence, a number of strategies were put in place to expand the economy's ability to be self-sufficient and for diversification. Initially, the import substitution strategy (ISI) was adopted. Protectionism and the establishment of a development bank so as to provide a systematic flow of alternative subsidized finance to new and upcoming industries and investment projects (Jouan, 2005). The manufacturing sector boomed but the ISI strategy did not manage to provide enough employment opportunities for the populace therefore an export led strategy was adopted to complement the ISI strategy.

On the other hand, the economy was still dependent on sugar as the main source of economic growth. However, with the ever-persistent threat of cyclones and unanticipated international shocks (e.g. the oil shock of 1979) Mauritius later adopted IMFs structural adjustment programme. Inflation had soared high during the 1970s and was causing a lot of problems for the economy and population of Mauritius. Eventually, diversification led to the establishment of a number of industries that include tourism, aviation, textile and clothing. In the financial sector, liberalisation was adopted in the late 1980s with a number of restrictions being abolished. This marked the beginning of the development of the services sector in the early 1990s. Though sugar, then textiles and tourism first drove the Mauritian economy's growth, more recently, financial services have been significant in the drive for greater and sustained economic growth. A look at the performance of significant indicators of economic development that have significant implications on financial development follows.

4.2.1 Gross Domestic Product

Mauritius's gross domestic product (GDP) stood at $12.6 billion[7] (current US$) in 2014. The trends on GDP tend to give the overall performance of a country as far as national income is concerned. The increase or decrease thereof, of a country's GDP is an important indicator of economic progression, which has important implications on the advance of financial development and investment. The trends for GDP for the economy of Mauritius show an ever-increasing real national income that was at below US$ 2 billion in 1976 to end at above US$8 billion by 2012. Starting from a mono-crop economy (sugar) in the 1970s to end up with a diversified economy

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[7] World Development Indicators (2016), World Bank

was a journey that masked Mauritius' success story. Figure 4.1 shows the trends in GDP for Mauritius for the period 1976 - 2014.

Figure 4.1: GDP (Constant 2005 US$)
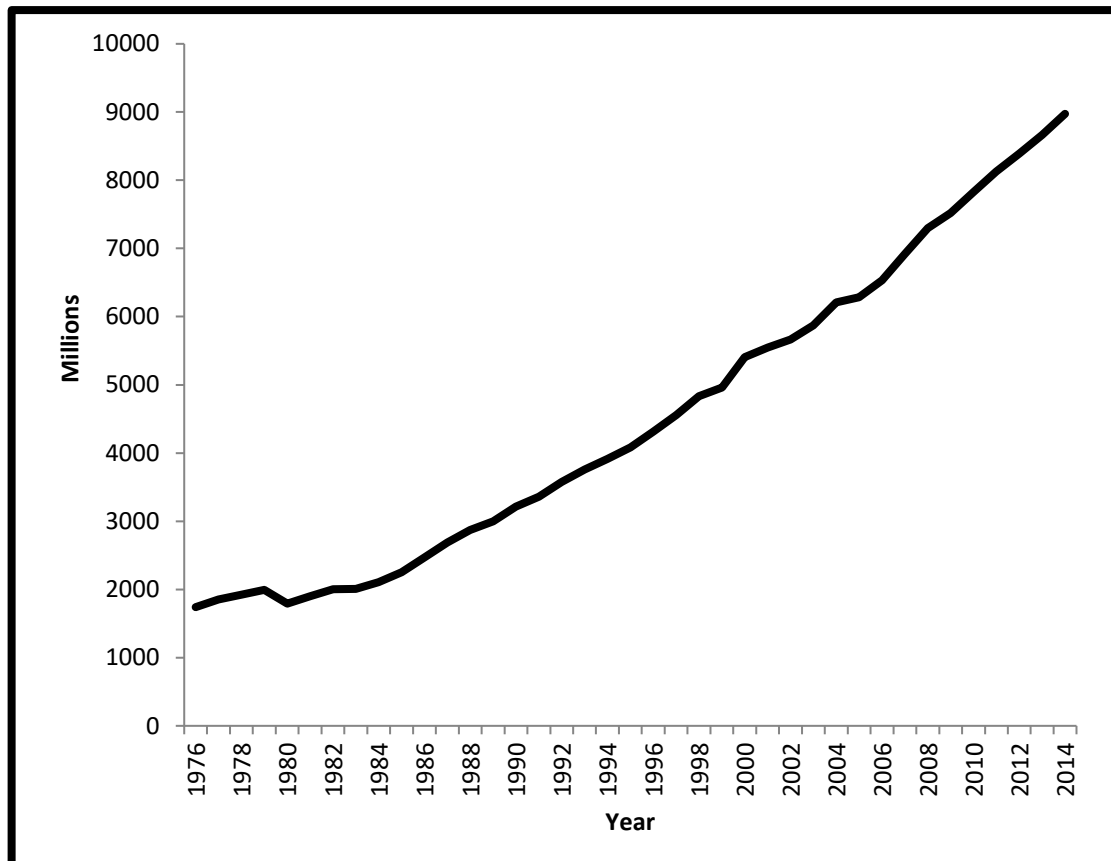
The relatively ever-increasing phenomenon in Mauritius' GDP is best explained by well-maintained fiduciary management principles and other industry-specific policies that were and still are of great importance in maintaining such growth. The advanced levels of growth in GDP necessitated the Mauritian government to put up a financial liberalisation policy at the beginning of the 1990s. The financial sector was taken as being of much importance in attaining national and international financial intermediation standards that would lead to even higher economic performance (Sobhee and Bhowon, 2007). The domination of the sugar industry as the main contributor to GDP, the dipped prices of sugar and the effect of cyclones on the sugar industry explain the rather unchanging levels of GDP before 1985. This was despite the significant inroads that had been made in establishing alternative sources (diversification) of national income in the economy.

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4.2.2 GDP Growth

Mauritius's GDP growth, on the other hand, especially after the 1980s has been slightly volatile though relatively unchanged and low as compared to the former years. Figure 4.2 shows the trends in the annual growth rate of GDP for Mauritius during the period 1977 to 2014.

Figure 4.2: GDP Growth (annual %)
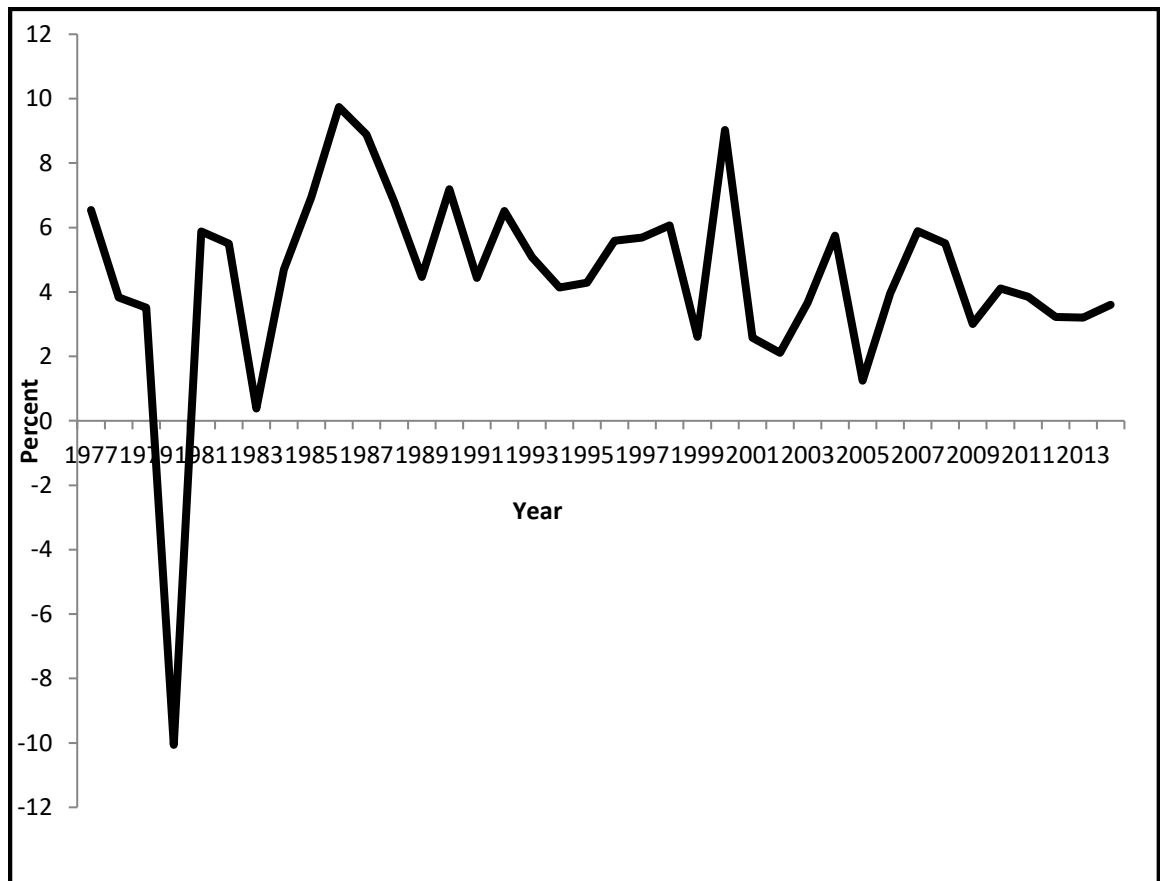
From the 1970s to the early 1980s, GDP growth was very low even to the extent of being negative in 1980. The main reason being the dip in sugar prices, which was followed by the 1979 oil shock that catapulted the economy towards a national crisis (Jouan, 2005). Notable policies were put in place. These included a series of development plans that emphasized investment in infrastructure, health and education and financial sector reforms. From 1984 onwards, the country's GDP growth rates have been highly volatile though they maintained above 2% levels for most of the period with 2005 being the exception.

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4.2.3 GDP per Capita

The GDP per capita trends seem to mirror the GDP trends in every way. Figure 4.3 shows the trends in GDP per capita for Mauritius from 1976 to 2014.

Figure 4.3: GDP per Capita (Constant 2005 US$)
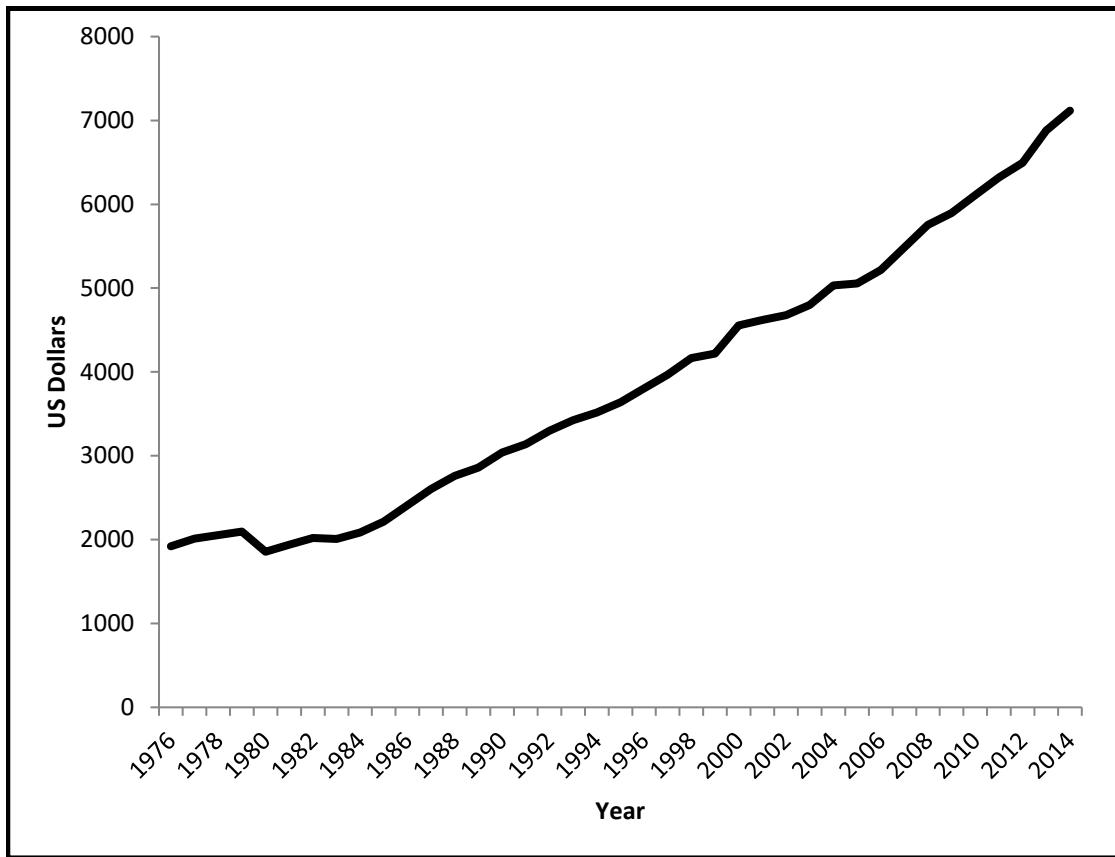
Trends in GDP per capita mirror those of GDP, gradually ascending from the late 1970s onwards. The growth in GDP has outpaced population growth and the result is an ever-increasing GDP per capita over the years. The creation of an export-processing zone in 1970 was instrumental in fostering Mauritius' GDP per capita growth. The EPZ facilitated the involvement of the economy's textile industry in Europe and achieved higher than expected achievements. The EPZ was instituted in conjunction with ISI, which was associated with strict policy of infant industry protection, that is, until the mid-1980s. The EPZ was used as a method to open up the domestic market to international influence without specifically taking away protection from the import substituting industries (Rodrik, 2005). Furthermore, its active policy framework has fostered the growth of the Mauritian economy, the setting up of international financial services and prudent economic management.

4.2.4 Economic Sector Contributions to GDP

The key drivers of such growth, when segmented into sectors over the period 1975 to 2005 show the following picture.

The bulk of the share of GDP, of recent, is mostly attributed to the Manufacturing, and Public administration, Education, Health and other Social work sectors. The financial sector only comes forth after the Wholesale and Retail sector with an average 10% contribution to GDP. Figure 4.4 shows the trends in sectoral contributions to GDP from 2010 to 2013.

Figure 4.4: Economic Sector Contributions to GDP
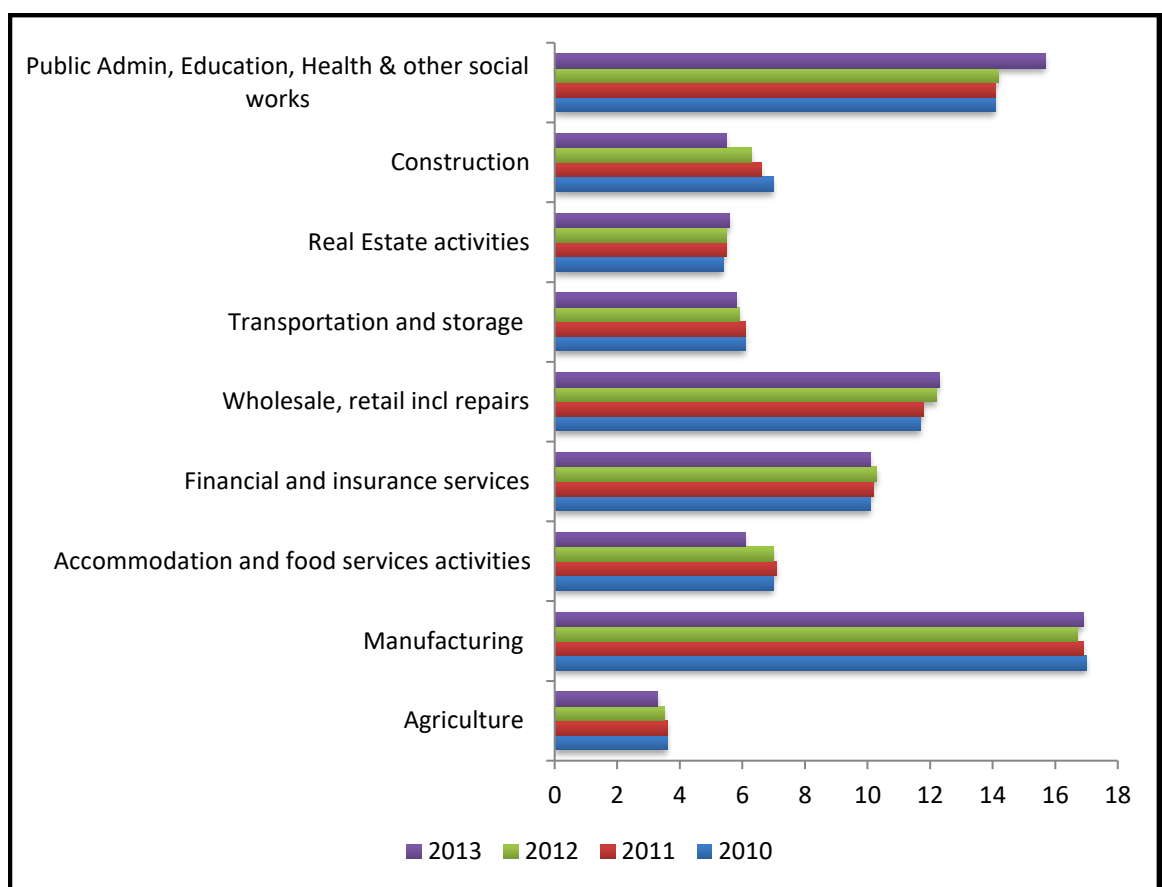
Source: Mauritius Chamber of Commerce and Industry website

The faster growth in the manufacturing sector is chiefly attributed to the adoption of policies, since independence, that were meant to foster and encourage the establishment of the manufacturing sector. These include the ISI stance adopted by the government on the advent of independence, the creation of the export-processing zone (EPZ) in 1970, a number of fiscal incentives and a favourable policy of leasing land to industries and hotel promoters. Meanwhile,

the contribution of agriculture to GDP declined from above 30 percent levels in the 1960s to an average of 4% by 2012 (MCCI, 2014).

The financial sector has been visualized as one of the growth-inducing and attracting sectors by the government of Mauritius. The Bank of Mauritius, following on government initiatives and its mandate, has been hugely involved in regulating the financial intermediation sector and the economy at large so as to avoid any arising of strain in the banking sector. The growth of the financial sector has, in part, benefitted from the better and fuller understanding of real-sector issues by the Bank of Mauritius that it got by having regular roundtable discussions prior to every meeting of the MPC. These discussions have played an important part in the policy (mainly market supporting) and regulatory work of the BoM and in monetary policy decisions (BoM report, 2008).

The market supporting policies of the BoM and the embracing conditions of the economy have led to an average growth of the financial sector of about 11% (in nominal terms), with about 8% of the growth arising from bank-based financial services and the other 3% arising from insurance and other financial intermediation activities (BoM reports, *several issues)*. Even before 2010, the financial sector has been, on average, expanding. The bulk of this expansion was mainly through financial intermediation. For example in 2004 alone, the financial sector expanded by 6.4% as compared to 5.9% the previous year, with a value addition of about US$500million (Gnany, 2005)

4.2.5 Inflation

Mauritius has had relatively lower than 15% inflation after 1980 with an average inflation rate of 7% for the period 1980 – 2014. However, from the early 1970s to 1980, inflation was highly unstable and increasing. The Mauritian government only managed to avert the advent of inflation by instituting macroeconomic reforms that included stabilization and structural adjustment. Devaluation of the rupee, liberalisation of the exchange rate, introduction of new sales tax and elimination of price controls were some of the measures to come out of the economic difficulties (Rodrik, 2005). Figure 4.5 shows the trends in inflation from 1961 to 2014.

Figure 4.5: Year on Year Inflation
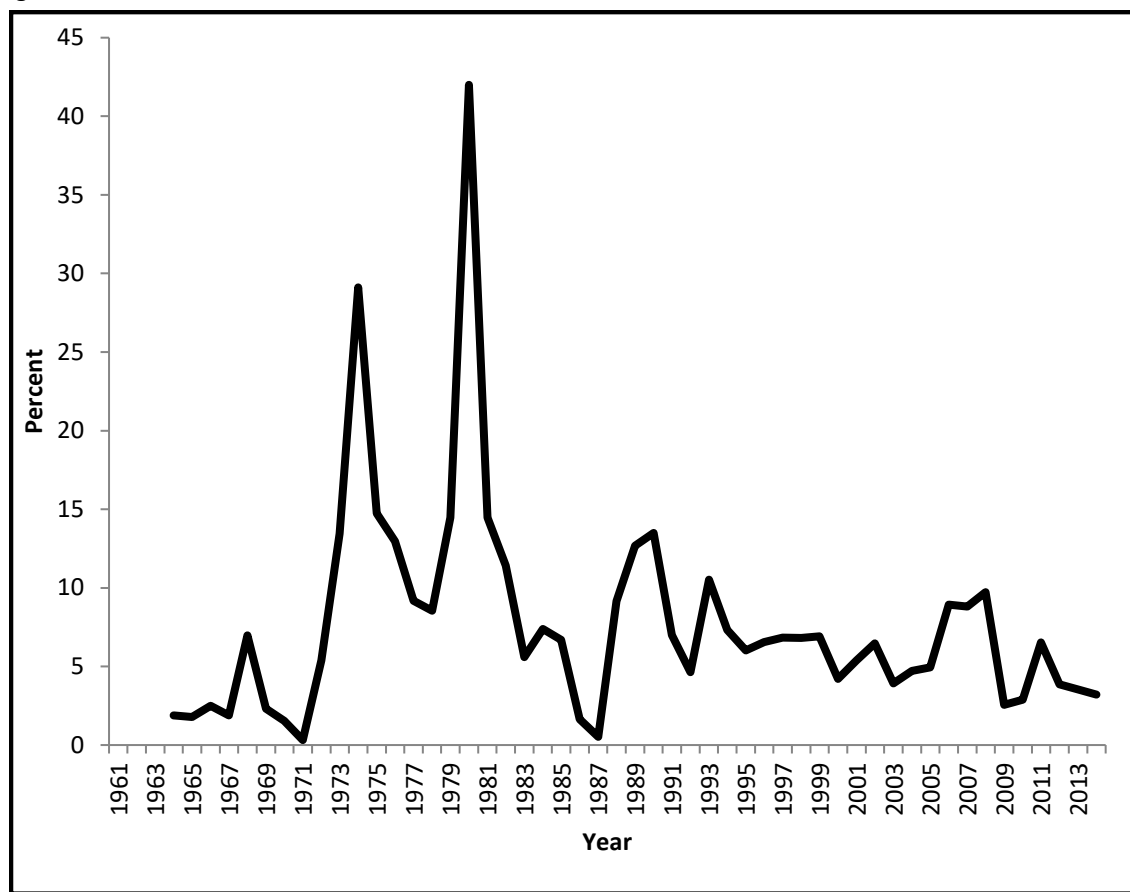
Progressively, the management of inflation has evolved from a strong dependence on direct monetary instruments, such as credit ceilings, to a steady but concise introduction of market-based instruments such as weekly auctions of Treasury and Bank of Mauritius bills (Zafar, 2011).

4.3 Monetary Policy and Financial Sector Reforms in Mauritius

Monetary policy in Mauritius, like in all other countries, is spearheaded by the central bank, that is, the Bank of Mauritius. Despite the evolution of monetary policy through the years since the creation of the Bank of Mauritius in 1967, the handling of monetary policy has taken on a larger implication with the advent of the process of economic and financial liberalisation in the late 1980s and 1990s. During the financial liberalisation period, a number of financial reforms were instituted.

Before the gradual process of financial liberalisation in the late 1980s, policy mainly focused on setting maxima on the credit expansion by banks through the enactment of high reserve

requirements. Moreover, interest rate guidelines that were based on directed lower interest rate policy to high priority sectors (for example, the sugar plantations). Though the main objective of monetary policy was to encourage investment, the control of the financial sector by the state managed to discourage financial deepening which led to lower levels of competition amongst financial institutions.

During the financial liberalisation period, exchange controls were removed. A more flexible exchange rate regime replaced the previous basket-peg regime and policy switched from direct control to indirect monetary management. However, the use of the Lombard facility up until December 2006 sort of made the Bank of Mauritius the lender of first resort rather than the lender of last resort. Under the Lombard Facility, the Bank of Mauritius stood ready to provide overnight-collateralised advances to banks at their initiative. The rate payable for use of this facility, the Lombard Rate, acted as a signal of the monetary policy stance of the Bank. In addition, the Lombard rate signalled changes in market interest rates and was used to ensure appropriate liquidity levels in the economy. The main operations conducted by the Bank to manage liquidity are the sale/purchase of Bank of Mauritius Bills, and repurchase transactions (Heerah-Pampusa, Khodabocus, Morarjee and Bissessur, 2006).

In December 2006, the Repo Rate eventually replaced the Lombard Rate, as the key policy rate to signal changes in its monetary policy stance (Tsangarides, 2010). A standing facility without any borrowing quota and through which the Bank provides a collateralised overnight facility to banks was also introduced in replacement of the Lombard Facility. The rate of interest chargeable on the Standing Facility was set at 400 basis points above the Repo Rate (BoM Annual Report, 2007). The change in accommodation policy enhanced the inter-borrowing relationship amongst banks in the market mainly because the money market rate has been relatively much lower than the Lombard rate. In addition, upon the enactment of the Bank of Mauritius Act of 2004, the Monetary Policy Committee was instituted. The MPC, which includes the BoM Governor and two Deputy Governors, two Board Directors and four members as appointed by the Minister, has been formulating the monetary policy of the Bank of Mauritius since 2007 (Tsangarides, 2010). The advance of monetary policy and financial sector reforms from 1987 onwards is presented in Table 4.1.

Table 4.1: Sequencing of Monetary Policy and Financial Sector Reforms

1987	• Removal of exchange control on current account (ended in 1992).
1988	• Liberalisation of interest rates.
1989	• Liberalisation of Exchange rate controls.
1991	• Issue of Bank of Mauritius Bills. • Auctioning of bills. • Gradual elimination of directed credit programme. • First phase of open market operations begins with treasury bills in the primary market. • Liberalisation of capital account (ended in 1994).
1992	• Abolition of ceilings on credit to priority sectors. • Accommodation policy reviewed so that banks having liquidity deficits seek reserves from the interbank market before seeking refinancing from the central bank.
1993	• Abolition of credit ceilings on non-priority sectors. • Imposition of a credit-deposit ratio. • Minimum risk-weighted capital adequacy ratio of 8%.
1994	• February – Setting up of the Secondary Market Cell at Bank of Mauritius. • June – Bank Rate linked with weighted average yield of Treasury Bill of over 12weeks plus a margin. • July – suspension of Exchange Control Act. • July – Establishment of the Interbank Foreign Exchange Market.
1995	• July – Bank rate linked to overall yield on Treasury Bills at most recent auction plus margin.

1996	• July – Abolition of credit-deposit ratio.
	• July – imposition of 15% limit on the overall foreign exchange exposure.
	• December – bank rate linked to overall yield on Treasury bills at most recent auction plus a margin.
	• Phasing out of the high reserve requirement begins.
1997	• July - Cash ratio brought down to 6% and non-cash liquid asset ratio to 0%.
1998	• July – Issue of 728 days Treasury Bills.
	• December – creation of secondary market in treasury bills through over the counter (OTC) sales of treasury bills to individuals and non-financial institutions.
	• Phasing out of the high reserve requirement ends.
1999	• December – issue of 30-day Treasury bills.
	• Introduction of Reversed REPO Transactions marking the second phase of open market operations which allowed the central bank to influence the liquidity of the banking sector.
	• Introduction of the Lombard facility.
2000	• November - Introduction of Swap Transactions
	• December – introduction of the Mauritius Automated Clearing and Settlement System.
2001	• June- introduction of Stock Exchange of Mauritius Automated trading System (SEMATS).

2002	• Establishment of Primary dealer system. • Bank of Mauritius therefore ceased its over the counter sale of Government of Mauritius Treasury Bills to individuals and non-financial institutions. • The established primary dealers were Barclays Bank PLC, State Bank of Mauritius Ltd, The Hong Kong and Shanghai Banking Corporation Limited and The Mauritius Commercial Bank Ltd.
2003	• December – trading of Treasury/Bank of Mauritius Bills on the Stock Exchange.
2005	• November - Establishment of a Credit Information Bureau.
2006	• The Repo rate introduced replacing the Lombard facility as the key policy rate to signal changes in its monetary policy stance. • Repo rate set at 8.5%. • A standing facility introduced to replace the Lombard facility.
2010	• Repo Rate cut by 100 basis points to 4.75 per cent.

Source: Jankee, (2006) Bank of Mauritius Reports (various issues)

4.4 The Financial Intermediaries Market in Mauritius

The development of Mauritius's financial sector has been different from most of the Southern African countries, as it has spanned more than 200years. The banking industry of Mauritius is composed of 6 local banks, 10 foreign-owned subsidiaries, 1 joint venture bank and 4 branches of foreign banks making a total of 21 banks (MBA, 2015). The Bank of Mauritius is the central bank in Mauritius and is responsible for among other things:

- maintaining price stability
- conducting monetary policy
- regulating credit and currency

- ensuring the development of a stable and sound financial system

- controlling the foreign exchange reserves of the country

- managing the clearing, payment and settlement systems

- formulating and implementing policies to enhance economic activities; and

- licensing, supervising regulating and overseeing all financial institutions

Given herein is the evolution of the financial sector in Mauritius.

4.4.1 Summary of the Mauritius Financial Sector Development

A look at the history of the Mauritian financial sector shows that it started in the early 1800s and it has experienced a number of bank closures and entry throughout its more than 200 years of existence. A summary of the historical background of the financial sector of Mauritius and its legal reforms from 1810 onwards is discussed in tabular form in this section.

Table 4.2 summarises the process of financial development in Mauritius.

Table 4.2: Summary of Financial Development in Mauritius (1810 – 2012)

1810	• Colonial Bank of Mauritius, Bourbon and Dependencies established.
1813	• Colonial Bank of Mauritius, Bourbon and Dependencies closed down in September because it did not have prior authorisation from the Secretary of State. • La Banque de L'ile Maurice (Bank of Mauritius) established in December.
1826	• La Banque de L'ile Maurice liquidated.
1831	• Banque de Maurice established.
1838	• Mauritius Commercial Bank (MCB) incorporated (initially as Banque Commerciale de l'isle Maurice).
1848	• Banque de Maurice stopped operations due to the 1847 London financial crisis leaving the MCB as a monopoly banking institution.
1852	• Oriental Bank Corporation established.
1859	• Chartered Mercantile Bank of India established.
1881	• Banque Franco-Egyptienne established.
1865	• Chartered Mercantile Bank of India stopped operations.
1885	• Oriental Bank Corporation exited the market.
1886	• Nouvelle Banque Orientale starts operations.
1889	• Banque Franco-Egyptienne exited the market.
1892	• Nouvelle Banque Orientale exits the market leaving MCB as the monopoly bank in Mauritius.
Late 1800s and early 1900s	• Foreign banks established local branches and a few locally incorporated banks (e.g. the Post Office Saving Bank) but MCBs dominant position continued.
1916	• The Hong Kong and Shanghai Banking Corporation Limited established a branch (formerly known as 'The Mercantile Bank Limited'.
1919	• Barclays Bank Mauritius starts operations.
1955	• Mauritius Commercial Bank became a limited liability company.
1959	• P.T Bank Internasional Indonesia Tbk. (BII) established.
1962	• Bank of Baroda established.

1964	• Habib Bank Limited sets up a branch in Mauritius.
1966	• Bank of Mauritius Act enacted.
1967	• Creation of the Central Bank.
1973	• State Commercial Bank Ltd established by the government, later renamed State Bank of Mauritius.
1986	• Liberalisation of exchange controls on both current and capital transactions.
1988	• Offshore banks allowed to operate. • Bramer Banking Corporation Ltd established (formerly known as South East Asian Bank Ltd). • Stock Exchange Act 1988.
1989	• Stock Exchange of Mauritius created. • Barclays Bank Mauritius becomes first bank to be granted an offshore banking licence. • Banking Act, effective on the 1st January.
1991	• Banque Internationale des Mascareignes Limitee commences operations as an offshore banking business.
1992	• Mauritian Offshore Business Activities Act (MOBA) enacted giving rise to the Mauritian Offshore Business Activities Authority (MOBAA), which was set up to regulate and supervise the non-bank offshore sector. • Mauritius Offshore Business Activities Authority became the regulator of the offshore sector.
1993	• Abolition of Credit ceilings.
1994	• The liberalisation of capital controls/the establishment of an inter-bank foreign exchange market and the adoption of the managed float of the exchange rate. • State Bank of Mauritius opens its first overseas branch in Mumbai India.
1995	• State Bank of Mauritius listed on Stock Exchange of Mauritius. • Deutsche Bank starts operations.

