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FINANCIAL STRUCTURE AND ECONOMIC GROWTH NEXUS: COMPARISONS OF BANKS, FINANCIAL MARKETS AND ECONOMIC GROWTH IN SOUTH AFRICA.

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ABSTRACT

The importance of the financial structure system, which comprises the banking sector and financial markets, to the growth of a country's economy cannot be underestimated. It is important to analyse comparatively the contribution of each sector to the economic growth of a country. This study, therefore, empirically examined the relationship between financial markets, banks and economic growth in South Africa using time series analysis for the period 1990 to 2011. The study used the Vector Error Correction model (VECM) based causality tests to establish the link between financial structure (represented by both banks and financial markets) and economic growth. Real GDP was used as a measure for economic growth, Bank credit to the private sector was used as a proxy for the banking system, turnover ratio and value of shares traded was used as a measure for the stock market and bond market capitalisation was used as a measure for the bond market. To determine the net effects of financial structure on long run growth in South Africa, one control variable was added which was the ratio of government expenditure to GDP to control for the government's role in the economy. The Johansen co-integration technique was also employed to obtain a long run relationship.

The results from the study revealed that the stock turnover ratio, bond market capitalisation, and government expenditure have a long run relationship with economic growth while bank credit to private sector and value of shares traded showed a negative relationship with economic growth. With granger causality all the variables proved to granger cause economic growth except for bond market capitalisation where economic growth prove to granger cause bond market development.

The study recommended that measures to improve liquidity, transparency and accessibility of both the banking sector and financial markets instruments should be a priority for South African authorities. The authorities should, therefore, encourage stock market development through an appropriate mix of taxes, legal and regulatory policies to remove barriers to stock market operations and thus enhance their efficiency since stock markets in Africa are underdeveloped. Strong financial regulation and supervision in banks to ensure efficiency in credit allocation should be done to enable channelling of credits to capital development rather than consumption spending.

DECLARATIONS

On originality of the work:

I, the undersigned, **Praise Godza,** student number **200804611**, hereby declare that this dissertation is my own original work, and that it has not been submitted, and will not be presented, at any other university for a similar or any other degree award.

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I, **Praise Godza,** student number **200804611,** hereby declare that I am fully aware of the University of Fort Hare's policy on plagiarism and that I have taken every precaution to comply with the regulations.

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DEDICATION

This dissertation is dedicated to all my family members who supported and encouraged me to further my studies.

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ACRONYMS AND ABBREVIATIONS

ADF- Augmented Dickey-Fuller test

BESA- Bond Exchange of South Africa

DF - Dickey Fuller

FSB- Financial Service Board

GDP- Gross Domestic Product

JSE- Johannesburg Stock Exchange

PP- Phillips-Perron

SARB- South African Reserve Bank

SA- South Africa

SSA-Securities Services Act

VAR- Vector Autoregressive

VECM- Vector Error Correction Modelling

UK – United Kingdom

USA – United States of America

OECD -Organisation for Economic Co-operation and Development

CHAPTER 1: INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

Establishing the relationship between the financial system and economic growth has attracted a lot of academic attention (Levine, 2002; Allen and Gale, 2000; Arestis, 2005; Beck, 2003; Demirguc and Levine, 1996; Ujunwa, 2012). However, conclusions have been varied. These studies have been conducted with the conviction that the stability and growth of an economy are heavily reliant on a financial sector which is sound and efficient. Thus the financial system has a vital role to play in supporting the growth of the economy.

In defining 'financial structure' economists and policymakers have focused on the relative merits of bank-based versus market-based financial systems. A bank-based financial system is an economy which relies heavily on the functioning of financial intermediaries whereas a market-based financial system is an economy which relies heavily on the functioning of capital markets. Empirical work over the last century has primarily involved studies of Germany and Japan as bank-based systems and the United States (USA) and the United Kingdom (UK) as market-based systems (Levine, 2002). Bank-based financial systems are believed to finance development more effectively than markets when they are not hampered by a lot of regulatory restrictions because banks are believed to be in a better position to address agency problems. In contrast to bank-based systems, well-functioning markets which are big and liquid are believed to foster growth and profit incentives, increase business control governance and facilitate risk management better.

South Africa has a financial system which is fundamentally sound. The sector comprises a sophisticated banking sector, well-established capital markets, and a group of nonbank institutions, including insurance companies, pension funds and collective investment schemes. Capital markets are relatively advanced with significant activity in the derivatives, securitization and hedge fund markets. However, the markets are subject to contagion risks given their close linkages with offshore markets. Commercial banks form the largest segment of the financial sector, with assets representing some 120 percent of GDP (International Monetary Fund, 2008). Yet, banks are facing increased credit risk, especially in their household loan portfolios, given record household indebtedness and the mounting debt service burden. Noting the importance of the banks and the capital markets and the problems experienced in

both, the important question to raise is which type of financial structure exerts more influence on economic growth for South Africa?

1.2. Statement of the problem

Theory gives contradictory predictions about the incidence of financial system development on economic growth, and about the separate impact of banks on growth and financial markets on growth. Also the competing theoretical models posit the superiority of one type of financial system over the other or they simply relegate financial structure as irrelevant (Arestis, Luintel & Luintel, 2005). At present there is hardly consensus at the theoretical level meaning the conclusion as to which form of the financial structure is more conducive to economic growth is not there. Whether or not financial structure influences economic growth is a crucial policy issue and the debate is still very alive concerning this issue.

Some of the empirical literature on this issue attempted to examine whether one type of financial system better explains economic growth than the other. However, these studies were not without their own problems. For example, the study of Allen and Gale (2000) which analysed the UK and the USA as market-based systems versus Japan and Germany as bank-based systems tends to show that financial structure matters. However, their study was subject to the criticism that these countries historically share similar growth rates. Therefore, it may not form a suitable sample to investigate the relative contribution of one financial system over another in the growth process (Arestis *et al.*, 2005). Other studies find that financial structure is irrelevant to economic growth meaning that neither bank-based nor the market-based financial system can explain economic growth. Instead, they show that it is the overall provision of financial services (banks and financial markets taken together) that are important.

Although the distinction between bank-based and market-based financial systems, and their relative importance to economic growth, has been the focus of the relevant theoretical debate for over a century, the relationship between these two different forms of financial structure and economic growth remains unaddressed, especially in the case of specific emerging countries. Also, of the available studies which were done, none included the bond market even though it is a market for long-term capital and results in a deep financial system; their focus was on banks and the stock market only. Whether a bank-based system or a market-based system substitute or complement each other in explaining economic growth is an important issue that economic policy must take into account. It is, therefore, relevant to empirically examine the

relationship between the banking sector, the stock market and the bond market, and economic growth in the South African context. This study will differ by incorporating all the three financial markets.

1.3. Objectives

The general objective of the study is to determine the extent to which the two forms of financial structure complement or substitute each other in explaining economic growth.

The specific objectives are:

- To examine trends in the banking system, financial markets, and economic growth in South Africa for the period 1990 to 2011.
- Empirically establish the financial structure which promotes economic growth for South Africa.
- Based on the empirical results, articulate policy implications for the right financial structure in South Africa.

1.4. Hypothesis

The hypothesis to be tested is:

H_0: Both market and bank-based financial structures do not promote economic growth in South Africa.

H_1: Both market and bank-based financial structures promote economic growth in South Africa.

1.5. Justification of the study

Dailami and Atkin (1990) note that the dominants of banking in the financial system of most developing countries in conjunction with severe insolvency problems affecting much of the banking sector have tended to crowd out formal consideration and analysis of capital market issues. However, it is suggested that the prevailing problems of the banking sector originate from unbalanced capital structures at the corporate level and the lack of development of financial markets. It is clear that capital market development needs to be viewed as an essential ingredient in the reform of the banking sector. Taking into account that most African financial systems are disintegrated and inefficient and in the past banks have played the major role of raising and channelling funds to productive sectors of the economy, the element of complementarity between the banking sector and the securities markets deserves attention, therefore.

Of the studies which suggested the importance of the coexistence of both markets and intermediaries, the available studies have ignored the bond market in their analysis, even though it is argued that it results in a deep financial system. The study incorporates the bond market in the analysis and we will seek to establish if financial markets are better in the case of the South African economy or whether banks performs better in terms of generating finance for growth. Also a lot of studies that were done focussed much on the role of finance not on the complementarity of financial intermediaries and financial markets. The study will also seek to establish if the coexistence of financial markets and financial intermediaries will complement each other, resulting in deeper financial systems and improved economic growth. This will help policy makers to pursue proper strategies which will promote financial development and economic growth at the same time.

1.6. Organisation of the study

The study is composed of six chapters. Chapter 1 provides the introduction and background of the study; chapter 2 will look at the overview of the South African financial system and economic growth with more emphasis on the trends; chapter 3 focuses on the reviews of both theoretical and empirical literature of financial structure and economic growth; chapter 4 will presents the description of data, and the formulation and estimation of the model to be used; chapter 5 focuses on analysis and interpretation of the results; while chapter 6 provides the policy recommendations and the conclusions of the study.

CHAPTER 2: OVERVIEW OF THE SOUTH AFRICAN FINANCIAL SYSTEM AND ECONOMIC GROWTH

2.1. Introduction

The purpose of this chapter is to present an overview of the South African financial system and economic growth. A discussion and overview of the South African banking sector, the Johannesburg Stock Exchange market and the Bond market will be given. Graphical presentations of all the variables used to measure the bank sector, stock market and bond market will be illustrated so as to display the trends of these variables over the years 1990 until 2011. The relative importance of all sectors in their contribution to economic growth will also be discussed. Lastly, the chapter ends with some concluding remarks.

2.2. The South African financial system

During the past years a number of developments have taken place in the South African financial system. These include the transformation approach towards the implementation of monetary policy, the emergence of new financial instruments and products, new financial intermediaries and brokers, changes in supervision of markets and institutions, and substantially higher levels of activity in the financial markets (Van Zyl, Botha and Skerritt, 2003). All these changes were made possible by both the public authorities and private financial services sector as necessitated by the global liberalisation of financial markets. This made South Africa have a robust and well regulated financial system which compares favourably with those of industrialised countries.

Its financial services sector is boasting dozens of domestic and foreign institutions providing a full range of services which include commercial, retail and merchant banking, mortgage lending, insurance, and investment. Foreign banks are well represented and electronic banking facilities are extensive, with a nationwide network of automated teller machines (ATMs) and internet banking facilities available (Southafrica Info, 2012). South African banks are considered the most secure globally by the World Economic Forum. Standard Bank, First National Bank, ABSA Bank and Nedbank are the four South African banks rated among the world's top financial institutions.

A vibrant financial market system also comprises the South African financial system. The South African financial market is composed of the money market, bond market, equity market, foreign exchange market and the commodities market. In this study the focus will be on the Johannesburg stock exchange (JSE) and the bond market.

The JSE is an important pillar in the South African economy which facilitates trading in listed shares of companies inside a proper regulatory framework that is adhered to by all market players and is carefully enforced by a regulatory act. It is one of the largest stock exchanges in the world in terms of market capitalisation and is included in the Morgan Stanley Index and the International Finance Corporation (IFC) emerging markets indices (Odhiambo, 2011).The South African bond market on the other hand issues and trades in long-term securities. It is described as one of the leading emerging bond markets in the world and it is dominated by government issued bonds traded in its centralised exchange, known as the Bond Exchange of South Africa Limited (BESA).

The Financial Services Board is responsible for the the regulation of financial markets and institutions. It is a unique, independent institution established by statute to oversee South Africa's non-banking financial services industry in the public interest (Southafrica Info, 2012). For all the banks it is the South African Reserve Bank which is responsible for the regulation. The mission of these two is to promote sound and efficient financial institutions and services together with mechanisms for investor protection in both the markets and banks in South Africa.

2.3. South African banking sector overview

The South African banking sector is considered to be the dominant segment of the South African financial system. It is well developed and effectively regulated, comprising a central bank, a few large financially strong banks and investment institutions, and a number of smaller banks. Its financial intermediaries are classified into two broad categories, namely deposit and non-deposit intermediaries. This is illustrated in table 2.1 below

Table 2.1: Classification of South African financial intermediaries

Deposit intermediaries	**Non-deposit intermediaries**
South African Reserve Bank (SARB)	**Contractual intermediaries**
Corporate for public deposits (CPD)	Long-term insurers
Land and Agricultural Bank (LAB)	Short-term insurers
Private banks	Pension and provident funds
Mutual Banks	Public investment commissioners (PIC)
Postbank	
	Portfolio Intermediaries

	Unit trusts Property unit trusts Participation mortgage bond schemes **Development finance intermediaries (DFIs)** Development Bank of Southern Africa (DBSA) Industrial Development Corporation (IDC) National Housing Finance Corporation (NHFC) Khula Enterprise Finance (KEF) Infrastructure Finance Corporation (INCA)

Source: Van Zyl et al. (2008)

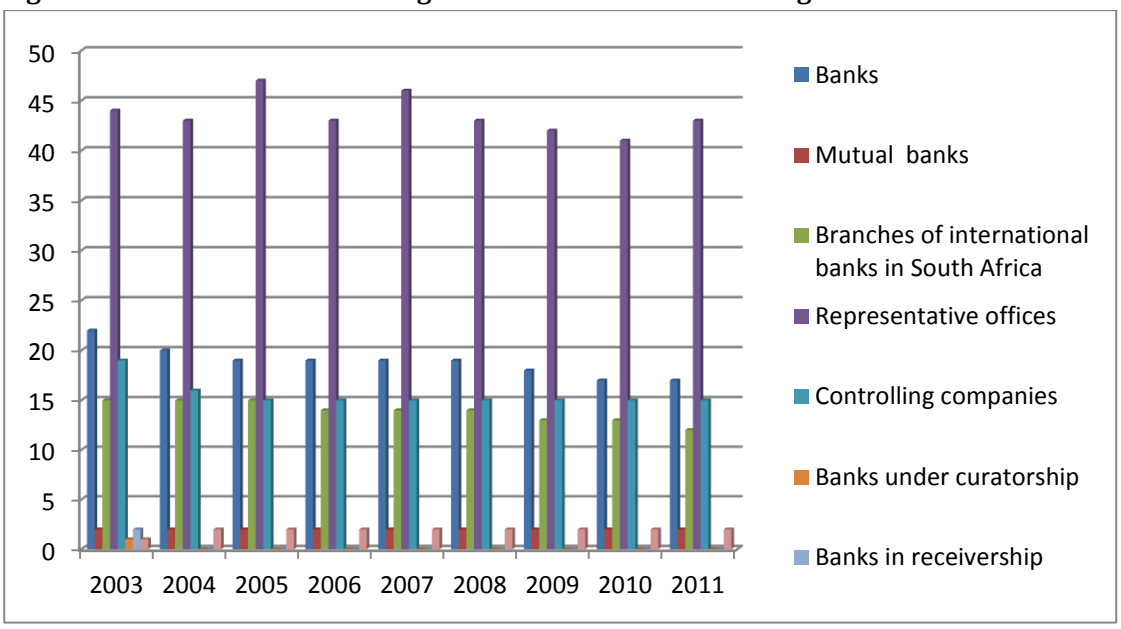
However, there are a number of institutions and funds that border on being classified as financial intermediaries. These institutions are termed quasi-financial intermediaries and are not included in the classification above.

As previously stated, there have been a number of considerable changes that happened in the banking sector in recent years for it to become competitive. Among the changes that happened, the early 1990s has been characterised by a process of consolidation resulting from mergers of a number of banks including Allied, Volkskas and United to form the Amalgamated Bank of South Africa (ABSA) and the proposed merger between Nedcor and Stanbic which eventually failed. The National Payment Act was also introduced in 1998 in order to bring South African financial settlement in line with international practice on settlement system and systematic risk management procedures (Southafrica Info, 2012).

The changes that were happening made the South African banking sector continue growing. By the end of 2001 there were 43 registered banks in South Africa and this was as a result of the spread of the Banks Act of 1990 which led to a number of banking licences being issued. However, in 2002 the sector was hit by the announcement of Saambou's financial troubles and it led to a number of banks not renewing their banking licenses and others seeking financial assistance from foreign shareholders. Other banks such as Regal Bank were placed under curatorship during that period due to financial difficulties (The Banking Association South

Africa, 2010). Figure 2.1 below shows the number of registered or licensed entities from 2003 to 2011 after the financial troubles in 2002.

Figure 2.1: South African banking sector: Number of entities registered or licensed



Source: South African Reserve Bank (2011)

Figure 2.1 above shows that in 2003 there were 22 registered banks, 2 mutual banks, 15 branches of foreign banks, 44 representative offices, 19 controlling companies, 1 bank under curatorship, 2 banks in receivership, and 1 bank in final liquidation. Some of these figures continued to decrease year after year and by 2011 there were 17 registered banks in South Africa. It did not change from 2010. Mutual banks increased from 2 to 3. The number of branches of foreign banks decreased from 13 to 12 while the number of representative offices increased from 41 to 43 over the same period. The list of the banks available in South Africa is given below in table 2.2.

Table 2.2 List of banks in South Africa

Category	Bank
Registered banks – locally controlled	ABSA Bank Limited; African Bank Limited; Bidvest Bank Limited; Capitec Bank Limited; FirstRand Bank Limited; Grindrod Bank Limited; Imperial Bank Limited; Investec Bank Limited; Nedbank Limited; Regal Treasury Private Bank Limited (In liquidation); Sasfin Bank Limited; Teba Bank Limited; The Standard Bank of South Africa Limited.