1997	- South African Bank Nedcor acquires 20.1 % of State Bank of Mauritius. - State Bank of Mauritius opens second branch in India in Chennai. - Investec Bank (Mauritius) Limited established.
1998	State Bank of Mauritius opens third branch in India in Hyderabad.
2001	- Financial Services Development Act which enabled the conception of the Financial Services Commission (FSC). - Standard Bank (Mauritius) Limited starts operations (November).
2002	- Financial Intelligence and Anti-Money Laundering Act introduced paving the way for the creation of the Financial Intelligence Unit (FIU). - Bank One Limited commences business operations. - Barclays Bank takes over Banque Nationale de Paris Intercontinentale Mauritius (BNPI). - Standard Chartered Bank (Mauritius) Limited established.
2003	Mauritius Post and Cooperative Bank Ltd established through a merger of the New Cooperative Bank Ltd with the Post Office Savings Bank.
2004	- Banque Internationale des Mascareignes Limitée changes its name to Mascareignes International Bank Ltd when it became a wholly owned subsidiary of Financiére Océor. - Banque des Mascareignes Ltée another subsidiary of subsidiary of Financiére Océor began operations in Mauritius as a domestic banking business. - Revision of the Banking Act and Bank of Mauritius Act.
2005	With the coming of the Banking Act 2004, Mascareignes International Bank Ltd merged its operations with Banque des Mascareignes Ltée.
2006	HSBC starts operations.

2007	• Formation of a Monetary Policy Committee and the enactment of the Financial Services Act. • AfrAsia Bank founded. • Bank One Limited acquired through a joint venture between a local group CIEL Investment Limited and the Kenyan group- Investment and Mortgages Bank Ltd.
2008	• SBI (Mauritius) Ltd established through the amalgamation of the Indian Ocean International Bank Ltd (IOIB) and SBI International (Mauritius) Ltd (SBIIML).
2010	• ABC Banking Corporation Ltd previously known as ABC Finance and Leasing Ltd granted its banking licence.
2012	• BanyanTree Bank Limited granted banking licence (6 September).
2013	• BanyanTree Bank Limited starts operations (18 February).

Source: Jouan (2005), Seetanah, B., Padachi, K., Hosany, J. and Seetanah, B. (2011), Bank of Mauritius Annual Reports (various issues)

4.4.2 Trends in Financial Sector Development in Mauritius

A number of financial development indicators are employed in this section as a discussion of the trends in financial development in Mauritius are explained.

4.4.2.1 M2 to GDP

The ratio of broad money, M2 to GDP is the measure of financial development that shows the real size of the financial sector in a country. A higher ratio of M2 to GDP implies a larger financial sector and improved financial intermediation. In addition to being a measure of financial deepening, the M2 to GDP ratio is a measure of money supply relative to the size of the economy. Prior to the gradual liberalisation instituted in Mauritius through the Bank of Mauritius, the level of the financial intermediation as measured by the M2 to GDP ratio was higher than that of Botswana and South Africa for the same period.

The M2/GDP ratio for Mauritius averaged just above 40% while that of Botswana and South Africa was 28% and 38%, respectively. By 1986, with the liberalisation of exchange controls on both current and capital transactions the M2/GDP ratio increased to above 50% levels. Due to increased offshore banking services provision, the size of the Mauritian financial services sector

appears to have continuously gained prominence over the years. By the early 1990s it was more than 60% of the GDP hitting the 80% mark by year 2000(World Bank, 2016). It progressively improved hitting its maxima of 102% by 2005 and from then onwards has been on a steady maintained average of 100% of GDP.

Given the resultant leap brought about by financial liberalisation, it is safe to say that the trends before 1986 show a holding back of the capacity of the financial sector. The main reason for such being repressive policy tended to distract rather than promote financial sector investment and business initiatives. After the changes in policy (domestic and international liberalisation) in the period 1986 to 1994, the financial sector began to turn potential into reality. Figure 4.6 shows the trends in M2 to GDP from 1977 to 2014.

Figure 4.6: Ratio of M2 to GDP
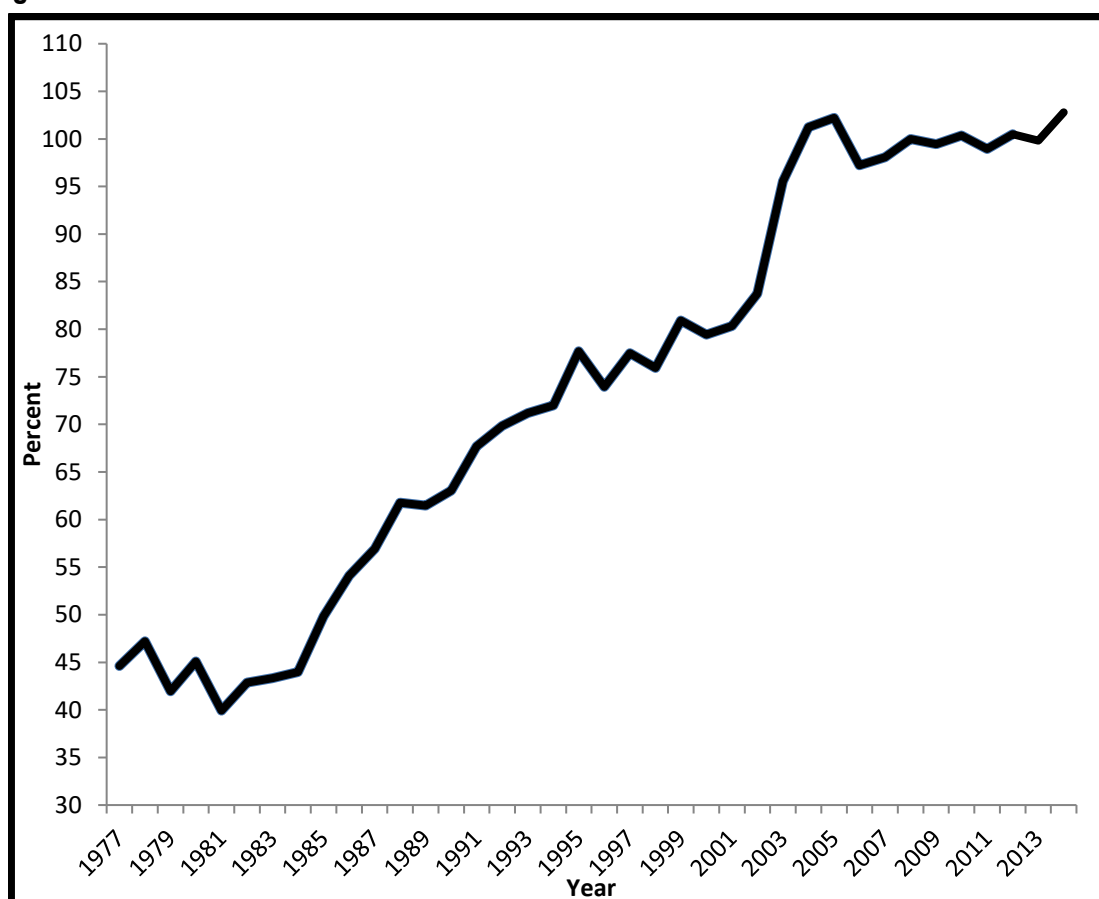
According to the M2/GDP ratio, the level of financial deepening appears to have improved extensively. With banks diversifying into non-bank financial services which include leasing,

factoring, asset management, private equity, stockbroking, registry, investor services business, specialist services in cross border transactions, specialist finance and lending, trustee and fiduciary services, Islamic banking, remittance services, wealth management and private banking, the increased financial widening and deepening was inevitable.

The M2/GDP ratio tends to measure the size and depth of the financial sector and its development. Therefore, the resurgent increase in the M2/GDP ratio also shows that the size of the financial sector also increased comprehensively even relative to other sectors as it is now counted as one of the main economic sectors in Mauritius. The effect of financial liberalisation is noticeable and was mainly steered by macroeconomic stability and the achievement of prudential regulation and supervision, and more so, the gradual approach to financial liberalisation (Galbis, 1994).

4.4.2.2 Real Interest Rate

For Mauritius, before the 1980s, given the highly unpredictable inflation and repressed interest rate policy, it is possible that real interest rates were generally negative. The notion of negative real interest rates is expected given that the Bank of Mauritius had a restrictive and a financially repressive monetary policy that had set the prime lending rate for particular strategic sectors of the economy and the commercial bank interest rates for each class of deposits. However, from 1980 to 1990 real interest rates were below 7% levels, inflation levels for the same period averaged just below 10%. With the liberalisation of interest rates in 1988, real interest rate levels began to gradually increase. The gradual increase was mainly due to the gradual liberalisation of the financial sector.

The liberalisation of exchange rate controls followed in 1989, the gradual elimination of the directed credit programme, the first phase of open market operations began with treasury bills in the primary market and the gradual liberalisation of capital account followed in 1991(Jankee, 2006). Furthermore, in 1992, credit ceilings to priority sectors were abolished and the BoM's accommodation policy was reviewed so that banks having liquidity deficit seek reserves from the interbank market before seeking refinancing from the central bank. These reforms came in with increased interest rates while inflation remained rather stable at below 10% levels. Hence, the overall effect of liberalisation of the financial sector inclusive of interest rate liberalisation was the gradual increase in the real interest rates. The increase continues until the year 2000 in which

real interest rates reached a maximum of 18%. From 2001 onwards, real interest rates, though volatile, began to steadily decline until they reached 6.4% by 2014. Figure 4.4 shows the trends in the real interest rate from 1981 to 2014.

Figure 4.7: Real Interest Rate
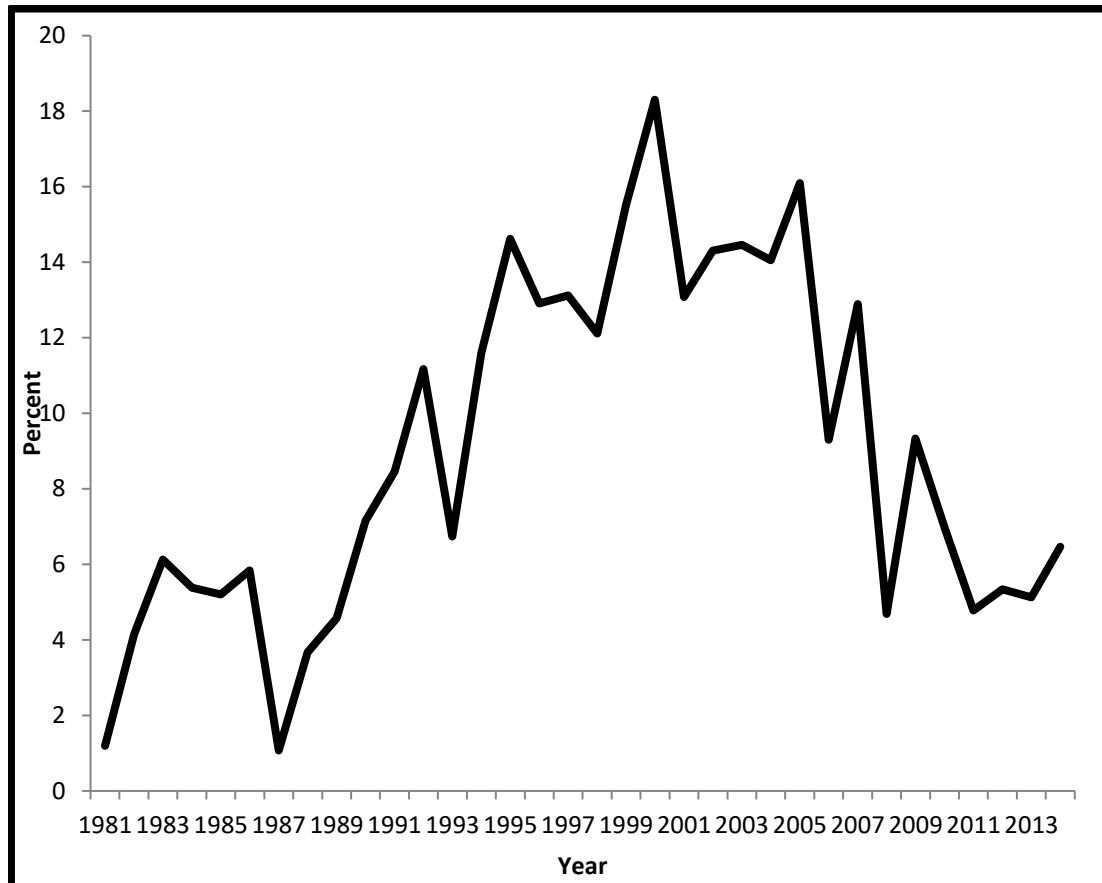
The decrease in real interest rates after 2001, though attributed to financial liberalisation, may also be attributed to tight financial market liquidity controls or the loosening of the underlying conditions by the BoM. For example, from 1996 the BoM abolished the maintenance of the credit-deposit ratio, gradually phased out the use high reserve requirement, engaged in open market operations, instituted the creation of a secondary market in treasury bills through over the counter (OTC) sales of treasury bills to individuals and non-financial institutions and introduced the reversed REPO transactions marking (BoM, 1998). These reforms enabled the central bank to influence the liquidity of the banking sector and the interest rates in the market therefore having an indirect effect on the real interest rate. Furthermore, the monetary policy stance of the nation became reactive to the happenings in the market. For instance, the Lombard rate, which was the

Bank's signalling mechanism of its monetary policy stance, was reduced on four occasions during 2003 by a total of 125 basis points with banks reacting in tandem to policy changes (Tsangarides, 2010). These policy changes were geared towards stimulating investment and enhancing economic growth through reduced lending rates.

4.4.2.3 Interest Rate Margins

The objective of financial sector liberalisation is usually to cause narrow interest rates spreads, increase availability of financial resources through increased savings, enhance efficiency in credit allocation and increase investments (Ngumi, 2014). Upon financial liberalisation an initial increase in the spread between lending and deposit rates would be expected due to increased competition in the credit market resulting from reduction in the barriers to entry of foreign and domestic competitors. But as the financial sector becomes more efficient, the interest rate margin spread should eventually start to narrow. Moreover, for the case of Mauritius, financial liberalisation was accompanied by a reduction in the reserve requirement, which in turn should increase loanable funds, putting downward pressure on the cost of funds. Therefore, expectations arising due to these developments are that the interest rate margin should decrease over time. Figure 4.8 shows the trends in the interest rate spread for Mauritius from 1981 to 2014.

Figure 4.8: Interest Rate Spread (Lending Rate minus deposit rate, %)
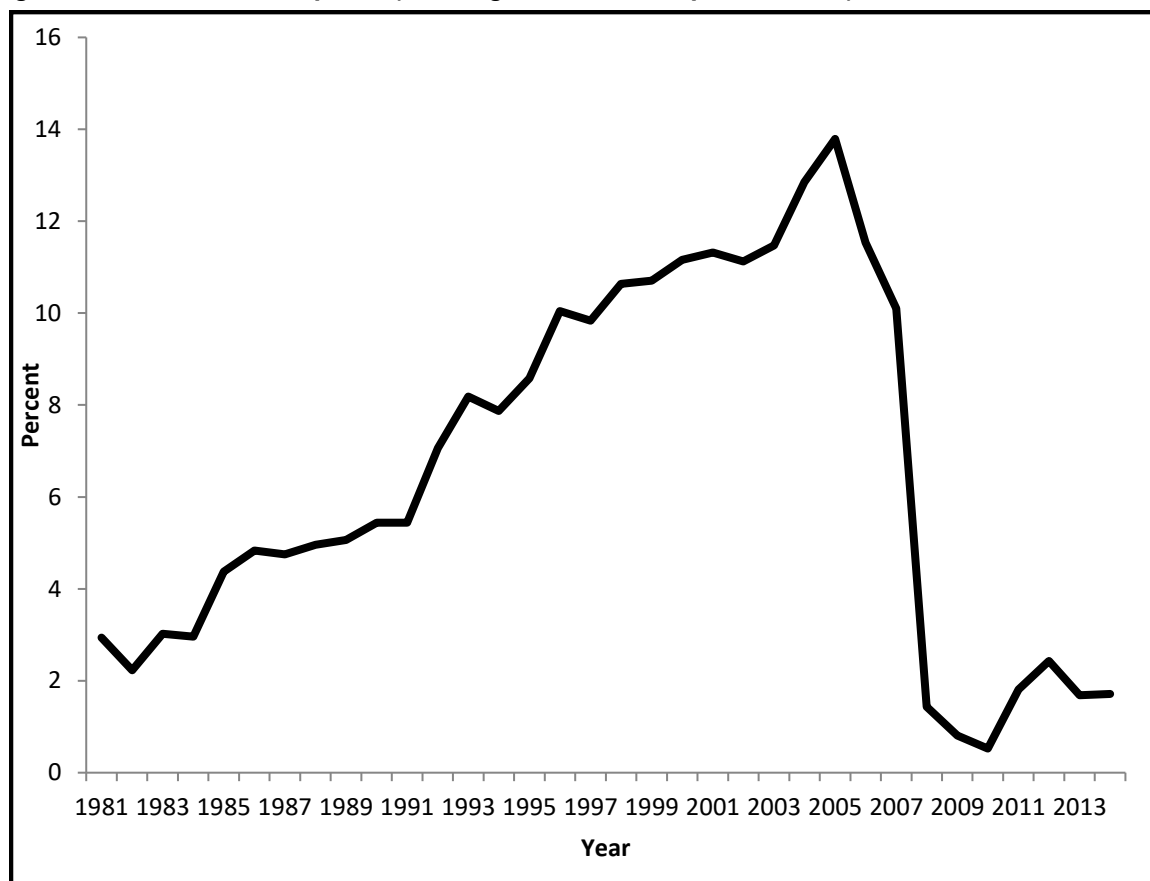
Conversely, for Mauritius, the interest rate margin continued to rise meaning that lending rates rose much faster during and after the reform years than deposit rates. Before 1992, the interest rate margin had a mean of below 6%. From 1993 onwards, interest rate margins went beyond 6% and continued to steadily rise until they almost reached 14% levels in 2005(World Bank, 2016). Margins declined sharply thereon-reaching minima of 0.5% by 2010 and then marginally rising to 2.4% by 2014. The rather unstoppable and uncontrollable rise in the interest rate margin in Mauritius points to a financial sector characterized by oligopolistic behaviour of a few commercial banks and state dominance, that is, limited financial sector competition (Senbet and Otchere, 2006). The resultant decrease in the interest rate margin from 2006 onwards maybe attributed to increased competition arising from the entry of a number of banking entities and non-bank financial institutions, the increasing stock market capitalisation and also to the international financial crisis of 2008. Nevertheless for the Mauritius case the interest rate margin reflects the prevalence of market power and compensates for the quality of loans (Ramful, 2001).

4.4.2.4 Savings

From 1978, Mauritius had a domestic savings rate of 18% of GDP, which steeped down to 10% of GDP by 1980. By the advent of financial liberalisation, the gross domestic savings rate of Mauritius started to increase in such a way that it reached up to 28.5% of GDP by 1986. From 1987 to 2003, gross domestic savings averaged 25% of GDP only to sharply decline to 14.7% by 2006 and eventually 11.6% of GDP by year 2012.

After financial liberalisation, expectations are that the savings will increase due mainly to the ripple effects of increased real interest rates that would have resulted from increased competition among financial institutions and the rather permitting stable inflation rate. The effects of the increased real interest rates on savings maybe explained through their substitution effect and income effect on consumption and savings. The substitution effect arising from increased real interest rates will lead to a preference to save while currently postponing consumption. Given the allowing stable inflation rate and the increasing interest rates deferring current consumption for later becomes less costly and more beneficial in the future. On the other hand, increased real interest rates might lead to increased consumption due to increased interest income. However, if the substitution effect remains relatively greater than the opposing income effect, savings are expected to continuously increase or maintain their levels vis-à-vis GDP. Figure 4.9 shows the trends in gross savings to GDP from 1977 to 2014.

Figure 4.9: Gross Savings as a Percentage of GDP

The decreasing savings rate after 2001 closely mirror the decreasing trends in the real interest rate after 2000 and the interest rate margins after 2005. Therefore, the decrease in savings might be explained by a decrease in real return for savings that led savings to be used for other alternatives not only limited to consumption. A look at the market capitalisation of the Stock Exchange of Mauritius seems to confirm that there was increased investment in the capital market during the period of decreasing savings.

4.4.2.5 Trends on Credit

Despite the measures of financial development already discussed in preceding sections there is need to assess other measures that pertain to credit provision in the market. Financial development should lead to increased credit provision to all sectors by the financial sector especially after financial liberalisation. Therefore, the extent to which the financial sector is a provider of loanable funds to both the public and the private sector is a necessary and good

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measure of the level of financial development. The two measures of financial sector deepening and development for assessing credit provision in Mauritius that are employed in this section are the net domestic credit to GDP ratio and the domestic credit to the private sector to GDP ratio. The net domestic credit to GDP ratio is the sum of net claims on the central government and claims on other sectors of the domestic economy expressed as a percentage of GDP. The domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable that establish a claim for repayment (WDI, 2014).

The domestic credit to the private sector to GDP ratio trend shows that, despite maintaining above 20% levels, it marginally declined from 1976 onwards until 1985. the net domestic credit to GDP ratio in the same period (1976 to 1985) was generally ascending upwards. With the advent of the financial liberalisation period, the domestic credit to the private sector to GDP ratio shows a gradual ascend which is only matched by the net domestic credit to GDP ratio after 1990. In addition, the gap between the two ratios seems to have narrowed after financial liberalisation. Financial development spearheaded by financial liberalisation appears to have opened the door for the once-not-included sectors in the private markets. In addition, increased competition for credit seems to have translated into an appreciation of the private sector as creditworthy than the status quo before liberalisation. However, it should be noted that increased financial sector competition might lead to decreased savings and even investment as they indulge in excessive credit provision for consumption purposes. This may be due to short-termism, preference for high returns and prevailing liquidity in the banking sector. In the banks' lending decisions for investment purposes, the ability to repay is a significant determinant of getting credit not to mention the profitability of the sector and the associated long-term risks.

The removal of high required reserves, the improved real time payment systems and the opening up of the economy to offshore banking are some of the reasons why the level of credit provision as a share of GDP has been increasing in Mauritius. The removal of high reserve requirements enabled banks to have extra funds available for credit. The improved real time payment systems made it quite easy not to hold on to unusually large excess reserves and led to increased financial intermediation. The opening up of the economy through offshore banking activities opened up the banking sector to new markets and has aided the financial sector to have extensive offshore banking activities (Moriera, 1999). Figure 4.10 shows the trends in credit from 1976 to 2014.

Figure 4.10: Trends on Credit
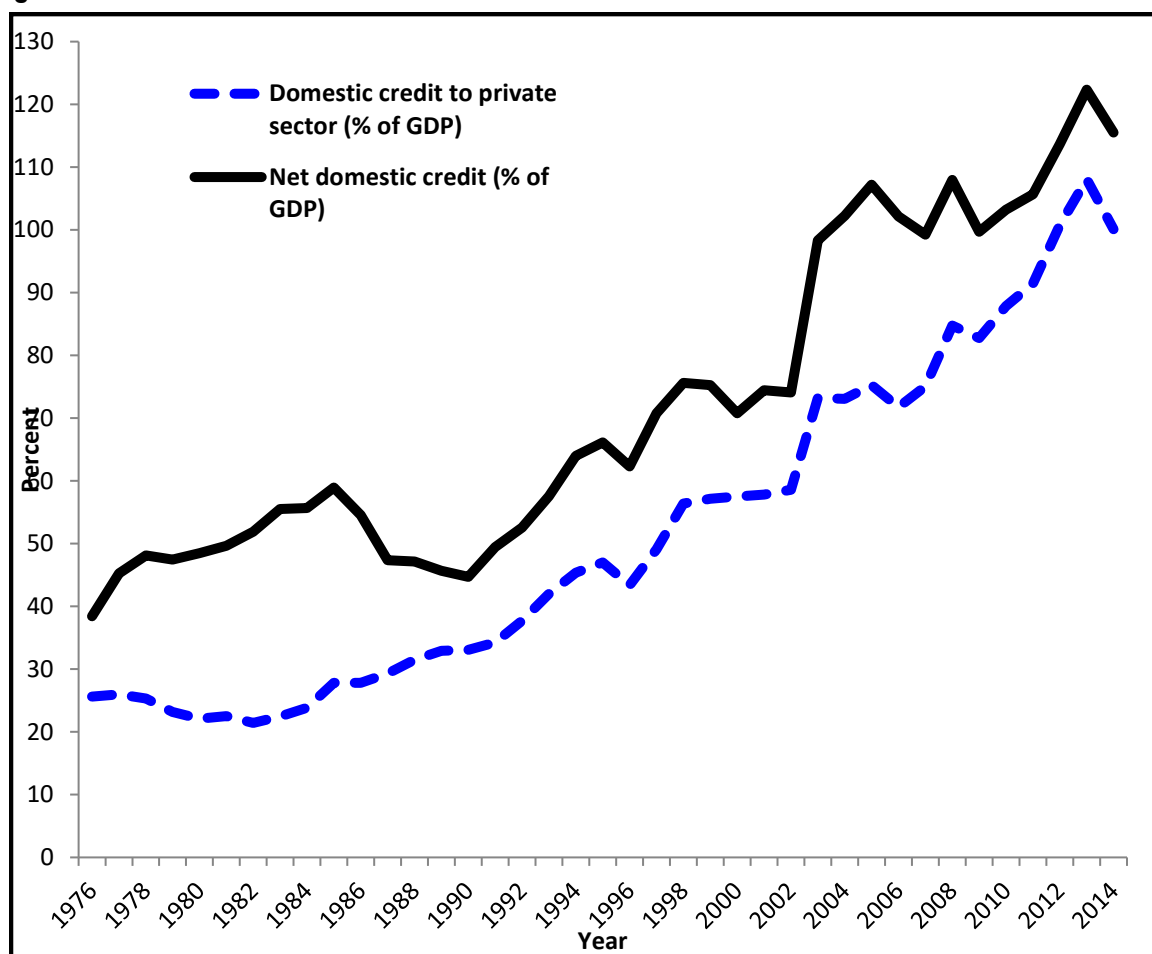
4.4.2.6 Trends on Deposits

The level of deposits relative to the economic output, as a measure of financial development, is expected to be growing as the economy expands and as liberalisation policies are put in place. Deposits to financial institutions are liabilities from which they use to create money from themselves and also earn profit from such financial intermediation. Furthermore, the increased mobilization of deposits relative to the GDP tend to imply confidence with the baking industry and increased efficiency in either payment systems or savings, or both. The two ratios to be used to evaluate if the financial sector is an efficient mobiliser of deposits are the bank deposits to GDP ratio and the bank credit to bank deposits ratio. Expectations on the bank deposits to GDP ratio are that they should be increasing so as to show that there is increased financial development that is reacting accordingly with any movements in national income. The bank credit to bank deposits ratio is expected to be increasing as more deposits are translated into credit otherwise deposits are more of sight deposits than long-term ones or banks are sitting with excess liquidity

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than they should, or both. Figure 4.11 shows the trends in bank deposits to GDP and bank credit to bank deposits for Mauritius from 1960 to 2013.

Figure 4.11: Bank Deposits to GDP and Bank Credit to Bank Deposits (%)
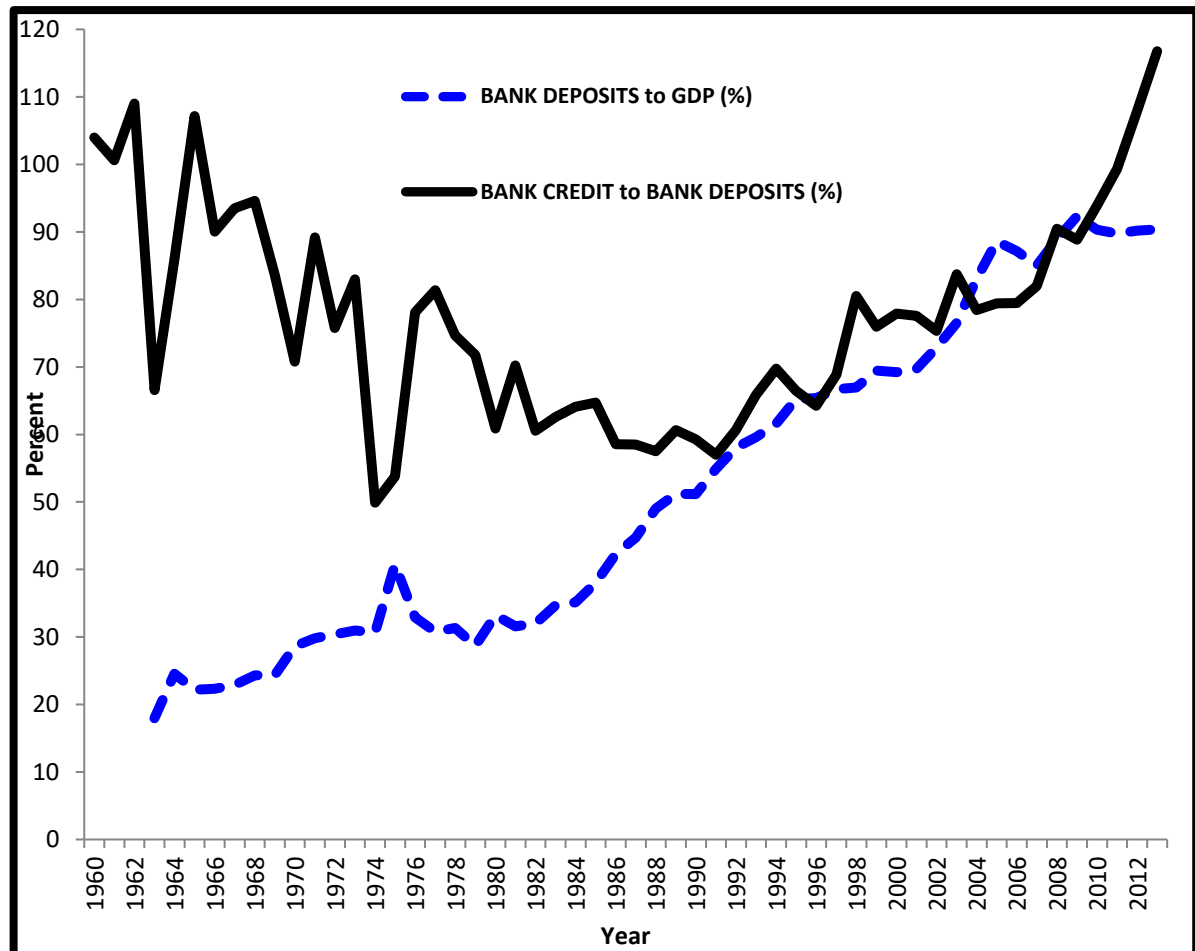
From the above-illustrated trends, though the ratio of bank deposits to GDP started at just above 20% in early 1960s it gradually ascended through the years to 90% by 2011. Notably, the ratio of bank deposits to GDP was increasing at an increasing rate with the advent of financial liberalisation in the mid-1980s from whence it surpassed the 40% mark. By 1993, deposits accounted for more than 60% of GDP. The increasing trend of deposits relative to GDP can best be explained by the opening up of the financial services sector both domestically and internationally (increased offshore banking activities), and to the increasing real interest rate, which was boosted by stable inflation rates.

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On the other hand, the bank credit to bank deposits ratio reveals that the banking sector was far more efficient in converting deposits into credit in the earlier years than it was in the later years. The maximum share of credit it managed to get was 109% in 1962 from thereon it has been having stretches of declines (than inclines) as the ratio of credit to deposits mostly averaged between 60% to 80% for the period 1961 to 1990. From the year 1991 and onwards the ratio of bank deposits to GDP has been on a general ascend though it did not manage to eclipse the levels that existed in the early 1960s. However, it should be noted that the bank credit to bank deposits ratio contains demand deposits, that is, it is the private credit by deposit money banks as a share of demand, time and saving deposits in deposit money banks.

The extent to which demand deposits account for the total deposits might be the reason why the ratio tends to show the inefficiency of money creation by banks. If the bulk of the deposits are short-term deposits, that is, mainly 6-month fixed deposits, call and current account deposits, then the deposit base that financial institutions have to create credit is not sufficient enough due to relatively high sight deposits. The other reason that might have significantly hampered the performance of financial institutions in the provision of credit is the influx of substantial offshore banking-based deposits that are being directed to the capital market rather than the money market. Furthermore, there are a number of non-bank financial institutions that offer products and services that compete directly with those offered by banks, and these form part of the unaccounted-for competition for deposits in the market. Inherently, in the later years, the gap that used to exist between bank deposits to GDP and bank credit to bank deposits has been obliterated as the level of bank deposits continued its ascend.

4.4.2.7 Deposit Money Bank Assets To GDP

Given the increased levels of deposits (liabilities), there is need to evaluate and assess the trends in the asset base of banks so as to review the banking industries capital-adequacy and its internal insurance against creditor-related risk. Therefore, a look at the deposit money bank assets to GDP ratio is done in this section so as to assess if the banking sector is abreast with the happenings in its liabilities side of the balances sheet as it is with its asset side of the balance sheet. As the financial sector expands in credit provision, expectations are that its asset base also has to react accordingly so as to avoid being overexposed to specific types of risks. Furthermore, the deposit money bank assets to GDP ratio gives evidence of the importance of financial services relative to the size of the economy (Beck, Demirgüç-Kunt and Levine, 2010).