Registered banks – foreign controlled	Albaraka Bank Limited; Habib Overseas Bank Limited; HBZ Bank Limited; Islamic Bank Limited (In Final Liquidation); Mercantile Bank Limited; The South African Bank of Athens Limited.
Mutual banks	GBS Mutual Bank; VBS Mutual Bank
Local branches of foreign banks	Bank of Baroda; Bank Of China Limited Johannesburg Branch (trading as Bank Of China Johannesburg Branch); Bank of Taiwan South Africa Branch; Calyon (trading as Calyon Corporate and Investment Bank), China Construction Bank Corporation – Johannesburg Branch; Citibank N.A.; Deutsche Bank AG; JPMorgan Chase Bank N.A. (Johannesburg Branch); Royal Bank of Scotland (Formerly ABN Amro); Société Générale; Standard Chartered Bank - Johannesburg Branch; State Bank of India; The Hongkong and Shanghai Banking Corporation.
Foreign banks with approved local representative offices	AfrAsia Bank Limited; Banco BPI, SA; Banco Espirito Santo e Comercial de Lisboa; Banco Privado Português, S.A.; Banco Santander Totta S.A.; Bank Leumi Le-Israel BM; Bank of Cyprus Group; Bank of India; Barclays Bank Plc; Barclays Private; Clients International Limited; BNP Paribas Johannesburg; Commerzbank AG Johannesburg; Credit Suisse AG; Credit Suisse Securities (Europe) Limited; Ecobank; Export-Import Bank of India; Fairbairn Private Bank (Isle of Man) Limited; Fairbairn Private Bank (Jersey) Limited; First Bank of Nigeria; Fortis Bank (Nederland) N.V.; Hellenic Bank Public Company Limited; HSBC Bank International Limited; Icici Bank Limited; KfW Ipex-Bank GmbH; Lloyds TSB Offshore Limited; Millenium BCP; National Bank of Egypt; NATIXIS Southern Africa Representative Office; Royal Bank of Scotland International Limited; Société Générale Representative Office for Southern Africa; Sumitomo Mitsui Banking Corporation; The Bank of New York Mellon; The Bank of Tokyo-Mitsubishi UFJ, Ltd; The Mauritius Commercial Bank Limited; The Rep. Off. for Southern and Eastern Africa of The Export-Import Bank of China; UBS AG; Unicredit Bank AG; Union Bank of Nigeria Plc; Vnesheconombank; Wachovia Bank, N.A.; Wells Fargo Bank, National Association; Zenith Bank Plc

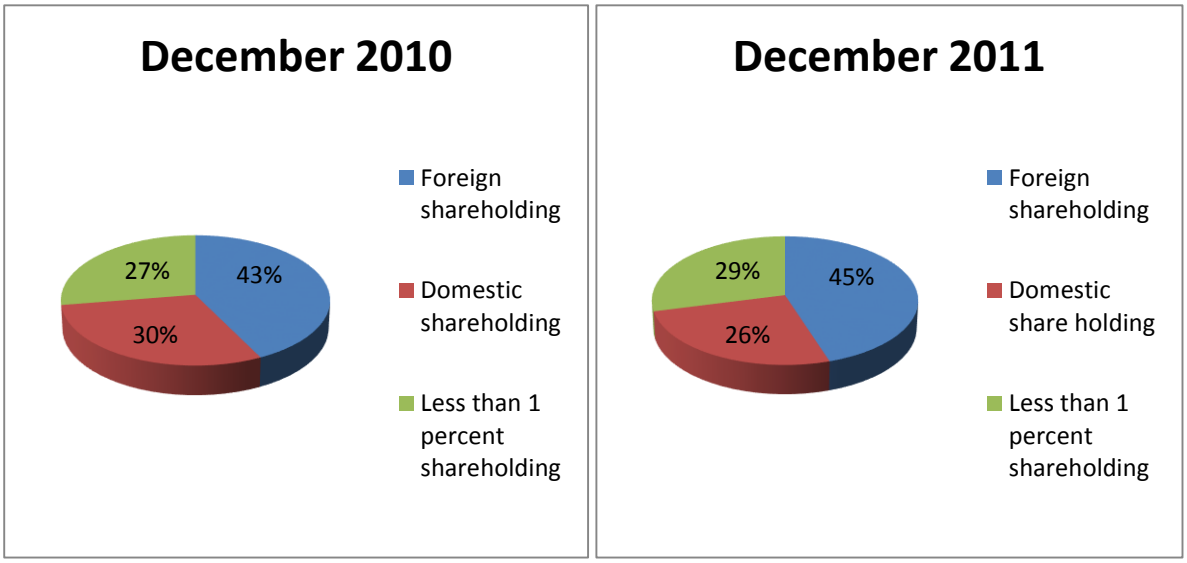
Source: South African Reserve Bank (2010)

Despite the instability and change that took place in the South African banking sector, many foreign banks and investment institutions did set up their operations in South Africa and others acquired stakes in major banks. For example, ABSA is a subsidiary of Barclays bank, a major global financial service provider, and it holds a stake of 55.52% in the group. Standard bank is also in partnership with the Industrial and Commercial Bank in China which takes a 20% stake in Standard Bank (Anani, 2010). A number of changes also took place in respect of the regulatory environment, product offerings and number of participants. This resulted in a greater level of competition in the market, especially from smaller banks such as Capitec bank and African Bank which have targeted the low income and the previously unbanked market (Banking Association South Africa, 2010).

2.3.1. Banking sector Shareholding structure

The South African shareholding structure is comprised of foreign and domestic share holders. Among the foreign and domestic shareholders, all the shareholders who hold less than one per cent of the nominal value of shares are classified as minority shareholders. Significant shareholders are all the shareholders with more than one per cent shareholding. The shareholding structure of South African banks as at 31 December 2011 is given below in figure 2.2.

Figure 2.2 Shareholding structure of the South African banking sector



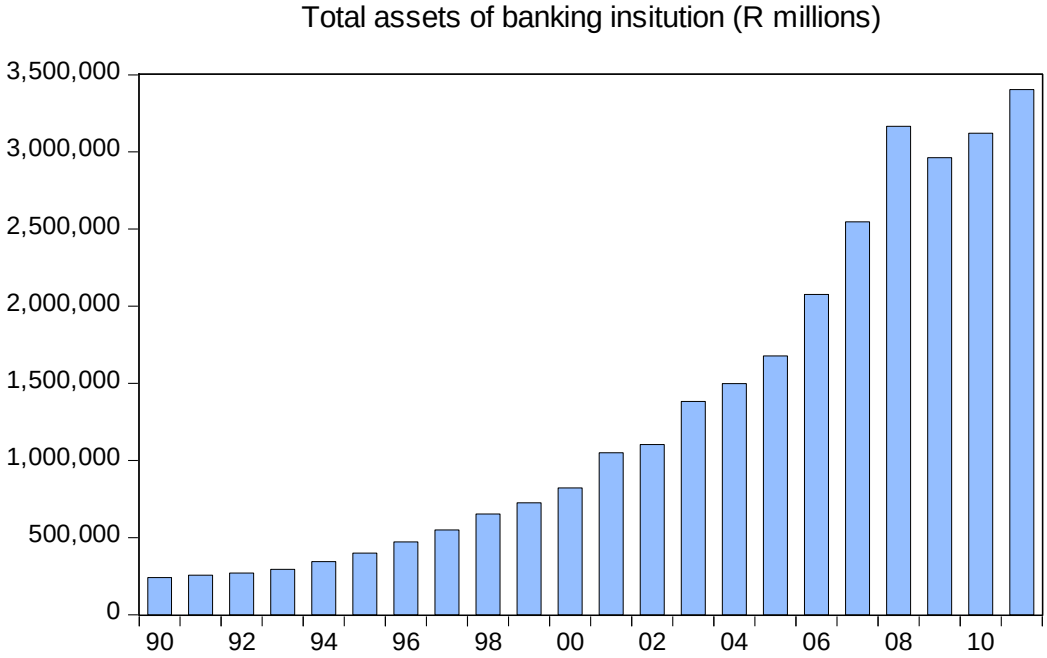
Source: South African Reserve Bank (2011)

Figure 2.2 above shows that in December 2011 foreign shareholders held 45 per cent of the nominal value of the South African banking sector's shares in issue compared to 43 per cent in December 2010. The foreign shareholding that Barclays bank has in ABSA bank limited, one of the largest banks in South Africa, is believed to be the significant contributing factor for the large foreign shareholding in the sector. Significant domestic shareholders and minority shareholders were 26 per cent and 29 per cent respectively as in December 2011 while in December 2010 they were 30 and 27 per cent respectively.

2.3.2. Banking institution total assets

The size of the banking industry in South Africa can be measured by the size of its assets. Bank assets are physical and financial properties of a bank which include loans, reserves and investment securities. Figure 2.3 below shows the total assets of the banking institution for the period 1990 to 2011.

Figure 2.3 Total assets of the banking institution for the period 1990 to 2011



Source: South African Reserve Bank (2012)

Figure 2.3 above shows that the banking institution assets have been increasing since 1990. In 2008 the assets of the banking institution peaked at R3 166 502 million, declining to R2 962 613 million in 2009 as the country was in an economic recession. In 2010 there was an improvement as the assets started to increase. According to the South African Reserve Bank (2012) the increase in the value of the assets could be explained by a 3, 8 percent increase in home loans and an increase in government securities held by the banking sector in 2010.The assets continued to increase and 2011 marks the highest total banking institution assets for the period under review. This could be attributed to a year-on-year increase in gross loans and advances which, in turn, was caused by increases in term and other loans. Increases in treasury bills and increased investment in government securities could also be a factor explaining the increase in bank assets in 2011.

Table 2.3 below illustrates the individual bank assets as at end June 2011.

Table 2.3 Individual bank assets as at end June 2011

Bank	**Assets (R'bn)**	**Market share**
The Standard Bank of SA	781 947 804	25.5%
ABSA	663 076 327	21.6%
FirstRand Bank	578 078 265	18.8%

Nedbank	546 961 735	17.8%
Investec Bank	201 501 528	6.6%
Imperial Bank	57 446 288	1.9%
Citibank N.A.	51 068 333	1.7%
Duetsche Bank	34 910 860	1.1%
African Bank	28 103 931	0.9%
JP Morgan Chase	25 758 392	0.8%
Caylon Corporate and Investment Bank	15 918 044	0.5%
Standard Chartered Bank	13 274 633	0.4%
The Hong Kong and Shanghai Banking Corporation	12 871 226	0.4%
Capitec Bank	10 793 359	0.4%
Societe Generale	8 584 122	0.3%
China Construction Bank	6 524 014	0.2%
Mercantile Bank	5 959 348	0.2%
Bank of China	4 760 807	0.2%
The Royal Bank of Scotland	1 879 659	0.1%
Teba Bank	3 520 766	0.1%
Albaraka	2 638 585	0.1%
HBZ Bank	2 065 276	0.1%
Grinrod Bank	2 105 980	0.1%
State Bank of India	2 099 982	0.1%
Bidvest Bank	2 340 742	0.1%
Sasfin	1 550 210	0.1%
The SA Bank of Athens	1 221 759	0.0%
Habib Overseas Bank	734 270	0.0%
GBS Mutual Bank	788 009	0.0%
Bank of Taiwan	738 066	0.0%
Bank of Baroda	455 251	0.0%
VBS Mutual Bank	259 292	0.0%
Total assets	**3 069 936 863**	**100%**

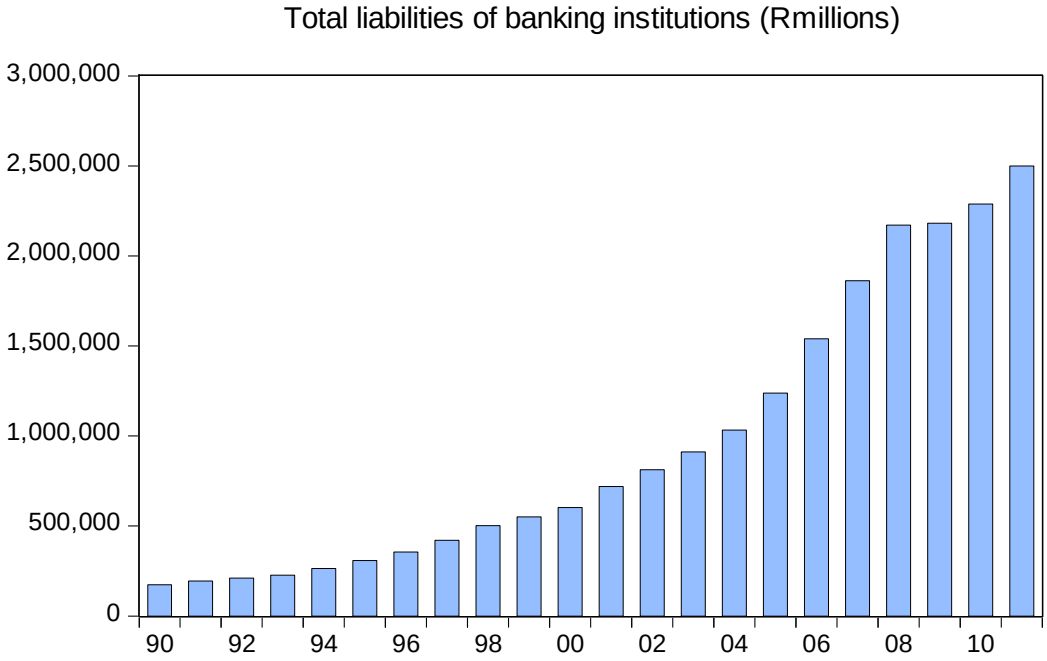
Source: South African Reserve Bank (2011)

From table 2.3 above the four major banks (ABSA, FirstRand, Nedbank and Standard Bank) represent about 84 percent of total banking assets with the remaining smaller banks representing about 16 percent. Standard Bank is the largest bank in terms of assets, with a market share of 26 percent, followed by ABSA with 22 percent. FirstRand and Nedbank had a market share of about 19 percent and 18 percent respectively.

2.3.3. Banking institution total liabilities

Bank liabilities are debts incurred by a bank, what it owes including, most notably, customer deposits. According to the South African Reserve Bank (2011) deposits constitute on average 86.2 percent of the liabilities. Figure 2.4 below shows the total liabilities of the banking institutions for the period 1990 to 2011.

Figure 2.4 Total liabilities of the banking institutions for the period 1990 to 2011



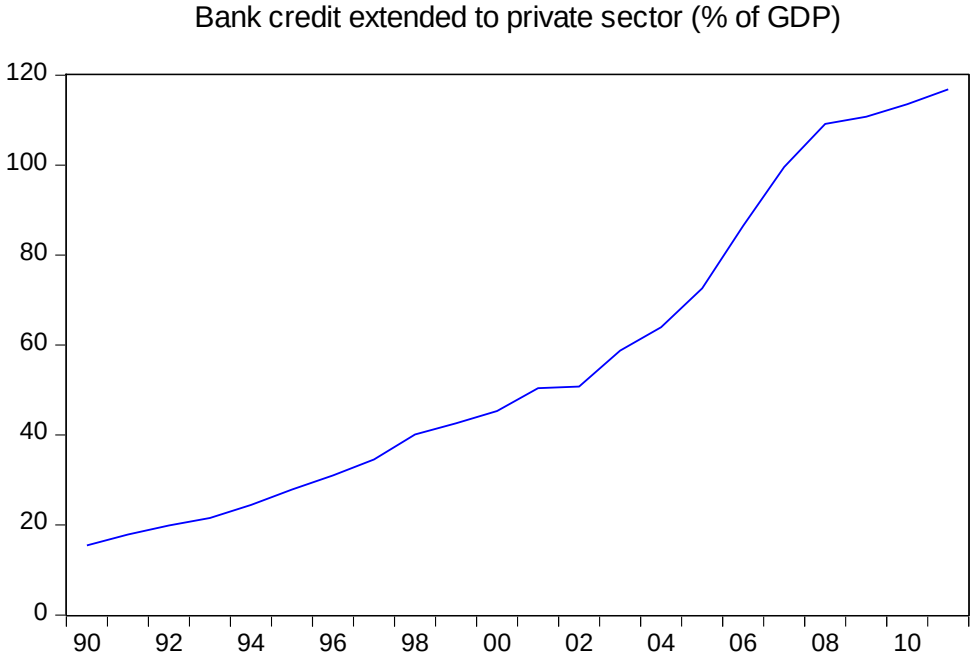
Source: South African Reserve Bank (2012)

Figure 2.4 above shows that from 1990 to 2000 the bank liabilities were increasing at a low rate. From 2001 onwards large increases in bank liabilities were experienced and 2011 marks the highest bank liabilities for the period under review. This could be attributed to a large increase in the deposits. The South African Reserve Bank (2011) also accredited this increase to increase in the derivative financial instruments and other trading liabilities in 2011 due to the increase in foreign exchange derivative financial instruments.

2.3.4. Total credit extended to private sector

There was a rapid increase in domestic credit to the private sector associated with the rapid increase in portfolio capital inflows during the 1990s. Portfolio capital flows increased during the 1990s domestic credit and was associated with growth in the extension of credit to the private sector (Mohamed, 2011). Figure 2.5 below shows the bank credit to the private sector as a percentage of GDP from 1990 to 2011. From 1990 to 2001 the bank credits were increasing. In 2002 a small decrease was experienced and this could be explained by the Saambou's financial troubles that were experienced by all the financial institutions in South Africa at that time. From 2002 onwards the bank credits increased year after year up to 2008 where a small decrease was experienced again. The decrease could be attributed to the global financial crisis which was also felt by the South African economy in 2008. From 2009 onwards the bank credits started to increase again but at a low rate.

Figure 2.5 Bank credit extended to private sector for the period 1990 to 2011



Source: South African Reserve Bank (2012)

Table 2.4 below illustrates the domestic credit extension levels by all the monetary institutions between June 2010 and June 2011. For the period under review the credit extension has been restrained, with the total domestic credit extended to the private sector increasing by only 1 percent. This could be linked to economic developments which led to monetary institutions

applying stricter lending measures and consumers being reluctant to take on more debt due to high levels of indebtedness (The Banking Association South Africa, 2011).

Table 2.4: Credit growth trends as at June 2010 and June 2011

Description	**June 2010**	**June 2011**	**% growth**
Investments	122 118	116569	-5%
Bills discounted	5 023	5 236	4%
Total loans and advances	1 859 581	1 888 631	2%
Instalment sales credit	201 887	206 001	2%
Leasing finance	41 195	30 658	-26%
Mortgage advances	983 387	1 023 395	4%
Other loans and advances	633 112	628 576	-1%
Of which: To households	1 012 116	1 061 577	5%
Total credit extended to private sector	1 986 722	2 010 436	1%
Net credit extended to government sector	45 275	40 957	-10%
Total domestic credit extension	**2 031 997**	**2 051 393**	**1%**

Source: South African Reserve Bank (2011)

2.3.5. Branches and ATM's

By the end of December 2011, the total number of ATMs, branches and points of sale in South Africa for all banks were 179 319 with the major four banks (ABSA, FirstRand, Nedbank, Standard Bank) taking 175 539 of the total number. Table 2.5 below shows the number of branches, atm's and points of sale in South Africa by the end of December 2011.

Table 2.5: Number of ATMs, branches and points of sale (POS)

Category	**value**
Number of branches(major four banks)	2927
Number of branches (all banks)	6303
Number of ATMs, branches(major four banks)	26439
Number of ATMs, branches, POS (major four banks)	175 539
Number of ATMs, branches, POS (All banks)	179 319

Source: South African Reserve Bank (2012)

2.3.6. Number of Customers

According to PriceWaterhouseCoopers (PWC) (2009), the number of retail accounts by the major four banks amounted to 34, 5 million in 2009 and this number is expected to increase to 42 million accounts by 2012. African Bank, Capitec and Teba Bank reported 3, 5 million accounts in 2009 and this figure excluded the 1, 3 million new clients from the acquisition of Ellerines by African Bank. PWC estimated that the retail accounts by the reporting banks could have been in the region of 40 million in 2009

2.3.7. The Banking sector contribution to the economy

Banks contribute to the operation and growth of the economy through various roles, including that of intermediary and provider of payment settlement facilities. Financial intermediaries issue financial liabilities that are acceptable as investments to the ultimate lenders, and use the funds to acquire the claims that reflect the requirements of the borrowers. The banking sector is the biggest contributor to the South African economy, with the sector representing about 10.5 percent of gross domestic product (GDP), taxes amounting to 15 percent of GDP and employment representing about 4 percent (The Banking Association South Africa, 2012). Over 150 000 people are employed by the South African banking sector with the bulk of this number represented by the four major banks.

Basically, since a bank is funded primarily by depositors, it has an obligation to ensure that the risk to which depositors' funds are exposed is minimized. Banks have developed systems to facilitate the transfer of funds, such that money can be transferred almost instantaneously, and with minimal risk to the parties involved. According to FirstRand (2009) South Africa is ahead of many developed nations in that regard. It ensures the efficient allocation of resources in the economy through lending to businesses and individuals using sophisticated credit scoring systems. In addition to that, banks also provide 24 hour access to funds to consumers and facilities to save or invest with safety.