Therefore, as the GDP expands, the deposit money banks assets to GDP ratio is also expected to expand. For Mauritius, with its persistent growth in GDP, the financial sector is expected to grow in the same way. Trends on the deposit money bank assets to GDP ratio show the expected trajectory. From the early 1960s through the establishment of the Bank of Mauritius in 1967 to the gradual introduction of financial reforms from the mid-1980s deposit money bank assets appear to have been slowly and steadily increasing taking 20years to increase by 15% by 1984. However, after financial sector reforms, it only took 5 years to achieve the same level of growth as achieved in the last 20years. Financial liberalisation proved to be a worthwhile and beneficial policy move as never-before levels of the deposit money bank assets to GDP ratio were realized. Figure 4.4 shows the trends in deposit money bank assets to GDP from 1960 to 2013.

Figure 4.12: Deposit Money Bank Assets to GDP (%)
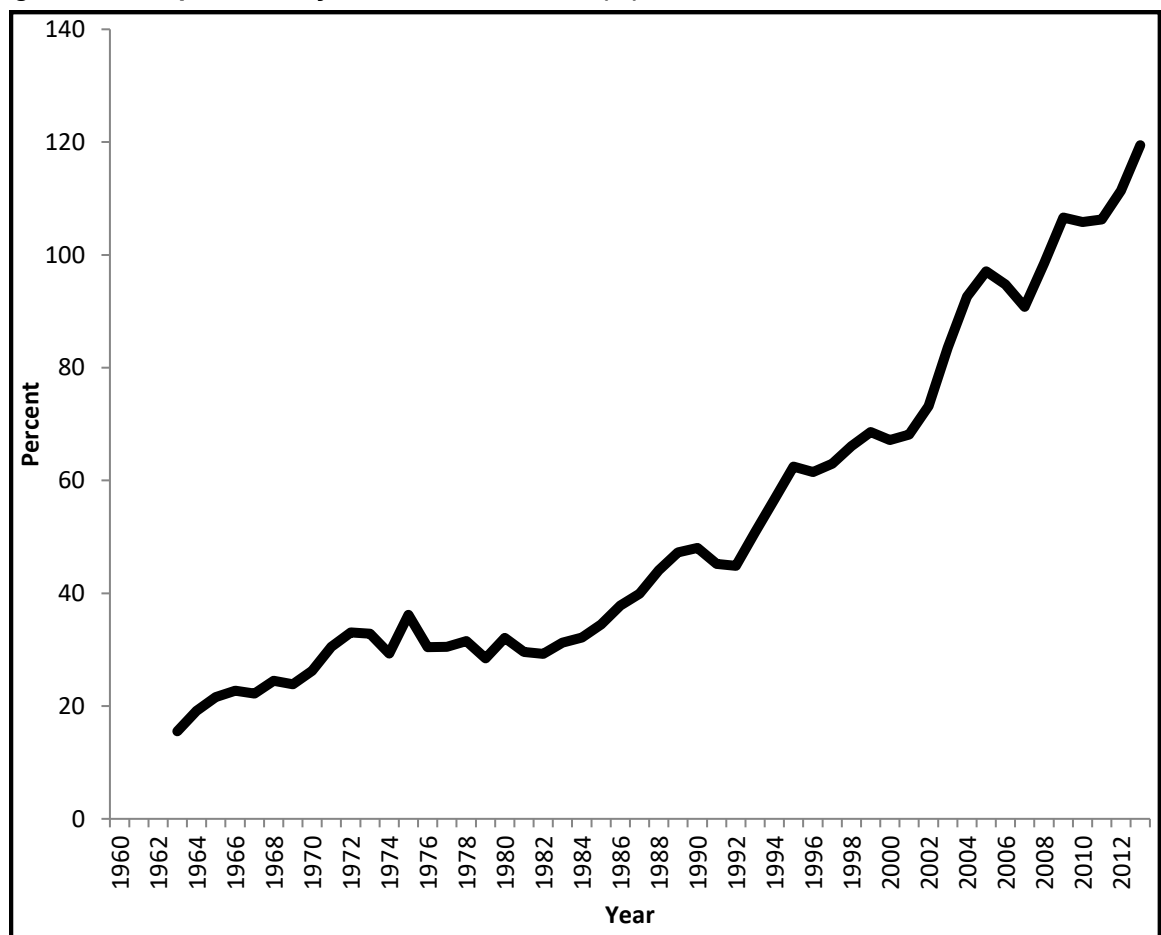
Source: Financial Structure Database- Beck. et al., 2000, 2010, Cǐhák. et al., 2012

By 2011, deposit money bank assets accounted for more than 105% of GDP as compared to 34% in 1984 and 19% in 1964. Therefore, financial liberalisation seems to have enhanced financial development and increased investment in the banking industry.

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4.4.2.8 Other Bank Performance Measures

There are other bank performance indicators that can be employed to assess the profitability, efficiency and performance of the banking sector in Botswana. These include bank overhead costs to total assets, the net interest margin, the bank return on equity, the bank z-score, bank concentration, the bank return on equity, and the bank cost to income ratio. The most recent trends in the net interest margin, bank overhead costs to total assets, the bank average return on assets (Bank ROA), the bank z-score are illustrated in Figure 4.13 while those for bank concentration, the return on equity and the bank cost to income ratio are illustrated in Figure 4.14.

Figure 4.13: Bank Performance Indicators
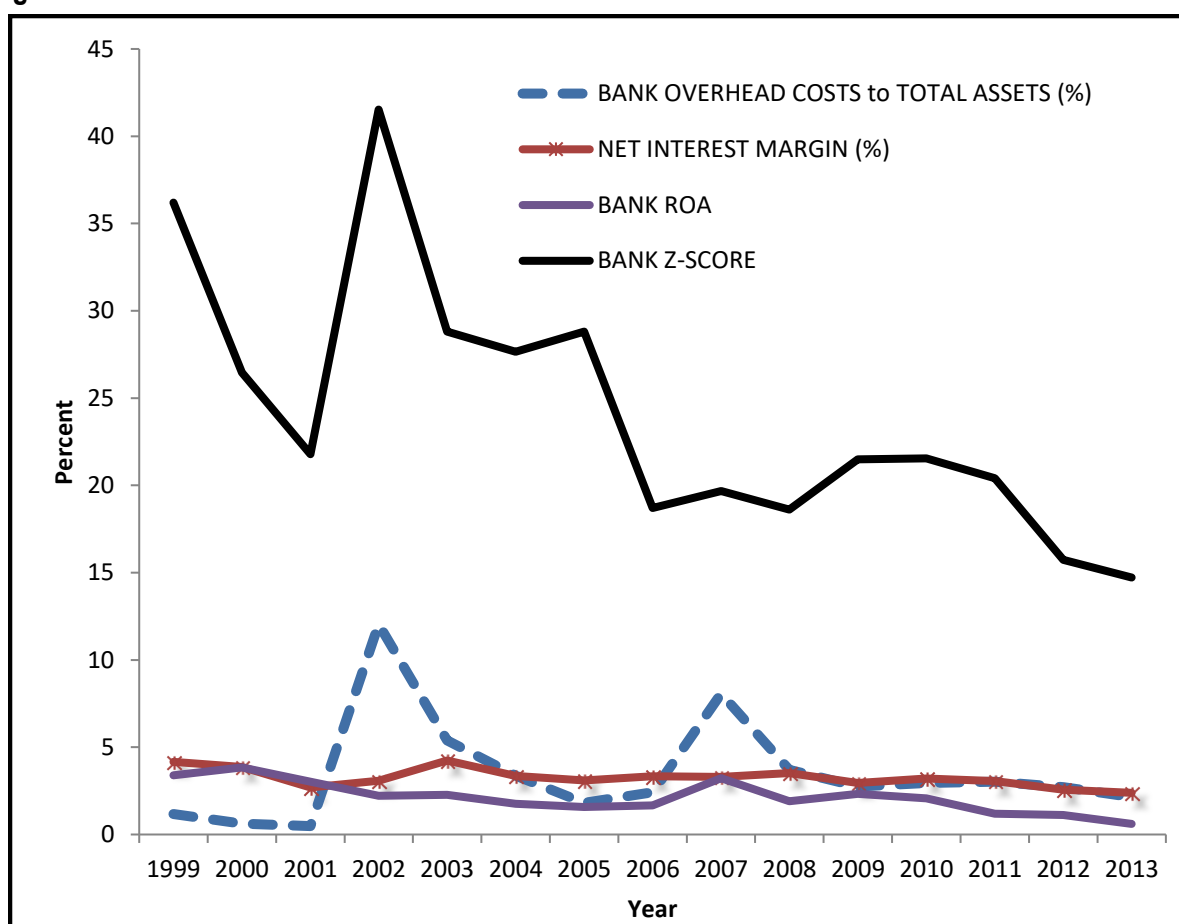
Source: Financial Structure Database- Beck. et al., 2000, 2010, Cǐhák. et al., 2012

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Figure 4.14: Other Bank Performance Indicators
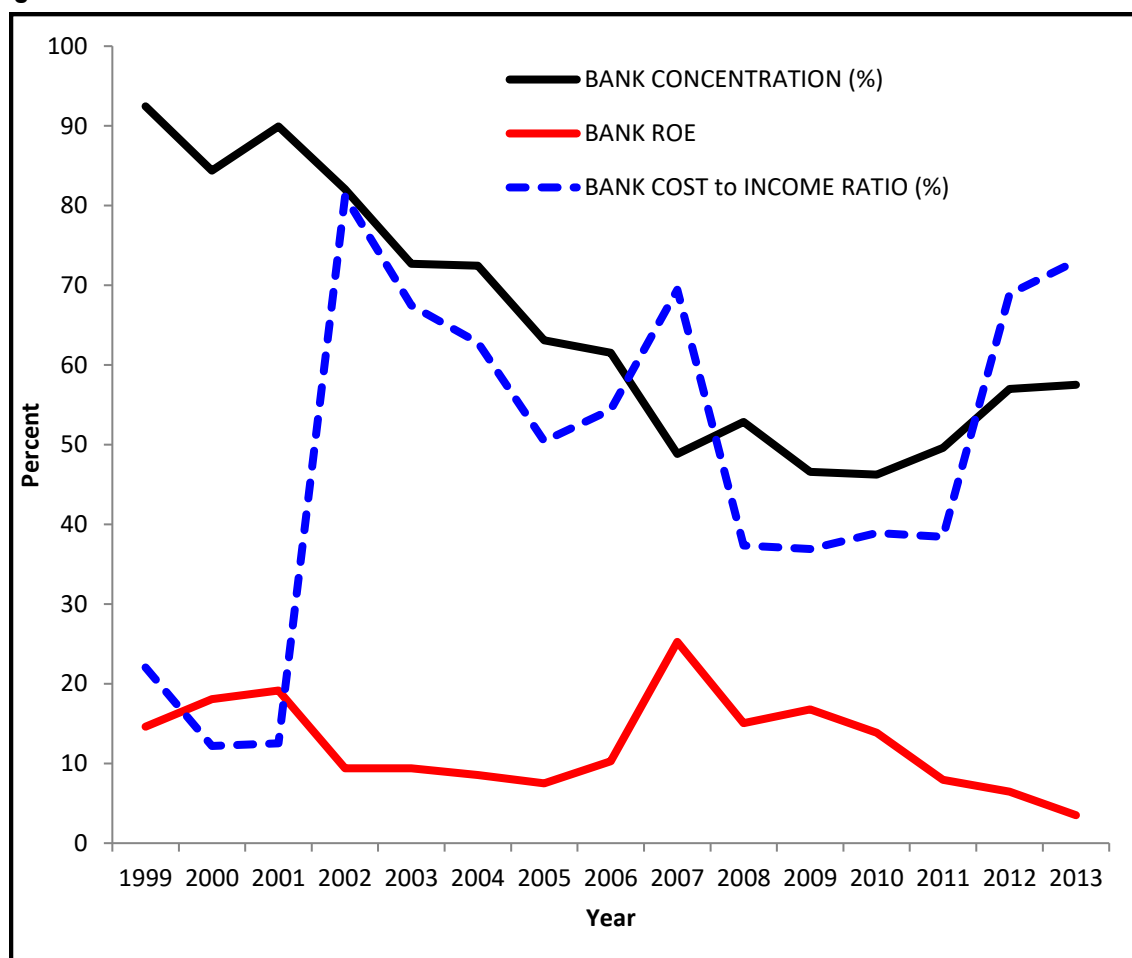
A look at Figure 4.13 shows that banks in Mauritius exist in a relatively stable market , compared to most African countries and some developed nations. The net Interest margin ratio identifies the major income generating capacity of the banks, i.e., the ability to use assets to generate income (the core earnings capability of the bank). The net interest margin for the Mauritius banking sector has remained largely stable due, most likely, to the rising share over this period of treasury bills in total assets and the increased incidence of sight deposits that cannot be used to generate interest income. Implications on the financial sector's competitive structure from the stable net interest margin seem to point to an oligopolistic competitive structure. A look at the concentration level is required so as to validate the existence of oligopoly and its extent thereof.

The z-score reflects the extent to which banks are able to absorb losses and is, therefore, an indicator of banking stability, is the ratio of return on assets plus capital-asset-ratio to the standard deviation of return on assets. The higher the z-score the more stable the bank. The z-

score shows that Mauritian banking sector is more stable than that of South Africa and Botswana because it averages 20% while that of South Africa and Botswana averages 8.1% and 14.1%, respectively for the same period. The stability of the Mauritian financial sector is also proven by the unchanging trends on the average of the bank overhead costs to total assets and the bank average return on assets.

The degree of concentration in the banking sector as measured by the three- bank concentration ratio, which measures the market share of the largest three banks in the economy, shows a noticeable decrease from 92% in 1999 to 50% by 2011(Beck. *et al.*, 2000, 2010, Cihák. *et al.*, 2012). The decreased trend in the concentration ratio can be explained by the increased entry into the banking sector by many banks that seem to have diluted the market. The opening of new banks appears to have induced increased competition and efficiency. The bank cost to income ratio shows a rather volatile trend that has eventually capsized at below 40% levels from 2008 onwards showing greater efficiency than in the latter years. Therefore, the entry of these new commercial banks has made a significant impact on the market structure and the competitiveness in the banking sector.

4.5 Stock Market Development

Following the enactment of the Stock Exchange Act of 1988, the stock exchange of Mauritius was established in 1989 and is known as the Stock Exchange of Mauritius (SEM). The SEM controls three markets: The Official Market, the Development and Enterprise Market (DEM) and the Over-The- Counter (OTC) Market. The basis of the launch of the Stock Exchange was to modernize the financial system of Mauritius with a view to integrate it within the global financial market (Larose, 2005).

The Stock Exchange of Mauritius (SEM) has been subject to on-going changes since its opening in 1989. These include the Central Depository System (CDS - 1997,) SEM's Automated Trading System (SEMATS - 2001) and the secondary market for treasury bills (Larose, 2003).

Market capitalisation has increased tremendously from a mere 11% in 1992 to 70% in 2011(Beck. *et al.*, 2000, 2010, Cihák. *et al.*, 2012). Figure 4.15 shows the trends in market capitalisation, stocks total value traded, and turnover ratio for Mauritius.

Figure 4.15: Market Capitalisation, Stocks Total Value Traded, and Turnover Ratio
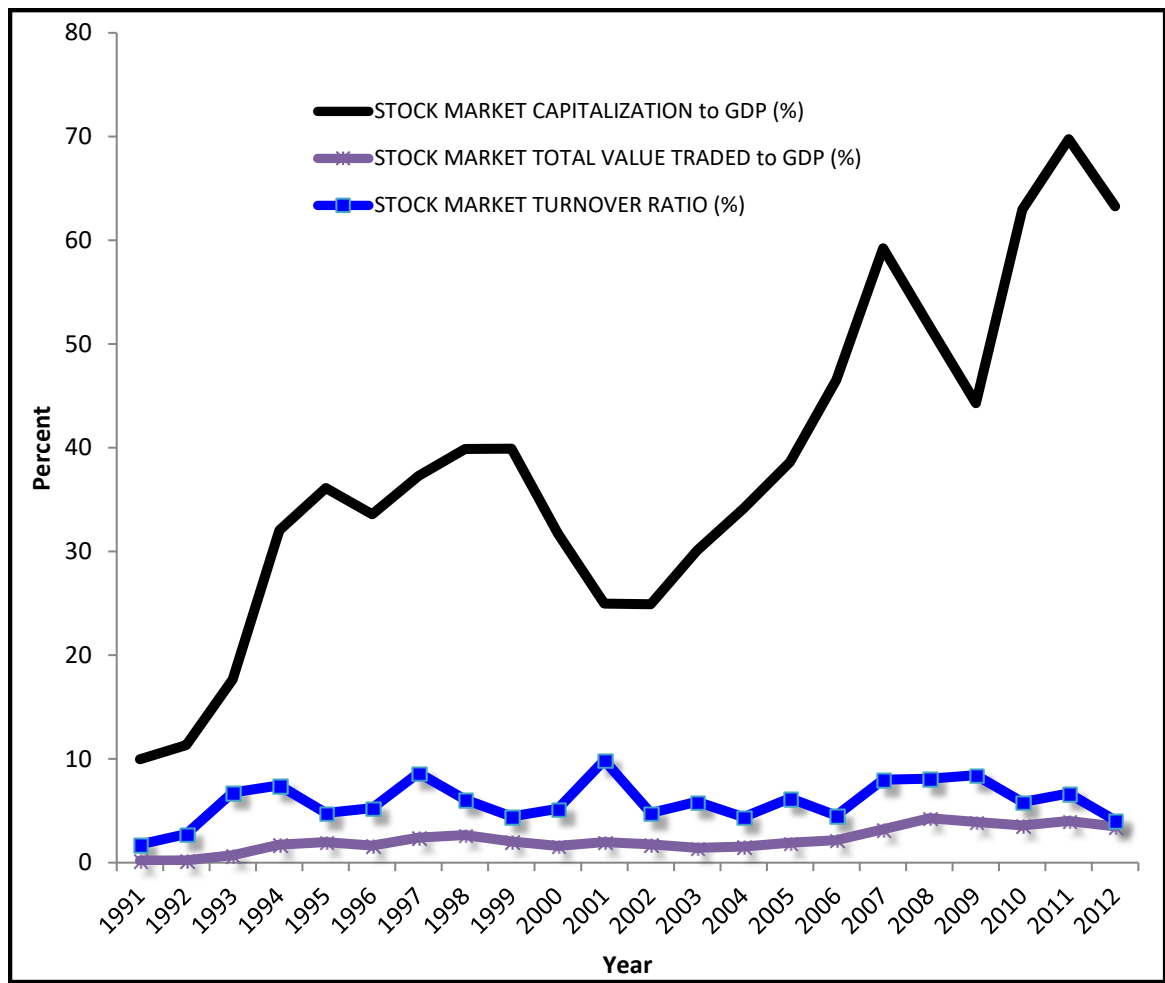
Starting with a modest 10% of GDP as the size of the SEM in 1992, the stock market capitalisation experienced steeped increases to eventually triple its size by 1994. Marginal increases were maintained in the following 5 years. From 2000 to 2002, the market capitalisation levels hit levels of below 25% of GDP, only to resurge again with a maintained upward trend. The upward trend though affected by the 2008 international financial crisis led to the market capitalisation rate reaching a peak of 70% by 2011. Unfortunately, stock ownerships tend to be dominated by sophisticated investors and are not much considered by many households, who are not that financially literate enough and are less knowledgeable of the activities and operation of the stock market.

4.6 Domestic Investment Trends vis-à-vis Savings

Domestic investment trends proxied by the ratio of gross fixed capital formation (GFCF) over GDP show a mixed picture for the period under discussion. From 1979 to 1987, investment levels slumped to below 28% of the GDP only to recover the 28% levels in 1988. From then on to 1994, investment appears to be on an upward trend reaching a maximum of 31% (1994). From 1995, investment levels in relation to the GDP, despite intermittently rising here and there, started to decline. By 2005, the level of investment was now 21% of GDP as compared to the earlier 31% of 1994. By 2012 the level of investment had regained a bit of momentum rising to 23% of GDP only to decrease to 19% by 2014.

The significant improvements in the financial sector have seen the Mauritian private sector increase investment in off-shore financial services, particularly in India and some countries in the Southern Africa region (Phiri and Kannan, 2014). Domestic savings, on the other hand, were declining and low before 1981. From 1981 to 1986 they were on an upward trend starting at 10% of GDP ending at 28% of GDP. Increased savings seem to have induced an increase in investment for the period 1981 to 1986. Though decreasing marginally, from 1987 to 2003, savings were maintained at an average of about 25% of the GDP. From 2004 onwards, the level of savings as a ratio of the GDP has been decreasing ending at 13% of GDP by 2012. Figure 4.16 shows the trends in gross fixed capital formation vis-à-vis gross domestic savings for Mauritius during the period 1977 to 2014.

Figure 4.16: Trends in Investment
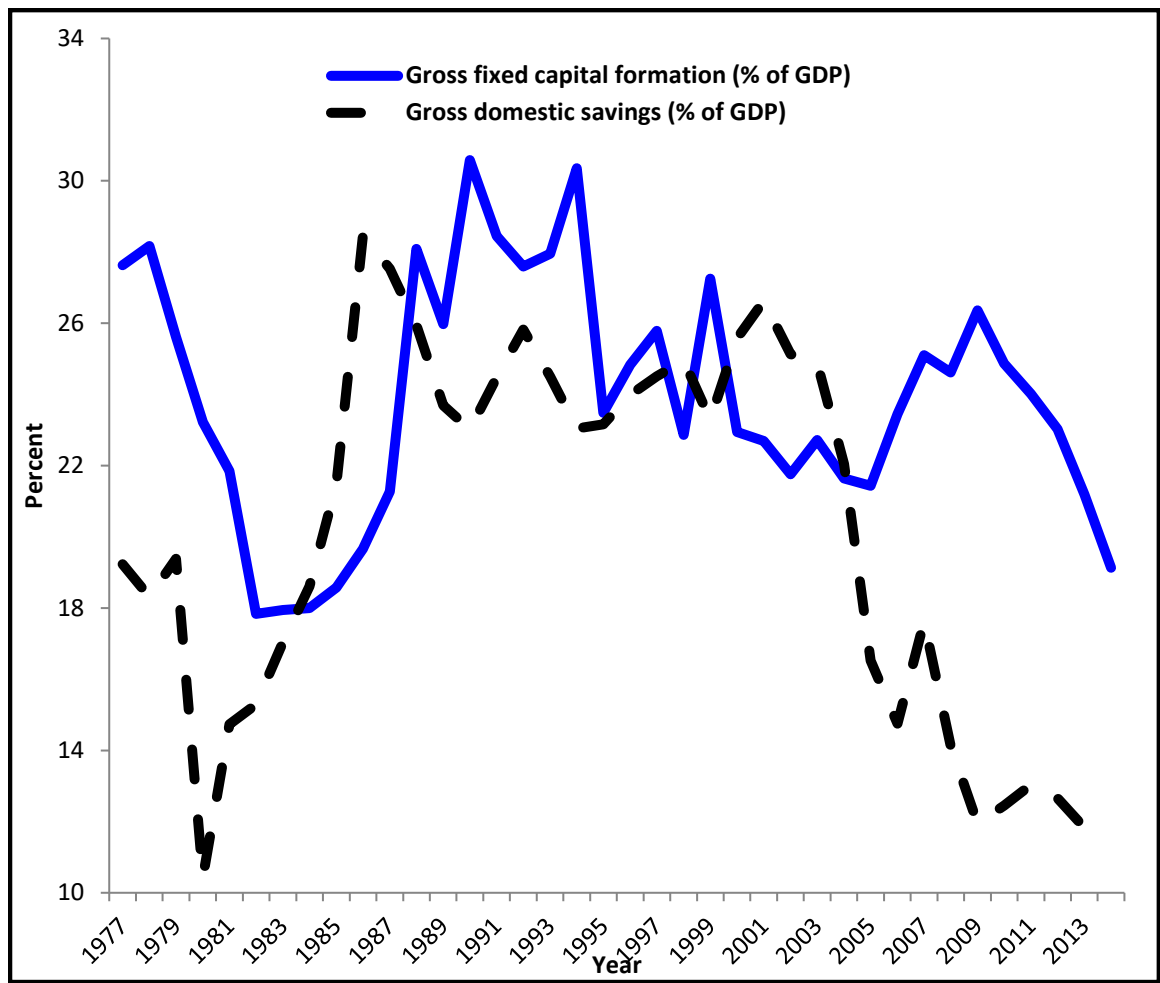
Increased consumption levels fuelled by reduced direct taxes and import duties can explain the decreased savings.

4.7 Conclusion

In this chapter, the notion that Mauritius has passed through numerous financial sector experiences has been demonstrated. Though Mauritius's financial sector eventually managed to overtake the agriculture sector, it needed the stimulus of gradual liberalisation to progress to international levels of financial intermediation. The opening up of the financial sector, domestically and internationally has had several notable benefits to the Mauritian economy. These benefits include financial deepening, banking and supervision standards, enhanced monetary policy framework, advancement of the financial sector in intermediation, credit

provision, increased competition and banking stability. On the other hand, investment has been enhanced and has stabilized in the latter years as compared to the pre-liberalisation period.

CHAPTER 5

LITERATURE REVIEW

5.1 Introduction

This chapter explores the theoretical and empirical literature underpinning the relationship between financial development and investment. The analysis of the related literature gives a foundation upon which one can start from widely accepted principles in evaluating the financial development and investment relationship to empirically test and give a conclusion on the said relationship. The chapter is divided into four sections. Section 5.2 presents the review of related theoretical literature on the finance-investment nexus. Section 5.3 outlines the associated related empirical literature. Section 5.4 gives the concluding remarks.

5.2 Theoretical Literature Review

Financial development *per se* is a term that has been used to mean a number of things in economics though all of them centre on the financial sector. Levine (1997:691) defines financial development, functionally as involving improvements in producing information about possible investments and allocating capital; monitoring firms and exerting corporate governance; facilitation of trading, diversification, and management of risk, mobilization and pooling of savings and easing the exchange of goods and services. These functions of the financial system are taken to influence investment decisions and technological innovations through their influence on savings mobilization and, market organization and centrality. The financial system, as a component of the economy, comprises a number of interrelated components including the legal infrastructure, the markets and the institutions (Hawkins, 2006: 67). The importance of the financial sector is mainly explained, in economics, through its facilitation of investment through capital accumulation and technological innovation that then results in economic growth.

In this section, individual investment and financial development theoretical models that can be augmented to explain the relationship under investigation are discussed. The section is divided into five subsections. Subsection 5.2.1 outlines theoretical growth models that link financial development indicators to economic growth through effects on investment. Subsection 5.2.2 summarises theories that proposed financial liberalisation as a strategy for financial development and give the expected impact on investment. Subsection 5.2.5 gives an overview of possible

investment models that can be used to evaluate the impact of financial development on investment.

5.2.1 Growth Models, Financial Development and Investment

Economic growth models tend to explain how an economy achieves or tends to economic growth by looking at particular variables that induce that growth. Notably, most theoretical growth models tend to propose that savings are translated into investment, which leads to increased economic growth. Therefore, since the mobilisation of savings is one of the functional roles achieved through financial development, it is safe to say that financial development is implied to be an important aspect in achieving economic growth through its impact on investment through the savings-investment nexus. The following sections give a brief discussion of some of the notable theoretical models. Section 5.2.1.1 presents the neoclassical growth models, financial development and investment relationship while 5.2.1.2 covers the endogenous growth models. All these models are discussed in relation to their implied association with financial development and investment.

5.2.1.1 Neoclassical Growth Models, Financial Development and Investment

Neoclassical growth models assert that financial development impacts investment development mostly through channelling mobilised savings into investments. Growth models, in theory, have focused on a number of components so as to explain the eventual advent of economic growth in any economy. Some of the most notable components are capital accumulation, labour force growth, technological progress and population growth. Financial development, savings, government spending, monetary policy and many other issues have been taken in most theoretical discussions as underlying factors to the achievement of the components required for economic growth (Levine, 2005). The Solow neoclassical growth model is one of the well-known models of economic growth that has been discussed extensively in economic literature and that proves the inherent relationship between finance and investment. Following Perkins *et al*, (2001), the illustration of the Solow growth model follows the following deduction.

Starting with a production function that relates total output to the size of the capital stock and the labour force.

$$Y = F(K, L) \hspace{5cm} 5.1$$

Where Y is the total output, K is the capital stock and L is the labour supply.

Assuming that it exhibits constant returns to scale, we can express the production function in per worker terms by dividing it by L and that yields,

$$\frac{Y}{L} = F\left(\frac{K}{L}, 1\right) \qquad 5.2$$

Therefore, equation 5.2 shows that output per worker is a function of capital per worker. In other words,

$$y = f(k) \qquad 5.3$$

Where $y = \frac{Y}{L}$, i.e. output per worker and $k = \frac{K}{L}$,

Equation 5.3 states that the capital per worker is necessary to the growth process. Solow's model assumes diminishing returns to capital, a closed economy and takes savings as a fixed proportion of income, i.e.

$$S = sY \qquad 5.4$$

Where S is the total value of saving, s is the fixed average savings rate, Y still is the total output

Since we are dealing with a closed economy, i.e. assuming all national output is used for either current consumption or investment, savings therefore must be equal to investment.

$$S = I \qquad 5.5$$

Changes in capital stock are made up of new investment less the depreciation, i.e.

$$\Delta K = I - dK \qquad 5.6$$

Where ΔK represents change in capital stock, and d the depreciation rate

In the labour market, we assume that the labour force and the population grow at exactly the same rate,

$$\Delta L = \alpha L \qquad\qquad\qquad 5.7$$

Substituting equation 5.5 into equation 5.4 and then substituting into equation 5.6 yields equation 5.8.

$$\Delta K = sY - dK \qquad\qquad\qquad 5.8$$

That means changes in capital stock are explained by the difference between the saving and depreciation. Dividing both sides of equation 5.8 by K yields,

$$\frac{\Delta K}{K} = \frac{sY}{K} - d \qquad\qquad\qquad 5.9$$

The growth rate of the capital per worker ratio can be expressed as the difference between the growth rate of capital stock minus the growth rate of labour supply,

$$\frac{\Delta k}{k} = \frac{\Delta K}{K} - \frac{\Delta L}{L} \qquad\qquad\qquad 5.10$$

Therefore, equation 5.11 is true, i.e.

$$\frac{\Delta K}{K} = \frac{\Delta k}{k} + \alpha \qquad\qquad\qquad 5.11$$

To get equation 5.11, make $\frac{\Delta K}{K}$ subject of the equation and substitute $\frac{\Delta L}{L}$ with α since $\alpha = \frac{\Delta L}{L}$ (from equation 5.7). Equation 5.11 and equation 5.9 are two specifications of the same subject, therefore they are equal and equating them yields equation 5.13;

$$\frac{\Delta k}{k} + \alpha = \frac{sY}{K} - d \qquad\qquad\qquad 5.12$$

$$\Delta k = sy - (\alpha + d)k \qquad\qquad\qquad 5.13$$

Equation 5.13 of the Solow neoclassical growth model gives an important relationship between savings and investment. Since savings' mobilization is one of the fundamental attributes of the financial sector, then financial development is implied as having a fundamental impact on

investment. Equation 5.13 states that the change in the capital per worker is positively related to the saving per worker (sy) and negatively related to the population growth and depreciation.

Though the Solow neoclassical growth model illustrates the importance of financial development as an important determinant of investment, it has some limitations. From the above illustration, it can be seen that the parameters $s, d\ and\ \alpha$ are assumed to be fixed exogenously and there is no clear explanation of the transmission of savings to investment. Using exogenous variables tends to ignore market inefficiencies, imperfections in capital and financial markets. In developing countries, there is a higher probability of increasing returns to scale which might invalidate the assumption of constant returns to scale as used in the Solow model. The model is also weak in explaining the finance-investment nexus because it focuses on only the determinants of long-term growth, which tends to ignore short and medium-term growth impacts on the economy (Lipsey, 2002).

5.2.1.2 Endogenous Growth models, Financial Development and Investment

Like the neoclassical growth models, endogenous growth models also confirm the finance-investment relationship, though under a different set of assumptions. Endogenous growth models emphasize that liberalisation of markets leads to increased domestic investment. These models assert steady growth can be generated endogenously—i.e., can occur without any exogenous technical progress (McCallum, 1996:53). In particular, endogenous growth models are characterised by the absence of diminishing returns to each factor of production, coupled with endogenous technological change that generates economic growth through the increased investment transmission mechanism. Economists have appreciated the Solow growth model more over the Harrod-Domar model because it allows for substitution between capital and labour (Todaro and Smith, 2011). The traditional Solow model assumed diminishing returns in the use of capital and labour as inputs and constant returns to scale. Capital and labour are assumed to grow at either equal or differing levels, or both through time. For example, total capital stock grows when savings are greater than depreciation. However, capital per worker grows when savings are also greater than what is needed to equip new workers with the same amount of capital as existing workers have. (Todaro and Smith, 2011). Both, the traditional Solow and the endogenous growth models posit that the rate of savings is directly related to investment and the rate of technological progress, and therefore imply a direct relationship between financial development and investment. Though the latter allows for sustained long-term growth, which is absent in the former. Endogenous growth models underscore the importance of financial

development through effectual resource mobilisation and allocation so as to achieve rapid growth by increasing savings and investment. Bencivenga and Smith (1991) give a theoretical example of how financial development, measured as the introduction of financial intermediaries, shifts the composition of savings into investment through the use of endogenous growth models. Endogenous growth models, though having plentiful variations are usually based on externalities resulting from linked capital and knowledge accumulation or, accumulation of human capital (i.e., individuals' workplace skills), and/or continuing growth in innovation in response to private rewards which accentuate the significance of financial development to investment (McCallum, 1996). Examples of various endogenous growth models include Romer's Model, Rebelo's Model, the simple human-capital model, Lucas's human-capital model, Barro's model of endogenous growth with government spending and taxation, Barro's model with endogenous savings and endogenous growth with research and development. Endogenous growth models tend to infer that saving through financial development can lead to persistent investment growth.