Government looks towards banks in addressing the socio-economic needs of its citizens, particularly the provision of banking services to the previously un-banked, as well as assisting in the financial education of the public (FirstRand, 2009). Financial literacy in South Africa is thought to be poor in terms of necessitating face-to-face interaction of bank staff with the majority of its customers so banks have pledged to provide facilities like e-banking, and telephone banking in even the remotest of areas in order to address customer needs. Ozdemir

and Trott (2009) identified time savings, fast service, cost savings, instant access, opportunity cost savings and convenience as perceived usefulness aspects for internet banking.

In general, banks have a positive impact on the running of the economy. The stable and sound South African banking system which is backed by a strong regulatory system continues to benefit and contribute towards the growth of the economy through its services.

2.3.8. Regulation of the Banking Sector

The South African banking sector is heavily regulated to ensure proper oversight over its operations. The South African Reserve Bank is responsible for the regulation of the banking sector. According to Banking Association South Africa (2012) the legislation that affects the banking industry, amongst others includes: the Banks Act; the National Payment System Act; the Financial Intelligence Centre Act (FICA); the Financial Intermediary and Advisory Services Act (FAIS); the National Credit Act; the Consumer Protection Act; the Home Loan and Mortgage Disclosure Act; and the Competition Act. In addition to these, banks also have to comply with the King Code on Corporate Governance and Basel II, except for the 2 mutual banks.

2.4 South African financial markets

Apart from a vibrant bank sector, South Africa also has a sound financial market system. The economic function of financial markets is to provide channels for transferring excess funds from surplus units to deficit units. Surplus units may purchase primary or indirect securities or reduce their debt by purchasing their own outstanding securities. On the other hand, deficit units may issue securities or dispose of some financial assets previously acquired (Van Zyl *et al.*, 2008). As previously stated, the focus of this study is on the Johannesburg Stock Exchange and the bond market of South Africa.

2.4.1 The Johannesburg Stock Exchange (JSE)

The JSE is the stock market for South Africa and also one of the oldest stock exchanges in the world, having been established as far back as 1886. In its 120 years of existence, it has developed into the 18th biggest stock exchange in the world by market capitalisation of R3.3-trillion as of September 2005 with approximately 400 listed companies and a market liquidity of 31.2% which is a remarkable achievement for an emerging market country like South Africa (JSE, 2012). The JSE is an essential component in the functioning of South Africa's economy, providing an orderly market for dealing in securities and thereby creating new investment opportunities in the country. The JSE's main function is to facilitate the raising of capital by

re-channelling cash resources into productive economic activity, thus building South Africa's economy while enhancing job opportunities and wealth creation. In addition, from a derivatives perspective, the JSE provides an effective and efficient price determination facility and price risk management mechanism (Southafrica Info, 2012).

Over recent years, there have been a number of important developments in the JSE which contributed to its efficiency and global standing. Trading is now fully automated through an electronic clearing and settlement system, the STRATE system (Share TRAnsactions Totally Electronic). The product base of the JSE has also expanded to include not only shares but also a range of equity, commodity and interest rate derivatives. In 2002, the JSE entered into a strategic alliance with the London Stock Exchange (LSE). This alliance led to a number of further improvements, such as the implementation of a new trading system and an indexing system that is aligned to that of the JSE, as well as the adoption of listing requirements that are in line with international best practice (Odhiambo, 2010). These developments enhanced the profile of the JSE, in particular to international investors. The latest development in the history of the JSE was its own demutualisation in 2005. It became a public unlisted company on 1 July 2005, and listed on its own exchange a year later.

The JSE has also contributed in increasing the awareness around good corporate governance by providing incentives to listed companies to commit to higher governance standards. According to the OECD (2009), in 2008 the JSE announced a new constituency of the Socially Responsible Investments (SRI) index which assesses environmental, social and economic sustainability practices and corporate governance of listed companies.

2.4.1.1 Listing on the Johannesburg Stock Exchange

The JSE lists shares on two separate markets, the Main board and AltX. The Main board lists main board companies and its requirements are strict while the AltX lists smaller, fast growing companies who fail to meet the Main board criteria. The number of listed companies is the total firms which have shares listed on the JSE at the end of a financial period, split into domestic and foreign but excluding investment funds and unit trusts. By being listed on the JSE, companies position themselves to benefit from access to capital for growth and fund acquisitions and boosting their profiles with customers, suppliers and investors, thereby making more business opportunities available.

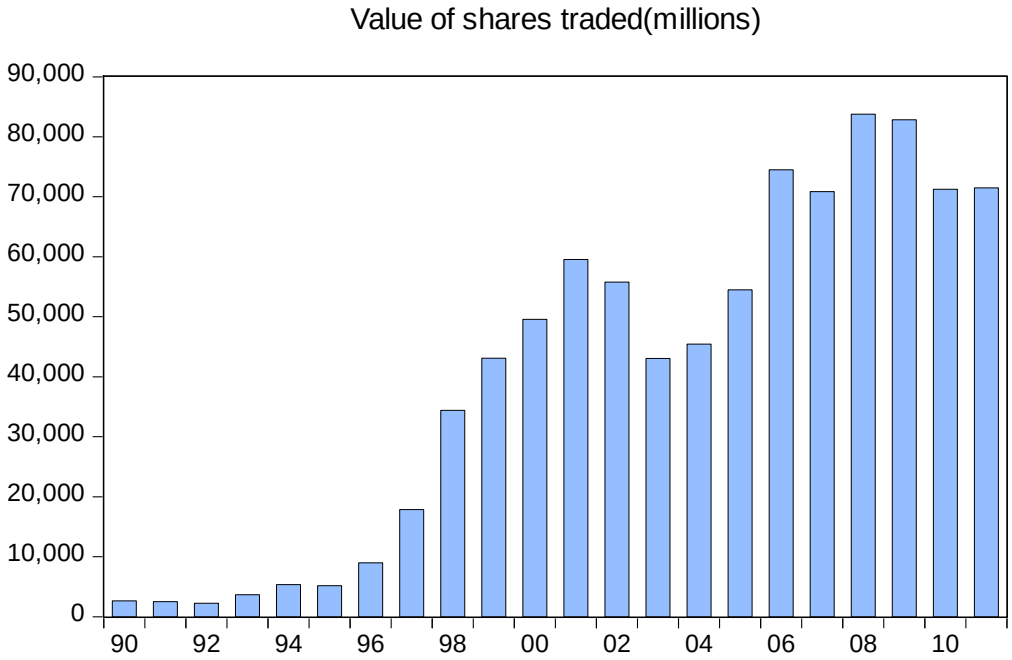
In 1990 there were 769 companies listed on the JSE. The stock exchange experienced a number of new listings and quite a number have been delisted since 1990.The economic conditions of 2009 resulted in fewer listings and more delistings across most exchanges and the JSE was no exception. According to the JSE (2012) currently there are 332 domestic listings and 56 foreign listings. The listed companies on the JSE have dropped significantly since 1990. Apart from the 2009 economic conditions, the major reason could be the improvements and strictness of the JSE system in respect of corporate governance standards which has caused many companies to deregister because of the failure to meet the full requirements of the constantly evaluated corporate governance standards.

2.4.1.2. Johannesburg Stock Exchange value of shares trading

The value of shares traded is the total shares traded on the stock market exchange. It measures the activity of the stock market trading volume as a share of national output and should reflect the degree of liquidity that stock markets provide to the economy. Beck and Levine (2002) pointed out that the value of shares traded has two potential disadvantages in reflecting the activities of a market. The first disadvantage is that it does not reflect the liquidity of the market but rather measures the trading relative to the size of the economy. The other disadvantage is that the value of shares traded can rise without an increase in the number of transactions since it is a product of quantity and price; hence this will cause markets to anticipate higher economic growth by the higher prices.

Currently trading at the JSE is done using the fully automated electronic trading system called the JSE TradElect which is operated under licence from the London Stock Exchange. The JSE TradElect system replaced the JSE SETS system in April 2007 after the SETS system replaced the JSE JET system in May 2002 (JSE, 2012).The JSE operates an order-driven, central order book trading system with opening, intra-day and closing auctions, so the TradElect provides for the hierarchical organization of the market into segments, sectors and securities. From the introduction of the automated trading system in 1996 the JSE has shown an improvement in the value of shares traded as compared with the time when the open outcry trading floor was used. Figure 2.6 below shows the value of shares traded on the JSE for the period 1990 to 2011.

Figure 2.6: Value of shares traded on the JSE for the period 1990 to 2011



Source: South African Reserve Bank (2012)

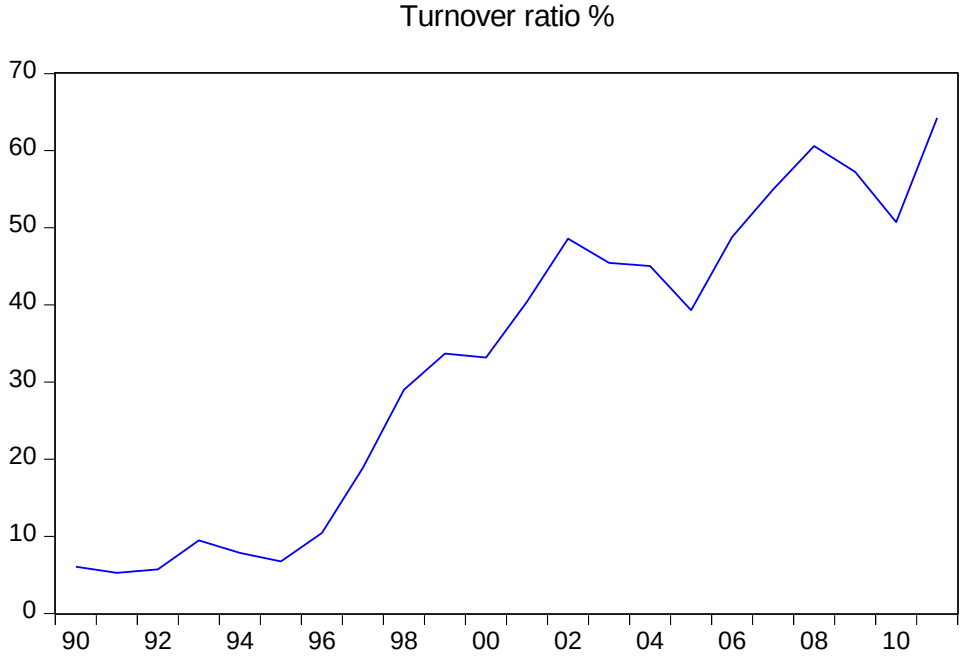
Figure 2.6 above shows that the value of shares traded from 1990 to 1996 was very low, indicating that a low volume of shares was traded during that time. This could be explained by the traditional open outcry system trading which was used at that time which was not fast and efficient to trade large volume of shares. From 1997 onwards the JSE started to experience an increase in the value of shares traded indicating that there was also an increase in the volume of shares traded. This could be attributed to an order driven, centralised, and automated trading system which was introduced on 7 June 1996, namely the JSE Equities Trading (JET) system after the closure of the open outcry trading floor which increased transparency and resulted in large volumes of shares being traded. 2008 marks the highest value of shares traded and could also be explained by the TradElect system which was introduced in 2007 which was modified to suit the JSE specific needs.

2.4.1.3. The Johannesburg Stock Exchange stock turnover

The stock turnover ratio is the ratio of the value of total shares traded and market capitalization. It measures the activity or liquidity of a stock market relative to its size. A small stock market which is active is believed to have a high turnover ratio as compared with a large but less liquid stock market. Countries with illiquid markets are thought to create disincentives to long-run investments because it is comparatively difficult to sell one's stake in the firm. In contrast, more liquid stock markets are thought to reduce disincentives to long-run investment, since liquid

markets provide a ready exit-option for investors, hence fostering more efficient resource allocation and faster economic growth. Correia *et al.* (2007) revealed that the South African exchange still suffers low liquid level characteristics of emerging markets despite the numerous changes that the JSE has undergone since 1994. They suggested that the lack of liquidity remains a problem for the JSE, particularly for smaller listed companies. The most liquid companies of the JSE are the top 40 listed companies. Despite the fact that JSE liquidity as compared with other world markets is very low, the JSE liquidity has increased for the past 20 years showing an improvement which is significant for an African emerging market. Figure 2.7 below shows the JSE turnover ratio for the period 1990 to 2011.

Figure 2.7: JSE stock turnover ratio for the period 1990 to 2011



Source: South African Reserve Bank (2012)

From the figure 2.7 above from 1990 to 1995 the JSE turnover ratio was very low ranging at an average of about 6 percent. From 1996 onwards the JSE started to experience high turnover ratio. This could be explained by the deregulation in line with the mature markets which happened in 1995 that attracted foreign investors to South Africa, and the new trading system which was introduced in 1996. Allowing foreign investors could have boosted the liquidity of the JSE due to the increase in the number of players in the market. An increase in the number of market participants can increase the chances of successful trades being made and also ways in which new capital could be raised (Economic Focus, 1991). 2008 marks the highest turnover ratio despite the global financial crisis that happened. This could be explained by the current

trading system which was introduced in 2007 which is more superior to the previous two introduced in 1996 and 2002.

2.4.1.4. Stocks performance in South Africa

FTSE/JSE and the JALSH are used to describe the performance of the market at a given point in time. The JALSH is a major stock market index which tracks the performance of large companies based in South Africa while the FTSE/JSE All Share Index is a major stock market index which tracks the performance of all companies listed on the Johannesburg Stock Exchange in South Africa and is a free-float, market capitalization weighted index. Both the JALSHI and the FTSE/JSE indices have revealed a positive performance in the stock market from the nineties. According to Statistics South Africa (2012) from 1995 until 2012 the JALSH averaged 14 025.5 reaching an all time high of 35 574.5 in August of 2012 and a record low of 4 308.0 in September of 1998, while the South Africa Stock Market (FTSE/JSE), from 1995 until 2012, averaged 16 557 index points reaching an all time high of 46 193 index points in November of 2012 and a record low of 4 308 index points in September of 1998.

2.4.2 The bond market of South Africa

Apart from developments in the stock market and the banking sector, the growth of the bond market in South Africa has been outstanding as well. The bond market is defined as a financial market where buying and selling of debt securities and new issue of debt, usually in the form of bonds, is done by participants (Mishkin, 2001). The primary goal of the bond market is to provide a mechanism for long term funding of public and private expenditures. South Africa's domestic bond market is dominated by government issued bonds, and does, in fact, have a centralised exchange known as the Bond Exchange of South Africa Limited (BESA).

2.4.2.1. The Bond Exchange of South Africa

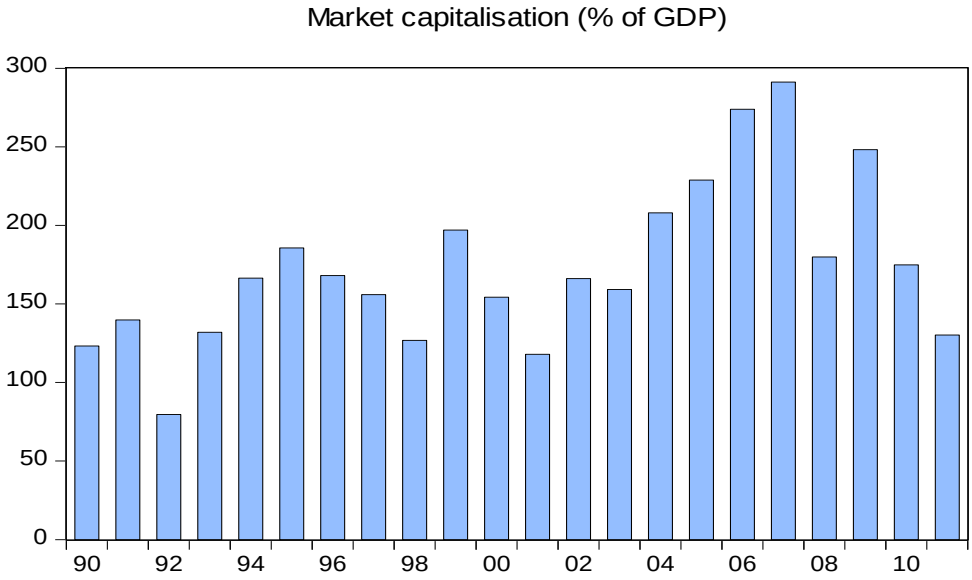
BESA is an independent, licensed exchange, which was constituted as a public company after its demutualisation in 2002. The bond exchange has been mandated to operate and regulate the long term debt securities and interest rate derivatives markets in South Africa. Its main aim is to build the local capital market by providing a variety of platforms and services to meet the demands of securities market participants who include issuers, traders and investors (Hove, 2008). It also acts as a direct regulator of the domestic bond market, and operates according to the parameters set out by the Securities Services Act of 2004, while the Financial Service Board oversees all its operations. The Bond Exchange of South Africa is also dedicated to protect

both traders and dealers through the implementation of best practice standards, and it regulates the conduct of issuers and traders by supervising and enforcing quality controls through the mechanism of minimum disclosure standards. Currently BESA enjoys an annual liquidity of 38 times the market capitalisation, making it one of the most liquid emerging bond markets in the world (South African Financial Sector Forum, 2012).

2.4.2.2. Size and performance of the bond market

The size and performance of a bond market can be described in terms of market breadth and depth. Market breadth describes both the size of the market as well as the number of participants whereas market depth, according to Mboweni (2006), is the market liquidity which is the ability to execute transactions of a representative size cheaply and rapidly without having too much of an effect on the price. Bond market capitalisation is used to measure the size of the bond market while the bond turnover ratio is used to describe the market depth. Market capitalisation is measured as the value of listed bonds divided by the nominal GDP. Figure 2.8 below shows South Africa's bond market capitalisation for the period 1990 to 2011.