Criticisms of endogenous growth theory centre on its dependence on traditional neoclassical assumptions, overlooking influential factors (like market inefficiencies, imperfect capital and financial markets in developing countries) and its focus on only the determinants of long-term growth, which tends to ignore short- and medium-term growth impacts on the economy (Fine, 2000).

5.2.2 Financial Liberalisation, Financial Development and Investment

The effect of financial development on investment has attracted some considerable insight from economists who have come up with many alternative schools of thought. One of the main facets that has gained popularity in macroeconomics is the relationship between financial development that is spurred on by financial liberalisation, and investment. Notable, amongst the advocates for financial liberalisation as an avenue for financial development and in turn investment, is the McKinnon-Shaw framework, Kapur's Model, Mathieson's Model and the Galbis model (Jouan, 2005). The last three (Kapur's Model, Mathieson's Model and the Galbis model) are an extension of the McKinnon-Shaw framework that mainly focuses on the effects of financial liberalisation either on the quantity of investment (Kapur's and Mathieson's Models) or on the quality of investment (the Galbis Model) (Gibson and Tsakalotos, 1994: 584). The discussion of how financial development as explained by financial liberalisation is theoretically postulated as impacting investment is extensively discussed in the following sections. Section 5.2.2.1 presents

the McKinnon-Shaw Framework; Section 5.2.2.2 the Kapur's Model; Section 5.2.2.3 the Galbis Model and; Section 5.2.2.4 presents the Mathieson Model.

5.2.2.1 The McKinnon-Shaw Framework

McKinnon (1973) and Shaw (1973) provided the theoretical background of rationalizing financial liberalisation as a conduit for financial development, hence investment. In the 1960s, government intervention that was spurred on by the Keynesian approach to tackling market imperfections is thought to have led to financial repression. McKinnon (1973) and Shaw (1973) coined the term 'financial repression' which they explained as the incidence of ceilings on deposits and/or loan interest rates. They argued for financial liberalisation, that is, the removal of all explicit controls on price and allocation of credit. Financial repression is taken to lead to below market rate interest rates that tend to reduce savings and investment. However, proponents for financial repression argue that government intervention in the financial sector may be necessary so as to place clear limits on the degree of competition allowed in financial markets, to avoid - the weakening of the risk-return relationship, the loosening of credit limits, falling profits, and the incidence of increased speculative activity. Also, financial repression enables governments to require financial institutions to lend to specific activities and provide credit at subsidized rates and to borrow with ease to finance budget deficits (Graham, 1996).

The works of McKinnon (1973) and Shaw (1973) presumed that growth in a financially repressed environment is hindered primarily by the low level of saving, not the lack of investment opportunities. Controlled interest rates are thought to reveal capital scarcity inaccurately, which in turn stimulates inefficient misallocation of resources. In addition, financial repressive policies tend to discourage efficient risk-taking thereby forcing the financial sector to perform at less than potential. Therefore, the McKinnon-Shaw hypothesis encourages the abolition of interest rate maximums and other financial repressive policies so as to boost financial sector competition which in turn leads to higher savings and investment.

The assumed transmission mechanism of lifting controls on interest rates hypothesizes a natural increase in interest rates (due to increased competition in the financial sector) to levels that stimulate higher saving. If the responsiveness of saving to interest rates is strong enough, a reduction in disintermediation is expected to occur. Within this optimistic framework, financial liberalisation produces higher interest rates and higher savings that, in turn, induce higher and better-quality investment, and, ultimately economic growth (Reinhart, and Tokatlidis, 2003; 57).

The McKinnon and Shaw proposition is best explained by the model of savings and investment developed by Fry (1978) and later elucidated on by Gibson and Tsakalotos (1994) as shown in Figure 5.1.

Figure 5.1 : McKinnon-Shaw Framework
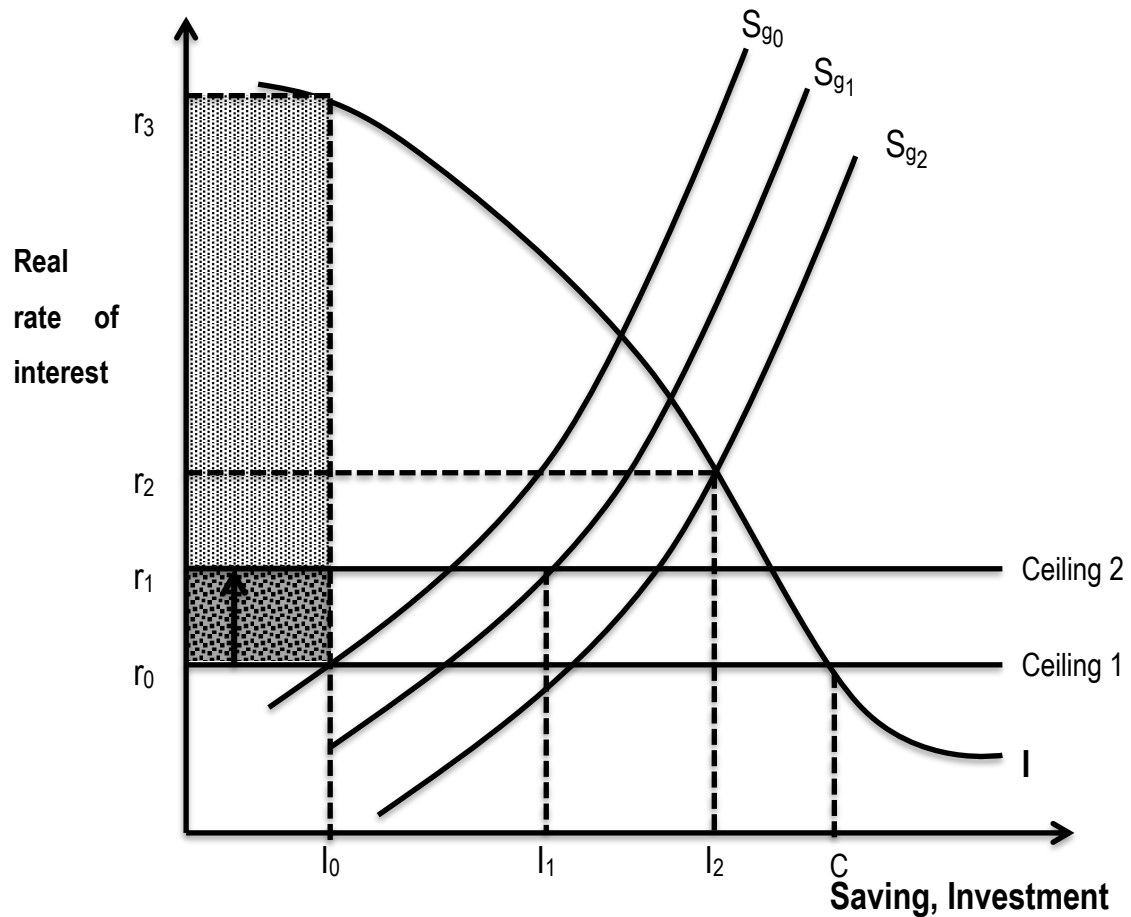
Savings are positively related to the rate of interest and the rate of growth of national income (g), that is

$$S = f(r, g): r > 0, g > 0 \qquad\qquad 5.14$$

The savings function is drawn for given rates of national income (g), that is,

- S_{G_0} represents savings at national income level g_0, where $g_2 > g_1 > g_0$
- r_0 represents the initial ceiling interest rate imposed by government

- investment is negatively related to the interest rate as depicted by the downward sloping curve I. (i.e. $I = I(r)$: $I_r < 0$)

If government imposes an interest rate ceiling of r_0, on all savings with loans excluded, then borrowers would end up facing an interest rate of r_3 (assuming national income g_0) as banks aim to make the highest possible margin on loans and investment-savings levels of I_0 will be realised. The resultant margin made from lending activities ($r_3 - r_0$) would likely be spent on non-price competition (Fry, 1978:467). However, government controls are likely to affect both loan rates and interest rates as they aim at encouraging investment through reducing the cost of borrowing (Gibson and Tsakalotos, 1994: 586). The same level of investment I_0 will be attained, and there will still be unsatisfied excess investment demand (I_0 to C). In such a case, credit will be rationed through the use of non-price factors and some good investment projects will not be financed. Examples of non-price factors include the quality of collateral, perceived risk of failure, political, pressures, name, nepotism, loan size and corruption of loan officers (Fry, 1978; 467). Since loan ceilings discourage risk taking, their institution will lead to the non-financing of a large proportion of potentially high-yielding investments as banks would prefer to provide financing for less-risky projects. Therefore, there will be a tendency to finance investments that yield returns that are just above the ceiling rate (the shaded area just above r_0). If interest rates are allowed to rise from r_0 to r_1, though still below the market equilibrium, this partial liberalisation leads to more availability of resources in the financial sector as savings that were initially outside the formal sector are made available and in the process, investment levels also increase to I_1. The increased interest rates lead to an increase in the efficiency of investment as investors embark on better projects that tend to yield higher rates of return. Therefore, the level of national income increases to g_1 and, in the process causes a shift in the savings function to S_{g_1} hence inducing I_1 investment levels. Therefore, partial liberalisation leads to greater investment efficiency as it discourages the financing of lower yielding investments (the shaded area above r_0 but below r_1) and hence increases the quantity and quality of investment. If full liberalisation is instituted, the same process repeats itself as eventually interest rate and investment levels will settle at the market equilibrium levels of r_2 and I_2, respectively. From the above-illustrated deduction, it is safe therefore to say that interest rate ceilings act as a deterrent to future consumption behaviour (savings-prone behaviour), induce avoidance of financial services due to low interest rates and lead to low quantity and quality of investments as investors will tend to relatively less risky (hence low return poor quality) projects. In addition, financial liberalisation will lead to greater financial development as more and more sound investment projects are financed. Competitive pressures

will be restored in both the financial services provision sector and the investments market which will lead to greater efficiency of investment and financial product provision (Fry, 1978).

Despite their shared understanding on the effect of financial repression on financial development (savings' levels) and investment, McKinnon (1973) and Shaw (1973) had different approaches to the transmission mechanism. The McKinnon analysis rests upon two main assumptions, i.e. each economic unit self-finances (all investment is self-financed) and investment expenditures are indivisible. Therefore, economic units must initially accumulate the money balances needed to finance their projects (Jouan, 2005: 36).

Therefore, according to McKinnon (1973) higher savings rates translate to higher investment. Shaw (1973) focuses more on the debt intermediation side of financial intermediation. Due to the functional role of financial intermediaries, as efficient mobilisers of resources and lowering of costs associated with saver-investor intermediation (operational efficiency), investors and savers tend to benefit from better and more efficient debt intermediation through lower borrowing costs and, higher interest rates and better liquidity, respectively. Therefore, Shaw's argument states that the yields on all forms of wealth, especially money, have a positive effect on the savings ratio, hence also on investment (Jouan, 2005: 38). In summary, McKinnon (1973) emphasises the role of deposits as an avenue to higher savings rate that are then translated into investment while Shaw (1973) emphasises the role of efficient debt intermediation as an avenue to greater investment through increased savings arising from high debt yields. Therefore, both McKinnon (1973) and Shaw (1973) stress the impactful importance of financial development (as explained by levels of deposits and debt intermediation) on investment.

5.2.2.2 Kapur's Model

Kapur (1976) asserts the notion that financial development arising from financial liberalisation is an important determinant of investment. Kapur (1976), following the McKinnon-Shaw framework, assesses the relationship between the quantity of investment and financial market liberalisation. The model is grounded in the hypothesis that financial liberalisation promotes economic growth through its effect on investment. The model examines the impact of financial liberalisation in an economy characterised by underutilised fixed capital and surplus labour. That is, taking the Harrod-Domar aggregate production function:

$$Y = \sigma K \qquad\qquad\qquad 5.15$$

where Y is the real output; K is the total utilised capital and σ is the productivity of capital. Assuming that bank credit is used to finance both the proportion of the cost of replacing worn-out capital and all net additions to working capital, and that bank credit is determined by the deposit interest rate and inflation, Kapur derived the following equation.

$$\gamma = \mu \frac{M}{P.Y} . \frac{\sigma q}{(1-\alpha)} - \pi\theta \qquad\qquad 5.16$$

where,

$\gamma = \frac{\Delta Y}{Y}$ (economic growth)

$\mu = \frac{\Delta M}{M}$ (rate of monetary growth)

$\frac{M}{P.Y} = \frac{Money\ Stock}{Nominal\ GDP}$ (the reciprocal of the income velocity of money)

$q = \frac{L}{M}$(ratio of bank credit to money)

$\pi = \frac{\Delta P}{P}$(inflation)

$\theta =$ the fixed fraction of the cost of replacing worn-out capital and all net additions to working capital

Equation 5.16 shows that the rate of economic growth is positively correlated with the rate of monetary growth μ, the output/capital ratio σ , the ratio of loans to money q and the ratio of utilized fixed capital to total utilized capital α (Fowowe, 2013).

By using Cagan's money demand function, Kapur transforms equation 5.16 into equation 5.17 below:

$$\gamma = \frac{\mu\sigma q}{(1-\alpha)} e^{a(d-\pi^e)} \qquad\qquad 5.17$$

where:

d = deposit rate

π^e = expected inflation

Kapur goes on to argue that in a financially repressed economy, μ is above the equilibrium value of the rate of money growth and therefore, this leads to decreased economic growth. Inflationary tendencies come into play, more money is used in financing working capital and less credit is allocated to financing investment. Therefore, a smaller banking sector leads to a lower rate of

capital accumulation (Jouan, 2005: 50). The presence of the deposit rate in the exponential function shows that as the deposit rate increases, real money demand increases, increasing the supply of credit, hence the quantity of investment also increases. Therefore, Kapur's model expands Shaw's analysis by considering the transmission from interest rate rises to increased investment while focusing on working capital as an important link between finance and investment. Kapur (1976) asserts the notion that financial development arising from financial liberalisation is an important determinant of investment.

5.2.2.3 The Galbis Model

The relationship between financial development and investment is taken a step further by Galbis (1977) as he discusses an economy comprising two production sectors with broadly different technologies and financial constraints but produce the same output that is sold at the same price. According to Galbis (1977) in agreement with the McKinnon and Shaw framework, what is required for increased quality in investment is financial development, which is explained as a consequence of financial liberalisation. The model is based on McKinnon's choice of technique approach to analyse the effect of financial repression on the average efficiency of capital that is the efficiency of capital (Mohieldin, 1995: 29). Sector 1 is taken as the less efficient sector while Sector 2 is the more efficient one. Given that the output and price of the output of both sectors is the same, that means their most notable difference is the efficiency of investment (differences in technology) in each sector. Following the ascribed deduction of differences in technologies postulates that they are two different production functions for the two sectors which are specified as:

$$Y_1 = F_1(K_1, L_1) \qquad\qquad 5.18$$

$$Y_2 = F_2(K_2, L_2) \qquad\qquad 5.19$$

Equation 5.18 and 5.19 give a representation of two different technologies used to produce the same output that exist in one economy.

Assuming that the production functions are continuous, twice differentiable and competitive conditions exist in each sector gives the following returns to capital;

$$\partial Y_1 / \partial K_1 = r_1 \qquad\qquad 5.20$$

$$\partial Y_2 / \partial K_2 = r_2 \qquad\qquad\qquad 5.21$$

Since Sector 2 has already been assumed to have higher quality investment, it is imperative to assume that it has higher rates of return to the factors of production, therefore;

$$r_2 > r_1 \qquad\qquad\qquad 5.22$$

Taking equations 5.18 and 5.19, and coming up with the total income earned in the whole economy (assuming full employment of factors of production and payment of marginal productivities), with the aid of Euler's theorem, Galbis (1977) derives the following equation;

$$Y = Y_1 + Y_2 = r_1 K_1 + w_1 L_1 + r_2 K_2 + w_2 L_2 \qquad\qquad 5.23$$

$w_1, \ L_1 \ and \ w_2, L_2$ represent the wage rate and the quantity of labour employed in Sector 1 and Sector 2, respectively.

Equation 5.23 gives the basis upon which production factors can be moved from one sector to the other. For example, assuming unchanging capital stocks, the movement of capital from Sector 1 to Sector 2 would result in in increased income (Y) since Sector 2 is more efficient in factor usage.

Savings in both sectors are taken as the difference between income and consumption (the addition of the marginal propensity to save and to consume adding up to 1). Sector 1 – the relatively inefficient sector is composed of small self-financing units who have no access to the capital market and their only available financial asset is their deposits with commercial banks. On the other hand, Sector 2 depends on its savings (non-consumed output) and the savings/deposits in commercial banks from Sector 1. This means that Sector 2 cannot fully finance its investments without the only option of taking on bank credit.

From the above sectoral analysis, the size of the deposit rates in the relatively inefficient sector is of paramount importance in the realization of better-quality investment. If the government, through monetary policy and other forms of financial repression causes the deposit rate to be below the market equilibrium rate, it will provide an incentive for economic agents in Sector 1 to have preference to invest more in their relatively inefficient investment projects rather than depositing money into the banking sector. This will tend to stifle credit provision to Sector 2 (due

to reduced quantity of loanable funds), which is highly dependent on bank credit for its investment projects. Therefore, Sector 2 will only depend on savings to finance its investment projects. In such a case, financial repression has led to an increase in low quality investment projects. Financial liberalisation through interest rate liberalisation is assumed to lead to higher interest rates on deposits. This increases the demand for deposits in Sector 1, hence leads to a reduction in low quality investment for bank interest will be a higher return on investment as compared to the usual self-financed investment backward sector projects. The increased money balances from Sector 1 are channelled by the banks to Sector 2 (which is highly dependent on bank credit for funding) (Galbis, 1977). Therefore, when compared with the scenario of low deposit rates, the same quantity of investment has been maintained but the difference is the quality of investment. Investments in Sector 2 yield higher returns and higher output (see equation 5.22) and hence augment the average rate of return on aggregate investment. Consequently, according to Galbis (1977) in agreement with the McKinnon and Shaw framework, what is required for increased quality in investment is financial development, which is explained as a consequence of financial liberalisation.

5.2.2.4 The Mathieson Model

The Mathieson Model, like the McKinnon and Shaw framework, emphasizes the need for financial development through financial liberalisation so as to induce increased investment. Mathieson (1979) advocates for interest rate liberalisation so as to achieve credit market equilibrium in the midst of stabilization policy. Starting with the Harrod-Domar aggregate production function (equation 5.15 in Kapur's model) in a labour-surplus economy, which produces consumption and investment goods, a distinction of the domestic goods market and the foreign goods market is made. Financial markets are taken as consisting of the banking system alone and are assessed in terms of the proportion of all additions to physical and working capital holdings financed by credit from the banking system. Therefore, the implication is that savings will be dependent on return on capital and the real loan rate (i.e. the inflationary effect accounted for). Given that physical and real working capital are utilised in fixed proportions, implications are that the relationship between savings and the additions to the sum of physical and real working capital stocks are explained as follows;

$$\dot{K} = s(r_K - r_L + \Pi_G^e)Y \qquad\qquad 5.24$$

with

$$\frac{\partial s}{\partial (r_K - r_L + \Pi_G^e)} = s' > 0, \frac{\partial^2 s}{\partial (r_K - r_L + \Pi_G^e)^2} = s'' < 0$$

where

$\dot{K}$ represents the additions to the sum of physical and real working capital stocks

Y is the real output

s is the savings ratio

r_K is the return on capital

r_L is the nominal loan rate

Π_G^e is the expected rate of inflation, therefore $r_L - \Pi_G^e$ is the real loan rate which gives $r_K - r_L + \Pi_G^e$ as the difference between the return on capital and the real loan rate

Therefore, equation 5.24 determines the rate of growth of investment and the demand for new loans. If the return on capital is less than the real loan rate, there will be disinvestment in the economy (assuming its in the short run and the savings ratio is still positive). However, if the savings ratio is negative (dissaving) then most of the investment will be focusing mainly on working capital with little or no investment in physical capital. To ensure that there is sufficient investment and credit market equilibrium, Mathieson (1979) advocates for financial liberalisation that is theorized to increase financial development and in tandem increase the real return on deposits. The increase in the real return on deposits is assumed to lead to an increase in the quantity of investments as investors benefit from the availability of loanable funds in the banking sector. Thus, according to Mathieson (1979), financial development through financial liberalisation has a positive impact on investment.

5.2.3 Investment Models

Investment is, has been and shall continue to be an important aspect in economic literature and of economics in general. Theoretical models of investment in economics can, generally, be divided into two fields of study, that is, micro and macro. The micro-models of investment concentrate more on firm-level investment behaviour while the macro-models tend to concentrate on aggregate investment. Given that the study under review is focusing on national aggregates, a composite study of the probable investment models that can be used to evaluate the impact of financial development on investment at a macro-level will be discussed in this section. However, it is noteworthy to mention that it is possible, given plausible underlying assumptions, to generalise a micro-investment model into a macro investment model, for example, by assuming that the whole economy decides on its investment decisions in the same

way a single firm does its decisions. To specifically delimit the breadth of this study there is need to define investment and differentiate the types of investment. Investment can be defined in a number of ways depending on who is defining it, their profession, the context from which they are defining it and more so the purpose for which they are defining it. For example, a portfolio manager can take the purchase of already existing financial assets as investment but to an economist that is just a change in ownership as it has not led to any real change in income for the whole country. Also financial assets are financial liabilities to others, hence they tend to balance each other out with no incremental benefit to the economy. Therefore, in economics, investment can be defined as any transaction that leads to an increase in the real wealth of an economy or it is a representation of an increase in wealth arising from a change in the capital stock.

The types of investment that exist in an economy can be divided accordingly as durable and non-durable investment, inventory investment, public and private investment, long-term and short-term investment, fixed investment and residential investment (Gordon and Veitch, 1986). The three main types of investment can be summed up as:

- Business fixed investment – summarised as businesses or government spending on equipment and structures for use in production.
- Residential investment – purchases of new housing units by occupants or landlords.
- Inventory investment – the value of the change in inventories of finished goods, materials and supplies including work-in-progress (Auerbach, 1993).

The first two types of investment are usually long-term in nature and are often reported on in economics as fixed investment and more recently are divided into public and private investment, and/or foreign direct investment. Inventory investment is usually reported on as a residuum, i.e. changes in inventories and it is usually short-term in nature.

All these types of investments are usually financed, in general, through internal funding and/or financial markets (the capital market and the money market) for a specified cost to the financier. The cost might be foregoing consumption (internal funding), interest payments, dilution of profit-share ratios and loss/gain of leverage. However, all these financial processes are some of the fundamental reasons for the existence of the financial sector. Therefore, the development of the financial sector has an implied importance to investment. Thus, the discussion of theoretical models that explain what impacts investment and how, are discussed herein. Five theories of

investment are discussed, that is, Tobin's Q-theory, Kalecki's theory of Investment, the neoclassical theory of investment, the accelerator model and the flexible accelerator model.

5.2.3.1 Tobin's Q-theory

Tobin (1969) developed the q-theory as an explanation of the determinants of aggregate investment. The q-ratio, which is used to advance the q-theory, is defined as the market value of firms divided by the replacement cost of the firm's assets, i.e.,

$$Q = \frac{market\ value\ of\ the\ economy's\ capital\ stock}{replacement\ cost\ of\ the\ economy's\ capital\ stock}$$

Tobin (1969) in defining the q-ratio used of the value of capital as revealed in the stock market. If the total market value of a firm's stocks and bonds exceeds the cost of replacing all of the capital it owns, this implies the value of its capital is greater than the cost of acquiring it. If the market value of the company is greater than the cost of replacing its capital (q greater than one) it should invest in new capital. If the market value is less than its capital replacement cost (q less than one) it should not invest in new equipment.

The incentive to invest in new real capital is taken to be a positive function of Tobin's q-ratio. As the value of the stock market increases relative to the total stock of real capital, then the rate of investment should increase. That is, a q in excess of one means that investors on the stock market are prepared to pay more for a claim to a unit of real capital than it costs the firm to buy and install it. Therefore, firms have the incentive to invest. In other words, the q-theory implies a relationship between financial development and investment through the stock market. A situation where investors are prepared to pay more for a claim to a unit of real capital than it costs the firm to buy and install it implies that the return on capital investment is expected to be greater than its cost. Therefore, the performance of the stock market must be kept at a level that gives credence to the investments done in it. The deduction from the q-model is that the rate of investment is an increasing function of the q-ratio. The stock market is postulated as directly related to investment. The transmission mechanism can be exemplified in a number of alternative ways. If investor confidence on the profitability of capital is low, stock prices would be expected to fall, inherently causing a decline in the q-ratio and hence shifting the investment function downwards. Alternatively, a fall in stock prices arising from a non-advancing stock market advancement initiative (no or little financial development) would result in loss of wealth, change investor market perceptions and induce a downward shift in the investment function. The q-theory, like all other theories of investment, links the return on capital accumulation to the level of investment with the

vehicle for investment being the financial markets. Therefore, financial development is ascribed as an important determinant of investment though for the q-theory the onus is only on the stock market and not on the financial sector as a whole (Eklund, 2013).

The measurement of the q-ratio has been relatively problematic in nature, as many economists have ended up using the average q-ratio than using the marginal q-ratio (Gurler and Yurtoglu, 2003). The main drawback being that it is very difficult to get data on the value of a marginal unit of capital but it is easier to estimate the average q. The average q on the other hand is a less appropriate measure of Tobin's q-ratio since average measures tend to confuse average and marginal returns and is not straightforward to interpret. Hayashi (1982: 226) has alluded to the average q being a valid proxy for marginal q when four assumptions are met: that firms operate in perfectly competitive product and factor markets, that firms also have linear homogenous production and adjustment cost technologies, that capital is homogenous, and that investment decisions are separable from other real and financial decisions. The assumption of perfect competition and homogeneity in production are acutely improbable in nature for most countries. Therefore, the use of the q-theory, especially for developing countries where such data is hard to come by, is problematic.

5.2.3.2 Kalecki's Theory of Investment

Michael Kalecki was a Polish economist who advanced indirectly discussed issues spanning the role of financial markets and of liberalisation of capital flows, with the purpose of trying to identify their influence on economic growth, unemployment and income distribution (Saywer, 2004). Kalecki's concept of effective demand model was developed before Keynes and it was different in a number of significant elements, particularly its emphasis on the significance of income distribution, social classes and prices in the determination of income (Laski, 1987). The main thrust of Kalecki's theory of investment is that it differentiates between investment decisions and investment expenditures. It should be noted, however, that Kalecki in his over 250 publications presented a number of additive theories to his initial investment theory. Of note, is the terse role of money and finance in his analysis of investment. The rate of interest was taken as a monetary phenomenon that could not be taken as a mechanism for bringing about investment through savings. Investment is postulated as being able to finance itself despite the level of the rate of interest because investment tends to automatically bring into existence an equal amount of savings (Sawyer, 2004: 53). Kalecki's theory explains investment decisions as a direct response

to either an increase or decrease in purchasing power in the economy. The Kalecki theory of investment, money and finance made the following summarized assertions (Laramie *et al,* 2004, Sawyer, 2004):

- The extent to which there will be an increase in investment in the economy depends on the reaction of the banking system (especially the central bank) to every increase in the demand for investment funds (credit). For example, if the rate of interest on credit was to increase faster than the increase in gross profitability in the economy, then, according to Kalecki's theory, the rate of interest will be prohibitive to the rise of investment.

- Kalecki's theory states that investment tends to finance itself. The financing of investment by investment is explained as a circle that starts from the investor borrowing money to invest from the banking system. Assuming a closed economy and that workers do not save, the money will be spent on capital goods and it will be received by other investors in the economy (the sellers of the capital goods) in the form of profits. Profits are then used to pay off a debt and/or are deposited as savings in the bank. Therefore, the gross profits of an economy tend to finance their own initial investment. This gives credence to the first assertion of a prohibitive interest rate vis-à-vis gross profitability.

- Banks are taken to have their balance sheet made up of mainly unused deposits, investment reserves and money in circulation. Unused deposits are used for investment only when there is an excess demand of investment orders over the production of investment goods. In other words, for a balanced balance sheet to be maintained an increase in the assets (investment reserves) should be matched by an increase in liabilities.

- The transactionary demand for money and the speculative demand for money is dependent on the interest rate. If the interest rate on credit is sufficiently greater than the interest rate on deposits then bank credit operations will expand as deposits are converted into credit because of the incentive to invest rather than to keep unused deposits.

- Interest rates are implied as being determined by the value of transactions and the supply of money by banks i.e. their relationship could change at any time. Therefore, the spread between interest rate on loans and that on deposits can change at any given time (financial freeplay).

- Rather than the usual - deposits lead to greater credit provision understanding of financial development (supply leading argument), Kalecki's theory of investment and

finance tends to advocate that the demand for bank loans determine the volume of bank deposits. As investors (explained using government as an example) continue to borrow from banks with varying interest rates, the level of deposits is expected to react to the increased demand for financing. Therefore, an increase in investment leads to greater transactions demand and the level of credit provision tends also to increase.

- There is increasing risk associated with borrowing on the part of the firm. According to Kalecki's principle of increasing risk, it is better for any firm in the economy to finance new investment through its own profits other than use loans and/or shares. The use of either loans or shares leads to increasing risk for the firm. Loans tend to make the firm susceptible to creditor demands and increased interest burden if not well planned for. Getting financing through shares tends to expose the firm to a higher risk of their share price eventually falling as the rate of gross profit for the firm becomes relatively lower than the deposit rate or that of other firms.

Therefore, in Kalecki's theory of investment, the banking sector plays a passive role (Laramie *et al.*, 2004: 149). Despite alluding to the need for the banking system and its decisions on the stock of money, the non-bank public money demand characteristics, the loans-balance sheet-interest connection and differentiating money as a medium of exchange and as a store of value, Kalecki's theory purposefully does not emphasize the role of financial factors in influencing investment, that is, as postulated by Laramie *et al* (2004: 157);

$$I_{t+\mathrm{T}} = e(1-\alpha)P_t + r\left[\frac{(n\Delta P_t + \partial P_t)}{\pi - I_t}\right] + B(t) \qquad\qquad 5.25$$

where

$I_{t+\mathrm{T}}$ represents investment expenditures at time *t*+T

e represents the proportion of entrepreneurial savings (the difference between profits and capitalist consumption) that is invested

P represents profits

ΔP_t represents changes in profits at time t, with n being the fraction of the increase in profits used to finance new investment

∂P_t represents the transfer of profits from new to old equipment,

$\frac{(n\Delta P_t + \partial P_t)}{\pi - I_t}$ represents the difference between investment that yields the standard rate of profit and actual investment

r therefore, measures the intensity of the reaction of entrepreneurs to the difference between investment that yields the standard rate of profit and actual investment

$B(t)$ measures the effect of past economic, social and technological improvements on investment.

In addition, since Kalecki's investment theory is mainly concerned with investment decisions and investment expenditures, it has been taken as a short period analytic model especially when including financial constraints and credit relations in the model (Laramie et al, 2004: 150).

5.2.3.3 The Neoclassical Framework to Investment

The neoclassical theory of optimal capital accumulation models investment as the adjustment of a capital aggregate to an optimal level, assuming profit-maximization, perfect competition, and well-behaved neoclassical production functions (Fazzari and Mott, 1986:171). According to Eklund (2013), the neoclassical investment function can be modelled as follows;

$$I_t = K_t^* - K_{t-1}^* \qquad\qquad 5.26$$

K_t^* represents the optimal capital stock at time t.

Therefore, investment is the difference of the optimal capital stock between two periods. However, the optimal capital stock K_t^* is defined as follows;

$$K_t^* = \frac{p\theta Y_t}{c} \qquad\qquad 5.27$$

where,

p is the price of output

θ is the coefficient of Y in the term for the marginal product of capital $(\theta Y / K)$

Y_t is the output level at time t

c is the user cost of capital

Substituting 5.27 into 5.26, gives us;

$$I_t = \frac{p\theta Y_t}{c} - K^*_{t-1} \qquad\qquad 5.28$$

Equation 5.28 shows that there is instantaneous adjustment of the actual capital stock towards the optimal capital stock. Neoclassical theory assumes that capital adjustments are immediate and complete; hence the neoclassical investment function is eliminated. Therefore, the neoclassical theory to investment rather becomes a capital theory rather than an investment theory (Eklund, 2013). One major drawback of the neoclassical investment function is that it does not clarify how the actual capital stock adjusts to the optimal capital stock. However, if one were to assume partial adjustment, the theory can be adopted as an investment theory, which stipulates that investment is mainly impacted by financial development through the user cost of capital and the price of the output.