Figure 2.8: Bond market capitalisation for the period 1990 to 2011

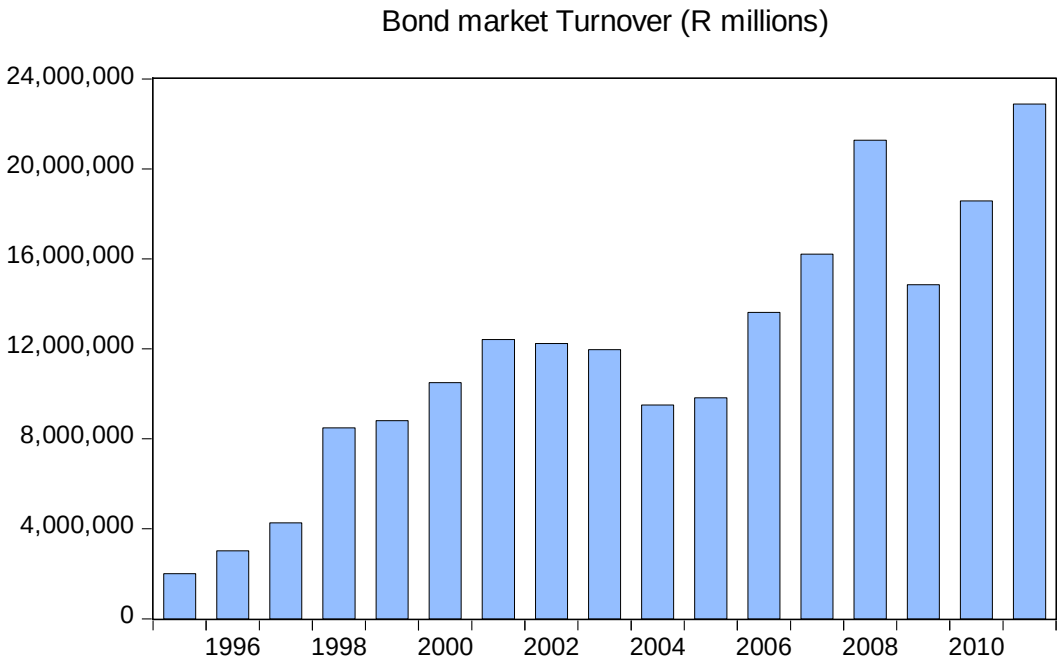


Source: World Bank (2012)

Figure 2.8 above shows that bond market capitalisation as a percentage of GDP has generally been high since 1990. This could be attributed to the structural improvements that took place in the bond market during the late 1980s and 1990s, such as the creation of a yield curve and

also the adoption of a well communicated and structured regular system of auctions which increased transparency. The high market capitalisation shows that bonds are tradable instruments in South Africa and also that there are more participants in this market. 2007 mark the highest market capitalisation as a percentage of GDP. This could be explained by a significant increase in the number of corporate listings which started in 2006. There was an increase in the value of listed bonds in the corporate sector during the period of 2006 as compared with the nineties where parastatals used to dominate the non-government bond market (Jones, 2007).

Figure 2.9: Bond market turnover for the period 1995 to 2011



Source: South African Reserve Bank (2012)

Figure 2.9 above shows that from 1995 to 1997 the bond market turnover was very low, though it was showing an increase in every year. From 1998 onwards the turnover was general high. This could be explained by the market-making role previously undertaken by the SARB which was transferred to a panel of 12 primary dealers, selected from both local and foreign banks to improve efficiency and transparency in the secondary market in 1998 (BESA, 2011). From 2006 there was a great increase in the market turnover. BESA attributed the increase in turnover to the volatility in the bond market created by various external events such as increases in the Reserve Bank's repo rate, the depreciating rand, high bond yields and increased holdings and

trading by foreign investors (BESA, 2007). Also the increase in turnover in 2006 onwards could be accredited to non-residents' contribution to the market. According to Mboweni (2006), in 2006, non-residents purchased bonds totalling R26.8 billion and increased trading activity from 32% in 2005 to 38% in 2006. 2011 marks the highest market turnover for the period under review.

2.4.2.3. Comparing the South African bond market and other countries

The South African bond market is considered to be a leader among other emerging market economies due to its outstanding performance. Van Zyl (2008) showed that the South African bond market is a leader in terms of the number of bonds listed and turnover. Table 2.6 below shows the sizes of the foreign debt and domestic debt securities market in South Africa and a few other countries at the end of 2006.

Table 2.6: Size of securities markets at the end of 2006 (Billions of USA dollars)

Country	International debt securities(Issuer)			Domestic debt securities (Issuer)			Equities market
	Government	Financial institutions	Corporates	Government	Financial institutions	Corporates	
Australia	10.6	371.9	16.9	97.1	215.4	144.8	1095.9
Denmark	258.6	2221.8	110.7	1222.7	881.8	143.2	1637.6
Germany	1.3	326.6	9.0	111.3	98.2	13.8	1212.4
Switzerland	6.4	1749.9	255.4	835.1	379.4	23.1	3794.3
United Kingdom	8.0	12.2	5.6	69.8	25.3	14.3	711.2
South Africa	44.9	28.9	19.8	169.1	112.5	27.4	348.3
Mexico	55.3	2.3	3.9	60.4	4.9	11.4	51.2
Argentina	3.7	22.4	6.0	59.2	33.9	53.0	235.6
Malaysia	33.8	6.1	0.4	129.5			148.8

South Korea	7.7	64.9	28.2	459.9	291.9	258.2	834.4

Source: Van Zyl et al. (2008)

Table 2.6 shows that the size of the bond market in South Africa is relatively large, even compared with some of the developed countries. As far as emerging economies are concerned, only South Korea has a larger domestic government bond market than South Africa. Several factors were identified as contributing to the development of the South African bond market. This includes a healthy banking sector, a properly regulated framework and macroeconomic stability. As is common in most economies, banks have been major holders of corporate bonds, encouraging issuance and hence growth of the market in South Africa. The major changes in the South African bond market regulations, especially the move from OTC markets to exchange-traded market has also contributed towards its growth. Faure (2007) points out that another important factor contributing to the growth of the South African bond market has been the surge in long-term borrowing since the issue of short-term borrowing entails a series of borrowings which is administratively burdensome. The bond market has, therefore, played a significant role in the economy, in terms of making fixed investment projects possible in contributing to the growth of the economy.

2.4.3 Fair, efficient and transparent markets

To ensure that the markets are fair, efficient and transparent the regulator's licensing of exchanges, central securities depositories (CSDs) and clearing houses, and its approval of operating rules are used. According to Mboweni (2006) the fairness of the markets is closely linked to investor protection, and especially to the prevention of improper trading practices. Market structures should not excessively favour some market users over others. Regulation should ensure the highest levels of transparency and efficiency, and should ensure that investors are given fair access to market facilities and market or price information. Regulation should also detect, deter and penalise market manipulation and other unfair trading practices.

2.4.4 The regulators of financial markets

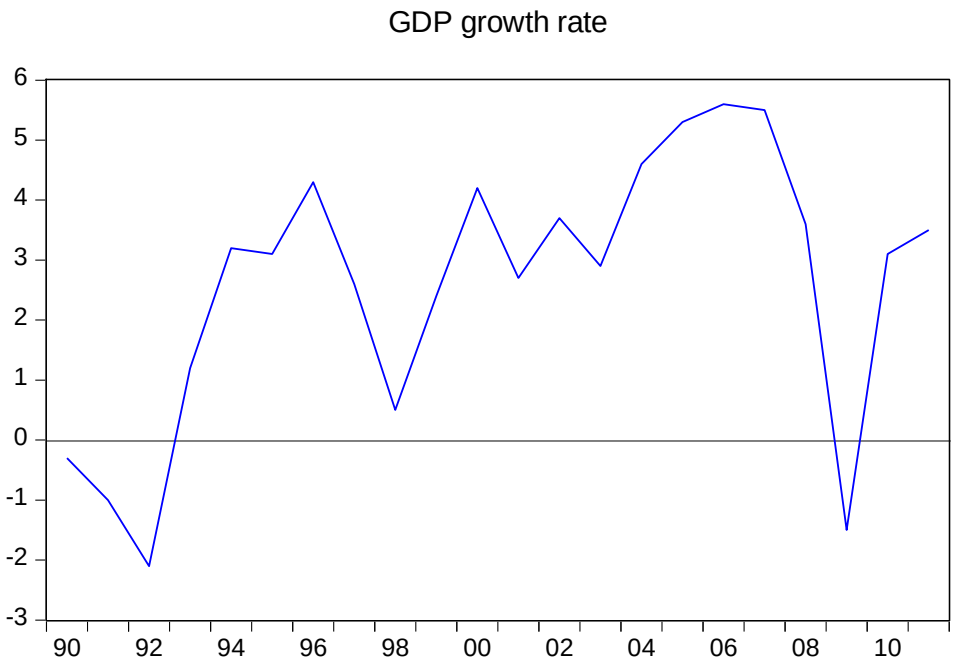
The Financial Services Board (FSB) is the primary regulator and it delegates supervision to the Registrar, who, in turn, delegates certain aspects of this authority to the Self Regulatory Organisations (SROs). This function is supported by the Financial Markets Advisory Board (FMAB) and the FSB Directorate of Market Abuse (DMA). The Registrar is accountable to the Minister of Finance for the effective and efficient implementation and enforcement of the

Securities Services Act (SSA). The SRO is expected to issue directives, perform market surveillance, submit annual reports and audited financial statements to the Registrar, and conduct an annual self-assessment review as part of its responsibilities. Should an SRO fail to properly perform its regulatory functions, the Registrar may assume these responsibilities (Policy document explaining the Financial Markets Bill, 2011).

2.5. Economic growth in South Africa

The Gross Domestic Product (GDP) growth rate provides an aggregated measure of changes in the value of the goods and services produced by an economy. Since the beginning of democracy in 1994 South Africa has experienced an improvement in economic growth as compared with the previous years. This improvement can be explained by improvement in the macro economic performance, the introduction of new policies and also the removal of financial sanctions which ensureds an environment that is attractive to investment. Faulkner and Loewald (2008) pointed out that the decade prior to the year 1994, South Africa was under economic sanctions and investor confidence was low which made it hard for the economy to attract investment. So the inception of democracy created a calm political environment coupled with increased foreign direct investment which ensured improvement in the performance of the economy in South Africa. Figure 2.7 below shows an overview of economic growth rate for the period 1990 to 2011.

Figure 2.10 Real GDP growth rate



Source: South African Reserve Bank (2012)

From figure 2.10 above it can be seen that before the advent of democracy negative growth rates were recorded and an improvement was seen starting from 1993 onwards. From the first quarter of 1993 to the second quarter of 2008, the country enjoyed an unprecedented 62 quarters of uninterrupted economic growth. However, when the global financial crisis made itself felt, GDP contracted in the third and fourth quarters of 2008, officially dipping the economy into recession. In 2001 GDP rose by 2.7% and continued to increase by 3.7% and 3.1% in 2002 and 2003 respectively. In 2004 there was a large increase of 4.9% followed by a 5% increase in 2005 and a 5.4% increase again in 2006. In 2007 the increase in GDP started to decrease compared to the previous year and a 5.1% increase was recorded in 2007 followed by a 3.1% increase in 2008 which is again lower than the previous year. The contraction continued into 2009 with negative GDP growth rates of -6.4 and -3.4 recorded in the first and second quarters of 2009 respectively. 2010 was a relief as seen by an improved growth of 3.1%.

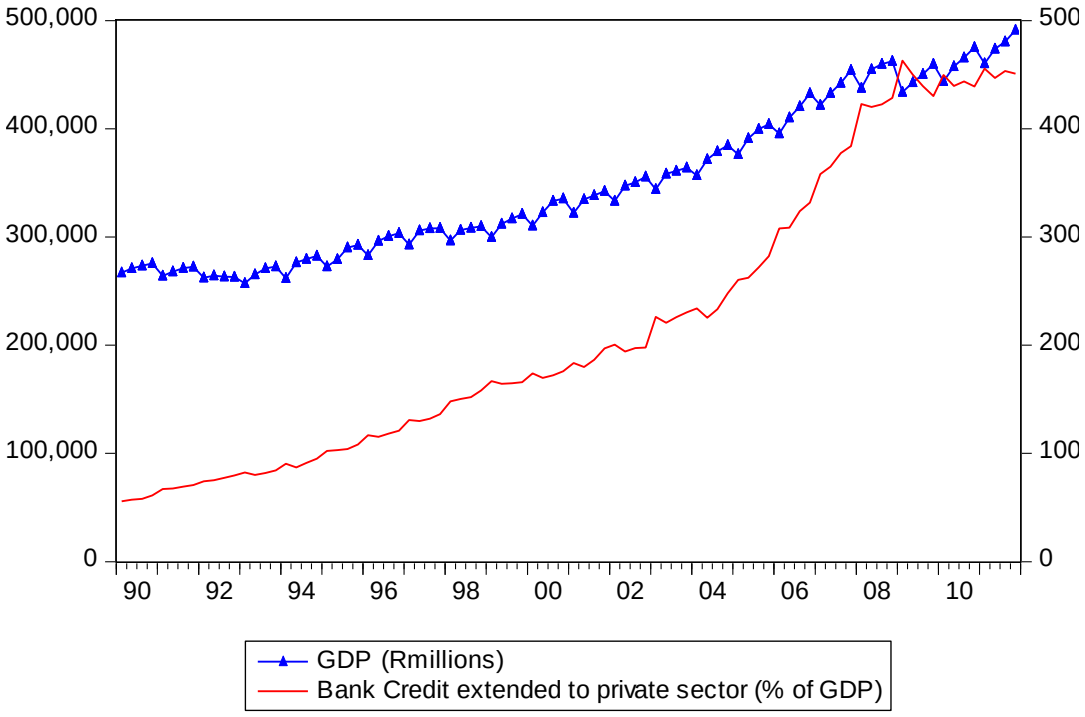
According to Statistics South Africa (2012), from 1993 until 2011 South Africa's GDP growth rate averaged 3.26 percent reaching an all time high of 7.60 percent in December of 1994 and a record low of -6.30 percent in March of 2009. The favourable average growth rate can be attributed to good macroeconomic reforms which have boosted competitiveness, growing the economy, creating jobs and opening South Africa to world markets. The policies have helped South Africa to have a strong macroeconomic structure that has managed to cut taxes, drop tariffs, rein in the fiscal deficit, curb inflation and also to have relaxed exchange controls. Despite depressed world market conditions, South Africa has succeeded in steadily growing. The strong growth rate of South Africa is supported by a sound financial system.

2.6. The relationship between bank credits to the private sector and the GDP

Judging from figure 2.11 below, there seems to be a simple relationship between bank credits and economic growth. There is a positive relationship between the two variables. When bank credits were increasing, economic growth was also increasing and vice versa. For the whole period bank credits and GDP were moving together. From 1990 to 2008 both GDP and bank credits were increasing and the two graphs cross each other in 2007. A decrease was experienced in the last quarters of 2008 up to the first quarters of 2009 in both GDP and bank credits. This could be explained by the global financial crisis which was experienced in the

economy during that period which caused some of the financial institutions to collapse resulting in the commercial lending of banks to be under pressure.

Figure 2.11 Relationship between bank credit to private sector and GDP

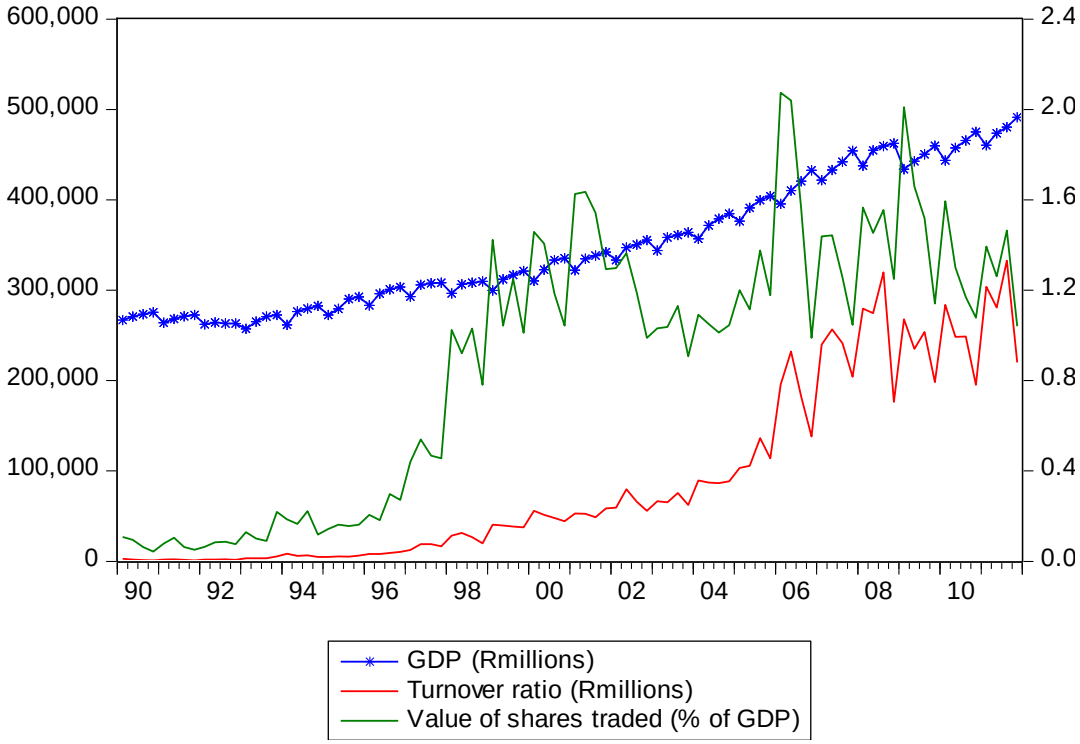


Source: South African Reserve Bank (2012)

2.7. The relationship between stock turnover, value of shares traded and GDP

Figure 2.12 below shows that in the nineties stock turnover and the value of shares traded were very low though increasing in every year, while GDP showed a steady growth rate. Despite the fluctuation in turnover ratio and the value of shares traded, there is a positive relationship between these variables and economic growth. The increase in the value of shares traded and the turnover ratio from 1998 onwards could be explained by the automated trading system which increased the efficiency, transparency and liquidity of the market. GDP was also increasing and could be explained by the efficiency of the stock market.

Figure 2.12 Relationship between stock turnover, the value of shares traded and GDP

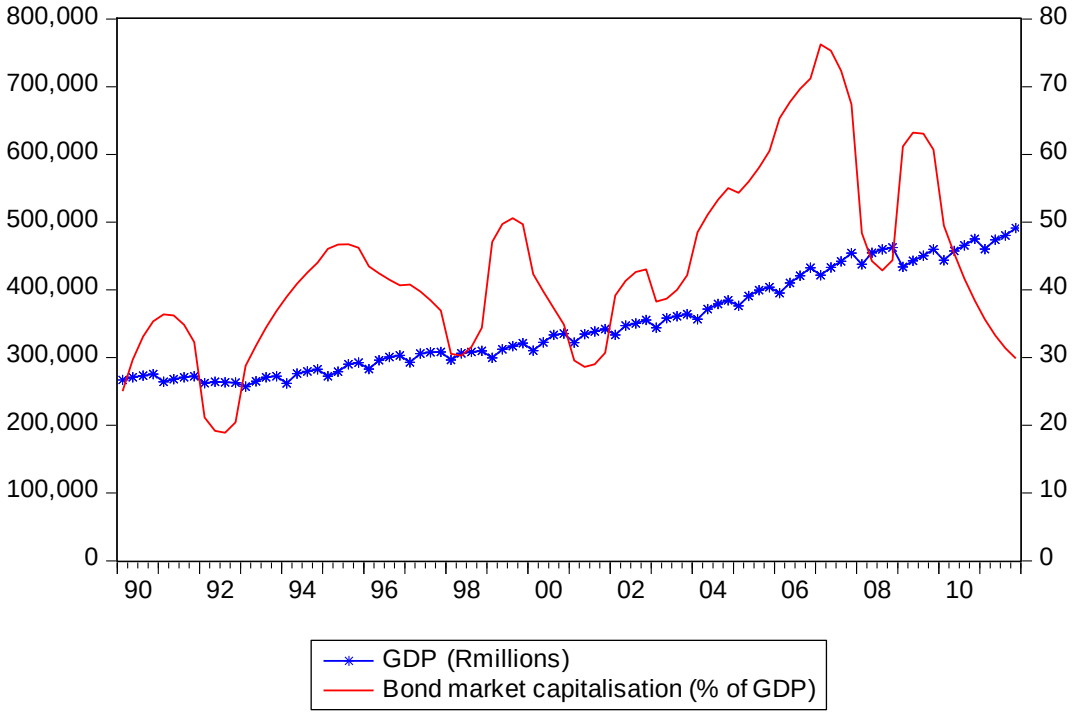


Source: South African Reserve Bank (2012)

2.8. The relationship between bond market capitalisation and GDP

Figure 2.13 below shows that for the whole period GDP was increasing at a steady rate while cyclical movements were experienced in the bond market. Despite the fluctuations in bond market capitalisation, a positive relationship is shown between the two variables. 2007 marks the highest bond market capitalisation for the period under review but in 2008 and 2011 the market experienced sharp decreases. The sharp decreases could be explained by the exit of foreign investors due to the impact of the global financial crisis. Also the interest rate developments which were lower than the expected inflation rate, which happened in 2010 could have caught the market unexpectedly and could also be an explanation of this decrease.

Figure 2.13 Relationship between bond market capitalisation and GDP



Source: South African Reserve Bank (2012)

2.9. Conclusion

This chapter examined the trends in South Africa's financial system and economic growth through analysing the banking sector, the stock market, the bond market and economic growth. Over recent years, there have been a number of important developments in the JSE which have contributed to its efficiency and global standing. The product base of the JSE has expanded to include not only shares but also a range of equity, commodity and interest rate derivatives. The introduction of the automated trading system increased the efficiency, transparency and liquidity of the JSE market. The bond market has also experienced a lot of structural developments and is considered the most liquid emerging bond market in the world. The regulator's licensing of exchanges, CSDs and clearing houses, and its approval of operating rules, helps to ensure fair markets. The regulation of financial markets is done by the Financial Service Board. Stable, investor friendly and fair markets feed though to a more efficient and effective allocation of limited resources supporting business growth, economic growth and employment. A number of changes were also experienced in the banking sector in respect of the regulatory environment, product offerings, and the number of participants resulting in a greater level of competition on the market from smaller banks such as Capitec Bank and African Bank which have targeted the low income and the previously unbanked market. The South African banking sector is heavily regulated to ensure proper oversight over its

operations. The South African Reserve Bank regulates the banking sector and the legislation that affects the banking industry includes the Banks Act, the National Payment System Act, among others. The operations of both the financial markets and the banking sector have proved to be the biggest contributors to the South African economic growth.

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

This chapter provides a review of various theories and empirical studies on financial markets, banks and economic growth. The chapter is made up of three sections. In the first section we discuss the theoretical propositions linking finance and economic growth, whilst the second section concentrates on the empirical studies regarding financial markets, banks and economic growth in both developed and developing countries, and South Africa in particular. The last section concludes the chapter.

3.2 Theoretical link between finance and economic growth

3.2.1. McKinnon (1973) and Shaw (1973)

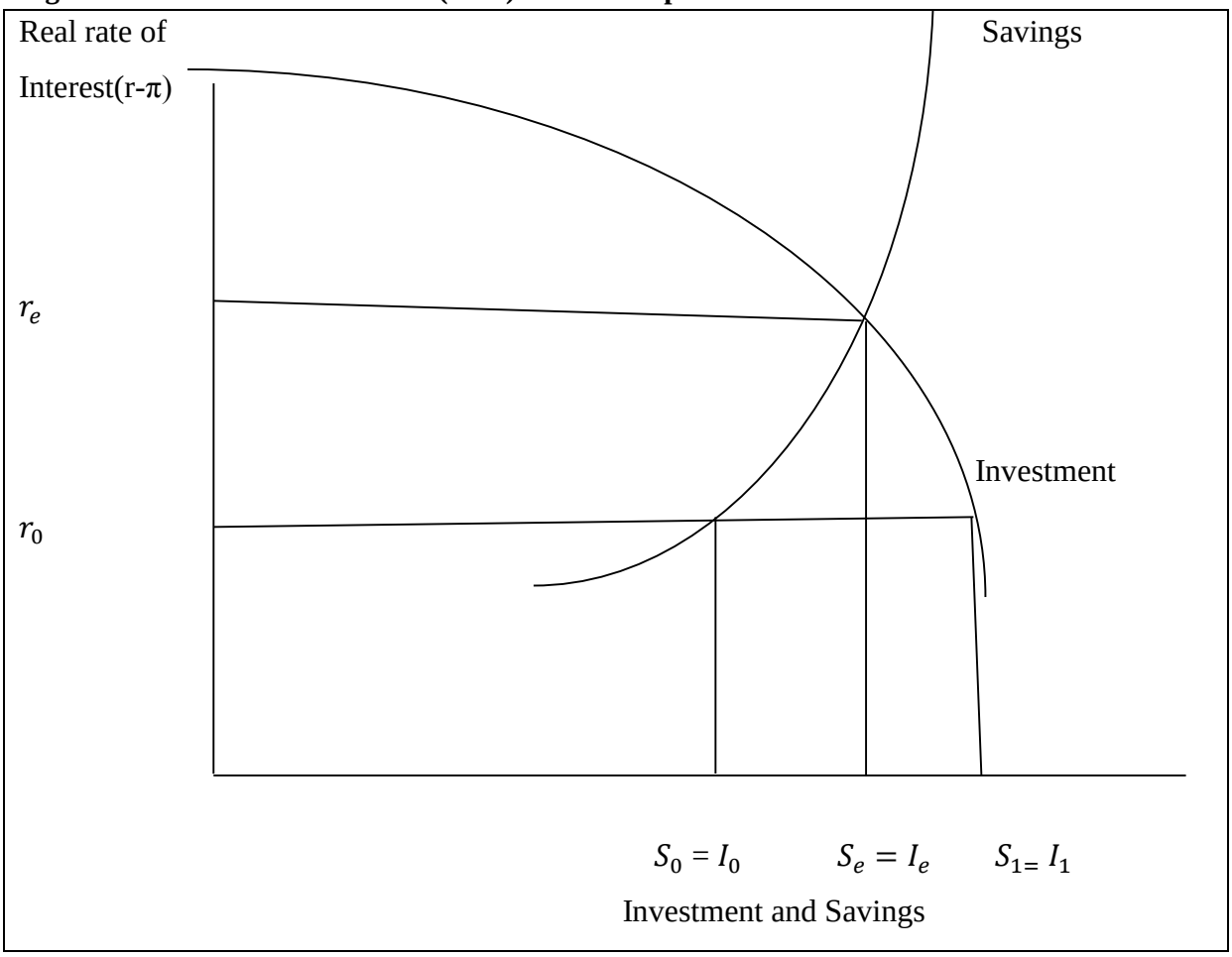
The theoretical linkage of the relationship between financial development and economic growth can be traced using McKinnon (1973) and Shaw's (1973) work, developed from the idea of Schumpeter (1912) that financial development encourages growth because it increases the level of investment and improves its allocation. McKinnon and Shaw explained the concept of financial repression as a situation whereby a set of government regulations, laws, and other non-market restrictions prevent the financial intermediaries of an economy from functioning at their full capacity. This is because the set of obstacles mentioned above will prevent the prices of credit and financial assets from being at their equilibrium. Under the McKinnon-Shaw framework the financial variable which is prevented from being in equilibrium is the interest rate on bank deposits, which translates to that on bank loans, and the cause of the repression is assumed to be government policy which deliberately prevents banks from adjusting interest rates up to equilibrium (Fry, 1988).

While theoretically an economy with an efficient financial system can achieve growth and development through efficient capital allocation, McKinnon and Shaw (1973) argue that, historically, many countries, more especially developing ones, have restricted competition in the financial sector with government interventions and regulations. They stressed two channels in which financial repression can have detrimental effects on the economy which are: financial repression affects how efficiently savings are allocated to investment, and financial repression also affects the equilibrium level of savings and investment through its effect on the return to savings (Arestis, 2005). They argue that government restrictions on the banking system such as interest rate ceilings, high reserve requirements and direct credit programmes restrain the

quantity and quality of investment which will hinder financial development, and ultimately reduce growth. Investment is believed to suffer both in quantity and quality because bankers do not ration the available funds according to the marginal productivity of investment projects but according to their own discretion.

Assuming all savings are placed in bank deposits which banks then pass on in the form of loans to investors and that investment is financed by bank credit, a basic model of financial repression is shown in figure 3.1 below:

Figure 3.1 Mckinnon and Shaw's (1973) financial repression model



Source: Fry (1988)

Figure 3.1 above is based on the assumption that both saving (S) and investment (I) are functions of a real interest rate. Saving is assumed to be positively related to the real interest rate given the rate of economic growth and is a primary determinant of the supply of investible resources, according to McKinnon and Shaw (1973). Suppose that an interest rate ceiling has been imposed at r_0 below the interest rate equilibrium r_e and that the banks' lending and deposit

rates are equal. This low rate of interest will lead to lower savings S_0 limiting investment to I_0 respectively. This means that at this low level of interest rate, the volume of savings will be insufficient to provide enough bank credit to finance the levels of investment which firms desire, and banks or the government will then have to ration credit by one means or another. This situation is called financial repression. However, McKinnon and Shaw (1973) recommend a financial liberalisation process of abolishing interest rate ceilings and they argue that an increase in the real rate of interest towards the market equilibrium level r_e will result not only in higher savings but also in a more efficient allocation of investible resources, both contributing to higher economic growth. This is given by $S_e = I_e$ on figure 3.1 above.

Higher interest rates increase the attractiveness of savings relative to consumption spending encouraging more individuals to substitute current savings for current consumption. This leads to an increase in the volume of financial savings through financial intermediaries and thereby raising investment funds. As more savings are mobilized and investment in financial assets increases, this leads to an increase in the level of financial depth in the economy (Dornbush & Fischer, 1994).

Mckinnon and Shaw (1973) also pointed out that the incentives for savers and investors in an economy can be distorted by financial repression. The low return on bank deposits encourages savers to hold their savings in the form of unproductive assets such as land, rather than the potentially productive bank deposits. Similarly, high reserve requirements restrict the supply of bank lending even further whilst directed credit programmes distort the allocation of credit since political priorities are, in general, not determined by the marginal productivity of different types of capital. In addition, McKinnon and Shaw (1973) also pointed out that financial repression can lead to dualism in which firms that have access to subsidized funding will tend to choose relatively capital intensive technologies; whereas those not favoured by policy will only be able to implement high yield projects with short maturity. They argued that financial development could cause economic growth especially via the effective resource allocation channel, unless the government has direct interventions on financial system that degenerate the resource allocation.

Their analysis is sometimes called the ‘complementarity hypothesis’ and it concluded that alleviating financial restrictions mainly by allowing market forces to determine real interest

rates can exert a positive effect on growth rates as interest rates rise toward their competitive market equilibrium. The hypothesis implies that the demand for real money balances (*M/P*) depends on real income (Y), the ratio of gross investment to GNP (I/Y) ,and the real deposits rate of interest, (d- π^e) where d is the nominal deposit rate and π^e is the expected rate of inflation. The demand for real money balance is expressed in the following function:

M/P = L(Y, I/Y, d- π^e) 3.1

The investment ratio, I/Y, must be positively related to the real rate of return on money balances. This is because a rise in the real return on bank deposits, d- π^e, if it raises the demand for money and real money balances, is complementary to investment. It must also lead to a rise in the investment ratio. Hence, McKinnon's complementarity hypothesis gives a demand for investment function as:

I/Y = F(R, d- π^e) 3.2

where, R is the average return on physical capital. The complementarity hypothesis states that the partial derivatives in equation (3.1) and (3.2) should meet the requirements: $L_{I/Y} > 0$; $F_{d-\pi^e} > 0$

McKinnon and Shaw (1973) point out that deepening of finance increases the real size of the monetary system and generates opportunities for the profitable operation of other institutions. They defined 'financial deepening' as an expansion of the real size of the financial sector, encompassing a broad spectrum of financial services and operations. Their focus was on financially repressed developing countries and the need for them to allow interest rates to be market determined so as to increase the level of savings and investment in the economy. They argue that a change in policy leading to financial liberalization not only increases the size of the financial market, as measured by society's money holdings but, more importantly, it provides profitable opportunities for new firms to enter the financial sector.

McKinnon and Shaw (1973) also brought forward the following model in their analysis:

M^d/ p = f(Y, r, d- p/p) 3.3

where M^d/ p is the demand for assets by the public in real terms used as a proxy for financial development , (Y) is the real GDP , (r) is the average rate of return to capital and (d-p/p) is the expected real rate of interest. All three determinants have a positive effect on the real demand for financial assets. They concluded that financial liberalization is essential for financial deepening since positive real deposit rates encourage accumulation of money balances (savings) which, in turn, encourage investment. McKinnon and Shaw (1973) attributed the existence of credit rationing to the existence of financial repression and agreed that financial repression exerts an adverse impact on savings, investment, financial deepening and, hence, economic growth whilst financial liberalization positively affects those factors.

Curbing financial repression is one of the policy prescriptions that have been recommended by the IMF and World Bank as central to financial reforms. To McKinnon and Shaw (1973), a remedy for this is reducing the rate of inflation or raising the institutional nominal interest rates which will, in turn, maximise investment. McKinnon and Shaw also stress reformation of financial markets through saving propensities and the quality of capital formation as the optimal strategy to generate both faster and steadier growth in real output. Thus, creation of financial institutions and markets increases the supply of financial services and this leads to economic growth. They also forwarded a policy prescription of deregulating interest rate restrictions because regulation affects domestic savings adversely and thus capital formation, which retards economic growth and development.

3.2.2. Endogenous growth model (Pagano (1993))

The endogenous growth model which is the AK model of Pagano (1993) is also used to link financial development and economic growth. This model captures the potential effects of financial development on growth with financial intermediation considered as an endogenous process. This model suggests that financial intermediation has a positive effect on growth and also a two-way causal relationship between financial intermediation and growth is thought to exist. The growth process encourages higher participation in the financial markets, thereby facilitating the establishment and promotion of financial intermediaries. The financial intermediaries then enable a more efficient allocation of funds for investment projects, which promote investment itself and enhance growth (Greenwood and Jovanovic, 1990).

In a closed economy the model is presented as:

$Y_t = AK_t$ 3.4

where, aggregate output (Y) is expressed as a function of the aggregate capital stock (AK).

Pagano assumes the simplest endogenous growth model where no population growth is experienced in the economy and only one good which can be consumed or invested is produced. If capital stock is also assumed to depreciates at a rate of δ per period, the gross investment is given by the following equation:

$I_t = K_{t+1} - (1- \delta)K_t$.....3.5

In the model above, savings are transformed into investment by financial intermediaries. In doing this, the financial intermediaries take up all the resources making a dollar saved by households to produce less than a dollar's worth of investment. According to Pagano (1993), if a fraction, ϕ, of each dollar saved is assumed to be available for investment, while 1- ϕ is taken by the financial intermediaries in return for the services supplied, the transaction cost can be given as the difference between the lending and borrowing rates charged by banks. Since it is a closed economy the capital market equilibrium requires that savings left after removing the financial intermediaries' share should be equal to the gross investment. Therefore the capital market equilibrium will be given as:

$\phi S_t = I_t$.....3.6

Using equation (3.4) and (3.6) while dropping the indices, the output growth rate, g, can be given as follows:

$g = A\left(\frac{I}{Y}\right) - \delta = A\phi s - \delta$.....3.7

where s represents the rate of gross savings.

Equation 3.7 above gives the steady state growth rate of an AK model in a closed economy with financial intermediation. It suggests the two main channels in which economic growth can be influenced by financial development assuming that the increased financial intermediation in the economy feeds more to financial development. The efficiency in which savings are allocated to investment is identified as the first channel. Bencivenga and Smith (1991) point out that when banks get more involved in greater and improved intermediation, they are more likely to grow and turn out to be more efficient in what they do, and as a result the difference between their lending and borrowing rates falls. This will result in an increase in the quantity

of savings channelled to investment. Using equation (3.7) above, g will increase as a result of an increase in ϕ.

The second channel is that, financial intermediation can affect growth if it leads to an improvement in the allocation of capital in the economy. Allocating funds to projects with a high marginal product of capital is one important function of financial intermediaries. When there is an increase in financial intermediation in the economy, banks are believed to get more experience in evaluating alternative investment projects, hence better and able in selecting high-yielding projects (Bailliu, 2000). Channelling of large proportion of funds to projects where the marginal product of capital is higher is also easier with banks, because they are also thought to be better and able in providing risk sharing; hence as a result they can encourage individuals to invest in riskier but more productive investments. In the model above, an improvement in the capital allocation will mean an increase in the overall productivity of capital A which will translates into higher growth rate.

Pagano's framework can as well be extended to include international capital flows by assuming that foreign citizens are now allowed to invest in the local economy and that the investment is done through financial intermediaries. With international capital inflows on net present, a larger pool of savings will be available for investment than in the absence of international capital flows. Therefore the equilibrium in the capital market will be given as:

$\phi^*(S_t + NCF_t) = I_{t^*}$ .....3.6'

where NCF_t represents the net international capital flows.
The growth rate of the stead state will be now presented as:

$g^* = A^* \frac{I^*}{Y} - \delta = A^* \phi^* \frac{(S+NCF)}{Y} - \delta = A^*\phi^*S^* - \delta$ ..... 3.7'

Equation (3.7') above represents the AK framework stead state growth rate with both financial intermediation and international capital flows present. Capital flows can support economic growth if they lead to an increase in the rate of investment. An increase in investment rate means an increase in the saving rate. For the rate of savings rate to increase in the presence of international capital mobility, the international capital flow must be greater than zero ($NCF_t >$

0); the capital flows must be directed to fund investment and not consumption spending; and investment funded by foreign capital must not crowd out domestically funded investment (Bailliu, 2000).

If the capital flows result in investments that are linked to positive externalities they can also promote economic growth. Some of the possible benefits that capital flows can bring about through positive externalities include increased competition in the host country industries as a result of foreign investment, which will cause the local firms to become more productive, through the adoption of more efficient methods or by investing in human or physical capital (Blomstrom, 1991). Transfer of technology is another benefit that can be brought by foreign investment. In the equation presented above, if capital flows direct to investments that produce positive externalities, the social marginal productivity of capital given as A^* will then increase.

Another way in which capital inflows can have a positive influence on economic growth is through increasing the efficiency in domestic financial intermediation of the local economy especially in selecting productive investment projects. If the capital inflows are intermediated by the domestic institution they will affect economic growth more positively by making the local banking sector better and effective in all its investment projects. So $\phi^*$and A^* will be better compared to a closed economy.

According to Pagano (1993) the endogenous growth model analysis also shows that the level of domestic financial development plays a role in the process linking capital inflows and economic growth. For example, we consider two economies with different levels of financial sector development. Suppose the country with the more developed financial system is country 1 and the other is country 2. All things being equal, we would expect that $A^1 > A^2$ and $\phi^1 > \phi^2$. Thus, even if both countries receive an equal amount of net capital inflows, this model predicts that the country with the more developed financial system will have a higher growth rate, because its financial sector is more efficient at converting the foreign funds into productive investments, and better able to allocate them to the most productive investment projects (Bailliu, 2000).