5.2.3.4 The Accelerator model

The accelerator theory of investment, like the neoclassical theory, relates investment to national income (output). Clark (1917) first suggested the acceleration principle. It is an alternative case of the neoclassical theory of investment where the price variables have been reduced to constants (Eklund, 2013). The accelerator model begins with the assumption that the firm's desired capital-output ratio is constant. Therefore, the theory states that the level of the desired capital stock is proportional to the level of output, that is;

$$K^*_t = \alpha Y^*_t \qquad\qquad 5.29$$

There is a fixed relationship, explained by α, the optimal capital-output ratio (also known as the accelerator coefficient), between the desired capital stock K^*_t and the expected future output Y^*_t. Assuming zero depreciation, if the difference between the capital stock which firms started with, K_{t-1} and the desired capital stock is incurred in a particular fixed period then net investment is given by;

$$I_t = K^*_t - K_{t-1} = \alpha(Y^*_t - Y_{t-1}) \qquad\qquad 5.30$$

Therefore, a positive surge in the output growth rate is required to accelerate the level of investment. The main insight that the accelerator theory provides is its emphasis on the role of

net investment as a disequilibrium phenomenon. That is, the resultant effect when the stock of capital differs from what firms and households would like it to be (Lipsey and Chrystal (1997)). The accelerator theory is a model that extrapolates the change in the past period's output into the future in determining investment spending. In other words, it is one of the first models that took expectations into consideration in assessing trends in investment. Its usefulness in explaining the finance-investment relationship is rather limited given its myopic view of expectations and its exclusion of financial variables and depreciation in explaining investment. The model's major shortcomings are in assuming a fixed capital-output ratio, failing to consider the issue of expectations when coming up with the next period's desired level of output and the notion of gradual adjustment of the capital stock to the desired one which might happen in more than one period as assumed by the model (Jorgenson, 1971). For these and other reasons the simple accelerator theory has been found, empirically, to provide a relatively poor explanation of changes in investment.

5.2.3.5 The Flexible Accelerator Model

Alternatively, the flexible accelerator theory has been adopted more often than the simple accelerator model. The flexible accelerator model was propounded by Chenery, H.B (1952) and Koyck, L.M (1954) (Jorgenson, 1971). The model is based on the accelerator model but in addition, it focuses more on the time structure of the investment process. It assumes that the expected (desired) future output is a function of past output levels. According to the flexible accelerator principle, the adjustment of the capital stock to be desired level is not instantaneous because of delivery lags and delayed response to changes in the level of demand. Desired capital changes are transformed into actual investment amounts through the use of geometric distributed lag functions. That is, the desired output is taken as a function of past output levels with geometrically declining weights associated with these past output levels. Then by making use of the Koyck transformation; a variable relationship between the growth rate of output and the level of net investment is postulated. Since actual capital is represented as a weighted average of all past levels of desired capital with geometrically declining weights, that means;

$$K_t = \sum_{i=0}^{\infty} \beta_i K_{t-i}^*$$
5.31

where,

β_i is the weight of desired capital at period $t - i$ so as to determine the level of actual capital in period t. Since this is a geometric lag function, the weights β_i decline geometrically, that is;

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$$\beta_i = (1-\gamma)\gamma^i, \quad where \quad (i = 0,1,2,3,4 \dots) \qquad\qquad 5.32$$

Differencing both sides of equation 5.40 above and accounting for the replacement of capital yields;

$$I_t = \sum_{I=0}^{\infty}[\beta_i(K^*_{t-i} - K^*_{t-i-1})] + \rho K_{t-1} \qquad\qquad 5.33$$

where,

I_t is investment at time time and is modelled as $I_t = K_t - K_{t-1}$, i.e. change in capital stock.
ρK_{t-1} is the proportion of capital stock existing in the previous period that needs replacement therefore it is subtracted from I_t and hence it is an addition on the right side of the equation.
β_i is as defined in equation 5.41 above.
Therefore, the only process needed in using the flexible accelerator model is the determination of the appropriate lag structure so as to avoid misspecification of the lag distribution.

For the model to be a gross investment model there is need to account for replacement capital. The specification of desired capital has been the subject of a wide variety of alternative theories, but these theories do agree on the validity of the flexible accelerator mechanism (Jorgenson, 1971). The flexible accelerator model demonstrates that investment is dynamic in nature and that the concept of gradual adjustment may hold true.

The flexible accelerator model has the main advantage of being adjustable so as to fit different country situations when explaining investment. The model can be augmented to take into account the effects of any other factors that might impact investment (Ndikumana, 2000). Relaxing or coming up with new but reasonable controllable assumptions in modelling investment relationships has enabled economists to come up with country-specific models.

5.3. Review of Related Empirical Literature

This section reviews empirical literature that focuses on the impact of financial development on investment; and on the causality between financial development and investment, empirical findings on the relationship between the two variables under discussion.

A substantial body of empirical work on financial development focuses on its interaction with economic growth (Nazlioglu, *et al.*, 2009). The main implication of this praxis is that the transmission mechanism from finance to investment is a given; or at the moment, the body of economics is mainly concerned about validating the importance of financial development to the world at large. More so, most of these studies on the finance-growth phenomena have focused more on developed nations than developing nations and have had huge inferences on the causal relationship than any other relationship. Inherently, in the finance-investment nexus, despite being not investigated on as much as the finance-growth relationship, the same trend of causality and panel studies focusing on developed countries seem to be the norm.

Given the aforementioned and the focus of this study, this section is organized only around the studies that examine, indirectly and directly, the relationship between financial development and investment. Subsection 5.3.2 discusses studies that focused on the impact of financial development on investment. The econometric approach used to examine the finance-investment relationship is used as the main attribute in discussing the empirical findings. Therefore, the first subsection of Section 5.3.2 discusses panel studies of finance and investment. The second subsection presents evidence from time series and non-panel country case studies. The third subsection examines industry and firm level analyses that provide direct empirical evidence on mechanisms linking investment and financial development. Section 5.3.3 discusses the studies that focused on assessing the causal relationship between financial development and investment. Given the few studies on the causal relationship, the section is not subdivided as the previous section but is structured chronologically, starting with studies that found unidirectional causality from financial development to investment, followed by those that found unidirectional causality from investment to financial development; then followed by the studies that found bidirectional causality between financial development and investment; then lastly, the studies that found no causality between financial development and investment The final section (Section 5.3.4) concluded the chapter.

5.3.1 Financial Development – Investment Impact Studies

5.3.1.1 Panel Studies on Financial Development and Investment

Studies of financial development and investment have employed panel data techniques, pure time series methodologies and case studies to assess and solve a number of economic problems. This section discusses the panel approach in some depth.

Despite a thorough search, there seems to be more studies with results advocating for a positive impact of financial development on investment than a negative one. Lahcen (2004) reviews the impact of financial liberalisation on savings, investment and growth and finds the only exception. That is, a negative impact of financial depth on private investment and a positive effect of the real interest rate on investment in the five Middle East and North African (MENA) countries investigated (Egypt, Jordan, Morocco, Tunisia and Turkey). The results are not consistent with theory[8] and with other empirical findings as is illustrated in Table 6.1. The inconsistent result is explained as, though not empirically proven, the result of financial development altering credit allocation in favour of households at the expense of the business sector.

However, Lahcen (2004) seems to appropriately and alternatively use the various traditional indicators of financial development and financial liberalisation in assessing the effects of financial liberalisation on private investment. Notable amongst the indicators used is the total liquid liabilities of financial intermediaries as a percentage of GDP, deposit money banks assets as a share of total assets, private credit by deposit money banks to GDP, private credit by deposit money banks to total domestic credit and a financial liberalisation index constructed on the basis of the eight main dimensions of financial reforms instituted in the MENA countries.

Most studies though are consistent with the theoretical underpinnings of the positive impact of financial development on investment. Starting with Benhabib and Spiegel's (2000) study of the role of financial development in growth and investment in four countries (Argentina, Chile, Indonesia and Korea) in which results show that the financial development indicators that are correlated with total factor productivity growth are different from those that impact investment.

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[8] See Chapter 5 for theoretical literature. Theory stipulates a positive relationship between financial development and investment, and a negative relationship between real interest rates and investment.

The period covered spans from 1965 to 1985. The estimated equation is based on the Solow growth model that is augmented to take into account issues of human capital vis-à-vis adoption of technology[9]. Standard financial development indicators and other control variables are employed in the panel regression. The share of assets in the banking system, the gini coefficient-financial depth variable and the initial income financial depth variable are found to be significant and positively related to investment (physical capital accumulation).

Ndikumana (2000) investigates the effects of financial development on domestic investment (total investment and private investment) in a sample of 30 sub-Saharan African countries for the period 1970 to 1995. The panel regression procedure is based on a dynamic serial correlation investment model that includes a number of indicators of financial development and a number of control variables. The control variables comprise of the growth rate of real per capita GDP, government consumption, the interest, international trade flows, inflation, external debt, and the black-market premium. Alternative specifications of the estimated model are assessed. Of importance, is the testing of the accelerator-enhancing effect of financial development on investment by Ndikumana (2000). To test for the accelerator-enhancing effect, two separate alternative equations are used. In the first equation, an interaction term that is equal to the product of the growth rate of real per capita GDP and the index of financial development is included. In the second alternative, the investment equation is specified such that the response of investment to changes in output is a function of past levels of financial development. Results from the test of the accelerator-effect show that higher financial development enhances the accelerator effects of an increase in real per capita GDP on investment, that is, as the financial system grows, an increase in aggregate demand prompts a greater surge in investment. The sample of countries used by Ndikumana (2000) included the countries assessed in this study (Botswana, South Africa and Mauritius). The main drawback of Ndikumana's (2000) study is that it did not investigate whether cross-country differences in financial development and the structure of financial systems have an effect on the ability of financial development to stimulate domestic investment. Ndikumana (2000) also alludes to the fact that country specific important aspects of the finance-investment link are unavoidably distorted in any analysis that uses aggregate or

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[9] Benhabib and Spiegel adopt a Cobb – Douglas technology specification which reflects the importance of human capital as a source of technological innovation.

panel data. However, the results of the study support the importance of financial development to investment.

Fowowe (2011), in a study of 14 sub-Saharan African countries, follows in the footsteps of Ndikumana (2000) with the inclusion of the accelerator effect in the estimated equation and by using a financial development index. The results support the accelerator theory to investment with the finding of a positive coefficient for output growth and that financial development positively impacts private investment.

Schich and Pelgrin (2002) evaluate the relationship between financial development and investment for 19 countries of the Organisation for Economic Co-operation and Development (OECD) with the aid of a panel error correction approach. Though private credit issued by deposit money banks is found to be a significant determinant of investment, stock market capitalisation is found to be of utmost significance. The results by Schich and Pelgrin (2002) mirror those of Bassanini, Scapetta and Hemmings (2001), and Leahy, Schich, Wehinger, Pelgrin and Thorgeirsson (2001). For the other near similar study on 19 OECD countries by Pelgrin and Schich (2002), financial development is found to be significantly related to investment.

Wurgler (2000) and Carlin and Mayer (2003) find out that the relationship between financial development and investment is dependent on the structure of a country's financial system, the characteristics of the industries and investment. However, though there is agreement on the impact of financial development on investment, Ndikumana (2005) seems to disagree with Wurgler (2000) and Carlin and Mayer (2003) as he postulates that it is not the type of financial system that matters for domestic investment but the level of financial development.

While most of the panel regression-using studies in Table 6.1 agree that financial development positively impacts investment, Misati and Nyamongo (2010) find unique results. Misati and Nyamongo (2010), in their study of the relationship between financial sector development and private investment in Sub-Saharan Africa find a negative relationship between the interest rate

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on deposits and private investment which according to the authors signals the presence of huge interest rate spreads[10].

Table 5.1 summarises existing empirical evidence on the impact of financial development on investment.

Table 5.1: Panel/Cross Sectional Studies on Financial Development and Investment

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Gelb, 1989	34 countries	- Real GDP growth - incremental output-capital ratio - ratio of financial savings to total savings - real interest rates - M3/GDP, GDP Growth - Lending Rate Asset/GDP - Credit/GDP - Institutions	Cross Country Regression	Financial liberalisation positively impacts the efficiency of investment
De Gregorio and Guidotti, 1995	112 countries	- Bank credit to the private sector to GDP - economic growth - literacy rate - inflation - GDP per capita - government spending,	Cross Country Regression	Financial development positively impacts the efficiency, rather than the volume, of investment
Benhabib and Spiegel, 2000	4 countries	- GDP - Labour force - average level of schooling - average annual growth rate - gini coefficient - financial depth (M2/GDP) - deposit money bank domestic assets divided by deposit money bank domestic assets plus central bank domestic asset	Generalized Method of Moments (GMM)	Financial development positively influences both rates of investment and total factor productivity growth

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
		- credit issued to private enterprises to GDP		
Wurgler, 2000	65 countries	- credit to GDP - stock market capitalisation to GDP - financial development summary index	Cross Country Regression	Developed financial sectors increase investment more in their growing industries, and decrease investment more in their declining industries, than those with undeveloped financial sectors.
Ndikumana, 2000	30 countries	- Real per capita GDP - gross national product (GNP) per capita - GDP deflator growth rate - total liquid liabilities (M3) to GDP - Total credit to the private sector to GDP - total domestic credit provided by the banking sector to GDP - Claims on government and other public entities to GDP - index of financial development	Panel Regression using a dynamic serial correlation model	Positive relationship between domestic investment (total investment and private investment) and various indicators of financial development. Higher financial development leads to higher future levels of investment, implying a potent long-run effect of financial development on domestic investment.
Leahy *et al,* 2001	21 countries	- Liquid liabilities - Private credit of deposit money banks provided to the private sector - Stock market capitalisation - composite financial development indicator	Dynamic panel regression techniques using ARDL	Significant positive relationships between investment and financial development when financial development is measured by stock market development or by private credit of deposit money banks and liquid liabilities

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Bassanini *et al*, 2001	21 countries	- Level of inflation - private credit of deposit money banks provided to the private sector to GDP - stock market capitalisation to GDP - private final consumption deflator growth rate - general government current nominal tax and non-tax receipts to nominal GDP - government nominal final consumption expenditure to nominal GDP.	Cross-country time-series regressions	Credit provided by the banking sector appears to be only weakly associated with investment, while the stock market capitalisation has a stronger positive bearing on investment.
Schich and Pelgrin, 2002	19 countries	- real gross domestic product - real long-term interest rate - ratio of a deflator of private non-residential fixed capital formation to an output price deflator - liquid liabilities - private credit of deposit money banks - stock market capitalisation	Dynamic panel error correction approach	Financial development is positively significantly related to investment levels, mainly explained strongest for stock market capitalisation, although the contribution of private credit issued by deposit money banks is also found to be positively significant
Pelgrin and Schich, 2002	19 countries	- real private gross domestic product, - adjusted real long-term interest rate - user cost of capital - liquid liabilities - private credit of deposit money banks - stock market capitalisation - total value traded as a share of GDP	Panel cointegration analysis	Financial development is significantly related to investment

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Carlin and Mayer, 2003	14 countries	- Growth rates - R&D share - Equity finance - external finance - Bank finance - Employment broken down by category of skill - Ownership concentration - Bank concentration - Accounting standards - Origin of Legal System - Creditor Rights - Anti-director Rights - Bank ownership of equity - Credit/GDP - Private credit/GDP - Government owned banks - Market capitalisation/GDP - Value traded/Market capitalisation - Initial public offerings (IPO) - Population	Pooled cross-country regression	A strong relation between the structure of countries' financial systems, the characteristics of industries, and the growth and investment of industries in different countries.
Lahcen, 2004	5 countries	- Liquid Liabilities to GDP - Deposit money bank assets to total financial assets - Private credit by deposit money Banks to GDP	Panel Regression with fixed-effects	Financial development indicators as well as on financial liberalisation index indicate a negative impact of financial depth on private investment

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
		- Private credit by deposit money banks to total domestic credit - Reserves to total deposits money banks - Real interest rates - Stock market capitalisation to GDP - Stock market total value traded to GDP - Stock market turnover - Net Interest rate Margin - Overhead costs as a share of total assets - Market structure - Private saving rate - Growth - Exchange rate overvaluation - Trade openness - Inflation rate - Secondary enrolment - Budget surplus as a share of GDP - Terms of trade - Share of population over 60 - Share of population under 15		
Ndikumana, 2005	99 countries	- GDP growth - Liquid Liabilities to GDP - Credit to private sector to GDP	Cross-section and panel data regressions	Financial intermediation affects domestic investment notably by alleviating financing constraints, allowing firms to increase investment in response to increased demand for output. It is the level of

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
		- Ratio of Bank Assets to total of bank assets and central bank assets, Net domestic credit to GDP - Bank credit to GDP - Trade to GDP		financial development, not the type of financial system that matters for domestic investment
Dutta and Roy, 2009	124 countries	- ratio of private credit by deposit money banks to GDP - Liquid Liabilities to GDP - claims on domestic real nonfinancial sector by deposit money banks to GDP - financial development index - credit provided by banks - stock market indicators - remittances - deposit resources available to the banking sector - growth of real GDP - real interest rates - imports plus exports over GDP - government expenditure to GDP	Quantile regression approach	Financial sector development positively impacts domestic investment and the degree of responsiveness to financial development varies with varying levels of domestic investment across countries.

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Adjasi and Biekpe, 2009	14 African countries	- investment to GDP - Market capitalisation ratio - Value of shares traded ratio - Turnover ratio - Stock market returns - Investment growth rate - GDP growth	Difference generalized method of moments (GMM).	Stock market returns positively influence investment growth. The response of investment to stock market returns increases with the level of market development across the sample
Becker and Sivadasan, 2010	38 countries	- Private credit to GDP - total private bond market capitalisation to GDP	Pooled cross-country regression	Financial development is beneficial because it reduces financial constraints at the firm level and therefore relaxes the correlation between internal resources and investment
Misati and Nyamongo, 2011	18 countries	- GDP growth - Fiscal deficit - Checks and balances - Corruption perception index - Economic freedom of the world - Stock market turnover - Credit to the private sector - Deposit rate - Informal index	Panel Regression using a simple accelerator model of investment using a fixed effects model	The study establishes a negative relationship between interest rate on deposits and private investment, signalling the presence of huge interest rate spreads in African economies. In addition, a positive relationship between both the credit to the private sector and the turnover ratio and private investment is found.

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Fowowe, 2011	14 countries	- Index of financial reforms - growth in real GDP - volatility of inflation.	Cross-country regressions using GMM	Financial sector reforms (measured by the index) have had a positive effect on private investment in the selected countries,
Luca and Spatafora, 2012	103 countries	- indicators of institutional quality - capital inflows - domestic credit - terms of trade (weighted by the trade ratio) - export markets (weighted by the export ratio)	Cross-sectional analysis and panel analysis	Private capital inflows and domestic credit exert a positive effect on investment; they also mediate most of the investment impact of the global price of risk and domestic borrowing costs. Surprisingly, neither greater domestic credit nor greater institutional quality increase the extent to which capital inflows translate into domestic investment
Wang et al, 2012	102 countries	- Domestic Saving Rate - Private Credits/GDP - financial development - age structure - rates of return - uncertainty - fiscal policy - income level and growth - region dummies - year dummies	Panel Regression	Financial development tends to reduce the precautionary-saving incentives of households but increase probability to borrow and invest

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Adeniyi and Egwaikhide, 2013	20 countries	- Credit to the Private Sector - Total Liquid Liabilities - Total Banking Sector Credit to the Private Sector - Aid - Openness - Domestic Saving	Three different panel estimation techniques -pooled OLS, fixed effects and random effects	Positive and significant impact of credit provided to the private sector on domestic investment. All other financial variables did not exert any statistically significant influence on domestic investment
Costantini *et al*, 2013	20 countries	- real GDP - US real lending rate - US nominal lending rate - domestic real lending rate - domestic nominal lending rate - claims on private sector by deposit money banks and other financial institutions - inflation rate - 3-year moving average of the standard deviation of the domestic exchange rate vis-a-vis the US dollar.	Panel Regression	Investment displays more sensitivity to world capital market conditions and exchange rate uncertainty. A perhaps even more surprising result is the thing that countries that managed to suppress domestic real interest rates without generating high inflation enjoyed higher levels of private investment than those that would have been obtained under liberalised conditions.
Dzansi, 2013	79 countries	- Remittances/GDP - Trade/GDP - GDP Growth - Lending Rate - Assets/GDP - Credit/GDP - Institutions	Panel estimation using ordinary least square (OLS), the random effect (RE) and the fixed effects (FE)	Remittance inflows, sound institutions and well-developed financial sector increase domestic investment.

Author(s)	Region/Country	Independent Variables	Methodology	Conclusion
Ndikumana and Mannah Blankson, 2015	50 countries	- GDP growth - External debt - Remittances - Trade - Domestic savings - Bank credit - Official development aid.	The Arellano-Bover/Bulndell-Bond dynamic panel data (DPD) estimation methodology	Domestic savings and credit to the private sector prove to be the most robust sources of financing for domestic investment

5.3.1.2 Time Series and Non-Panel Country Case Studies on Financial Development and Investment

A number of time series and non-panel country case studies empirical assessments have been published on the impact of financial development on investment. The studies use alternative methodologies, that is, ordinary least squares, simultaneous equations, autoregressive distributed lag (ARDL) bounds testing approach, vector autoregressive (VAR) procedures, the traditional cointegration analysis and author-specific time series econometric techniques. Notably, research methodologies have progressed by the use of more powerful econometric approaches, employing better measures of financial development and investment and more so by examining individual countries in greater detail. The individual time series country studies confirm, to a particular extent, the notions alluded to in the review of panel regression studies in the earlier section. Of note, financial development is positively related to investment.

Remarkably, a number of country studies have been using the accelerator modelling technique in assessing the relationship between financial development and investment in time series analysis. These studies include Tybout (1983), De Melo and Tybout (1986), Warman and Thirwall (1994), Matsheka (1998), Valderrama (2003), Husein (2007), Dutta and Roy (2009) and Asare (2013). Tybout (1983) investigates the effect of credit rationing (financial repression) on investment in Colombia. The results of the study give credence to existence of an accelerator effect of financial development on investment in Colombia and the positive effect of financial development in relation to firm size (the larger the better). De Melo and Tybout (1986) also find that, for the Uruguayan economy (1955-1983), the accelerator effect was significant throughout the sample period. The same deductions were found by Warman and Thirwall (1994) for Mexico, Matsheka (1998) for Botswana, Valderrama (2003) for Austria, Husein (2007) for China, Dutta and Roy (2009) for 124 countries (under panel studies) and Asare (2013) for Ghana. Therefore, empirical research gives more support to the wealth effect and accelerator channel than to a direct finance channel (Valderrama, 2003, 108). In addition, the use of a modified and realistic model termed the flexible accelerator model has circumvented the weak and unrealistic assumptions of the traditional accelerator model. The flexible accelerator model has enabled the time series estimation for developing countries that could not satisfy the assumptions of the

traditional accelerator principle[11]. Table 5.2 gives a summary of time series and non-panel country case studies on financial development and investment.

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[11] See theoretical review section for a fuller discussion of these two models.

Table 5.2: Time Series and Country Case Studies on Financial Development and Investment

Author(s)	Country(s)	Variables	Methodology	Conclusion
Masih, 1979	Pakistan	- Long-term loans and investments of all financial institutions to private large-scale manufacturing sector - Long-term loans and investments of all financial institutions to the entire private sector - total loans - total deposits - demand deposits - time deposits - borrowings from the State bank of Pakistan, - Holdings of securities - loans to the government by banks - deficit financing by the government - dummy variable for change in government - Excess liquid-asset holdings by banks.	Ordinary least squares, Structural equation modelling	Private investment found to be positively related to the availability of funds rather than the price of funds (interest rates).
Tybout, 1983	Colombia	- access to credit market	Ordinary least squares (OLS)	The effect of financial development on investment as measured by credit provision is dependent on firm size. Large firms have relatively easy access to credit and realise their investment plans irrespective of their earnings, small firms invest only in case of favourable earnings.

Author(s)	Country(s)	Variables	Methodology	Conclusion
De Melo and Tybout, 1986	Uruguay	- Total savings rate - interest rate - exchange rate - credit provision - financial development indicators	Ordinary least squares (OLS)	Financial development through financial liberalisation positively impacts aggregate private investment
Fry, 1989	34 countries	- Real interest rate - GDP growth rate - M3/GDP - Change in GDP - investment - Change in real M3 - real saving - Inflation rate	Exploratory	Greater financial depth caused by higher real deposit rates of interest itself improves the quality of investment
Laumas,1990	India	- Interest rate on time deposits - real rate of interest - inflation rate	Two-stage least squares estimation procedure	Financial development through financial liberalisation positively impacts aggregate private investment
Rittenberg,1991	Turkey	- real interest rate	Ordinary least squares (OLS)	Financial development through financial liberalisation negatively impacts investment through high interest rates and uncertainty

Author(s)	Country(s)	Variables	Methodology	Conclusion
King and Levine, 1993	80 countries	- liquid liabilities to GDP, - deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets - the ratio of claims on the nonfinancial private sector to total domestic credit (excluding credit to money banks) - the ratio of claims on the nonfinancial private sector to GDP - ratio of the size of the formal financial intermediary sector to GDP (LLY) - the importance of banks relative to the central bank (BANK) - the percentage of credit allocated to private firms - ratio of credit issued to private firms to GDP - real per capita GDP growth - the rate of physical capital accumulation - the ratio of domestic investment to GDP - efficiency of physical capital allocation	Simple correlations, cross-country regressions, Sensitivity Analyses	Financial development indicators had a positive and significant impact on investment.
Warman and Thirlwall, 1994	Mexico	- the rate of interest - supply of credit - lagged change in GDP	Ordinary least squares (OLS)	Investment is positively related to the supply of credit from the banking system, but the net effect of interest rates on investment is negative.

Author(s)	Country(s)	Variables	Methodology	Conclusion
Jefferis, 1995	Botswana	- Stocks quoted - Market index - US$ Index - Real Index - Capitalisation - Time & Savings deposits - Market capitalisation - Exchange rate - Growth - Real index growth - Turnover - Liquidity - Inflation	Exploratory	Stock market had a major impact on domestic institutional investment
Matsheka, 1998	Botswana	- real deposit interest rate - real private sector credit - lagged accelerator term	Ordinary least squares (OLS)	Supply of credit has a positive effect on domestic investment through financial savings. no support for the hypothesis of a positive effect of deposit interest rates on the level of investment.
Valderrama, 2003	Austria	- cash level - user cost of capital - ratio of liquid assets to capital - liquidity ratios - bank size	General Method of Moments	Financial variables, in this case the liquid-assets-to-capital-ratio, are an important determinant of investment, even more important than the user cost of capital

Author(s)	Country(s)	Variables	Methodology	Conclusion
Finance, 2004	Canada	- Several financial development indicators - growth indicators	Exploratory	Financial services development, including for the first time asset-based financing, raises investment
Ahmed, 2006	Botswana	- gross national savings - private savings - public savings - credit to the private sector to GDP - M3 and M2 to GDP - Real Interest Rate	Exploratory	Financial liberalisation positively impacts investment
Pentecost and Moore, 2006	India	- Broad money - nominal (GDP) - domestic credit - bank deposit rate - real money balances	Multivariate cointegration approach	Financial development through financial liberalisation positively impacts investment
Love and Zicchino, 2006	36 countries	- Capital expenditure - Property plant and equipment - Net sales or revenues - Sales to capital ratio - Cash flow to sales ratio - Ranking - Tobin's q - Stock market development Index	Vector autoregression (VAR)	The impact of financial factors on investment, which indicates the severity of financing constraints, is significantly larger in countries with less developed financial systems. Findings emphasises the role of financial development in improving capital allocation and growth.

Author(s)	Country(s)	Variables	Methodology	Conclusion
		- market capitalisation to GDP - total value traded to GDP - turnover - Financial intermediary development index - liquid liabilities to GDP - domestic credit to private sector to GDP - GDP per capita,		
Husien, 2007	Libya	- Demand - time and savings deposits plus foreign currency deposits in Deposit money banks and other banking institutions - real per capita GDP - real interest rate - total credit by deposit money banks - inflation rate	Vector autoregression (VAR)	Financial sector development, as explained by credit, has a very small impact on investment in the long run, the impact of the real interest rate on domestic investment is negative in the long run.
Ang, 2009	India	- Financial liberalisation index - Gross domestic saving/GDP	ARDL bounds procedure and the ECM test	Evidence shows a fairly robust long-run relationship between domestic saving and investment rates, The interaction between saving and financial liberalisation is found to have a positive significant effect on investment in the long run.

Author(s)	Country(s)	Variables	Methodology	Conclusion
Uçan and Öztürk, 2011	Turkey	- Real per capita GDP - GDP deflator growth rate - real interest rate - Total credit to the private sector to GDP - broad money to GDP - total domestic credit provided by the banking sector to GDP - Claims on government to GDP - index of financial development	Vector autoregression (VAR)	Results mainly indicate a positive relationship between total domestic investment and all four indicators of financial development as we create a composite index of financial development items. The results are qualitatively similar for total domestic investment and private investment, with stronger effects of financial factors on private investment than on total domestic investment. The findings also suggest that high financial development is a predictor of future levels of domestic investment. Higher financial development in the 1980s is associated with higher investment levels in the 1990s and 2000s. The results also confirm stylized facts for other determinants of investment. Inflation and real interest rate negatively affect total domestic investment.
Anwar and Sun, 2011	Malaysia	- Financial development indicators - economic growth - level of openness - real exchange rate	Simultaneous equations model	Financial development has contributed to the growth of the domestic capital stock in Malaysia

Author(s)	Country(s)	Variables	Methodology	Conclusion
Nasiru and Usman, 2013	Nigeria	- Domestic Savings	Autoregressive Distributed Lag (ARDL) Bounds testing approach	Evidence of a long-run relationship between saving and investment. Financial development as measured by adequate supply of savings has a positive impact on investment.
Ali *et al*, 2013	Pakistan	- real per capita GDP - Terms of trade - Liquid Liabilities - bank asset ratio - private sector credit to GDP	Ordinary least squares	Financial development positively impacts domestic private investment. Credit to private sector and liquid liabilities most significant factors affecting investment.
Asare, 2013	Ghana	- Income - Savings - money supply - inflation rate - interest rate - private wealth stock - private savings	Three Stage Least Squares	Private investment responded marginally to the financial liberalisation policies in Ghana.
Alem and Townsend, 2014	Thailand	- headman response - time to district centre - geographic information service,	Ordinary least squares, Instrumental Variables and Generalised Method of Moments	Bank-based financial development has a negative impact on investment shocks.

Author(s)	Country(s)	Variables	Methodology	Conclusion
Hassan, 2015	Nigeria	- Gross Domestic Product growth rate - Exchange rate - liquidity ratio - Money supply and Domestic Credit to Private sector - Interest rate - monetary policy rate - cash reserve ratio	Ordinary Least Square Multiple regression technique	Money Supply (M2) and Domestic Credit to Private Sector found to have a positive significant impact on private investment.

5.3.1.3 Industry and Firm Level Studies on Financial Development and Investment

The relationship between financial development and investment is taken a step further by a number of researchers as they discuss the impact of financial development on investment at industry and firm level. Though not as many as the other studies in the earlier sections, the studies at this kind of micro level enunciate more vividly the functional importance of the financial system to investment. For example, Gilchrist and Himmelberg (1995, 1998) prove the role of capital markets as better facilitators of exchange and investment through provision of unlimited access to commercial paper and bond markets.

Love (2003) uses firm level data for 38 countries to assert that financial development diminish financing constraints by reducing information asymmetries and contracting imperfections. The decrease in constraints induces firm investment and hence leads to an increase in aggregate investment. The same notions are reflected by Afangideh (2010), Kalatzis and De Castro (2010) and O'Toole and Newman (2012), as summarized in Table 5.3 below.

Table 5.3: Industry and Firm Level Studies on Financial Development and Investment

Author(s)	Region/Country	Variables	Methodology	Result/ Empirical findings/ Conclusion
Gilchrist and Himmelberg, 1995	United States of America	- Tobin's Q - fundamental Q - cashflow - low dividend payouts - firm size - dummy variables - participation in bond and commercial paper markets.	Standard neoclassical model of investment under perfect capital markets and the model augmented with cash flow Fundamental Q - ratio	For firms with access to commercial paper and bond markets, we find that the perfect capital markets model of investment can fully account for the role of cash flow. For firms with only limited access to capital markets as indicated by lack of participation in public debt markets) however, investment appears to be 'excessively' sensitive to fluctuations in cash flow.
Gilchrist and Himmelberg, 1998	United States of America	- marginal profitability of capital - cash flow - indicators of firm level fundamental and financial factors	Panel-data vector auto-regressions (VARs)	Estimated effect of financial factors on investment is quantitatively significant.
Love, 2003	38 countries	- Stock market development Index - Financial intermediary development index - Financial development - Country's legal origin categorized into four groups: English, French, German or Scandinavian - Efficiency of legal system and rule of law - Risk of expropriation - measure of corruption	Weighted regression by estimating a structural investment model	Financial development diminishes financing constraints by reducing information asymmetries and contracting imperfections. The decrease in financing constraints allows firms to invest according to their growth opportunities and therefore improves capital allocation (investment).

Author(s)	Region/Country	Variables	Methodology	Result/ Empirical findings/ Conclusion
		- Log of GNP per capita - Annual real growth rate of GDP - Property plant and equipment, net of depreciation - Capital expenditure - Depreciation and amortization expense - Beginning period capital - Sales to capital ratio - Cash plus equivalents scaled by total assets - Cash flow - Cost of goods sold - Log of total assets - Rank, Weight - Industry dummies		
Baker *et al*, 2003	Global - Compustat database	- Investment - Financing - Equity dependence - Contemporaneous cash flow - three-year cumulative return -	Panel regression	stock prices have a stronger impact on the investment of "equity-dependent" firms - firms that need external equity to finance marginal investments
Afangideh, 2010	Nigeria	- Private sector credit - liquid liabilities (M3) to GDP - total currency outside banks as a ratio of broad money to GDP	Three stage least squares estimation technique	Developed financial system alleviates growth financing constraints by increasing national saving, bank credit and investment activities in agriculture

Author(s)	Region/Country	Variables	Methodology	Result/ Empirical findings/ Conclusion
		- stock market capitalisation - value traded ratio - turnover ratio - real interest rate - investment in agriculture - bank lending to agriculture - Agricultural output - real gross domestic product		
Kalatzis and De Castro, 2010	Brazil	- Net income - Depreciation and amortization expense - Cash flow - Sales - Short-term debt - Long-term debt - Debt - Total capital - Cash and short-term investments - Logarithm of firm's total assets - Gross domestic product - Long-term interest rate - Ratio of total credit to GDP - Ratio of private sector credit to GDP - Ratio of stock market capitalisation to GDP	Fixed effect logit model and modified accelerator model of investment	Evidence that the financial development level has an important role in investment decisions of financially constrained firms.

Author(s)	Region/Country	Variables	Methodology	Result/ Empirical findings/ Conclusion
		- Measures of financial development,		
O'Toole and Newman, 2012	Vietnam	- Financial reform index - broad money/GDP - stock market capitalisation/GDP - domestic credit/GDP - domestic credit to private sector, bank deposits/GDP - bank credit to bank deposits - bank concentration - bank interest margin - Credit to private sector as percent of industrial output - state owned enterprises share of total loans - state owned enterprises share of loans to state owned enterprises share of output - % of investment lending by commercial banks to % of investment lending by state	Generalised method of moments techniques	Financial development reduces the external financing constraints for firms thus facilitating higher investment activity. Financing constraints are decreasing in credit to the private sector, increasing in the use of finance by state-owned enterprises and decreasing in the degree to which finance is allocated on commercial market terms.

5.3.2 Causality Studies

This section gives the limited number of studies that focused on evaluating the causal relationship between financial development and investment, the discussion of the studies has been limited to a single table summarising the respective findings. The findings on the causal relationship between financial development and investment show all the possible outcomes of such an analysis. However, following the same trend as in the impact studies, none of the studies (except Marques *et al*, 2013) that have been done thus far have tried to evaluate the causal relationship of both bank-based and market-based financial development on investment. Marques *et al* (2013) together with Majid (2008) and, Shan and Morris (2002) found no causal relationship between financial development and investment.

Interestingly, Lu, *et al* (2007) and Nazlioglu *et al* (2009) agree with Huang (2011) as their results point to bi-directional causality between finance and investment. Lu, *et al* (2007) use a neoclassical Cobb-Douglas production function with constant returns to scale, cointegration testing and Granger causality testing on data from China to get their result. Nazlioglu *et al* (2009) use the bounds (ARDL) testing approach to cointegration for measuring the relationship between financial development and investment in Turkey. Nazlioglu *et al* (2009), in assessing the limitations of their study, advocate for the use of other time series techniques that do not only use financial development indicators as explanatory variables but that also use other non-finance control variables to assess the finance-investment relationship. Their notion (Nazlioglu *et al*, 2009) is addressed in this current study.

On the other hand, Odhiambo (2010) finds an investment-led finance result in studying the finance-investment-growth nexus in South Africa using the bounds (ARDL) testing approach. The ratio of liquid liabilities to GDP is the measure of financial development that is used to get the notion that investment Granger-causes financial development in the short run and in the long run. Table 5.4 summarises the results of all studies that assessed the causal relationship between financial development and investment.

Table 5.4: Related Literature on Causality between Financial Development and Investment

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
Studies in favour of unidirectional Causality from Financial development to Investment				
Caporale *et al*, 2005	4 countries	- Ratio of gross fixed capital formation to nominal GDP - ratio of the real change of GDP to the real level of total investment - market capitalisation ratio - value traded ratio.	Toda and Yamamoto Causality test	Stock market development → Investment.
Carp, 2012	Romania	- annual percentage growth rate of GDP at market prices - local currency market capitalisation of listed companies, as a percentage of GDP - turnover ratio (%) - capitalisation for the period stock value traded (% of GDP - total investment as a percentage of GDP	Vector autoregressive models and Granger Causality	Stock market development → Investment.
Rousseau, 1999	Japan	- Non-intermediary holdings of corporate stocks and bonds - Per capita GNP - gross domestic fixed investment - private domestic fixed investment - currency in circulation - mid-year population - assets of insurance companies - loan agricultural cooperatives - assets of savings institutions - assets of special banks - assets of commercial banks.	Vector autoregressive models and Granger Causality	Financial development → Investment.

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
Xu 2000	41 countries	- Real GDP - Real Domestic investment - index of financial development - liquid liabilities/GDP - Total bank deposits/GDP.	Multivariate Vector autoregressive models (VAR)	Financial development → Investment.
Rousseau and Vuthipadadorn, 2005	10 Asian countries	- Difference between broadly defined and narrow money (M2- M1) - Credit allocated to the private sector - gross domestic product - gross domestic fixed investment.	Vector autoregressive models (VARs) and vector error correction models (VECMs)	Financial development → Investment. (in seven of the ten countries - India, Japan, Korea, Malaysia, Pakistan, Sri Lanka, and Thailand)
Chaudhry, 2007	Pakistan	- Economic Growth - Investment - Broad Money - Private Sector Credit - Stock Market Capitalisation - Foreign Direct Investment - Trade Openness	Engle-Granger Approach and ECM using OLS estimation	Financial development → Investment.
Hamdi et al, 2013	Tunisia	- banking deposit liabilities to GDP ratio - M3 to GDP - private sector credit to GDP - real GDP to total population - investment to GDP	Multivariate Granger Causality framework based on Vector Error	Financial development → Investment.

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
			Correction Model and Cointegration Techniques	
Asongu, 2014	16 countries	- Deposit Money Bank Assets/(Deposit Money + Central Bank Assets) - Liquid Liabilities/GDP - Central Bank Assets/GDP - Deposit Money Bank Assets/GDP - Private Credit by Deposit Money Banks/GDP - Bank Deposits/GDP - Financial System Deposit/GDP - Bank Credit/Bank Deposits - Private Credit by Deposit Money Banks and Other Financial Institutions/GDP - Foreign Direct Investment/GDP - Private Capital Flows/GDP - Remittance - Net Development Assistance/GDP - Gross Private Investment/GDP - Gross Public Investment/ GDP - Gross Fixed Capital Formation/GDP - Gross Domestic Investment/GDP - Net Long-Term Borrowing - Portfolio Investment/GDP - Portfolio Equity Flows/GDP - Budgetary Investment/GDP	Vector Error Correction Model and Granger causality	Financial development → Investment.

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
		- Net Foreign Investment/GDP - Total Gross Domestic Savings		
Studies in favour of unidirectional Causality from Investment to Financial development				
Odhiambo, 2010	South Africa	- Liquid Liabilities/GDP - Private Credit/GDP - M2/GDP - Investment - Economic Growth	Trivariate causality model ARDL Bounds testing procedure	Investment → financial development.
Studies in favour of bidirectional Causality between Financial development and Investment				
Shan *et al*; 2001	9 countries	- real per capita GDP - Ratio of loans made to the private sector by commercial banks and other deposit-taking banks to GDP - Total factor productivity - Ratio of the sum of imports and exports to GDP - Investment as a percentage of GDP - Consumer price index - Stock market price index	Toda and Yamamoto Granger Causality procedure	Investment ↔ financial development in China.

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
Rousseau and Vuthipadadorn, 2005	10 Asian countries	- Difference between broadly defined and narrow money (M2- M1) - Credit allocated to the private sector - gross domestic product - gross domestic fixed investment.	Vector autoregressive models (VARs) and vector error correction models (VECMs)	Financial development ↔ Investment. (in two of the ten countries - Philippines and Singapore)
Lu et al, 2007	China	- M2 - bank deposit liabilities to GDP - bank domestic credit to GDP - real GDP per capita - real per capita investment - real physical capital per capita,	Neo-classical Cobb-Douglas production function with constant returns to scale, unit root testing, (2) cointegration testing and (3) Granger causality testing.	Investment ↔ financial development.
Huang, 2011	43 countries	- Nominal private investment to nominal GDP - financial intermediary development index - Liquid Liabilities over GDP - Private Credit to GDP	Panel Regression, Causality using the Common Correlated	Investment ↔ financial development.

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
		- commercial bank assets to the sum of commercial bank and central bank assets	Effect approach	
Shan and Jianhong, 2006	China	- real GDP - Total credit to the economy - Labour force - Net investment - Total trade as a % of GDP	VAR and IRF	Investment ↔ financial development.
Nazlioglu et al, 2009	Turkey	- gross fixed capital formation to nominal GDP - government investment to nominal GDP - private investment to nominal GDP - money to income - banking deposit liabilities to income - domestic credit to income - private sector credit to income - share of private sector credit in domestic credit - liquid liabilities to income.	Dolado and Lutkepohl (1996) causality lest technique and Bounds Testing Approach to Cointegration	Investment ↔ financial development.

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Author(s)	Region/Country	Variables	Methodology	Direction of Causality
Studies in favour of No Causality relationship between Financial development and Investment				
Rousseau and Vuthipadadorn, 2005	10 Asian countries	- Difference between broadly defined and narrow money (M2- M1) - Credit allocated to the private sector - gross domestic product - gross domestic fixed investment.	Vector autoregressive models (VARs) and vector error correction models (VECMs)	No causal relationship between financial development and investment. (in one of the ten countries - Indonesia)
Majid, 2008	Malaysia	- the ratio of total bank deposits liabilities to nominal GDP - share of gross fixed capital formation to nominal GDP - growth rate of real Gross Domestic Product (GDP) - Changes in the Consumer Price Index	ARDL Bounds testing procedure	No causal relationship between financial development and investment.
Shan and Morris, 2002	19 OECD countries and China	- real GDP - ratio of total credit to GDP - spread of borrowing and lending interest rates - productivity - ratio of gross investment to GDP - ratio of total trade to GDP - consumer price index - official interest rate - stock market price index	Toda and Yamamoto Granger Causality procedure	No clear causal relationship between financial development and investment.

Author(s)	Region/Country	Variables	Methodology	Direction of Causality
Marques *et al*, 2013	Portugal	- Real gross domestic product - Stock market capitalisation/GDP - Total domestic credit ratio /GDP - Investment ratio logarithm /GDP - Consumer price index	VAR and IRF, Granger Causality	No causal relationship between financial development and investment.

Note: →indicates direction of causality.

5.4 Conclusion

In this chapter, the review of related theoretical and empirical literature on the financial development - investment nexus has been discussed. The functional importance of financial development to investment, a brief review of growth models, financial development and investment, the impact of financial development on investment as propagated by proponents of financial liberalisation and the interplay between various investment models and financial development have been examined. Based on the issues considered, it can be concluded that financial development has, theoretically, a rather significant impact on investment. Nevertheless, the opposite conclusion (no relationship at all) has also been arrived at though it was under restrictive assumptions that mostly took financial development, or the financial sector as given. Further, the actual measurement of financial development, according to the models and theories discussed in this chapter, has not been sufficiently included in the theoretical bases of the finance-investment nexus. Therefore, the impact of financial development on investment can be taken as ambiguous to a particular extent.

In the review of empirical studies that evaluated the impact of financial development on investment, studies have been categorised according to the econometric model used, that is, panel studies, time series and non-panel studies and, industry and firm level studies. On the other hand, causality studies have been categorised according to their findings.

Based on the issues considered, it can be concluded that financial development has, empirically, a rather significant impact on investment. However, the use of predominantly panel data studies and cross-country studies seemed to mask the actual country-specific relationship and to not take into account the individual country differences inherent in the finance-investment relationship. In addition, for country-specific studies, the flexible accelerator model has been proven to be the model of choice for assessing the impact of financial development on investment.

As far as the causal relationship is concerned, there has not been much emphasis on evaluating the said relationship as shown by the number of studies reviewed. Nevertheless, results from the review of causality studies show that the relationship is relatively ambiguous and there is much room for further empirical investigation. For both types of studies reviewed in this chapter, the notion is that most of the research done is highly skewed towards the bank-based side of financial

development as compared to the market-based side of financial development. Given the number of studies assessed, the financial development – investment nexus, by country, appears to be under-researched and has been taken as a conduit for discussing the finance-growth nexus rather than specifically focusing on the transmission mechanism of the finance-investment relationship. Therefore, the financial development - investment relationship especially for South Africa, Botswana and Mauritius can be taken as indefinite to a particular extent.

CHAPTER 6

ESTIMATION TECHNIQUES AND EMPIRICAL MODEL SPECIFICATION

6.1 Introduction

This chapter provides a framework for examining the relationship between financial development and investment in the study countries. It, among other things, discusses the models to be estimated, the definition and justification of variables, the estimation procedures to be followed and data sources. The chapter is divided into seven sections. Section 6.2 discusses the formulation of the impact model and the Granger-causality model. The justification of variables is provided in Section 6.3. The estimation procedures are discussed in Section 6.4. Section 6.5 gives the definition of variables and the associated data sources. The chapter conclusion is in Section 6.6.

6.2 Empirical Model Specification

This section presents and discusses the two models employed in evaluating the finance-investment nexus in this study. The first model, Model 1, is utilised in the estimation of the impact of both bank- and market-based financial development on investment; and is presented in Section 6.2.1. The second model, Model 2, is used in assessing the Granger-causality between financial development – both bank- and market-based – and investment; and is discussed in Section 6.2.2.

6.2.1 Model 1 - The Financial Development - Investment Impact Model

The formulation of the model to be used to evaluate the impact of financial development on investment for each country is underpinned by the flexible accelerator hypothesis that postulates that domestic investment follows the flexible accelerator hypothesis.

The formulation is a variant of the neoclassical flexible accelerator model discussed by Ramirez (1994), Ndikumana (2000) and, Schich and Pelgrin, (2002). The flexible accelerator model postulates that the desired capital stock K_t^* is proportional to the level of expected output Y_t^*, such that:

$$K_t^* = \alpha Y_t^* \qquad\qquad\qquad 6.1$$

Where K_t^* is the capital stock that the economy desires to have in period t, and Y_t^* is the expected level of output in period t.

The actual stock of capital is assumed to adjust to the difference between the desired stock in period t and the actual stock in the previous period $t-1$:

$$\Delta INV_t = \beta(INV_t^* - INV_{t-1}) \qquad\qquad 6.2$$

Or

$$INV_t = \beta INV_t^* + (1-\beta)INV_{t-1} \qquad\qquad 6.3$$

β is the coefficient of adjustment where $0 \leq \beta \leq 1$

If $\beta = 1$ then there is instantaneous adjustment of capital stock to its desired level otherwise if $\beta = 0$ no adjustment takes place at all.

ΔINV_t is the change in the actual domestic investment between 2 periods, that is, net domestic investment.

In gross terms, the gross investment is given by:

$$INV_t^* = \Delta K_t^* + \lambda K_{t-1}^* \qquad\qquad 6.4$$

That is change in the actual capital stock, ΔK_t^*, in a period plus replacement investment λK_{t-1}^*, where λ is the rate of depreciation of the private capital stock.

Since $\Delta K_t^* = K_t^* - K_{t-1}^*$ then:

$$INV_t^* = K_t^* - K_{t-1}^* + \lambda K_{t-1}^* \qquad\qquad 6.5$$

Using lag operator notation

$$INV_t^* = [1 - (1-\lambda)L]K_t^* \qquad\qquad 6.6$$

Where L is the lag operator and is defined as, $LK_t^* = K_{t-1}^*$. Inverting equation 6.5, the stock of capital can be related to the level of gross domestic investment

since $\Delta INV_t = \beta(INV_t^* - INV_{t-1})$ from 6.2

$$\Delta INV_t = \beta[1 - (1 - \lambda)L]K_t^* - INV_{t-1} = INV_t - INV_{t-1} \qquad 6.7$$

$$INV_t = \beta[1 - (1 - \lambda)L]K_t^* - (1 - \beta)INV_{t-1} \qquad 6.8$$

Substituting for K_t^* as given in equation 1 gives:

$$INV_t = \alpha\beta[1 - (1 - \lambda)L]Y_t^* - (1 - \beta)INV_{t-1} \qquad 6.9$$

Therefore, equation 6.9 can be used to specify the desired gross investment not only as a function of the desired level of real output but also of a number of other control variables such as the gross savings, among others. The desired level of real output can be estimated as the resulting growth in the real per capita GDP of the previous year. That is, since equations 6.5 and 6.6 show that gross domestic investment is dependent on lags of desired capital stock, which is in turn estimated as a function of desired output growth in equation 6.9, it is safe to say that, to a particular extent, the previous year's output growth rate is a good estimator of the following year's expected growth[12]. In addition, to test the accelerator effect of financial development on investment, there is need to come up with a variable that associates the change in economic growth and financial development to investment. That is, the output growth rate multiplied by the financial development indicator (Ndikumana, 2000: 391).

Therefore, the general empirical model to be estimated is:

$$INV_t = \rho_0 + \rho_1 DOG_t + \rho_2 BFDG_t + \rho_3 MFDG_t + \rho_4 RIR_t + \rho_5 SAV_t + \rho_6 INV_{t-1} +$$
$$\varepsilon_t \qquad 6.10$$

Where:

INV - the gross capital formation to GDP(a proxy for the level of domestic investment);

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[12] There is no need to account for depreciation exogenously because the assumption here is that all increase in the per capita GDP arises from changes in the capital stock plus replacement capital (see equation 6.5).

DOG - the growth rate of real per capita GDP (a proxy for the rate of growth of the desired level of real output);

$BFDG$ - the accelerator interaction term for bank-based financial development;

$MFDG$ - the accelerator interaction term for market-based financial development;

RIR - the real interest rate;

SAV - the gross domestic savings;

$\rho_1, \dots, \rho_6$ – the respective coefficients and,

ε-is the error term.

Equation 6.10 hypothesises that financial development enhances the effects of changes in aggregate demand, which is translated as a change in aggregate output. Therefore, stronger accelerator effects supplement higher financial developments.

Except for the coefficient for RIR, all other independent variables are expected to have a positive relationship with investment.

6.2.2 Model 2 – The Financial Development-Investment Causality Model

To further ascertain the relationship between financial development and investment, a trivariate Granger-causality[13] model is employed. In order to avoid bias of results resulting from an omission of a variable, the trivariate Granger-causality model is used and preferred over the bivariate Granger-causality model.

The Granger-causality test is used to examine the causal relationship between bank-based financial development and investment, and market-based financial development and investment – in each of the three Southern African countries. The intermitting variable chosen for the Granger-causality test is savings (SAV). The choice of the intermitting variable is informed by literature, which tends to connect investment and financial development through savings (see among others McKinnon, 1973; Galbis, 1977; Levine, 1997; Sawyer, 2004; Ndikumana and Mannah Blankson, 2015).

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[13] See Section 6.4.4 for the respective models used to evaluate causality

Two trivariate Granger-causality models are tested, and these are: Models 2A and 2B. Model 2A consists of investment (INV), bank-based financial development (BFDG) and savings (SAV); while Model 2B consists of investment (INV), market-based financial development (MFDG) and savings (SAV).

In interpreting the results of the Granger-causality model: if 'BFDG Granger-causes INV', then it means BFDG contributes significantly to the regression and changes in BFDG precede changes in INV.

6.3 Justification of the Variables

The variables that are used to proxy the regrassant and the regressors are justified in this section. In this study, the level of investment (INV) is proxied by the gross capital formation as a percentage of GDP. This same proxy was formerly known as gross domestic investment in earlier economic studies and databases (World Bank, 2016). The gross capital formation to GDP is preferred over the gross fixed capital formation because it includes the latter plus changes in inventories. Also it has been extensively used in literature (see among others Ndikumana, 2000; Dutta and Roy, 2009; Dzansi, 2013; Luca and Spatafora, 2012; Adeniyi, and Egwaikhide, 2013; Ndikumana and Mannah Blankson, 2015)

Financial development is split into two indices, that is, bank-based and market-based financial indices. Three bank-based financial development indicators are used to calculate the bank-based financial development indicator (BFD) – namely liquid liabilities as a ratio of GDP (M3), domestic credit to private sector (% of GDP) and domestic credit provided by financial sector (% of GDP). Three market-based financial development indicators are used to calculate the market-based financial development indicator (MFD) – stocks traded, total value as a percentage of GDP; market capitalisation of listed companies as a ratio of GDP; and the turnover ratio.

The ratio of M3 to GDP (liquid liabilities) is preferred in this study because it includes all probable sources of investment funds as far as deposits are concerned. Liquid liabilities are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travellers' cheques, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds

held by residents (World Bank, 2016). Furthermore, liquid liabilities are used in this study as a measure of the size of the bank-based financial sector. The higher the ratio of liquid liabilities to GDP the larger the financial sector, the smaller the ratio the smaller the financial sector (see Fry, 1989; Gelb, 1989; Ndikumana, 2000; Ahmed, 2006; Hamdi *et al,* 2013). Also, the changes in the M3 to GDP ratio are a good reflection of changes in liquidity of the financial sector over time (Ghali, 1999).

Since M3 to GDP does not measure the ability of the financial system to channel funds from depositors to investors, the domestic credit to private sector (as a percentage of GDP) and domestic credit provided by financial sector (% of GDP) ratios are employed as additional proxies of bank-based financial development in this study. The domestic credit to private sector (as a percentage of GDP) measures the importance of banks in the supply of credit to the private sector. The private sector is taken as a fundamental beneficiary of financial development. Therefore, the extent to which the private sector benefits from financial development is an important aspect in the measurement of the ability of the distributive capabilities of the bank-based financial system.

The third proxy that is included in the calculation of the bank-based financial development index is the domestic credit provided by the financial sector (as a percentage of GDP) ratio. The domestic credit provided by the financial sector (as a percentage of GDP) ratio measures the importance of banks in the supply of credit to the whole economy. It takes into account the ability of banks to channel depositor funds to the whole economy, public sector inclusive. The domestic credit provided by the financial sector (as a percentage of GDP) ratio also measures if banks are net providers of financing to the whole economy (for example, in South Africa) or if they are net debtors to the whole economy (for example, in Botswana).

Therefore, to have a summative index on bank-based financial development, the information contained in the three individual financial indicators is produced. Following Ndikumana (2000), the bank-based financial development index is calculated as:

$$BFD_t = \frac{1}{m}\sum_{j=1}^{m} \frac{BF_{j,t}}{\overline{BF}_j}$$
<div align="right">6.11</div>

where $BF_{j,t}$ is an indicator of financial development, $\overline{BF_j}$ is the sample mean of the indicator j and m is the number of indicators included in the computation of the index. Three bank-based financial development indicators are used to calculate the bank-based financial development indicator – namely liquid liabilities (M3) (as a percentage of GDP), domestic credit to private sector (as a percentage of GDP) and domestic credit provided by the financial sector (as a percentage GDP).

Since bank-based financial development is hypothesised as having accelerator-enhancing effects on investment, through changes in aggregate output, the bank-based financial development accelerator interaction term $BFDG_{t-1}$ at time $t-1$ is calculated as:

$$BFDG_{t-1} = BFD_{t-1} \times DOG_{t-1} \qquad\qquad 6.12$$

Bank-based financial development index $(BFDG)$ is expected to have a positive impact on investment.

For the calculation of the market- based financial development indicator (MFD), three market-based financial development indicators are used, that is, stocks traded, total value as a percentage of GDP; market capitalisation of listed companies as a ratio of GDP; and the turnover ratio.

Market capitalisation is the share price times the number of shares outstanding divided by GDP. Market capitalisation does not include investment companies, mutual funds, or other collective investment vehicles (World Bank, 2016). Market capitalisation of listed companies is used, in this study as is with other studies, as a measure of the market size. Market capitalisation/this proxy has been extensively used in related studies (see among others Afangideh, 2010; Kalatzis, and De Castro, 2010; O'Toole and Newman, 2012; Nyasha and Odhiambo, 2015a).

The second indicator of market-based financial development utilised is the stocks traded total value as a ratio of GDP. Stocks traded total value refers to the total value of shares traded during the year divided by the GDP. This indicator complements the market capitalisation ratio by showing whether market size is matched by trading (World Bank, 2016). In other words, it reflects the level of liquidity existing in the stock market of an economy.

The third indicator of market-based financial development utilised is the turnover ratio. The turnover ratio measures the total value of shares traded during the year, divided by the average market capitalisation for the period. Average market capitalisation is calculated as the average of the end-of-period values for the current year and the previous year (World Bank, 2016). The higher the turnover the lower the transaction costs and the opposite is true. Stock turnover measures trading relative to the stock market size and complements the stocks traded total value that measures trading relative to the economy.

In order to have a summative picture of market-based financial development, an index is calculated using the same procedure for constructing the bank-based financial development index. That is, the market-based financial development indicator is calculated as:

$$MFD_t = \frac{1}{m} \sum_{j=1}^{m} \frac{MF_{j,t}}{\overline{MF_j}}$$ 6.13

where $MF_{j,t}$ is an indicator of financial development, $\overline{MF_j}$ is the sample mean of the indicator j and m is the number of indicators included in the computation of the index. Three market-based financial development indicators are used to calculate the bank-based financial development indicator – namely Stocks traded, total value (as a percentage of GDP), Market capitalisation of listed companies (as a percentage of GDP), Stocks traded, turnover ratio (percentage). Therefore, the market-based financial development accelerator interaction term $MFDG_{t-1}$ at time $t-1$ is calculated as:

$$MFDG_{t-1} = MFD_{i,t-1} \times DOG_{t-1}$$ 6.14

Market-based financial development index (MFDG) is expected to have a positive impact on investment.

Given the underlying flexible accelerator principle (for Model 1), which associates investment to output and takes into account the time structure of investment, the first variable to be included in the model as a control variable is the rate of growth of GDP per capita (DOG)(see Ndikumana, 2000, 2005). The rate of growth of GDP per capita is used as a proxy of the growth rate of output. The rate of growth of GDP per capita is preferred in this study because it measures the change

of an economy's income relative to the population. The rate of growth of GDP per capita is expected to have a positive impact on investment.

To capture the effect of interest rates vis-à-vis inflation, the real interest rate (RIR) is used as a second control variable in this study. The real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator (World Bank, 2016). The use of the real interest rate is supported by theoretical and empirical literature that tends to agree that interest rates are important for investment (see McKinnon, 1973; Shaw, 1973; Gibson and Tsakalotos, 1994; Lahcen, 2004; Fowowe, 2013). Real interest rate is expected to have a negative impact on investment.

Savings are also included as a control variable because of their proven track record as an important determinant of investment (see among others McKinnon, 1973; Galbis, 1977; Levine, 1997; Sawyer, 2004; Ndikumana and Mannah Blankson, 2015). Savings are calculated as savings as a share of GDP. The coefficient of savings (SAV) is expected to be positive.

6.4 Estimation Procedures

Since the flexible accelerator model demonstrates that investment is dynamic in nature and that the concept of gradual adjustment may hold true, ordinary least squares (OLS) estimation is ruled out. The OLS method poses estimation problems when variables exhibit strong trends (sustained upward or downward movements). That is, when the variables are nonstationary (have a unit root), spurious regression arises. Spurious regression usually arises when there are "correlated time trends" that appear very much attractive at face value but without any meaningful economic relationship. Therefore, there is need to test for unit roots on all data series. Unit root tests are conducted utilising the Dickey-Fuller generalised least square (DF-GLS) and the Phillips-Perron (PP) tests, among other tests. If there is evidence of cointegration, the autoregressive distrusted lag bounds testing procedure will be employed. To ascertain the short-run and long-run relationships between financial development and investment, the study makes use of the Error Correction Modelling (ECM) dynamic modelling approach. All estimations are computed using Microfit 5.0.1 software.

6.4.1 Unit Root Tests

Substantive economic and financial time series demonstrate trending behaviour in their means[14]. Unit root tests, in this study, are used to determine the order of integration of each data series, that is, if the data is trending. Two of the most common trend removal techniques for data are first differencing and time-trend regression. The former, first differencing, is normally appropriate for time series that are integrated to order 1 while the latter, time trend regression is normally for trend stationary (order 0 integration) time series. However, given that this study is using the ARDL approach, the purpose of unit root testing is to make sure that all the variables are at most integrated to order 1. The ARDL estimation method is only appropriate and applicable when analysing variables that are integrated of an order not more than one.

Some of the most popular types of unit root tests used in econometrics are the Dickey-Fuller (DF) test, the Augmented Dickey Fuller (ADF) test, and the Phillips-Perron (PP) test. The other stationarity tests also used are the Kwiatkowski, Phillips, Schmidt and Shin (KPSS) test. However, in this study, the Dickey-Fuller generalised least square, the Ng-Perron modified unit root tests and the Perron (1997) Unit Root Test (PPURoot) are employed to investigate whether the variables have a unit root or not. The choice of the three as compared to the popular alternatives is supported by the notion that the ADF and PP test seem not to be able to distinguish between highly persistent stationary processes from non-stationary processes; and their power diminishes as deterministic terms are added to the test regressions and are size distorted[15] .

6.4.1.1 Dickey Fuller Generalised Least Squares (DF-GLS) Unit Root Test

Elliot, Rothenberg and Stock (1996) used detrending to come up with the Dickey Fuller Generalised Least Squares (DF-GLS) test for unit root, which is an efficient version of the ADF test. Elliot Rothenberg and Stock (1996) define their detrended data as

$$x_t^d = x_t - \beta_c' D_t \qquad\qquad 6.15$$

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[14] The presence of a stochastic trend.
[15] Tend to reject the null hypothesis too often when it is true.

Equation 6.15 illustrates the procedure Elliot et al (1996) called GLS detrending. Using the GLS detrended data, Elliot et al (1996) estimate the ADF test regression without deterministic terms and compute the t-statistic for testing $\partial = 0$, which is calculated as

$$\Delta x_t^d = \partial x_{t-1}^d + \sum_{i=1}^{p} \emptyset_i \Delta x_{t-i}^d + \mu_t \qquad \qquad 6.16$$

6.4.1.2 Ng-Perron Modified Unit Root Test

Following Elliot *et al* (1996), Ng and Perron (2001) constructed a much more efficient version of the PP test and their Ng and Perron (1996) modified PP test. With the aid of GLS detrended data Ng and Perron (2001) constructed four test statistics, that is,

$$MZ_\propto^d = (T^{-1}\left(x_t^d\right)^2 - f_0)/(2k) \qquad \qquad 6.17$$

$$MZ_t^d = MZ_\propto \times MSB \qquad \qquad 6.18$$

$$MSB^d = (\frac{\kappa}{f_0})^{1/2} \qquad \qquad 6.19$$

$$MP_T^d = \begin{cases} (\overline{c}^2\kappa - \overline{c}T^{-1}\left(x_t^d\right)^2)/f_0 & if\ y_t = \{1\} \\ (\overline{c}^2\kappa + (1 - \overline{c})T^{-1}\left(x_t^d\right)^2)/f_0 & if\ y_t = \{1, t\} \end{cases} \qquad 6.20$$

The statistics $MZ_\propto^d$ and MZ_t^d are efficient versions of the PP $Z_\propto$ and Z_t tests that have much smaller size distortions in the presence of negative moving average errors.