3.2.3 Neostructuralist views

Even though the McKinnon-Shaw school argued that financial saving, investment and economic growth were raised as a result of increased deposit rates, little attention was given to

the existence of curb markets in developing countries yet a lot of people, especially in rural areas, existed outside the formal banking system. Neostructuralists treat curb markets, in which moneylenders and indigenous banks intermediate between savers and investors, as a crucial feature in their models of developing economies. Neostructuralists view these markets as more often competitive and agile (Taylor, 1983). Neostructuralists claim that banks cannot intermediate as efficiently as curb markets between savers and investors, since the reserve requirements constitute a leakage in the process of financial intermediation through commercial banks.

Two of the neostructuralists' assumptions entail that a restrictive monetary policy that raises interest rates and a devaluation that raises price of imports can produce stagflation, that is, acceleration in the inflation rate which will cause a reduction in the rate of economic growth. According to the neostructuralist models, households face three categories of assets, namely gold or currency, bank deposits, and curb market loans. So substitution into money must come from substitution out of inflation hedges. Taylor (1983) and Van Wijnbergen (1982) point out that whether or not higher deposit rates do increase the total real supply of credit depends on the required reserve ratio and on whether the increased holdings of real money balances come mainly at the expense of inflation hedges or mainly from direct lending in the curb market. They concluded that, in practice, financial liberalization is likely to reduce the rate of economic growth by reducing the total real supply of credit available to business firms.

Neostructuralists assumed that funds flow freely between the banking system and the curb market; savers and investors can use either market, at least to some extent. In their models the relevant interest rate is the curb market rate because it represents the marginal cost of borrowing, on the one hand, and enters the money demand function, on the other hand, since curb market loans constitute an alternative to holding money balances. An increase in the curb market rate raises the price level because a rise in curb market rate increases working capital. This rise in the curb market rate also reduces output by deterring investment. An increase in the deposit rate of interest may raise the curb market rate and so depress growth if it reduces the total supply of working capital supplied by both the banking system and the curb market.

Van Wijnbergen (1982) stresses the importance of incorporating the curb markets in monetary models of developing countries. He argued that the corporate sector in the typical developing economy relies on credit to finance almost all its working capital and the debt/equity ratios tend

to be extremely high in developing economies. Curb markets were considered a gateway and a main source of funds for poor borrowers who could not obtain loans due to their inability to provide sufficient collateral and other formalities. Curb markets also were deemed more profitable to the lender as they could charge higher interest rates than formal institutions. Banks supply loans to the business sector depending on their demand of excess reserves, the level of deposits, and the required reserve ratio. So the nominal bank lending rate is fixed by the government below its equilibrium level, which is in contrast to the curb markets' interest rate which is free to find its market clearing equilibrium level. According to Van Wijnbergen (1982) a tight monetary policy reduces the rate of economic growth by squeezing total credit availability. When a tight monetary policy is pursued or when money demand function shifts upward, the curb markets' interest rate increases, investment declines, and the rate of economic growth falls.

According to Myint (1984) neostructuralists argued that interest rates charged by the non-institutional lenders were high mainly because of the shortage of financial saving, partially due to a substantial proportion of saving in rural or peasant sectors being in the form of hoarding of gold and jewellery. Therefore, it was proposed that more efficient financial intermediaries which could offer attractive financial products be established to increase financial saving and hence bring about a reduction in interest rates and an increase in economic growth.

3.3. Empirical Evidence

There is huge literature regarding financial markets, banks, and economic growth. Different studies provide diverse results depending on the country(s) of study. Most of the studies have been carried out at firm level, industry level, and cross country level. The first section will look at multiple countries studies followed by a review of single-country studies in the second section. Lastly, studies focusing on the South African economy will be clarified in the third section.

3.3.1 Empirical Literature from multiple countries

Demirguc-Kunt and Levine (1996), using data from forty-four industrial and developing countries for the period 1986 to 1993, did a cross country comparisons of bank-based and market-based financial systems using the ordinary least square method. They collected and compared a broad array of indicators of stock market and financial intermediary development since economists lack a common concept or measure of stock market development. They constructed aggregate indexes and analyzed them to document the relationship between the

emergence of stock markets and the growth of financial intermediaries. They produced a set of stylized facts that facilitates and stimulates research into the links among stock markets, economic development, and corporate financing decisions. Their empirical results showed evidence of wide cross country differences for each indicator as well as intuitively appealing correlations between various indicators. The conclusion they arrived at from their study was that countries with well developed market-based institutions also had well developed bank-based institutions; and countries with weak market-based institutions also had weak bank-based institutions, thereby supporting the view that the distinction between bank-based and market-based financial systems is of no consequence.

Levine and Zervos (1998) did a cross country regression for forty seven countries on stock markets, banks, and economic growth covering the period 1976 to 1993 using the cointegration techniques analysis. Their study investigated the empirical relationship between various measures of stock market development, banking development, and long-run economic growth. They integrated their study into recent cross country research on financial intermediation and growth. Specifically, they evaluated whether banking and stock market indicators are both robustly correlated with current and future rates of economic growth, capital accumulation, productivity growth and private saving.

They found that stock market liquidity as measured both by the value of stock trading relative to the size of the market and by the value of trading relative to the size of the economy was positively and significantly correlated with current and future rates of economic growth, capital accumulation and productivity growth. Stock market liquidity was found to be a robust predictor of real per capita gross domestic product (GDP) growth, physical capital growth, and productivity growth, after controlling for initial income, initial investment in education, political stability, fiscal policy, openness to trade, macroeconomic stability, and the forward-looking nature of stock prices. Moreover, the level of banking development as measured by bank loans to private enterprises divided by GDP also enters the regressions significantly. Both banking development and stock market liquidity were found to be good predictors of economic growth, capital accumulation and productivity growth. The results are consistent with the view that market-based systems provide different services from bank-based systems.

Demirguc-Kunt and Levine (1999) did a cross country comparisons study on bank-based and market-based financial systems covering the period 1960 to 1995. Their study examined

financial structure for a cross section of up to 150 countries. They used simple graphs, correlations and regressions to illustrate the relationships between financial structure and economic development. Furthermore, they provide empirical evidence on the potential legal, regulatory and policy determinants of financial structure. They studied ratios of banking sector development measured in terms of size, activity and efficiency relative to stock market development which was also measured in terms of size, activity and efficiency to classify countries into three groups, namely bank-based, market-based, and underdeveloped financial systems. Countries where the conglomerate ratio of banking sector development to stock market development was below the mean were classified as market-based. Countries with larger ratios were classified as bank-based. A country's financial system was considered underdeveloped if it had below median values of both bank and market development. This produced three categories of financial structure which are underdeveloped, bank-based, and market–based, and it helped them to observe much clearer patterns. They also defined different indicators of financial structure which are financial intermediaries relative to markets and looked for patterns as countries become richer. The legal, regulatory, and policy determinants of financial structure after controlling for the level of GDP per capita were also investigated.

Their results were that banks, nonbanks, and stock markets are larger, more active and more efficient in richer countries. Financial systems, on average, are more developed in richer countries. In higher income countries, stock markets become more active and efficient relative to banks. Also there is some tendency for national financial systems to become more market oriented, as they become richer. They also found that countries with a Common Law tradition, strong protection of shareholder rights, good accounting regulations, low levels of corruption, and no explicit deposit insurance tend to be more market-based. Countries with a French Civil Law tradition, poor protection of shareholder and creditor rights, poor contract enforcement, high levels of corruption, poor accounting standards, restrictive banking regulations, and high inflation tend to have underdeveloped financial systems.

Beck, Demirgüç-Kunt,Levine and Maksimovic (2000) evaluated the impact of financial structure on economic growth using a large international dataset for the period 1980 to 1995. An assortment of different datasets and econometric methodologies to assess the relationship between financial structure and economic development were used, that is firm level analyses on 33 countries, industry-level studies on 34 countries, and country level investigations of 48 countries.

The results they got from country level, industry level and firm level investigations all tell the same story as their data provides no evidence for the bank-based or market-based views. They found that distinguishing countries by financial structure does not help in explaining cross country differences in long run GDP growth, industrial performance, new firm formation, firm use of external funds, or firm growth. However, the component of financial development explained by the legal rights of outside investors and the efficiency of the legal system in enforcing those legal rights was found to be strongly and positively linked with GDP growth, industrial performance, new firm formation and firm growth. They concluded that the legal system importantly influences financial sector development and this, in turn, influences firm performance, the formation of new firms, and national growth rates. Their results were thus consistent with the financial services view which stresses that what is important are the financial services provided rather than the form of their delivery. Also their findings suggest a valuable policy message that, instead of focusing on the composition of the financial system, policy makers should, instead, focus on strengthening the rights of outside investors and enhancing the efficiency of contract enforcement.

Bailliu (2000) did a study on private capital flows, financial Development, and economic growth in developing countries using panel data for 40 developing countries from 1975 to 1995. His study investigated the role of private capital flows in the determination of economic growth. Unlike other existing empirical work, his study focused on the effects of a broad measure of capital flows on economic growth, rather than on a more specific category, such as FDI, and it emphasized the role played by the domestic financial sector in the process linking capital flows and growth. A dynamic panel data methodology was used that controls for country specific effects and accounts for the potential endogeneity of the explanatory variables.

His study found evidence that capital inflows foster economic growth, above and beyond any effects on the investment rate, but only for economies where the banking sector has reached a certain level of development. The effect of capital flows on growth was found to be negative in all countries where the banking sector was poorly developed. According to Bailliu (2000) the results could have been caused by the relationship between a low level of financial sector development and all the distortions imposed by government in the financial sectors of the sample countries selected. The distortions imposed by the government are thought to channel

all the capital flowing into countries with underdeveloped banking sectors into speculative rather than productive investments. His findings suggested that the domestic financial sector plays a crucial role in ensuring that international capital flows positively encourage economic growth in developing countries. Since a number of developing countries are now experiencing financial integration in their economy, Bailliu (2000) recommended that it is important that a better understanding is developed of how international capital flows affect economic growth and how the domestic financial sector influences this process.

Khan and Senhadji (2000) did a study on financial development and economic growth using a data set which includes 159 countries comprising both industrial and developing countries. Their study covers the period 1960 to 1999 and it provided new empirical evidence on the relationship between financial development and economic growth for a large cross section sample of countries. In their study they looked at the empirical relationship between financial depth and growth by estimating a standard growth equation with financial development indicators drawn from a recent extensive database covering both the banking sector and market securities. The focus of the empirical exercise was to test the robustness of previous results with respect to alternative financial depth indicators; estimation method; data frequency; and nonlinearities in the relationship.

Their results confirm the strong positive and statistically significant relationship between financial depth and growth in the cross section analysis. These results were robust to four different financial depth indicators covering the banking system, and the stock and bond markets. Consistent with previous studies, the effect in each case was quite powerful, although it should be noted that the size of the effect varies with the particular indicator under consideration. Correcting for simultaneity bias changed their results marginally. That is, from the reasonable confident they got from their results that financial depth is an important determinant of cross country differences in growth, an important question was whether the time variation in the financial depth indicators can explain growth variation across time. This question was explored by estimating the growth equations with non overlapping five year average of the original panel. Interestingly, their results were generally weaker when a time dimension was introduced in the model. According to Khan and Senhadji (2000) one possible explanation may be that a linear model is appropriate for capturing the effect of financial depth on cross country differences in long term growth but not for explaining growth dynamics of individual countries.

Beck and Levine (2002) investigated the impact of stock markets and banks on economic growth. They used a panel data set for the period 1976 to 1998 with a sample of 40 countries and they applied the recent GMM techniques developed for dynamic panels. Their study used new panel econometric techniques that reduce statistical shortcomings with existing growth studies along with new data to re-examine the relationship between stock markets, banks and economic growth. They examined whether measures of stock market and bank development each have a positive relationship with economic growth after taking into account five things which are controlling for simultaneity bias, omitted variable bias and the routine inclusion of lagged dependent variables in growth regressions; moving to data averaged over five-years, instead of quarterly or annual data, to abstract from business cycle influences; using a new system, panel estimator that eliminates the biases associated with the difference panel estimator; assessing the robustness of the results using several variants of the system estimator; and controlling for many other growth determinants. They also assessed whether the stock market and bank indicators jointly enter the growth regression significantly.

Their study found that markets and banks are important for economic growth. Their results strongly reject the notion that overall financial development is unimportant or harmful for economic growth. Using three alternative panel specifications, the data rejected the hypothesis that financial development is unrelated to growth. Bank and stock market development always entered jointly significant in all the system panel estimators that they employed. These findings were strongly consistent with models that predict that well functioning financial systems ease information and transaction costs and thereby enhance resource allocation and economic growth. Furthermore, when they assessed the independent impact of both stock market development and bank development on economic growth, the measure of stock market development and the measure of bank development frequently both enter the growth regression significantly after controlling for other growth determinants, country specific effects and potential simultaneity bias. This suggested that both banks and markets are important for growth. Their findings were not due to potential biases induced by simultaneity, omitted variables or unobserved country-specific effects. Furthermore, their findings also suggested that it is important to use alternative specifications of the system panel estimator in drawing inferences.

Dolar and Meh (2002) conducted a non technical survey study on financial structure and economic growth. In their study they presented a brief summary of a large body of literature

that studied the link between financial structure and long run economic growth. Their study gave a non-technical survey of that literature designed for a general audience. They explained how financial markets and intermediaries perform their functions and discussed the impact of these roles on growth. They found that there is a rich diversity of opinion in the existing literature on the relationship between financial structure and growth. Advocates of the intermediary and market-based views argue that financial intermediaries and markets are substitutes in promoting growth. Proponents of the financial services; and law and finance views stress that intermediaries and markets are, in fact, complements in fostering economic performance. The literature suggested that financial structure does not explain differential growth rates across countries but what matters for growth is the overall level and quality of financial services. Therefore, the best way to examine the connection between financial structure and growth is not to study how markets and intermediaries can substitute for each other, but rather how markets and intermediaries complement one another.

Beck (2003), using data for a sample of forty countries over the period 1975 to 1998, did a study on stock markets, banks, and economic development using the ordinary least square method. The sample included both developing and developed economies, and they averaged data over a longer time period to remove business cycle effects. To measure stock market development, they used the turnover ratio measure of market liquidity, which equals the value of shares traded on domestic exchanges divided by the total value of listed shares. To measure banking sector development, they used bank credit, which equals bank claims on the private sector by deposit money banks divided by GDP. The structure of the financial system was measured using two indicators, namely structure activity and restrict. Structure activity was built on the indicators of stock market and banking sector development named above as the turnover ratio and bank credit, respectively. Restrict was used to measure regulatory restrictions on banks activities. To control for the level of financial development, they constructed an aggregate indicator called ‘finance activity’ that accounts for the development of financial intermediation and stock markets.

Their results of regressions of economic growth on financial structure showed that neither the structure-activity nor restrict variable has a statistically significant impact on real per capita GDP growth. Thus there was no evidence in favour of either the market based or bank based hypothesis. By contrast, the finance activity indicator for financial development enters the regressions significantly. This was strong evidence that cross country variation in financial

development explains cross country variation in growth performance. In other words their results showed that variation in both banking sector and stock market development can explain variation in economic growth, but the degree to which a financial system is market-based or bank-based cannot explain economic development across countries. This is consistent with the financial services view, which focuses on the services provided rather than the providers of services and which emphasises complementarities between markets and intermediaries.

Caporale, Howells, and Soliman (2003) conducted a study on endogenous growth models and stock market development using evidence from four countries, namely Chile, Korea, Malaysia and the Philippines. Quarterly data for the period 1971 to 1998 was used and recently developed tests for casuality in VARs were employed. They re-examined the relationship between stock market development and economic growth by testing the hypothesis that stock market development affects economic growth through its impact on investment. This hypothesis was empirically tested by examining the causal linkages between these variables in the four developing countries named above.

Their study provided a theoretical basis for establishing the channel through which stock markets affect economic growth in the long run. The evidence obtained from a sample of four countries suggested that investment productivity is the channel through which stock market development enhances the growth rate in the long run. Their results were also consistent with the findings by Levine and Zervos (1998) that stock markets can give a big boost to economic development. In addition, though, their study showed that stock market development enhances economic growth through its impact on investment productivity in the long run. The results were also consistent with Leigh's (1997) argument that well functioning stock markets can perform their allocated functions through the pricing of shares. An efficient pricing process will reward the well managed and profitable firms by valuing their shares more highly than those of unsuccessful and unprofitable firms. This mechanism lowers the cost of capital and hence ensures a greater allocation of new investment resources and in aggregate will enhance economic growth. The general conclusion of their study, therefore, was that a well functioning stock market is vital in promoting economic growth in less-developed countries.

Arestis, Luintel and Luintel (2005) using the Johansen approach and VECM did a cross country study on financial structure and economic growth using a sample which consisted of six countries for the period 1962 to 2000. Their study found significant cross-country

heterogeneity in the dynamics of financial structure and economic growth, and concluded that it is invalid to pool data across the sample countries. It indicated that extant panel and/or cross section studies of financial structure and economic growth, which pool several countries, may well have concealed important cross country differences. They found a robust co-integrating relationship between output per capita, capital stock per capita and the financial structure, indicating significant effects of financial structure on real per capita output, which was in sharp contrast to some of the recent findings. Tests rejected the null of equality between the between-dimension panel and country specific parameters in relation to the financial structure variable. Thus, panel estimates did not appear to correspond to country specific estimates parameters. The speed of adjustment to long-run disequilibria also differed significantly across countries. A comparison of their time series and panel results also revealed that a single country may sufficiently dominate the result for the whole panel. As a result, panel results may provide deceptive results for most country estimates in the panel.

Their findings of a significant effect of financial structure on output levels were in sharp contrast to those of and Beck and Levine (2002), amongst others. This contrast was maintained by both the empirical approaches of time series and the dynamic heterogeneous panel estimators they have pursued in their study. They attributed this difference in the results to their empirical approach, which allows for cross country heterogeneity in parameters and adjustment dynamics. Arestis *et al.* (2005) point out that it is thus possible that the apparent insignificant effect of financial structure on growth shown by existing panel tests may be due to their failure to address cross country heterogeneity. The main policy message of their findings was that financial structure matters for economic growth.

Luintel, Khan, Arestis and Theodoridis (2008) did a study on financial structure and economic growth using a sample which consisted of fourteen countries for the period 1976 to 2005. They employed the Fully Modified OLS (FMOLS) of Phillips and Hansen (1990) and they also thoroughly scrutinized their results through bootstrap exercises. They highlighted the short comings of recent empirical works on financial structure and economic growth that concluded that financial structure is irrelevant after analyzing multi-country dataset in panel and/or cross-section frameworks. They re-examined this issue utilizing a time series and a dynamic heterogeneous panel methods. They tested several hypotheses about the prospective role of financial structure and financial development on economic growth.

Their results showed that, for the majority of sample countries, financial structure was significant in explaining economic growth. Secondly, they found significant heterogeneity in cross country parameters and adjustment dynamics as their tests showed that data cannot be pooled for the countries included in their sample, which reinforced the use of the time series approach. Thirdly, tests also revealed that the panel estimates parameters do not correspond to country specific estimates. Fourthly, their bootstrap results provided a new and interesting insight as their asymptotic approximations tend to remain valid for the finite sample results so long as the empirical models do not utilize impulse dummies and/or interacted regressors. However, when empirical models used impulse dummy and/or interacted covariate, the distributions of empirical test statistics did not appear symmetric. This suggested that those empirical studies which utilized impulse dummies and/or interacted regressors should base their inferences on suitably computed finite sample critical values. Their results were robust to various sensitivity tests. Overall, their findings implied that the complete absence of cross country support for financial structure, reported by panel or cross section studies, may be because they do not sufficiently account for the cross country heterogeneity.