6.4.1.3 Perron (1997) Unit Root Test (PPURoot)

Since there might be the incidence of structural breaks in the data, the Perron (1997) unit root test is employed. The underlying argument being the notion that most macroeconomic data are characterised by large and infrequent shocks some of which have persistent effects. The PPU root test allows for a break under both the null and the alternative hypothesis and, the test has a correct size asymptotically, is consistent whether there is a break or not, is invariant to the break parameters and its performance does not depend on the magnitude of the break (Gylnn *et al*, 2007). The following two equations are therefore estimated to cater for two types of structural

breaks: equation 6.21 allows for a break in the intercept of a series; and equation 6.22 allows for a break in both the intercept and the trend simultaneously.

$$y_t = \alpha_0 + \alpha_1 DU_t + d(DTB)_t + \beta t + \rho y_{t-1} + \sum_{i=1}^{p} \phi_i \Delta x_{t-1} + e_t \qquad 6.21$$

$$y_t = \alpha_0 + \alpha_1 DU_t + d(DTB)_t + \gamma DT_t + \beta t + \rho y_{t-1} + \sum_{i=1}^{p} \phi_i \Delta x_{t-1} + e_t$$
$$6.22$$

Where the intercept dummy DU_t represents a change in the intercept; $DU_t = 1\ if\ (t = TB)$ and zero otherwise; the slope dummy DT_t represents a change in the slope of the trend function; $DT_t = t - TB\ or\ DT_t = t\ if\ t > TB$ and zero otherwise; the crash dummy $(DTB) = 1\ if\ t = TB + 1$ and zero otherwise; and TB is the break date. Each of the two models has a unit root with a break under the null hypothesis and the alternative hypothesis is a broken trend stationary process.

However, estimating the models using differenced variables may result in the loss of a valuable long-run relationship between the dependent and independent variables that is given by the levels of the variables. Therefore, there is need for cointegration analysis if the variables are not stationary.

6.4.2 Test for Cointegration – Auto Regressive Distributed Lag (ARDL) Bounds Testing Approach

At one time, conventional wisdom was that nonstationary variables should be differenced to make them stationary before including them in multivariate models. However, Engle and Granger discuss the concept of cointegration[16]. They showed that it is quite possible for a linear combination of integrated variables to be stationary. In this case the variables are said to be cointegrated (Başar and Temurlenk, 2007:99). Cointegration refers to a linear combination of

---

[16]Engle and Granger define cointegration: The components of the vector X_t are said to be *cointegrated of order d,b* denoted by $X_t \sim CI$ (d,b) if: 1. All components of X_t are integrated of order d. 2.There exists a vector β such that the linear combination βX_t of order (d-b) where b> 0. β is called the cointegrating vector. See Engle, R. and Granger, C (1987). 'Cointegration and Error-Correction: Representation, Estimation, and Testing.' *Econometrica* 55: 251-76.

non-stationary variables and the linear combination of the given non-stationary variables should necessarily be stationary (Enders, 1995). However, for this study, the auto regressive distributed lag (ARDL) bounds testing approach is utilised to examine the cointegration relationship between financial development and investment.

The ARDL bounds testing procedure has a number of distinct advantages as compared to the traditional cointegration tests. Since it is based on a single ARDL equation it gives the advantage of reducing the number of parameters to be estimated. Hence, it has the ability to estimate the long and short-run parameters of the model simultaneously. In addition, restrictions on the number of lags can be individually applied to each variable. The ARDL approach also does not require pre-testing for the order of integration (0 or 1) of the variables used in the model and compared to the Johansen and Juselius (1990) cointegration test. While other cointegration techniques like the Engle-Granger (1987) mechanism, the Phillips and Hansen (1990) procedure, the multivariate co-integration analysis of Johansen (1988), Johansen and Juselius (1990) are sensitive to the size of the sample, the ARDL test has superior small sample properties (Pesaran and Shin, 1999). Furthermore, given that the flexible accelerator model demonstrates that investment is dynamic in nature and that the concept of gradual adjustment may hold true, the ARDL approach is a best-fit model in explaining this gradual adjustment. In addition, the ARDL approach does not require a prior determination of the order of the integration amongst the variables, unlike other approaches which require that the variables be integrated of the same order. However, the ARDL approach is only applicable if there are only I(0) and I(1) variables in the data set. The ARDL approach generally provides estimates of the long-run model that are unbiased and t-statistics that are valid even when some of the regressors are endogenous (Nyasha, 2014).

The ARDL representation of the general empirical model to be estimated is, therefore, expressed as follows:

$$\Delta INV_t = \propto_0 + \sum_{i=0}^{n} \propto_{1i} \Delta BFDG_{t-i} + \sum_{i=0}^{n} \propto_{2i} \Delta MFDG_{t-i} + \sum_{i=0}^{n} \propto_{3i} \Delta DOG_{t-i}$$

$$+ \sum_{i=0}^{n} \propto_{4i} \Delta RIR_{t-i} + \sum_{i=0}^{n} \propto_{5i} \Delta SAV_{t-i} + \sum_{i=1}^{n} \propto_{6i} \Delta INV_{t-i}$$

$$+ \sigma_2 BFDG_{t-1} + \sigma_3 MFDG_{t-1} + \sigma_3 DOG_{t-1} + \sigma_4 RIR_{t-1} + \sigma_5 SAV_{t-1}$$

$$+ \sigma_6 INV_{t-1} + \mu_{1t}$$

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Where:

INV - the gross capital formation to GDP(a proxy for the level of domestic investment);

DOG - the growth rate of real per capita GDP (a proxy for the rate of growth of the desired level of real output);

$BFDG$ - the accelerator interaction term for bank-based financial development;

$MFDG$ - the accelerator interaction term for market-based financial development;

RIR - the real interest rate;

SAV - the gross domestic savings;

Δ - the difference operator;

n - lag length

$\propto_0$ - a constant;

ξ_1 ,$\propto_{i,1}, ..., \propto_{i,6}$ and $\sigma_1, ..., \sigma_6$, - the respective coefficients and;

μ_{1t} - the error term.

The above model is estimated for each of the three countries. The null hypothesis being of no cointegration relationship:

$$H_0: \sigma_{i,1} = \sigma_{i,2} = \sigma_{i,3} = \sigma_{i,4} = \sigma_{i,5} = \sigma_{i,6} = 0$$

Tested against the alternative hypothesis of the existence of a cointegration relationship:

$$H_1: \sigma_{i,1} \neq \sigma_{i,2} \neq \sigma_{i,3} \neq \sigma_{i,4} \neq \sigma_{i,5} \neq \sigma_{i,6} \neq 0$$

The null hypothesis indicates the non-existence of the long-run relationship. The ARDL method estimates (*p+1*)*k* number of regressions in order to obtain the optimal lags for each variable, where *p* is the maximum number of lags to be used and *k* is the number of variables in the equation. The calculated F-statistic is validated against the lower and upper bound critical values (see Pesaran *et al,* 2001:300). If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level relationship cannot be rejected. If the calculated F-statistic lies between the bounds, the test is inconclusive.

6.4.3 Error Correction Model

The error correction model, for each country, associated with the long-run equation above (equation 6.23) is represented by:

$$\Delta INV_t = \propto_0 + \sum_{i=0}^{n} \propto_{1i} \Delta DOG_{t-i} + \sum_{i=0}^{n} \propto_{2i} \Delta BFDG_{t-i} + \sum_{i=0}^{n} \propto_{3i} \Delta MFDG_{t-i}$$

$$+ \sum_{i=0}^{n} \propto_{4i} \Delta RIR_{t-i} + \sum_{i=0}^{n} \propto_{5i} \Delta SAV_{t-i} + \sum_{i=1}^{n} \propto_{6i} \Delta INV_{t-i}$$

$$+ \xi_1 ECM_{t-1} + \mu_t$$

6.24

Where all variables are as defined, with the exception of ECM$_{t-1}$, which is the error correction term lagged one period and its coefficient (ξ_1). The coefficient of the error-correction term lagged one period (ξ_1), which is also the speed of adjustment parameter, is expected to be negative and statistically significant to further confirm the existence of a cointegration relationship.

6.4.4 Trivariate Granger-Causality Test

This study utilizes a trivariate Granger-causality model within an ARDL-bounds testing framework to examine the causal relationship between bank-based financial development, market-based development and investment. Two trivariate Granger-causality models are tested, Models 2A and 2B. Model 2A consists of investment (INV), bank-based financial development (BFDG) and savings (SAV); while Model 2B consists of investment (INV), market-based financial development (MFDG) and savings (SAV).

The ARDL model for cointegration in this case is conducted by taking in turn each variable as a dependent variable. The ARDL model for cointegration testing used in this study can be expressed as follows (see Nyasha and Odhiambo, 2015a):

Model 2A Cointegration equation: Investment and bank-based financial development

$$\Delta INV_t = \propto_0 + \sum_{i=1}^{n} \propto_{1i} \Delta INV_{t-i} + \sum_{i=0}^{n} \propto_{2i} \Delta BFDG_{t-i} + \sum_{i=0}^{n} \propto_{3i} \Delta SAV_{t-i}$$

$$+ \alpha_4 BFDG_{t-1} + \alpha_5 SAV_{t-1} + \alpha_6 INV_{t-1} + \mu_{1t}$$

$$\Delta BFDG_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta BFDG_{t-i} + \sum_{i=0}^{n} \beta_{2i}\Delta INV_{t-i} + \sum_{i=0}^{n} \beta_{3i}\Delta SAV_{t-i}$$
$$+ \beta_4 BFDG_{t-1} + \beta_5 SAV_{t-1} + \beta_6 INV_{t-1} + \mu_{2t}$$

$$\Delta SAV_t = \rho_0 + \sum_{i=1}^{n} \rho_{1i}\Delta SAV_{t-i} + \sum_{i=0}^{n} \rho_{2i}\Delta INV_{t-i} + \sum_{i=0}^{n} \rho_{3i}\Delta BFDG_{t-i} + \rho_4 BFDG_{t-1}$$
$$+ \rho_5 SAV_{t-1} + \rho_6 INV_{t-1} + \mu_{3t}$$

Model 2B Cointegration equation: Investment and market-based financial development

$$\Delta INV_t = \omega_0 + \sum_{i=1}^{n} \omega_{1i}\Delta INV_{t-i} + \sum_{i=0}^{n} \omega_{2i}\Delta MFDG_{t-i} + \sum_{i=0}^{n} \omega_{3i}\Delta SAV_{t-i}$$
$$+ \omega_4 MFDG_{t-1} + \omega_5 SAV_{t-1} + \omega_6 INV_{t-1} + \mu_{4t}$$

$$\Delta MFDG_t = \varphi_0 + \sum_{i=1}^{n} \varphi_{1i}\Delta MFDG_{t-i} + \sum_{i=0}^{n} \varphi_{2i}\Delta SAV_{t-i} + \sum_{i=0}^{n} \varphi_{3i}\Delta INV_{t-i}$$
$$+ \varphi_4 MFDG_{t-1} + \varphi_5 SAV_{t-1} + \varphi_6 INV_{t-1} + \mu_{5t}$$

$$\Delta SAV_t = \gamma_0 + \sum_{i=1}^{n} \gamma_{1i}\Delta SAV_{t-i} + \sum_{i=0}^{n} \gamma_{2i}\Delta MFDG_{t-i} + \sum_{i=0}^{n} \gamma_{3i}\Delta INV_{t-i} + \gamma_4 MFDG_{t-1}$$
$$+ \gamma_5 SAV_{t-1} + \gamma_6 INV_{t-1} + \mu_{6t}$$

Where:

INV - the gross capital formation to GDP (a proxy for the level of domestic investment);

$BFDG$ - the accelerator interaction term for bank-based financial development;

$MFDG$ - the accelerator interaction term for market-based financial development;

SAV - the gross domestic savings;

Δ - the difference operator;

n - lag length

$\propto_0, \beta_0, \rho_0, \omega_0, \varphi_0, \gamma_0$ - respective constants ;

$\propto_1, \dots, \propto_6, \beta_1, \dots, \beta_6, \rho_1, \dots, \rho_6, \omega_1, \dots, \omega_6, \varphi_1, \dots, \varphi_6, \gamma_1, \dots, \gamma_6$ - the respective coefficients and; $\mu_1, \dots, \mu_6,$, - the error term.

After confirmation of cointegration between either type of financial development, and investment, the causal relationship between investment and, either bank-based financial development or market-based financial development is investigated with the aid of the trivariate Granger-causality approach. The following models are estimated for each country:

Model 2A: Investment and bank-based financial development

$$\Delta INV_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta INV_{t-i} + \sum_{i=1}^{n} \alpha_{2i}\Delta BFDG_{t-i} + \sum_{i=1}^{n} \alpha_{3i}\Delta SAV_{t-i} + \alpha_4 ECT_{t-1}$$
$$+ \mu_{1t}$$

6.31

$$\Delta BFDG_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta INV_{t-i} + \sum_{i=1}^{n} \beta_{2i}\Delta BFDG_{t-i} + \sum_{i=1}^{n} \beta_{3i}\Delta SAV_{t-i}$$
$$+ \beta_4 ECT_{t-1} + \mu_{2t}$$

6.32

$$\Delta SAV_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i}\Delta INV_{t-i} + \sum_{i=1}^{n} \phi_{2i}\Delta BFDG_{t-i} + \sum_{i=1}^{n} \phi_{3i}\Delta SAV_{t-i} + \phi_4 ECT_{t-1}$$
$$+ \mu_{3t}$$

6.33

Model 2B: Investment and market-based financial development

$$\Delta INV_t = \vartheta_0 + \sum_{i=1}^{n} \vartheta_{1i}\Delta INV_{t-i} + \sum_{i=1}^{n} \vartheta_{2i}\Delta MFDG_{t-i} + \sum_{i=1}^{n} \vartheta_{3i}\Delta SAV_{t-i} + \vartheta_4 ECT_{t-1}$$
$$+ \mu_{4t}$$

6.34

$$\Delta MFDG_t = \delta_0 + \sum_{i=1}^{n} \delta_{1i}\Delta INV_{t-i} + \sum_{i=1}^{n} \delta_{2i}\Delta MFDG_{t-i} + \sum_{i=1}^{n} \delta_{3i}\Delta SAV_{t-i}$$
$$+ \delta_4 ECT_{t-1} + \mu_{5t}$$

6.35

$$\Delta SAV_t = \gamma_0 + \sum_{i=1}^{n} \gamma_{1i}\Delta INV_{t-i} + \sum_{i=1}^{n} \gamma_{2i}\Delta BFDG_{t-i} + \sum_{i=1}^{n} \gamma_{3i}\Delta SAV_{t-i} + \gamma_4 ECT_{t-1}$$
$$+ \mu_{6t}$$

6.36

Where:

INV - the gross capital formation to GDP (a proxy for the level of domestic investment);

$BFDG$ - the accelerator interaction term for bank-based financial development;

$MFDG$ - the accelerator interaction term for market-based financial development;

SAV - the gross domestic savings;

ECT = error-correction term

Δ - the difference operator;

n - lag length

$\alpha_0, \beta_0, \phi_0, \vartheta_0, \delta_0, \gamma_0$ - respective constants;

$\alpha_1, \dots, \alpha_4, \beta_1, \dots, \beta_4, \phi_1, \dots, \phi_4, \vartheta_1, \dots, \vartheta_4, \delta_1, \dots, \delta_4, \gamma_1, \dots, \gamma_4$ - the respective coefficients,

$\mu_{1t}, \dots, \mu_{6t}$ - residual terms.

The statistical significance of the lagged error term, that is, ECT_{t-1} validates the long-run relationship between the variables. The estimated error correction term shows the speed of convergence from short-run towards the long-run equilibrium path in all models. The main advantage of the ECM based causality test over the traditional Granger-causality is that it aids in distinguishing between short-run and long run causal relationships. A negative coefficient of

the error correction term (ECT_{t-1}) assures the convergence of the estimated system of variables in the models and it also indicates the long-run causality among the variables (Shahbaz, Zeshan and Afza, 2012). However, only in situations where there is cointegration amongst the variables will the error correction term be included in the above-illustrated regression (equations 6.31 to 6.36). The t-statistic on the coefficient of the lagged error correction term is used to assess the significance of the long-run causal relationship among the variables. Short-run causality is gauged with the help of given differenced variables by using the F-statistic to assess the significance of the relationship.

6.5 Definition of Variables and Data Sources

Investment **(INV)** is proxied by the gross capital formation as a percentage of GDP. The growth rate of the real per capita GDP is used as a measure of desired output. Following, Ndikumana (2000), Demirgüç-Kunt and Levine (1996), Nyasha (2014), Nyasha and Odhiambo (2015b) in the use of financial development indices, the bank-based financial development accelerator interaction term **(BFDG)** represents the accelerator enhancing effect of bank-based financial development on investment. It is calculated as the multiplication of the bank-based financial development index and the real per capita growth rate. The market-based financial development accelerator interaction term **(MFDG)** represents the accelerator enhancing effect of market-based financial development on investment. It is calculated as the multiplication of the market-based financial development index and the real per capita growth rate.

Since theoretical and empirical evidence stress the significance of interest rates in investment, the rate of real rate of interest **(RIR)**, calculated, as the lending interest rate adjusted for inflation as measured by the GDP deflator, is included as a control variable in the general model. Since theoretical and empirical evidence also allude to the importance of savings in investment, the rate of gross domestic savings **(SAV)**, calculated by the World Bank (2016) as GDP less final consumption expenditure (total consumption), is included as a control variable in the general model. Given the underlying flexible accelerator-enhancing framework, the annual growth rate of the GDP per capita **(DOG)** is also included as a control variable.

The study uses annual data, covering the period 1976 to 2014 for South Africa, Botswana and Mauritius. The main data source is the World Development Indicators (World Bank, 2016). All

the series were obtained from this source except liquid liabilities for Botswana and Mauritius, which were obtained from the Global Financial Development Data (World Bank, 2016).

The variables used in this study and their respective sources are described and summarised in Table 6.1.

Table 6.1: Definition of Variables and Data Sources

Variable name	Variable used	Data Source
INV	share of investment in GDP (a proxy for investment)	World Development Indicators (World Bank, 2016).
DOG	annual growth rate of GDP per capita (proxy of the annual growth rate of output)	World Development Indicators (World Bank, 2016).
BFDG	the accelerator-enhancing index of bank-based financial development (a proxy for bank-based financial development)	World Development Indicators (World Bank, 2016). Liquid liabilities data for Botswana and Mauritius came from the Global Financial Development Data (World Bank, 2016).
MFDG	the accelerator-enhancing index of market-based financial development (a proxy for market-based financial development)	World Development Indicators (World Bank, 2016).
RIR	annual lending rate adjusted for inflation (a proxy of the real interest rate)	World Development Indicators (World Bank, 2016).
SAV	share of savings in GDP (a proxy for savings).	World Development Indicators (World Bank, 2016).

6.6 Conclusion

The formulation of the empirical model to be estimated and the model's theoretical underpinnings has been discussed in this chapter, together with the estimation techniques employed in this

study. The chapter has, among other things, deliberated on the model to be estimated, the definition and justification of variables, the estimation procedures to be followed and data sources used in this study.

CHAPTER 7

ECONOMETRIC ANALYSIS AND EMPIRICAL RESULTS

7.1 Introduction

This chapter discusses the econometric analysis and the empirical findings based on the models and methodology discussed in the previous chapter, with the objective of examining the relationship between financial development and investment in the three study countries. The study makes use of the ARDL bounds testing approach and the ECM-based Granger-causality model to examine the relationship between bank-based and market-based financial development, and investment. The chapter is divided into five sections. Section 7.2 presents the results of the unit root tests. The results of the impact model (Model 1) are presented and discussed in Section 7.3 while Section 7.4 presents and discusses the results of the ECM-based Granger-causality model (Model 2). Section 7.5 provides the conclusion of the chapter.

7.2 Unit Root Tests for All Variables

Before estimating the models, it is important to test for the stationarity of the variables; and where the variables are not stationary in levels, appropriate differencing has to be done until the variables become stationary. Given that this study makes use of the ARDL bounds approach for empirical analysis, unit root testing is employed for confirming that there is no variable that is integrated of an order more than 1. The main weakness of ARDL methodology is that the inclusion of variables that are integrated of order 2 and above in the estimation causes the methodology to disintegrate (Pesaran *et al*. 2001). Therefore, the ARDL bounds testing approach only applies for analysis of variables that are integrated of an order not more than one. In this study, the unit root tests to check for stationarity were conducted using the Augmented Dickey-Fuller Generalised Least Square, Perron (1997) PPURoot and Ng-Perron Modified unit root tests. Alternative unit root test (e.g. Perron (1997) PPURoot) was used to account for the incidence of structural breaks in the variables. The null hypothesis is that the relevant series are not stationary against the alternative that the series are stationary. The test results of all the variables for all the study countries in levels and in first differences are presented in Table 7.1.

Table 7.1: Unit Root Test Results for each Country

Dickey-Fuller Generalised Least Square (DF-GLS)

Variable	MAURITIS				BOTSWANA				SOUTH AFRICA			
	Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences	
	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend
INV	-2.667***	-3.055**	-	-	-2.747*	-2.777	-6.222***	-6.229***	-1.164	-1.710	-3.279***	-4.52***
DOG	-3.155***	-5.415***	-	-	-4.521***	-5.451***	-	-	-3.870***	-4.097***	-	-
BFDG	-2.589**	-5.912***	-	-	-1.783*	-2.043	-9.935***	-11.09***	-1.569	-2.089	-2.371**	-3.883**
MFDG	-2.759***	-3.843***	-	-	-4.096***	-4.941***	-	-	-1.588	-2.083	-5.201***	-5.249***
RIR	-1.092	-1.023	-9.835***	-10.11***	-1.571	-2.276	-4.813***	-4.045***	-1.329	-1.404	-4.297***	-4.316***
SAV	-1.129	-1.512	-4.589***	-5.506***	-2.104**	-2.549	-5.515***	-5.565***	-1.168	-1.739	-4.636***	-4.76***

Perron (1997) Unit Root Test (PPURoot)

Variable	MAURITIS				BOTSWANA				SOUTH AFRICA			
	Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences s		Stationarity in levels		Stationarity in first differences	
	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend
INV	-4.350	-4.631	-8.273***	-8.262***	-6.349***	-6.641***	-	-	-3.546	-4.546	-5.231**	-5.324*
DOG	-6.876***	-7.148***	-	-	-6.313***	-6.284***	-	-	-4.422	-4.537	-5.503**	-5.501*
BFDG	-6.817***	-6.952***	-	-	-6.492***	-7.009***	-	-	-4.391	-4.583	-6.451***	-6.41***
MFDG	-2.921	-2.862	-10.82***	-10.54***	-5.699*	-5.188	-6.741***	-6.449***	-4.615	-4.789	-7.067***	-7.61***
RIR	-3.313	-3.907	-11.11***	-10.95***	-3.969	-5.144	-6.045	-5.96***	-4.065	-5.005	-5.417**	-5.306*
SAV	-3.746	-3.543	-7.028*	-7.816*	-4.014	-4.325	-6.395***	-6.245***	-3.763	-5.101	-7.579***	-7.63***

Ng-Perron Modified Unit Root Test

MZa

Variable	MAURITIUS				BOTSWANA				SOUTH AFRICA			
	Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences	
	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend
INV	-10.43**	-12.07	-17.51***	-17.39**	-7.383 *	-8.505	-18.47***	-17.32*	-2.835	-7.426	-12.75**	-31.5***
DOG	-13.53**	-18.57**	-	-	-17.42***	-18.76**	-	-	-5.255	-13.557	-18.26***	-17.770**
BFDG	-3.058	-9.109	-37.62***	-22.26**	-5.21837	-6.858	-14.24***	-18.9**	-5.238	-15.166*	-18.15***	-17.544**
MFDG	-10.65**	-16.30*	-	-	-9.312**	-9.303	-9.023**	-22.47**	-12.71**	-14.177*	-	-
RIR	-1.721	-2.691	-14.59***	-14.17***	-12.63**	-13.994	-15.58***	-40.59***	-2.382	-3.429	-17.38***	-17.385**
SAV	-3.269	-4.533	-16.78***	-17.72**	-7.814*	-11.467	-17.90***	-18.272*	-5.918*	-316.3***	-	-

MZt

Variable	MAURITIUS				BOTSWANA				SOUTH AFRICA			
	Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences		Stationarity in levels		Stationarity in first differences	
	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend
INV	-2.162**	-2.439	-2.939***	-2.928**	-1.898 *	-2.061	-3.030***	-2.883*	-1.151	-1.828	-2.499**	-3.96***
DOG	-2.594***	-3.042**	-	-	-2.933***	-3.061**	-	-	-1.619	-2.590	-3.022***	-2.976**
BFDG	-1.167	-2.113	-4.311***	-3.325**	-1.615	-1.830	-2.621***	-3.073**	-1.616	-2.734*	-3.012***	-2.956**
MFDG	-2.296**	-2.681*	-	-	-2.154**	-2.143	-2.115**	-3.351 **	-2.519**	-2.631*	-	-
RIR	-0.917	-1.015	-2.692***	-2.649*	-2.512**	-2.614	-2.713***	-4.496***	-1.091	-1.274	-2.946***	-2.947**
SAV	-1.041	-1.434	-2.885***	-2.976**	-1.822*	-1.973	-2.324***	-2.697*	-1.642*	-12.57***	-	-

MSB												
	MAURITIUS				**BOTSWANA**				**SOUTH AFRICA**			
Variable	**Stationarity in levels**		**Stationarity in first differences**		**Stationarity in levels**		**Stationarity in first differences**		**Stationarity in levels**		**Stationarity in first differences**	
	Without trend	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**
INV	0.207**	0.202	0.167***	0.168**	0.257*	0.242	0.164***	0.166**	0.406	0.246	0.196**	0.126***
DOG	0.192**	0.164**	-	-	0.168***	0.163**	-	-	0.308	0.191	0.165***	0.167**
BFDG	0.381	0.232	0.114***	0.149**	0.309	0.267	0.184**	0.163**	0.309	0.180*	0.166***	0.168**
MFDG	0.216**	0.165**	-	-	0.231**	0.230	0.234**	0.149 **	0.198**	0.186*	-	-
RIR	0.533	0.377	0.185**	0.177*	0.199**	0.187	0.174***	0.111 ***	0.457	0.371	0.169***	0.169**
SAV	0.319	0.317	0.172***	0.168**	0.233*	0.172	0.129***	0.141***	0.277*	0.040***	-	-
MPT												
	MAURITIUS				**BOTSWANA**				**SOUTH AFRICA**			
Variable	**Stationarity in levels**		**Stationarity in first differences**		**Stationarity in levels**		**Stationarity in first differences**		**Stationarity in levels**		**Stationarity in first differences**	
	Without trend	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**	**Without trend**	**With trend**
INV	2.811**	7.640	1.470***	5.365**	3.402*	10.72	1.357***	5.616**	8.523	12.457	2.023**	2.909***
DOG	1.834**	4.935**	-	-	1.474***	4.862**	-	-	4.664	6.797	1.341***	5.156**
BFDG	7.879	10.082	0.723***	4.162**	4.696	13.307	1.901**	4.827**	4.682	6.120*	1.349***	5.227**
MFDG	2.344**	6.594***	-	-	2.643**	9.84738	2.747**	4.061**	1.935**	6.611*	-	-
RIR	14.066	29.231	1.709***	6.501*	1.943**	6.69	1.860***	2.289****	10.279	25.91	1.415***	5.247**
SAV	7.267	19.553	1.501***	5.146**	3.686*	9.930	3.528**	7.467*	4.378*	0.294***	-	-

Note: *, ** and *** denote stationarity at the 10%, 5% and 1% significance levels respectively

For the three countries, all the variables under consideration are at most integrated of order 1. The ARDL approach is only applicable for the analysis of variables that are integrated of an order not more than one. Therefore, given the confirmation of the order of integration to be at most 1, the next step is to test for cointegration among the variables using the ARDL bounds testing procedure.

7.3 Empirical Analysis of the Impact Model (Model 1)

In this section, a discussion of the results of the general impact model for all the study countries is given. Section 7.3.1 gives the results and the analysis of the ARDL bounds test while section 7.3.2 gives the estimated short-run and long-run coefficients, and their respective analysis. Section 7.3.3 presents the results of the associated diagnostic tests for the estimated general impact model.

7.3.1 ARDL Based Cointegration Test

The ARDL bounds testing approach to cointegration tests the existence of cointegration between the variables. The appropriate lag order is selected based on the Schwarz Bayesian Criterion. The Schwarz Bayesian Criterion (SIC) was used because it was more parsimonious than the Akaike Information Criterion. The empirical results of the ARDL bounds tests for cointegration are reported in Table 7.2.

Table 7.2: Bounds F-Test for Cointegration

Country	Dependent Variable	Function	F-statistic	Cointegration Status
Botswana	INV	F(INV| DOG, BFDG, MFDG, RIR, SAV)	3.904*	Cointegrated
South Africa	INV	F(INV| DOG, BFDG, MFDG, RIR, SAV)	5.240***	Cointegrated
Mauritius	INV	F(INV| DOG, BFDG, MFDG, RIR, SAV)	10.808***	Cointegrated
Asymptotic Critical Values for Botswana equation *(includes unrestricted trend)*				

Pesaran et al. (2001:301) Table CI (v) Case V	1%		5%		10%	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
	3.93	5.23	3.12	4.25	2.75	3.79
Asymptotic Critical Values for South Africa and Mauritius *(no trend)*						
Pesaran et al 2001:300 Table CI(iii) Case III	1%		5%		10%	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
	3.41	4.68	2.62	3.79	2.26	3.35

Note: *, ** and *** denote significance at the 10%, 5% and 1% significance levels respectively

For Botswana, the results indicate that the computed F-statistic is greater than the upper critical bound at the 10% level of significance while for South Africa and Mauritius it is at the 1% level of significance. This implies that for all countries there is cointegration between the series and it confirms that investment, desired output growth, bank-based financial development, market-based financial development, savings and real interest rates are cointegrated over the study period. Therefore, given the confirmation of cointegration for all study countries, the optimal lag length selected based on the SIC is ARDL (2,0,0,0,0,0); ARDL (1,0,0,1,0,0) and ARDL (1,1,0,0,1,1) for Botswana, South Africa and Mauritius, respectively.

7.3.2 Estimated Long-Run and Short-Run Coefficients

The estimated long-run and short-run coefficients for each country as per the ARDL bounds test (equations 6.23 and 6.24) are summarised in Table 7.3. Panel 1A of Table 7.3 gives the long-run results while Panel 1B gives the short-run results.

Table 7.3: Estimated Long-Run and Short-Run Coefficients

Panel 1A: Estimated Long-Run Coefficients -Dependent variable is INV

Regressor	BOTSWANA				SOUTH AFRICA				MAURITIUS			
	Coefficient	Standard Error	T-Ratio	Prob. Values	Coefficient	Standard Error	T-Ratio	Prob. Values	Coefficient	Standard Error	T-Ratio	Prob. Values
DOG	-0.7464*	0.40710	-1.8333	0.094	3.0081	1.8662	1.6119	0.127	0.23946	0.89493	0.26757	0.794
BFDG	0.69970*	0.35251	1.9849	0.073	-1.3979	0.88335	-1.5825	0.133	-2.2363	1.4203	-1.5745	0.144
MFDG	1.2989	1.3938	0.93193	0.371	0.53800**	0.20569	2.6156	0.019	1.2140	0.76488	1.5872	0.141
RIR	-0.0728	0.19004	-0.38309	0.709	0.21017	0.20186	1.0412	0.313	-0.73888*	0.3392	-2.1783	0.052
SAV	-0.18055	0.16880	-1.0696	0.308	0.97442**	0.37593	2.5920	0.020	0.39484	0.31981	1.2346	0.243
C	28.096***	8.2830	3.3920	0.006	-4.6960	8.4291	-0.55712	0.585	26.0946***	5.6517	4.6171	0.001
T	0.426**	0.15973	2.6684	0.022	-	-	-	-	-	-	-	-

Panel 1B: Estimated Short-Run Coefficients -Dependent variable is dINV

Regressor	BOTSWANA				SOUTH AFRICA				MAURITIUS			
	Coefficient	Standard Error	T-Ratio	Prob. Values	Coefficient	Standard Error	T-Ratio	Prob. Values	Coefficient	Standard Error	T-Ratio	Prob. Values
dINV1	0.21725	0.22029	0.98619	0.345	-	-	-	-	-	-	-	-
dDOG	-0.711**	0.25720	-2.7648	0.018	0.7760**	0.41732	1.8596	0.080	0.8872*	0.50211	1.7669	0.099
dBFDG	0.6666**	0.28636	2.3280	0.040	-0.3606*	0.20395	-1.7683	0.095	-1.7874	1.1967	-1.4937	0.157
dMFDG	1.2375	1.1637	1.0634	0.310	0.059806	0.038930	1.5362	0.143	0.97035*	0.54231	1.7893	0.095
dRIR	-0.06936	0.18966	-0.36573	0.722	0.0542**	0.0475	1.1403	0.270	-0.442**	0.201	-2.1890	0.046
dSAV	-0.17202	0.18345	-0.93769	0.369	0.2513**	0.0982	2.5595	0.020	-0.388	0.40110	-0.96891	0.349
dT	0.40609*	0.19741	2.0571	0.064	-	-	-	-	-	-	-	-
ECM (-1)	-0.952**	0.33209	-2.8690	0.015	-0.258***	0.0790	-3.2647	0.005	-0.799**	0.27296	-2.9282	0.011

R-Squared	0.76250	R-Bar-Squared	0.58977	R-Squared	0.93480	R-Bar-Squared	0.90627	R-Squared	0.64104	R-Bar-Squared	0.34734
S.E. of Regression	3.2253	F-Stat. F(10,25)	4.4144(0.013)	S.E. of Regression	0.65669	F-Stat. F(10,25)	32.7704(0.000)	S.E. of Regression	2.3633	F-Stat. F(10,25)	2.1827(0.111)
Residual Sum of Squares	114.4271	DW statistic	1.7471	Residual Sum of Squares	6.8998	DW statistic	2.2270	Residual Sum of Squares	61.4364	DW statistic	2.2679
Akaike Info. Criterion	-54.8208	Schwarz Bayesian Criterion	-59.3016	Akaike Info. Criterion	-27.0957	Schwarz Bayesian Criterion	-31.8079	Akaike Info. Criterion	-51.0692	Schwarz Bayesian Criterion	-56.2919

Note: *, ** and *** denote significance at the 10%, 5% and 1% significance levels respectively

Table 7.3 shows the estimated short-run and long-run coefficients for the countries in the study, however the analysis of the results is done per each country. Sections 7.3.2.1, 7.3.2.2 and 7.3.2.3 give the analysis of the results for Botswana, South Africa and Mauritius respectively. Nonetheless, the regression for the underlying ARDL model for each country fits well, as indicated by an R-squared of 76.2%, 93.4% and 64.1% for Botswana, South Africa and Mauritius respectively.