Beck, Demirguc-Kunt and Levine (2009) did a study on financial institution and markets across countries and over time for the period 1980 to 2007. Their study introduced the updated and expanded version of the Financial Development and Structure Database that contained a select number of financial system indicators that were readily available for a large number of countries over extended periods of time and they documented recent trends in structure and development of financial institutions and markets across countries. The database provided statistics on the size, activity, efficiency and stability of banks, nonbanks, equity markets, and bond markets across a broad spectrum of countries and through time. It also contained several indicators of financial globalization, including statistics on international bond issues, international loans, off-shore deposits and remittance flows. They also built on the recent literature on market-based versus bank-based financial systems by analyzing trends in the relative importance of financial markets and financial institutions over the past 20 years. They found a trend towards market-based financial systems, especially in high-income countries; while both market and bank finance have deepened over recent years, the deepening was stronger for markets than for banks.

Their study also presented financial system trends across the globe over the past decades. They showed that financial systems across the world deepened along many dimensions; standard

indicators of financial intermediary and market development have also increased over the past decades. However, they revealed, too, that the progress has been uneven across income groups and regions because the deepening has been concentrated in high income countries, while there has been no significant deepening in middle and low income countries. They also showed that integration into global financial markets has increased over the past years, as measured by international bond issues, international loans, offshore deposits and remittance flows. However, the increase in international lending and bond issues has been concentrated in high income countries, while low and lower middle income countries have benefitted from higher remittance flows.

Dermirguc-Kunt, Feyen and Levine (2011) conducted a study on optimal financial structures and development with more emphasis on the evolving importance of banks and markets. They used data from seventy two countries over the period 1980 to 2008 and they aggregated the data in 5-year averages (data permitting), so that they have a maximum of six observations per country. The ordinary least square method was employed and their results point out that, as economies develop, the services provided by the financial markets become comparatively more important than those provided by banks because, as economies grow, both the banking system and financial markets become more developed, but the sensitivity of economic output to changes in bank development tends to fall while the sensitivity of economic output to changes in financial market development tends to increase.

They also examined the association between the mixture of banks and financial markets operating in an economy and economic development to assess whether deviations of a country's actual financial structure from their estimated optimal structure is associated with lower levels of economic activity. They found that financial structure matters. After controlling for bank development, financial market development, a set of standard controls, and country fixed effects, they found that the financial structure gap is negatively associated with economic activity. Their results were consistent with the view that financial institutions provide different financial services from those provided by financial markets; as economies grow, they require different mixtures of these financial services to operate efficiently; thus, the optimal mixture of financial institutions and markets will evolve to provide the efficient mixture of financial services; and if an economy's actual financial structure differs from the optimum, the economy will not obtain an efficient blend of financial services with resulting harmful effects on economic activity.

3.3.2. Evidence from a single country

Ujunwa, Salami, Nwakoby and Umar (2012) conducted a study on financial structure and economic growth in the case of Nigerian economy. Time series data for a seventeen year period from 1992 to 2008 was used. The Ordinary Least Square regression approach was employed to estimate the formulated models in line with financial structure theories. In particular, the study examined competing views of financial structure which are the bank-based view; market-based view; financial-service view; and the legal-based view and economic growth. The gross domestic product per capita growth rate was used as the dependent variable, while the independent variables included; conglomerate indexes of: the bank-based financial structure; the market-based financial structure, the financial-service based financial structure; and the legal based financial structure.

From their analysis the bank-based view holds that bank based systems, particularly at early stages of economic development foster economic growth to a greater degree than market based financial system. In contrast, the market-based view emphasizes that markets provide key financial services that stimulate innovation and long run growth. Alternatively, the financial services view stresses the role of bank and markets in researching firms, exerting corporate control, creating risk management devices, and mobilizing society's savings for the most productive endeavours. The financial service view minimises the bank based versus market based debate and emphasises the quality of financial services produced by the entire financial system. Finally, the legal based view rejects the analytical validity of the financial structure debate. The legal based view argues that the legal system shapes the quality of financial services. Put differently, the legal-based view stresses that the component of financial development explained by the legal system critically influences long run growth. Thus, countries should focus on creating a sound legal environment, rather than on debating the merits of bank based or market based systems.

The regression results showed that the coefficient of bank-based financial structure was positive, but non-significant in predicting economic growth in Nigeria. The result was consistent with the bank-based financial structure theory which posits that the unique role of banks in identifying good projects, mobilising resources, monitoring managers and managing risks promotes economic growth. The coefficient of legal-based financial structure was also positive but not significant in promoting economic growth, implying that it is the overall level and quality of financial services as determined by the legal system that promotes the efficient

allocation of resources and economic growth. Thus, any legal system that promotes investors' rights, ensures compliance to the enforcement of contracts that promote economic growth.

Unfortunately the regression coefficients of market-based and the financial service view financial structure indicators were negative and not significant in promoting economic growth. This finding was consistent with the theory which argues that well functioning markets instantly reveal information in public markets, which provides individual investors with less incentive to acquire information. This argument is primarily based on the well known free-rider problem that if information is going to be revealed by the market, no one has incentive to collect it. As a result, competitive financial markets may be characterised by underinvestment in information. Stiglitz's (1985) view that well developed financial markets have a negative impact on the identification of innovative projects and thereby impede efficient resource allocation is also in support of the findings.

Overall the results showed strong support for the bank-based and legal-based theories of financial structure for Nigeria. The negative result of the market-based view and the financial service could be traced to the volatility of the economy, which suggests that the country lacks the infrastructure for an efficient market-based economy (Ujunwa *et al*, 2012).

Ujunwa and Salami (2010) investigated the impact of stock market development on long run economic growth in Nigeria. Their study used time serial data for a 21 year period from 1986 to 2006. The Ordinary Least Square regression was used to estimate the various models. The gross domestic per capita growth was adopted as the dependent variable. The independent variables included the total market capitalization, total value of shares traded, turnover ratio, as well as controlling for other variables that may introduce bias in their results.

The regression result showed that the relationship between stock size and economic growth is positive but not significant in explaining economic growth in Nigeria. This result provided proof that the size of the stock market determines the ability of the market to mobilize savings, improve the quality and quantity of investment and accelerate economic growth.

For stock market liquidity the regression coefficient showed that market liquidity was negative in promoting economic growth. This result found support for the preposition that takeover mechanism does not perform a disciplinary function and that competitive selection in the

market for corporate control takes place much more on the basis of size rather than performance (Singh, 1997). Therefore, a large inefficient firm has a higher chance of survival than a small efficient firm. These problems were further magnified in the Nigerian economy with weak regulatory institutions and greater macroeconomic volatility, and the result could be explained by the higher degree of price volatility on stock markets which reduce the efficiency of price signals in allocating investment resources. This serious limitation has raised an important question on the importance of market-based financial structure in promoting economic growth in Nigeria.

Lastly, the regression coefficient for turnover ratio was positive in explaining economic growth. This confirmed the preposition that a developing stock market allows savers to sell their shares easily if they so desire, thereby making shares a relatively more attractive investment. As savers become more comfortable with investing in the long term equities, they are likely to rebalance their portfolios towards equities and away from shorter term financial investments. Ujunwa and Salami (2010) point out that for firms this rebalancing lowers the cost of shifting to more profitable, that is, more productive longer term projects. Higher productive, longer capital, in turn, boosts economic growth.

3.3.3. Evidence from South Africa

Ndako (2008), using quarterly time series data from 1983 to 2007 did a study on stock markets, banks and economic growth for the case of South Africa. His study examined the casual relationship between the measures for banks, stock markets and economic growth using Vector Error Correction model (VECM) based causality tests. A further examination of the short-run dynamics among the variables in the system was done through computing the impulse response functions and variance decomposition. Examination of the link between financial development and economic growth was also done through application of the Structural Vector Auto regression (SVAR). Bank credit to private sector was used as a proxy for the banking system while the stock market was measured using turnover ratio and value of shares traded

The results from the study suggested the presence of a bidirectional causality relationship between bank credit to private sector and economic growth in the long-run. With the stock markets variables that is the turnover ratio and value of shares traded, a unidirectional causality relationship from economic growth to stock market system was found. The results for the impulse response functions and variance decompositions indicated the presence of a short run

impact of financial development on economic growth at the immediate year of initial shocks. Variance decomposition also showed that all the indicators for financial development namely bank credit to private sector, turnover ratio, and value of shares traded contain some useful information in predicting the future path of economic growth. The results from the Structural Vector Auto regression indicated little evidence of the long run relationship between finance and economic growth.

Ndako (2008) study indicated that the South African financial sector has a significant role in promoting the growth of the economy. He also pointed out that since the start of democracy in the 1990s; South Africa financial system has experienced a lot of reformation which include the market based reforms. These reforms have helped the South African financial system to be considered worldwide for providing class financial services. He therefore, recommended South Africa to continue with these reforms for its financial system to contribute effectively to economic growth even though there is still a lot that need to be done to translate this achievement in to a proper growth process by extending adequate provision loans to small scale enterprises which constitute large part of employment generation.

Odhiambo (2010) did a study on stock market development and economic growth in South Africa using an ARDL-Bounds testing approach for the period 1971 to 2007 . He examined the dynamic causal relationship between stock market development and economic growth. Three proxies of stock market development, namely stock market capitalisation, stock market traded value and stock market turnover against real GDP per capita, a proxy for economic growth, were used. The study attempted to answer two critical questions which are: Does the stock market development Granger cause economic growth? Is the causal flow between economic growth and stock market development sensitive to the proxy used for the measurement of stock market development?

The empirical results of the study showed that the causal relationship between stock market development and economic growth is sensitive to the proxy used for measuring the stock market development. When the stock market capitalisation was used as a proxy for stock market development, the economic growth was found to Granger cause stock market development. However, when the stock market traded value and the stock market turnover were used, the stock market development seemed to Granger cause economic growth. Overall, the study found the causal flow from stock market development to economic growth to

predominate. The findings of the study were consistent with the conventional supply-leading response in which the financial sector is expected to precede and induce the real sector development. The results apply irrespective of whether the causality was estimated in the short-run or in the long-run.

3.4. Analysis of Literature

The review of both theoretical and empirical literature indicates that the link between banks, financial markets and economic growth is ambiguous as there is no agreement by the available studies. Mckinnon and Shaw's (1973) theory supports the view that the financial system can have a positive influence on economic growth through efficient capital allocation but emphasised that government interventions and regulations, for example, financial repression, can restrict full participation of financial intermediaries and markets in providing economic growth. Pagano's (1993) model also suggested that financial intermediation has a positive effect on growth and also a two-way causal relationship between financial intermediation and growth is thought to exist. The Neostructuralists stressed the importance of incorporating the curb markets in the monetary models of developing countries as they act as alternatives to the formal banking system.

On the empirical side of the literature, the marginal effect of having different financial systems on growth was not strong in other studies as both of the financial structures showed similar long-run growth rates. Some studies document the irrelevance of financial structure to economic growth but emphasize that what matters more is the overall level of financial development and the efficiency of the legal system in protecting outside investors' rights in terms of inducing a higher economic growth rate. Other studies showed that market-based systems outperform bank-based systems among countries with developed financial sectors while bank-based systems fare better in countries with underdeveloped financial sectors.

In other studies literature suggests that financial structure does not explain differential growth rates across countries but what matters for growth is the overall level and quality of financial services. Therefore, the best way to examine the connection between financial structure and growth is not to study how markets and intermediaries can substitute for each other, but rather how markets and intermediaries complement one another. Other results confirmed the strong positive and statistically significant relationship between financial depth and growth in the cross section analysis indicating that the financial sector plays a critical role in a country's

economy. Conclusions from other studies showed that both stock market liquidity and banking development positively predict growth, capital accumulation and productivity improvements when entered together in regressions, even after controlling for economic and political factors. Other studies found evidence that capital inflow foster economic growth, above and beyond any effects on the investment rate, but only for economies where the banking sector has reached a certain level of development. For countries with poorly developed banking sectors, the effect of capital flow on growth was found to be negative.

The results of other studies of country level, industry level and firm level investigations all tell the same story as their data provided no evidence for the bank-based or market-based views. They found that distinguishing countries by financial structure does not help in explaining cross country differences in long run GDP growth, industrial performance, new firm formation, firm use of external funds, or firm growth. The results of other studies were that banks, nonbanks and stock markets are larger, more active, and more efficient in richer countries. In higher income countries, stock markets were found to be more active and efficient relative to banks. Also countries with a Common Law tradition, strong protection of shareholder rights, good accounting regulations, low levels of corruption, and no explicit deposit insurance were found to be more market-based in some studies, while countries with a French Civil Law tradition, poor protection of shareholder and creditor rights, poor contract enforcement, high levels of corruption, poor accounting standards, restrictive banking regulations, and high inflation tend to have underdeveloped financial systems.

The regression results of other studies showed that the coefficients of bank-based theory and legal-based theory were positive in promoting economic growth, while the regression coefficients of market-based theory and the financial service theory were negative in promoting economic growth. The results showed strong support for the bank-based and legal-based theories of financial structure. Other studies found that financial structure matters after controlling for bank development, financial market development, a set of standard controls, and country fixed effects. The results of other studies, however, have shown that variation in both the banking sector and stock market development can explain variation in economic growth, but the degree to which a financial system is market-based or bank-based cannot explain economic development across countries. Also of all the studies none included the bond market in their regression analysis even though it is a market for long-term capital and believed to be one of the safe havens in the event of a financial crisis compared to the stock market.

3.5 Conclusion

The objective of this chapter was to investigate the various theoretical frameworks linking finance and economic growth. Three theoretical models, namely the Mckinnon and Shaw model (1973), the endogenous model of Pagano (1993), and the Neostructuralist view were reviewed with the first two being the main models. Empirical literature on financial markets, banks and economic growth was also reviewed to find supporting evidence of the link between the financial system and economic growth.

A positive impact of the financial system on economic growth was found. Both financial intermediaries and markets play an important role in fostering economic growth. Variation in both banking sector and stock market development can explain variation in economic growth, but the degree to which a financial system is market-based or bank-based was found not to explain economic development across countries but the overall level and quality of financial services matters for economic. The theoretical evidence emphasised that the interest rate needs to be freely determined by market forces not by government policies so as to contribute towards financial development which will, in turn, promote economic growth.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

The review of literature on banks, stock markets and economic growth and an overview of the South African financial system have both shed some light on the linkage between banks, markets and economic growth. This chapter develops a model and estimation techniques for analysing how banks and markets help in explaining economic growth. The purpose of the chapter is to discuss all the techniques used in examining the long run relationship among banks, financial markets and the level of GDP, and also the techniques used in evaluating the dynamic causal relationship among these variables in South Africa. The data to be used in the model is also identified and explained. Following the introductory section, section 4.2 gives the model specification and definition of variables. Data sources and expected prior are covered in section 4.3. Sections 4.4, 4.5, 4.6 and 4.7 discuss the estimation techniques to be used while section 4.8 concludes the chapter.

4.2. Model specification and Definition of variables

In examining the impact of banks and financial markets on economic growth, the study will adopt and modify a model developed by Khan and Senhadji (2000) in their analysis of financial development and economic growth. Their study was backed by two theories, the endogenous growth model of Pagan (1993) and that of Mckinnon and Shaw (1973).

The model is presented as follows:

GDP= f (Bank credit (BCP), Turnover ratio (TR), Value of shares traded (VT), Bond market capitalization (BMC))..... 4.1

The empirical model will be presented as follows:

$GDP_t = \alpha_0 + \beta_1 BCP_t + \beta_2 TR_t + \beta_3 VT_t + \beta_4 BMC_t + \mu_t$ 4.2

To determine the net effects of financial structure on long run growth in South Africa, one control variable will be added which is the ratio of government expenditure to GDP to control for the government's role in the economy. The selection of the variable is consistent with Beck (2003) and Ujunwa *et al.* (2012). Some of the variables will be presented in logs.

The final empirical model is as follows:

$LGDP_t = \alpha_0 + \beta_1 LBCP_t + \beta_2 LTR_t + \beta_3 VT_t + \beta_4 BMC_t + \beta_5 GOVEXP_t + \mu_t$.....4.3

where:

LGDP is the logarithm of the gross domestic product. Real GDP growth rate is used to measure economic growth.

LBCP is the logarithm of bank credit to private sector. Bank credit to private sector excluding credit to public sector is used as a measure of the banking activity in the economy. This proxy is believed to be a superior measure for banking activity because the core function of banks is channelling of funds from savers' surplus to savers' deficit hence it represents an accurate indicator of the functioning of financial development system because it provides the quantity and quality of investment available. Levine and Zervos (1998) used this measure.

LTR is the logarithm of turnover ratio. Turnover ratio is used to measure the stock market liquidity and is given as the total value of shares traded divided by the total value of listed shares or market capitalization. Beck and Levine (2002) and Levine and Zervos (1998) preferred this measurement as a robust indicator of stock market efficiency to other measurements of stock market variables.

VT is the value of shares traded. It measures the organized trading from the exchange as a share of national output and it is given as the ratio of value shares traded to nominal GDP. It reflects liquidity on an economy-wide basis. Beck and Levine (2002) used this measure although it is believed to have some weaknesses in measuring the liquidity of a market.

BMC is the logarithm of bond market capitalisation. It is the total amount of outstanding domestic debt securities issued by private or public domestic entities divided by GDP. Capitalization measures the overall size of the market and the assumption behind this measure is that the overall market size is positively correlated with the ability to mobilise capital and diversify risk on an economy-wide basis. However, Beck and Levine (2002) have shown that with market capitalization, there is no theory suggesting that mere listing of shares will influence resource allocation and economic growth. Levine and Zervos (1998) also indicated that market capitalization is not a good predictor of economic growth. Despite all these assertions, capitalization is still used as an indicator of market development.

GOVEXP is the logarithm of government expenditure. Government expenditures are expenses by the government which includes all government consumption and investment but excludes

transfer payments. In this study government expenditure as a ratio of GDP is used as a control variable to ascertain the net effects of financial structure on economic growth.

β is the coefficient of the explanatory variable.

$\boldsymbol{\alpha}$ is the intercept of the regression.

μ is the error term.

Subscript **"t"** denotes time.

4.3. Data Sources and expected prior

4.3.1 Data Sources

Quarterly data for the period 1990 to 2011 was used. Data on real GDP growth was obtained from South African Reserve Bank (SARB), data on the market based indicators was obtained from the Johannesburg Stock Exchange and World Bank, while data on the bank-based indicators was also obtained from SARB. This period was chosen because it covers the period when the advent of democracy in South Africa started and also it takes into account the period of trade and financial openness of the South African economy to the outside world which had been previously largely inwardly orientated.

4.3.2 Expected priori

A positive relationship between bank credit to the private sector and economic growth is expected because banks play a very important role in channelling funds from savers' surplus to savers' deficit hence transforming savings into more productive investments which will promote economic growth. Also, by identifying the most worthwhile projects and firms, banks can foster innovation and efficient resource allocation. Levine and Zervos (1998) and Beck and Levine (2002) found that banking development as measured by bank loans to private enterprises divided by GDP enters the regressions significantly and positively shows that banking development is a good predictor of economic growth.