7.3.2.1 BOTSWANA

Panel 1A of Table 7.3 reveals that, for Botswana, in the long run, the coefficient of bank-based financial development is positive and statistically significant. This implies that for Botswana there is a long-run positive relationship between bank-based financial development and investment. The coefficient of market-based financial development is insignificant both in the short run and in the long run. This implies that market-based financial development does not have any impact on investment in Botswana.

Other long-run results for Botswana show that, the coefficient of the desired output growth (DOG) is negative and statistically significant, implying that the level of the desired output growth has a negative impact on investment. Real interest rates and savings are found to be statistically insignificant in the long run.

The results for the short-run coefficients (Panel 1B) show that the coefficient of bank-based financial development is also positive and statistically significant, as expected. Thus an increase in the level of bank-based financial development leads to an increase in investment in the short run. This positive long-run and short-run impact of bank-based financial development on investment may be attributed to the availability of lending funds because of the extensive public savings. The coefficient of the level of desired real output growth is found to be negative and statistically significant. Therefore, an increase in the level of desired output growth leads to a decrease in investment in the short run in Botswana. Although contrary to expectations of this study, these results can be attributed to the related challenges in measuring the desired output growth (see among others Ramirez, 1994, Blejer and Khan, 1984, Epstein and Denny 1983) and the rather unchanging lower than 5% GDP growth rates[17].

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[17] See section 3.2.

Real interest rates and savings are found to be statistically insignificant in the short run and long run. This might be explained by the financial sector using the vast savings in Botswana to finance consumption spending instead of investment. The coefficient of the trend term, both in the long run and in the short run, is positive and statistically significant. The coefficient on T is an estimate of the amount by which the function is shifting in each period.

Nonetheless, only bank-based financial development has a positive impact on investment in Botswana, for both the long run and the short run. The results for Botswana are consistent with Benhabib and Spiegel (2000), Ndikumana (2000), Dutta and Roy (2009), Fowowe (2011) and Hassan (2015) who find that bank-based financial development has a positive significant impact on investment. Market-based financial development has no significant impact on investment in Botswana. This finding may be attributed to the size of the market-based financial sector in Botswana, which is relatively small in size when compared to the bank-based side of financial development.

Therefore, the composition, behaviour, and size of the banking industry, the relatively small and illiquid capital markets, and the presence of consistent government surpluses appear to be the main reasons for bank-based financial development in Botswana being a significant contributor to investment within the accelerator framework/conditions.

For the estimated model, the coefficient of the error correction term (ecm (-1)) is also found to be negative and significant as expected. The negative and statistically significant estimate of the lagged error correction term (ecm (−1)) validates an established short-run relationship between all the variables in the estimated model for all countries.

7.3.2.2 SOUTH AFRICA

The long-run results reported in Table 7.3 show that the coefficient of market-based financial development is statistically significant and positive, as expected. This implies that for South Africa there is a long-run positive relationship between market-based financial development and investment. The coefficient for bank-based financial development is found to be statistically insignificant. This implies that bank-based financial development does not have any long-run impact on investment in South Africa. This might be due to investors preferring to finance their

investment through the stock market rather than banks as confirmed by the positive long-run impact of market-based financial development on investment.

Other long-run results for South Africa reveal that the coefficient for savings is statistically significant and positive, implying that the level of savings has a positive impact on investment. Real interest rates and GDP per capita growth are found to be statistically insignificant in the long run

However, the estimated short-run function, as presented in Table 7.3 has a statistically significant and negative coefficient for bank-based financial development. This implies that for South Africa there is a short-run negative relationship between bank-based financial development and investment. Though unexpected, this result is similar to those found by Misati and Nyamongo (2011) and Lahcen (2004). The short-run negative relationship between bank-based financial development and investment may be attributed to increased preference by banks to provide consumption credit (due to higher lending margins), the oligopolistic influence of the leading banks and investors preferring to finance their investment through the stock market rather than banks (this is partly confirmed by the positive long-run effect of market-based financial development on investment). The coefficient for market-based financial development is found to be statistically insignificant in the short-run. This implies that, in the short run, market-based financial development does not have any impact on investment in South Africa.

However, coefficients for the desired output growth and savings are statistically significant and positive. Therefore, for South Africa, the savings and expectations on output growth have a positive significant impact on investment.

The results of both the long-run and short-run estimated functions show statistical significance of the effect of either type of financial development on investment. Therefore, though it is for different periods, there is a confirmed accelerator-enhancing effect of financial development on investment. Specifically, market-based financial development has a positive effect on investment in the long run while bank-based financial development has a negative effect on investment in the short run. This implies that an increase in market-based financial development leads to an increase in investment only in the long run. On the other hand, an increase in bank-based financial development leads to a decrease in the level of investment in the short run.

Consequently, bank-based financial development has a negative effect on investment in the short run while market-based financial development has a positive effect in the long run.

Savings is statistically significant and positive both in the short run and in the long run. The desired output growth is only found to be significant and positive in the short run. Therefore, savings are a positive determinant of investment in South Africa, both in the long run and in the short run. The desired output growth has positive effects only in the short run. The real interest rate is found to be statistically insignificant both in the short run and in the long run.

The coefficient of the error correction term (ecm (-1)) is also found to be negative and significant as expected. The negative and statistically significant estimate of the lagged error correction term (ecm (−1)) substantiates an established long run relationship between all the variables in the estimated model. For example, the results for South Africa indicate that the estimate of ecm (-1) i.e. -0.258 is statistically significant at 1% level of significance. This implies that a 25.8% yearly change in investment is corrected by deviations in the short run toward the long run equilibrium path.

7.3.2.3 MAURITIUS

The long-run results from the impact model (Panel 1A) show that the coefficients of both bank-based and market-based financial development are statistically insignificant. This implies that both types of financial development do not have any effect on investment in the long run. This finding is not surprising, given the composition and structure of the Mauritian banking sector which is mainly dominated by offshore trading.

The short run result (Panel 1B) show that market-based financial development is the only type of financial development that has a positive and statistically significant effect on investment. These results are relatively similar to those of Leahy, *et al, (*2001) and Bassanini, *et al*, (2001).

For both the long run and the short run, real interest rates are found to have a negative and statistically significant effect on investment. The level of desired output growth is also found to have a positive short-run effect on investment. Savings are found to be statistically insignificant in the short run and long run.

The coefficient of the error correction term (ecm (-1)) is also found to be negative and significant as expected. The negative and statistically significant estimate of the lagged error correction term (ecm (−1)) substantiates an established long run relationship between all the variables in the estimated model.

Table 7.4 summarises the impact of bank-based and market-based financial development on investment.

Table 7.4: Summary of ARDL bounds testing approach results

	IMPACT OF BFDG ON INV						IMPACT OF MFDG ON INV					
	Positive Impact		Negative Impact		No Impact		Positive Impact		Negative Impact		No Impact	
	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run
Botswana	X	X									X	X
South Africa			X			X		X			X	
Mauritius					X	X	X					X

NB: INV=investment; BFDG=bank-based financial development composite index; MFDG=market-based financial development composite index, **X** indicates presence of corresponding impact.

According to Table 7.4, the effect of financial development on investment is not standard across the three countries. The effect of bank-based financial development on investment in Botswana is positive in both the short run and the long run. However, for the case of South Africa, it is negative in the short run and has no significant impact in the long run. For Mauritius, there is no impact of bank-based financial development on investment. Therefore, all three countries show differing results and tend to confirm that there might be inter-country differences that determine the relationship between investment and financial development. Focusing on the effect of market-based financial development on investment, there is no significant impact of such in the short run and the long run for Botswana. The same conclusion of no significant impact is found for South Africa and Mauritius in the short and the long run, respectively. However, for South Africa,

the effect of market-based financial development on investment is positive only in the long run. For Mauritius, the effect of market-based financial development on investment is positive only in the short run.

7.3.3 Diagnostic Tests

To ascertain the goodness of fit of the ARDL models, diagnostic tests were employed. The diagnostic tests focused on assessing serial correlation, the functional form, normality and the incidence of heteroscedasticity. Table 7.5 summarises the results of the diagnostic tests for each country over the study period.

Table 7.5: ARDL – ECM Diagnostics Tests

LM Test Statistics	Results		
	Botswana	South Africa	Mauritius
Serial Correlation	0.506(0.477)	0.631(0.427)	1.042(0.307)
Functional Form	3.986(0.046)	0.811(368)	1.920(0.166)
Normality	4.081(0.13)	0.688(0.709)	0.120(0.942)
Heteroscedasticity	0.0851(0.770)	0.091(0.762)	0.120(0.728)

The associated diagnostic tests for Model 1 for each of the study countries (as displayed in Table 7.5) show that there is no serial correlation; no problem of heteroscedasticity and the error term of the model is normally distributed. The Ramsey RESET test shows that the functional form of the model is well specified for South Africa and Mauritius while for Botswana it showed otherwise. However, an inspection of the CUSUM and CUSUMQ graphs for Botswana (Table 7.6) shows that there is stability and that there is no systematic change identified in the coefficients at the 5% level of significance over the study period.

The stability analysis of the employed ARDL model is done with the aid of the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMQ). The plot of the CUSUM and CUSUMQ for each country is given in Table 7.6. The

null hypothesis, in this case, is that the empirical model is misspecified and is validated if the graphs of both CUSUM and CUSUMQ cross the critical bounds. The reported CUSUM and CUSUMQ show that the estimated model for each country is stable and confirms the stability of the long-run coefficients of regressors.

Table 7.6: Plot of CUSUM and CUSUMQ

BOTSWANA

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

SOUTH AFRICA

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

MAURITIUS

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

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7.4 Trivariate Granger-Causality Test Results (Model 2)

To further assess the relationship between financial development and investment, the direction of causality between investment and financial development – both bank- and market-based is investigated. Both bank-based and market-based financial development are, as in the earlier model hypothesised as having accelerator-enhancing effects of changing investment, through changes in aggregate output. Savings ratio was added as an intermittent variable to form a trivariate Granger-causality model. The Granger-causality test was split into two models. The first model (Model 2A) tests the causality between investment and bank-based financial development and has the following variables: investment, bank-based financial development and savings. The second model (Model 2B) examines the causal relationship between investment and market-based financial development; and has the following variables: investment, market-based financial development and savings.

7.4.1 ARDL Bounds Test for Cointegration

Before the causal relationship is examined, the first step is to establish the existence of cointegration, if any, among the variables of interest. To establish if there is cointegration in the variables under study, the bounds F-test is employed. If there is cointegration, the estimated causality model will contain the error correction term as one of the regressors, and the opposite is also true (no cointegration, no error correction term in the estimated model). The results of the bounds F-test for both bank-based financial development (Model 2A) and market-based financial development (Model 2B) for each country are given in Table 7.7.

Table 7.7 : Bounds F-Test for Cointegration

BOTSWANA							
Model 2A: Investment (INV), Bank-Based Financial Development (BFDG) and Savings (SAV)				Model 2B: Investment (INV), Market-Based Financial Development (MFDG) and Savings (SAV)			
Dependent Variable	Function	F-statistic	Cointegration Status	Dependent Variable	Function	F-statistic	Cointegration Status
INV	F(INV| BFDG, SAV)	1.7749	Not Cointegrated	INV	F(INV| MFDG, SAV)	0.84919	Not Cointegrated
BFDG	F(BFDG|INV, SAV)	7.3366***	Cointegrated	MFDG	F(MFDG| INV, SAV)	1.4657	Not Cointegrated
SAV	F(SAV| INV, BFDG)	5.2626**	Cointegrated	SAV	F(SAV| INV, MFDG)	10.8092***	Cointegrated

SOUTH AFRICA							
Model 2A: Investment (INV), Bank-Based Financial Development (BFDG) and Savings (SAV)				Model 2B: Investment (INV), Market-Based Financial Development (MFDG) and Savings (SAV)			
Dependent Variable	Function	F-statistic	Cointegration Status	Dependent Variable	Function	F-statistic	Cointegration Status
INV	F(INV| BFDG, SAV)	5.9218**	Cointegrated	INV	F(INV| MFDG, SAV)	5.9238**	Cointegrated
BFDG	F(BFDG| INV, SAV)	1.4393	Not Cointegrated	MFDG	F(MFDG / INV, SAV)	1.3861	Not Cointegrated
SAV	F(SAV| INV, BFDG)	4.9841**	Cointegrated	SAV	F(SAV / INV, MFDG)	6.7929***	Cointegrated

MAURITIUS							
Model 2A: Investment (INV), Bank-Based Financial Development (BFDG) and Savings (SAV)				**Model 2B: Investment (INV), Market-Based Financial Development (MFDG) and Savings (SAV)**			
Dependent Variable	**Function**	**F-statistic**	**Cointegration Status**	**Dependent Variable**	**Function**	**F-statistic**	**Cointegration Status**
INV	F(INV/ BFDG, SAV)	6.1113**	Cointegrated	INV	F(INV/ MFDG, SAV)	5.0995**	Cointegrated
BFDG	F(BFDG / INV, SAV)	1.7592	Not Cointegrated	MFDG	F(MFDG / INV, SAV)	4.9018**	Cointegrated
SAV	F(SAV / INV, BFDG)	2.0098	Not Cointegrated	SAV	F(SAV / INV, MFDG)	0.36824	Not Cointegrated
Asymptotic Critical Values							
Pesaran et al 2001:300 Table CI(iii) Case III	1%		5%		10%		
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
	5.15	6.36	3.79	4.85	3.17	4.14	

Note: *, ** and *** denotes significance at the 10%, 5% and 1% significance levels respectively

Results from Table 7.7 show that for Botswana and Mauritius three out of the six equations to be estimated have cointegrated variables, for South Africa four out of the six equations to be estimated have cointegrated variables. This is confirmed by the respective F-statistics of each function vis-à-vis the asymptotic critical values.

7.4.2 ECM- Based Granger-Causality Analysis

To further assess the relationship between financial development and investment, the direction of causality between investment and financial development – both bank- and market-based are investigated. Following Nyasha (2014), the direction of causality is assessed by checking on the significance of the F-statistics of the explanatory variables and the t-statistic of the coefficient of the lagged error- correction term. The F-statistics of the explanatory variables indicate the short-run causal effects while the t-statistic of the coefficient of the lagged error- correction term indicates the long-run causal relationship in each of the estimated equations. The results of the causality test for the two models within the Error-Correction Mechanism (equations 6.31 to 6.36) are reported in Table 7.8

Table 7.8: Granger-Causality Test Results

BOTSWANA									
Model 2A: Investment (INV), Bank-Based Financial Development (BFDG) and Savings (SAV)					Model 2B: Investment (INV), Market-Based Financial Development (MFDG) and Savings (SAV)				
Dependent Variable	F-statistics (probability)			ECT_{t-1} [t-statistics]	Dependent Variable	F-statistics (probability)			ECT_{t-1} [t-statistics]
	ΔINV_t	$\Delta BFDG_t$	ΔSAV_t			ΔINV_t	$\Delta MFDG_t$	ΔSAV_t	
ΔINV_t	-	3.3668** (0.048)	1.9705 (0.157)	-	ΔINV_t	-	5.9522** (0.013)	1.6243 (0.232)	-
$\Delta BFDG_t$	4.4368** (0.021)	-	0.25232 (0.779)	-0.90476*** [-4.6878]	$\Delta MFDG_t$	5.1466** (0.021)	-	0.49357 (0.621)	-
ΔSAV_t	2.8521** (0.041)	4.9802*** (0.004)	-	-0.93098** [-2.1976]	ΔSAV_t	2.0289 (0.171)	5.9078** (0.015)	-	-0.49068* [-1.8250]

SOUTH AFRICA									
Model 2A: Investment (INV), Bank-Based Financial Development (BFDG) and Savings (SAV)					Model 2B: Investment (INV), Market-Based Financial Development (MFDG) and Savings (SAV)				
Dependent Variable	F-statistics (probability)			ECT_{t-1} [t-statistics]	Dependent Variable	F-statistics (probability)			ECT_{t-1} [t-statistics]
	ΔINV_t	$\Delta BFDG_t$	ΔSAV_t			ΔINV_t	$\Delta MFDG_t$	ΔSAV_t	
ΔINV_t	-	0.24156 (0.628)	2.4182* (0.060)	-0.11749*** [-3.7442]	ΔINV_t	-	1.5652 (0.262)	3.4928* (0.094)	-0.22205* [-1.8554]
$\Delta BFDG_t$	7.3722*** (0.002)	-	5.6529*** (0.008)	-	$\Delta MFDG_t$	3.3939** (0.058)	-	0.18308 (0.834)	-
ΔSAV_t	2.9626* (0.096)	1.4216 (0.257)	-	-0.26471** [-2.6421]	ΔSAV_t	2.4090 (0.118)	3.8565** (0.038)	-	-0.72215* [-2.2007]

MAURITIUS									
Model 2A: Investment (INV), Bank-Based Financial Development (BFDG) and Savings (SAV)					**Model 2B: Investment (INV), Market-Based Financial Development (MFDG) and Savings (SAV)**				
Dependent Variable	**F-statistics (probability)**			ECT_{t-1} [t-statistics]	**Dependent Variable**	**F-statistics (probability)**			ECT_{t-1} [t-statistics]
	ΔINV_t	$\Delta BFDG_t$	ΔSAV_t			ΔINV_t	$\Delta MFDG_t$	ΔSAV_t	
ΔINV_t	-	2.9022* (0.098)	2.5629 (0.120)	-0.64048*** [-4.3384]	ΔINV_t	-	4.0726** (0.040)	0.01037 (0.990)	-0.66779** [-2.5009]
$\Delta BFDG_t$	1.3512 (0.274)	-	0.59696 (0.557)	-	$\Delta MFDG_t$	1.0315 (0.386)	-	3.0881* (0.083)	-0.82375*** [-3.7465]
ΔSAV_t	1.2091 (0.313)	1.1296 (0.337)	-	-	ΔSAV_t	1.9703 (0.174)	0.13364 (0.876)	-	-

Note: *, ** and *** denotes significance at the 10%, 5% and 1% significance levels respectively

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The results of the Granger-causality test reported in Table 7.8 for Model 2A show that for Botswana, there is short-run bidirectional causality between bank-based financial development and investment. This is confirmed by the F-statistics of $\Delta BFDG$ and ΔINV in the ΔINV and $\Delta BFDG$ equations, respectively, that are 3.3668 and 4.4368 respectively. In addition, there is a long-run unidirectional causality from investment to bank-based financial development. The long-run causal flow is supported by the coefficient of the error-correction term in the bank-based financial development function, which is negative and statistically significant, as expected. Another deduction from the results of Model 2A for Botswana is that there is a long-run and short-run unidirectional causality from investment to savings and from bank-based financial development to savings.

Results of the same model (Model 2A) for South Africa reveal that there is unidirectional causality from investment to bank-based financial development in the short run. These results are relatively similar to Odhiambo (2010). Other results show that there is unidirectional causality from savings to bank-based financial development in the short run. In addition, for both the short run and the long run, there is bidirectional causality between savings and investment.

For Mauritius, giving reference to Model 2A, results show the existence of unidirectional causality from bank-based financial development to investment for both the short run and the long run. The results for Mauritius tend to confirm the general findings of Xu (2000), Caporale *et al* (2005), Carp (2012) and Asongu (2014).

The empirical results reported in Table 7.8 Model 2B show that, for the case of Botswana, there is short-run bidirectional causality between market-based financial development and investment. In addition, there is unidirectional causality from market-based financial development to savings, irrespective of whether the causality is estimated in the short run or in the long run.

For South Africa, there is a short run unidirectional causality from investment to market-based financial development. Other results for South Africa show the presence of short-run and long-run unidirectional causality from savings to investment and from market-based financial development to savings.

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On the other hand, for Mauritius, still referring to Model 2B, results show short-run and long-run unidirectional causality from market-based financial development to investment. The same is also found for savings to market-based financial development.

In summary, the results reported in Table 7.8 imply that: (i) in Botswana, (a) the banking sector and investment drive each other in the short run but it is investment that drives bank-based financial development in the long run; (b) market-based financial development and investment propel each other in the short run; (ii) for South Africa, in the short run, investment drives both bank-based and market-based financial development ; and (iii) in Mauritius, both bank-based and market-based financial development drive investment both in the short run and in the long run.

Table 7.9 summarises the results of the Granger-causality tests.

Table 7.9: Summary of Granger-causality test results

	MODEL 2A: BFDG AND INV		MODEL 2B: MFDG AND INV	
	Direction of Causality		Direction of Causality	
	Short Run	Long Run	Short Run	Long Run
Botswana	BFDG $\Leftrightarrow$ INV	BFDG $\Leftarrow$ INV	MFDG $\Leftrightarrow$ INV	No causality
South Africa	INV $\Rightarrow$ BFDG	No causality	INV $\Rightarrow$ MFDG	No causality
Mauritius	BFDG $\Rightarrow$ INV	BFDG $\Rightarrow$ INV	MFDG $\Rightarrow$ INV	MFDG $\Rightarrow$ INV

NB: INV=investment; BFDG=bank-based financial development composite index; MFDG=market-based financial development composite index, $\Rightarrow$indicates direction of causality.

Accordingly, from Table 7.9, results reveal that there is a bidirectional Granger-causal relationship between bank-based financial development and investment, and, market-based financial development and investment in Botswana in the short run. However, in the long run, it is investment that Granger-causes bank-based financial development for Botswana. In South Africa, investment Granger-causes both bank-based and market-based financial development, only in the short run. There is no long-run causality relationship between investment and both

types of financial development in South Africa. For Mauritius, both bank-based and market-based financial development Granger-cause investment in both the short run and the long run.

Results of the trivariate Granger-causality model show that for all countries, there are different causal relationships between the bank-based and market-based financial development and investment in the short run and in the long run. For Mauritius, financial development tends to drive investment, both in the short run and in the long run while in South Africa; investment drives financial development only in the short run with no causal relationship between the two being realised in the long run. In Botswana, financial development and investment drive each other in the short run while investment tends to only drive bank-based financial development in the long run.

7.5 Conclusion

The impact of financial development, split into bank-based and market-based financial development, on investment has been empirically examined. In addition, the causal relationship between bank-based financial development and investment, and between market-based financial development and investment has also been empirically evaluated. All the aforementioned empirical estimations have been done for three countries, namely Botswana, South Africa and Mauritius for the period from 1976 to 2014. The assessment of the impact and causal effect of financial development on investment has been done with the aid of the ARDL bounds test and the trivariate Granger-causality models for each of the countries in the study. The use of two models (causality and impact models) was necessary since each of the models measures different relationship postulations. The impact model evaluates the significance and extent to which explanatory variables predict the dependent variable. On the other hand, causality analysis focuses on evaluating whether one variable precedes another. Hence, causality does not always translate into an impact relationship.

Using the ARDL bounds test, the impact of both bank-based and market-based financial development on investment has been examined. The results from the ARDL bounds test show that the effect of financial development on investment is not standard across all countries. Bank-based financial development is found to have a positive short- and long-run impact on investment only in Botswana; and contrary to the expectations of this study, a negative short run effect in South Africa. No impact of bank-based financial development on investment is found for

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Mauritius for both the short and long run, and for South Africa in the long run. Market-based financial development is found to have a positive effect on investment, in the short run for Mauritius and, in the long run for South Africa. For Botswana, no impact is found for market-based financial development on investment.

With the aid of the trivariate Granger-causality model, the Granger-causality between bank-based financial development and investment, and market-based financial development and investment has been tested. The savings ratio has been included as an intermitting variable in order to address the problem of omission of variable bias.

The results from Granger-causality model show that for all countries, like in the general impact model, the causal relationship between financial development and investment is not standard across all countries. For Mauritius, financial development (whether bank- or market-based) drives investment, both in the short run and in the long run while in South Africa; investment drives financial development only in the short run with no causal relationship between the two variables being realised in the long run. In Botswana, financial development and investment drive each other in the short run while investment tends to only drive bank-based financial development in the long run.

CHAPTER 8

CONCLUSIONS AND POLICY IMPLICATIONS

8.1 Introduction

Given the discussion in the preceding chapters, this chapter presents a summary of findings and conclusions as well as policy implications based on the findings and results. In addition, this chapter suggests areas for further research. Section 8.2 presents a brief summary of the study. Section 8.3 discusses in brief, the main findings of the study, while Section 8.4 presents conclusions and policy implications of the study. Section 8.5 highlights the limitations of the study and identifies areas for further research.

8.2 Summary of the Study

The main emphasis of this thesis was to empirically evaluate and investigate comprehensively the relationship between financial development and investment in three SADC countries for the period from 1976 to 2014. Special focus was given to the impact of financial development, divided into bank-based and market-based components, on investment. In addition, the causal relationship between bank-based financial development and investment, and between market-based financial development and investment was also examined. In this study, the relevant extensive chronological historical background of the three countries selected, with specific emphasis on bank-based and market-based financial development and investment, has been outlined. A review of related theoretical and empirical literature has been given and it informed the empirical models employed in this study.

The primary objective of the study was to analyse the dynamic relationship of financial development on investment in three Southern African countries, namely South Africa, Botswana and Mauritius for the period from 1976 to 2014. Specifically, the study sought to, (i) empirically test the impact of bank-based financial development on investment in the study countries; (ii) empirically test the impact of market-based financial development on investment in the study countries; (iii) examine the causal relationship between bank-based financial development and investment in each of the study countries and, (iv) appraise the causal relationship between market-based financial development and investment in each of the study countries. To achieve these objectives, the study employed two models.

To attain the stated objectives, the study employs the flexible accelerator model framework to evaluate the impact of bank-based and market-based financial development on investment (Model 1); and to examine the Granger-causality (Model 2) between bank-based financial development and investment, and between market-based financial development and investment. Following Ndikumana (2000), for both models (Model 1 and Model 2), both bank-based and market-based financial development are assumed to have an accelerator-enhancing effect on investment. The flexible accelerator model was used exclusively over other models because it assumes gradual adjustment of investment and its determinants. On the other hand, the trivariate Granger-causality model was employed because of its superior estimation characteristics as compared to the bivariate model.

The Dickey-Fuller Generalised Least Square (DF-GLS), the Perron (1997) (PPURoot) and the Ng-Perron tests are used to evaluate the stationarity of the variables applied in this study. For each study country, the autoregressive distributed lag bounds testing approach has been used to test the existence of cointegration in the models used. The study makes use of the ARDL approach in both models because of its distinct advantages as compared to other estimation techniques.

8.3 Summary of Empirical Findings

The overall empirical findings of this study reveal that:

1. The impact of bank-based financial development on investment varies from country-to-country and over time. This confirms that there might be inter-country differences that determine the relationship between investment and bank-based financial development. Based on the results of the impact model, the effect of bank-based financial development on investment is not standard across all countries. The effect of bank-based financial development on investment in Botswana is positive in both the short run and the long run (see, among other, Benhabib and Spiegel, 2000: Ndikumana, 2000; Dutta and Roy, 2009; Fowowe, 2011; Hassan, 2015). However, for the case of South Africa, it is negative in the short run and has no impact in the long run. These results are consistent with those obtained by Misati and Nyamongo (2010) and Lahcen (2004). For Mauritius, there is no impact of the bank-based financial development on investment.

2. The impact of market-based financial development on investment differs from country-to-country and over time. For Botswana, there is no impact of market-based financial development on investment in the short-run and the long run for Botswana. The same conclusion of no impact of market-based financial development on investment is found for South Africa in the short run and for Mauritius in the long run. However, for South Africa, the effect of market-based financial development on investment is positive in the long run. For Mauritius, market-based financial development on investment is positive in the short run. These results are relatively similar to those of Leahy, *et al.* (2001) and Bassanini, *et al. (2001)*.

3. The results of this study have confirmed the existence of a positive impact of bank-based financial development on investment in only one of the three countries, i.e. Botswana. Contrary to the expectation of this study, the positive impact of bank-based financial development on investment is not supported in South Africa and Mauritius.

4. The empirical results on the direction of causality between bank-based financial development and investment indicate that the causal relationship varies from country – to-country and over time. For Botswana, there is a bidirectional causal relationship between bank-based financial development in Botswana and investment in the short run. However, in the long run, it is investment that Granger-causes bank-based financial development. The short-run results are consistent with Lu *et al* (2007), Huang (2011) and Nazlioglu *et al. (2009).* For South Africa, investment Granger-causes bank-based financial development, only in the short run. The results are consistent with Odhiambo (2010). For Mauritius, bank-based financial development Granger-causes investment both in the short run and in the long run (see among others Chaudhry, 2007; Asongu, 2014).

5. Like in the case of bank-based financial development, the direction of causality between market-based financial development and investment is similarly different across time and country. For Botswana, there is a bidirectional causal relationship between market-based financial development and investment in the short run. However, in the long run, there is no causal relationship between investment and market-based financial development. These results for Botswana are consistent with Shan *et al*, (2001). For

South Africa, investment Granger-causes market-based financial development, only in the short run. For Mauritius, market-based financial development Granger-causes investment both in the short run and in the long run. The results for Mauritius tend to confirm the general findings of Caporale *et al.* (2005) and Carp (2012).

8.4 Conclusions and Policy Implications

Based on the empirical findings of the current study, the following conclusions and recommendations can be reached:

1. Bank-based financial development has a positive impact on investment in Botswana, both, in the short run and the long run. Therefore, Botswana should pursue policies that enhance bank-based financial development in order to spur investment. For Mauritius and South Africa, given that there is no or negative impact of bank-based financial development on investment, respectively, policy should focus on other proven positive contributors to investment.

2. The study found that market-based financial development has no impact on investment in Botswana. Therefore, for Botswana, policy should focus on other proven positive contributors to investment. In South Africa the study found a positive impact of market-based financial development on investment in the long run and the same for Mauritius in the short run. Hence, South Africa and Mauritius should pursue policies that promote market-based financial development so as to augment investment, in the long run and in the short run, respectively.

3. Bank-based financial development Granger-causes investment unambiguously only in Mauritius. In South Africa, investment Granger-causes bank-based financial development, only in the short run. In Botswana, the study found out that there is a bidirectional Granger-causal relationship between bank-based financial development and investment, in the short run. In the long run, it is investment that Granger-causes bank-based financial development.

   This implies that for Mauritius, there is need to maintain policies that focus on enhancing the banking sector in order to continually stimulate investment. For Botswana, policies that enhance both bank-based financial development and investment should be

employed in the short run. However, in the long run, more effort should be put in enhancing investment in order to stimulate bank-based financial development. For South Africa, policies that enhance both bank-based financial development and investment should be employed in the short run.

4. Market-based financial development appears to Granger-cause investment unambiguously, in both the short run and the long run, only in Mauritius. This implies that for Mauritius, policies should focus on enhancing the market-based financial sector in order to continually stimulate investment. For Botswana, the study found a bidirectional causal relationship between market-based financial development and investment in Botswana only in the short run. This implies that for Botswana, policies that enhance both investment and market-based financial development should be employed in the short run. For South Africa, investment is found to Granger-cause market-based financial development only in the short run. This implies that for South Africa policies that enhance investment should be employed in the short run.

5. The study indicates that it is inconsistent, especially in empirical estimations, to accept the conventional assumption that the relationship between financial development and investment is a given. Hence there is need to empirically substantiate how financial development impacts investment before instituting any relative policies.

8.5 Limitations of the Study and Areas for Further Research

As is the case with many scientific studies, this research has a few limitations, despite the effort made to ensure that the study is analytically defensible. Foremost, the short time series data used in the empirical analysis is one probable limitation. Though the use of the ARDL approach might have lessened the problem of insufficient data, future research work should be carried out when there is sufficient data available to ascertain whether their result will differ fundamentally from the results of this study.

The study used an accelerator-enhancing approach to examine the relationship between bank-based and market-based financial development, and investment. Future studies might wish to use alternative methodologies to determine whether their findings will differ fundamentally from

the results of this study. These methodologies might involve using alternative causality testing procedures, such as the Toda-Yamamoto test and the employment of panel data analysis.

The study also made use of composite financial development indices that were composed of three indicators of financial development. Future studies may wish to explore the use of other alternative indicators to determine whether their findings will differ fundamentally from the results of this study.

Despite the said limitations, this thesis provides a comprehensive insight into the financial development and investment nexus in three Southern African countries.

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