A positive relationship is also anticipated on turnover ratio and economic growth because more liquid capital markets will create incentives to long run investments by giving investor more easy option to sell their stakes in firms, hence fostering more efficient resource allocation and economic growth. According to Beck and Levine (2002), big, liquid and well-functioning markets foster growth and profit incentives, enhance corporate governance and facilitate risk

management. Beck and Levine (2002) also found a positive relationship and conclude that markets are important for economic growth.

Likewise a positive relationship is likely to exist between value of shares traded and economic growth because well functioning markets which are very liquid can affect economic growth positively. Levine and Zervos (1998) also found that stock market liquidity as measured both by the value of stock trading relative to the size of the market and by the value of trading relative to the size of the economy was positively and significantly correlated with current and future rates of economic growth, capital accumulation, and productivity growth.

Again a positive relationship is likely to exist between bond market capitalisation and economic growth because the overall size of a market can mobilise capital and diversify risk which can promote economic growth. Beck, Demirgüç-Kunt and Levine (2009) found bond market capitalization to be positively correlated with income levels of countries in their study.

Also a positive relationship is anticipated between government expenditure and economic growth because in theory government spending is believed to help in smoothing out cyclical fluctuations in the economy and influences the level of employment and price stability which would, in turn, have a positive effect on economic growth. So an increase in government spending would be expected to impact economic growth positively.

4.4. Estimation techniques

Formal unit root tests, namely the Augmented Dickey Fuller (1981 & 1984) and Phillips-Perron (1988) tests, and an informal unit root test using the graphical method are used in this study to check if the random time series data is stationary. All the tests will be employed so as to check the robustness of the results. Co integration tests using the Johansen approach will be conducted to see if there is a long term relationship between growth and the explanatory variables. The Johansen approach is chosen because it is a VAR based technique with the advantage that less concern is needed over whether the explanatory variables are exogenous or endogenous which, in this case, takes into account the theoretical simultaneous relationship between economic growth and all the indicators of banks and financial markets. Having established co-integration, the Vector Error Correction Model (VECM) model will be applied to check what happens within the short run. To establish if there is causality between the different types of finance and economic growth, the Granger causality test is used. In this section all the techniques employed are discussed.

4.4.1 Testing for stationarity/Unit root

As with all time series analysis, the study begins with unit root analysis. Most economic series are not stationary in their levels such that estimations based on them provide invalid results, so finding out whether a series is stationary or not stationary is very important. Brooks (2008) defines a stationary series as one with a constant mean, constant variance and constant auto covariance for each given lag. The stationarity or otherwise of a series can strongly influence its behaviour and properties. The word 'shocks' is usually used to indicate a change or an unexpected change in a variable or maybe just the value of the error term during a particular time period. For a stationary series, shocks to the system will gradually die away and this is in contrast with the case of non-stationary data, where the persistence of shocks will always be infinite.

The use of non-stationary data can lead to spurious regressions. Brooks (2008) showed that if two stationary variables are generated as independent random series, when one of those variables is regressed on the other, the *t*-ratio on the slope coefficient would be expected not to be significantly different from zero, and the value of R^2 would be expected to be very low. However, if two variables are trending over time, a regression of one on the other could have a high R^2 even if the two are totally unrelated. So, if standard regression techniques are applied to non-stationary data, the end result could be a regression that looks good under standard measures of significant coefficient estimates and a high R^2, but which is really valueless. If the variables employed in a regression model are non stationary, then the standard assumptions for asymptotic analysis will not be valid. Thus the usual t-ratios will not follow a t-distribution, and the F-statistic will not follow an F-distribution.

There are two types of non-stationarity and there are two models that have been frequently used to characterise the non-stationarity, namely the random walk model with drift and the trend-stationary process. Different treatments are required to induce stationarity to the two. The first case is also known as stochastic non-stationarity, where there is a stochastic trend in the data and differencing is required to induce stationarity. The second case is known as deterministic non-stationarity and de-trending is required.

If a series for example y_t is not stationary it must be differenced d times before it becomes stationary, then it is said to be integrated of order d. This would be written as $y_t \sim$ I (d). Applying the difference operator more than d times to an I (d) process will also still result in a stationary series but with a moving average error structure. An I (0) series is a stationary series,

while an I (1) series contains one unit root. An I (2) series contains two unit roots and so would require differencing twice to induce stationarity. I (1) and I(2) series can wander a long way from their mean value and cross this mean value rarely, while I(0) series should cross the mean frequently.

To avoid spurious and or nonsense regression, unit root or stationarity tests should be done on all the variables before estimating the parameters and testing for co-integration. There are various tests of stationarity. In this study we are going to discuss the Dickey–Fuller, Augmented Dickey-Fuller (ADF) test and the Phillips-Perron test (PP).

4.4.2 Dickey–Fuller and the Augmented Dickey–Fuller test

Dickey (1979) and Fuller (1976) pioneered the work on testing for a unit root in time series analysis. The test is used to check whether a unit root is present in an autoregressive model. The basic objective of the test is to examine the null hypothesis that $\phi = 1$ against the one sided alternative $\phi < 1$ in

$y_t = \phi y_{t-1} + u_t$ 4.4

Thus the hypotheses of interest are:

H0: Series contains a unit root

H1: Series is stationary.

Rejecting the null hypothesis indicates that the series is stationary.

Three models can be estimated for each variable using the DF test, that is, an equation with no constant and no trend; with constant and no trend; and with constant and trend.

For easy computation and interpretation, the following equation is employed rather than the one above:

$\Delta y_t = \beta_1 + \beta_{2t}\psi y_{t-1} + \mu_t$ 4.5

where $\phi = 1$ is equivalent to a test $\psi = 0$ (since $\phi - 1 = \psi$), y_t is the relevant time series, Δ is a first difference operator, t is a linear trend and μ_t is the error term.

The error term should satisfy the assumption of normality, constant error variance and independent error terms; failure would render the DF test biased (Takaendesa, 2006). The Dickey-Fuller test is valid only if u_t is assumed not to be auto correlated, but would be so if

there was autocorrelation in the dependent variable of the regression Δy_t. The test would, therefore, be 'oversized', meaning that the true size of the test would be higher than the nominal size used. The solution to this shortfall is to use the Augmented Dickey-Fuller (ADF). The ADF test is preferred to the DF test because the latter has critical values that are bigger in absolute terms and may sometimes lead to a rejection of a correct null hypothesis (Brooks, 2008). The ADF test is carried out by augmenting the lagged values of the depended variable Δy_t and estimates the following equation:

$y_t = \psi y_{t-1} + \sum_{i=1}^{p} \propto_i \Delta y_{t-i} + u_t$ 4.6

The lags of Δy_t now soak up any dynamic structure present in the dependent variable, to ensure that u_t is not autocorrelated. The equation has an intercept and a time trend. The number of augmenting lags p is determined by minimising the Schwartz information criterion (SIC) or minimising the Akaike information criterion (AIC) or lags are dropped until the last lag is statistically significant. Econometric Views (Eviews) software allows all the options to choose from. The test is conducted on ψ, and the same critical values from the Dickey Fuller tables are used. The null hypothesis of a unit root is rejected in favour of the stationary alternative, if the test statistic is more negative than the critical value and is significant.

4.4.3 The Phillips-Perron (PP) test

The Phillips–Perron test is similar to the ADF test but the former incorporates an automatic correction to the DF procedure to allow for auto-correlated residuals (Brooks, 2008). The PP test differs from the ADF test mainly in how it deals with serial correlation and heteroscedasticity in the errors. An important assumption of the DF test is that the error terms u_t are independently and identically distributed. The ADF test adjusts the DF test to take care of possible serial correlation in the error terms by adding the lagged difference terms of the regressand while the Phillips and Perron use nonparametric statistical methods to take care of the serial correlation in the error terms without adding lagged difference terms. This gives the PP test an advantage over the ADF test as it gives robust estimates when the series has serial correlation. Given the fact that the ADF test and PP test are similar, these tests often give the same conclusions and they suffer from most of the same important limitations.

Since the ADF test is favoured over the DF test because the latter has critical values that are bigger in absolute terms and may sometimes lead to a rejection of a correct null hypothesis, this study will employ the ADF test and the PP tests. Both tests will be employed to check the robustness of the results and also they are the most widely used unit-root tests. As mentioned

earlier both tests give the same conclusion but in the event that conflicting results are obtained in the study, PP test results would take precedence over ADF results as the former test is considered to be more advanced compared with the latter. Culver and Papell (1997) point out that the ADF is unable to discriminate well between non-stationary series with a high degree of autocorrelation. It is also argued that the ADF test may incorrectly indicate that the series contains a unit root when there is a structural break in the series. It is also widely believed that the ADF test does not consider the cases of heteroscedasticity and non-normality frequently revealed in raw data of economic time series variables.

4.4.4 Cointergration and Vector error correctional model (VECM)

The process of converting non-stationary data into stationary data usually leads to loss of the long run relationship between the variables and testing if the variables are cointegrated is necessary in this research. Cointegration assesses the long run link between economic variables. Cointegration of two or more time series suggests that there is a long run or equilibrium relationship between them. According to Pesaran and Shin (1999) the economic interpretation of cointegration is that if two or more series are linked to form an equilibrium relationship spanning the long-run, then even though the series themselves may be non-stationary, they will move closely together over time and their difference will be stationary. Their long-run relationship will be the equilibrium to which the system converges over time, and the disturbance term can be interpreted as the disequilibrium error or the distance that the system is away from equilibrium at time *t*.

There are several ways of testing for cointegration but the two main methods that are widely used are the Engle-Granger (EG) two-step method (Engle & Granger, 1987) and the Johansen procedure technique (Johansen; 1991, 1995).The Engle-Granger approach is residual based. It seeks to determine whether the residuals have an equilibrium relationship or are stationary. The Johansen technique is based on maximum likelihood estimation on a VAR system. It seeks to determine the rank of the matrix.

4.4.5 Engle- Granger Two step method

Engle and Granger (1987) provided work for a two step procedure test for cointegration that is based on the residuals of an estimated model rather than on raw data. The first step is to make sure that all the individual variables contain one root. Estimation of the cointegrating regression using ordinary least square method will then follow. Residuals from the regression are then tested to ensure that they are stationary. If they are stationary the second step is conducted but

if they contain one unit root, a model containing only first differences is estimated. In the second step, the error correction model is then estimated which represents the short run dynamics of the model, using residuals from step one as one variable.

The Engle-Granger 2 step method, however, suffers from a number of weaknesses. According to Brooks (2008) there could be a simultaneous equations bias if the causality between two variables runs in both directions, but the single equation approach requires the researcher to normalise on one variable, that is, to specify one variable as the dependent variable and the others as independent variables. The researcher is forced to treat the two variables asymmetrically, even though there may have been no theoretical reason for doing so. The other weakness is that it is not possible to perform any cointegration test if there are multiple cointegrating relationships and usual finite sample problems of a lack of power in unit root and cointegration tests. With Engle-Granger again it is not possible to perform any hypothesis tests about the actual cointegrating relationship. Lastly, Pesaran and Shin (1999) also point out that the residual-based cointegration tests are inefficient and can lead to contradictory results especially when there are more than two I (1) variables under consideration. Due to all these explained weaknesses the Johansen method is more preferred to the Engle- Granger approach.

4.4.6 Johansen technique based on VARS

Johansen technique is a systems equation test which provides estimates of all cointegrating relationships that may exist within a vector of non-stationary variables or a mixture of stationary and non-stationary variables. In conducting the Johansen test the following steps are undertaken:

Step 1: Testing the order of integration of the variables is the first step.

All variables are set to assess their order of integration. Stationary cointegrating relationship(s) must be detected in all non-stationary variables to avoid the problem of spurious regressions. When all the variables are integrated of the same order, then we can proceed with the cointegration test as that is the most desirable case.

Step 2: Setting the appropriate lag length of the model is crucial so as to have the standard normal error terms that do not suffer from non-normality, autocorrelation and heteroskedasticity. When choosing the optimal lag length we estimate the VAR model for a large number of lags including all the variables in their levels and then inspect the values of

AIC and the SBC criteria because, in general, the model that minimises AIC and SBC is the one selected with the optimal lag length.

Step 3: Choosing the appropriate model regarding the deterministic components in the multivariate system is the third step. In general five models can be considered but the first and fifth models are not realistic, therefore the choice is reduced to one of the remaining three models which are models 2, 3 and 4. In choosing the appropriate model the Pantula principle is applied. It involves the estimation of all the three models and the presentation of the results from the most restrictive hypothesis (Asteriou and Hall, 2007). The model selection procedure then comprises moving from the most restrictive model, at each stage comparing the trace statistic to its critical value, stopping only when we conclude for the first time that the null hypothesis of no cointegration is not rejected.

Step 4: The last step is to determine the rank of **Π** or the number of cointegrating vectors. To estimate the Π matrix the appropriate order *k* of the VAR has to be determined and the lag length must be selected optimally as discussed under lag selection above. Once the appropriate VAR order *k* and the deterministic trend assumption have been identified, the rank of the Π matrix can be tested. According to Brooks (2008) there are two test statistics for determining the number of cointegrating relations under the Johansen approach which both involve estimation of the matrix **Π** namely λ*trace* and λ*max*, which are formulated as:

$\lambda_{trace}(r) = -T\sum_{i=r+1}^{g} \ln(1 - \hat{\lambda}_r)$ 4.7

and

$\lambda_{max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1})$ 4.8

where T is the sample size, r is the number of cointegrating vectors under the null hypothesis and $\hat{\lambda}_i$ is the estimated value for the ith ordered eigenvalue from the □ matrix. The larger the $\hat{\lambda}_i$, the more large and negative will be $\ln(1 - \hat{\lambda}_i)$ and hence the larger will be the test statistic. A significantly non-zero eigenvalue indicates a significant cointegrating vector.

The *λtrace* is a joint test where the null is that the number of cointegrating vectors is less than or equal to *r* against an unspecified or general alternative that there are more than *r*. The *λmax* conducts separate tests on each eigenvalue, and has as its null hypothesis that the number of cointegrating vectors is *r* against an alternative of *r* + 1. Johansen and Juselius (1990) provide critical values for the two statistics. The distribution of the test statistics is non-standard, and

the critical values depend on the value of $g - r$, the number of non-stationary components and whether constants are included in each of the equations. In each case, the null hypothesis is rejected if the test statistic is greater than the critical value.

4.4.7 Vector Error Correction model

Having established the number of cointegrating vectors, we will proceed with the estimation of the VECM. The VECM applies maximum likelihood estimation to VAR to simultaneously determine the long-run and short-run determinants of the dependent variable in the model.

This approach takes into account the short-term adjustments of the variables as well as the speed of adjustment of the coefficients. It measures, therefore, the speed at which the variables will revert to their equilibrium following a short term shock to each of them. In addition, this approach is appropriate for macroeconomics and financial data as it distinguishes between stationary variables with momentary effects and non-stationary variables with undeviating effects (Brooks, 2008). Assuming that y_t and x_t are cointegrated the error correction model can be modeled as follow:

$$\Delta y_t = \beta_1 \Delta x_t + \beta_2 (y_{t-1} - \gamma x_{t-1}) + \mu_t \quad \text{.....4.9}$$

where $y_{t-1} - \gamma x_{t-1}$ is known as the error correction term and γ defines the long-run relationship between *x* and *y*. The error correction model is interpreted as follows: *y* is alleged to change between t −1 and *t* as a result of changes in the values of the explanatory variable(s), *x*, between $t - 1$ and *t*, and also in part to correct for any disequilibrium that existed during the previous period. The error correction term appears with a lag. It would be unlikely for the term to appear without any lag for this would imply that *y* changes between $t - 1$ and *t* in response to a disequilibrium at time *t*. β_1 describes the short-run relationship between changes in *x* and changes in *y* while β_2 describes the speed of adjustment back to equilibrium, and its strict definition is that it measures the proportion of last period's equilibrium error that is corrected for.

Asteriou and Hall (2007) specified four main reasons why the error correction model (ECM) is very important. Firstly the ECM is important because it is a convenient model measuring the correction from disequilibrium of the previous period which has a very good economic implication. In addition to this, when there is cointegration ECMs are formulated in terms of the first differences which typically eliminate trends from the variables involved; hence they resolve the problem of spurious regressions. The other advantage of ECMs is the ease with

which they can fit into the general-to-specific approach to econometric modelling, which is in fact a search for the most parsimonious ECM model that best fits given data sets. Lastly, the other important feature comes from the fact that the disequilibrium error term is stationary and, because of this, the ECM has important implications such as the fact that the two variables are cointegrated which implies that there is some adjustment process which prevents the errors in the long run relationship becoming larger and larger.

4.4.8 Granger causality (GC) test

The study will also establish if there is causality between the different types of finance and economic growth. The vector error correction model (VECM) based causality test will be carried out through the Wald test. The Granger causality test helps in investigating the presence of feedback (bi-directional) or one-way causality between economic growth and all the measures of banks and financial markets. The Granger (1969) simple test defines causality as follows: variable y_t is said to granger-cause x_t if x_t can be predicted with a greater accuracy by using past values of the y_t variable. Assuming that there are two series for variables X_t and Y_t the GC test can be represented in the form:

$$\Delta X_t = \alpha_1 + \sum_{i-1}^{n1} \alpha_{11}\,(i)\,\Delta X_{t-1} + \sum_{j-1}^{m1} \alpha_{11}\,(j)\,\Delta Y_{t-j} + \varepsilon_{xt} \quad \text{.....4.10}$$

$$\Delta Y_t = \alpha_2 + \sum_{i-2}^{n2} \alpha_{21}\,(i)\,\Delta X_{t-1} + \sum_{j-1}^{m2} \alpha_{21}\,(j)\,\Delta Y_{t-j} + \varepsilon_{yt} \quad \text{.....4.11}$$

where ε_{xt} and ε_{yt} are stationary random processes intended to capture other pertinent information not accounted for in the lagged values of the variables**,** X_t and Y_t. The series Y_t fails to Granger cause X_t if α_{11} (j) = 0 (1,2,3, $m1$) and the series X_t fails to Granger cause Y_t if α_{22} (i) = 0 (1,2,3, $n1$).

4.5. Diagnostic checks

Diagnostic checks are very important in the analysis of stock markets, banks and economic growth because they validate the parameter evaluation outcomes achieved by the estimated model. The idea with diagnostic checks is to examine the goodness of fit of the model. These checks test the stochastic properties of the model such as residual autocorrelation, heteroscedasticity and normality, among others. The residual tests mentioned will be applied in this study and hence they are briefly discussed below.

4.5.1 Autocorrelation – LM tests

Gujarati (2004) defines autocorrelation as correlation between members of series of observations ordered in time, that is, in time series data or space that is in cross-sectional data.

Autocorrelation is most likely to occur in time series data. It can occur due to misspecification of the model, systematic errors in measurement and also omission of variables in a model. The Langrange Multiplier (LM) test is used to detect higher order autocorrelation. The LM statistic tests the null hypothesis of no serial correlation against an alternative of autocorrelated residuals. It centres on the value of the R^2 for the auxiliary regression. If one or more coefficients in an equation are statistically significant, then the value of R^2 for that equation will be relatively high, while if none of the variables is significant, R^2 will be relatively low. The LM test operates by obtaining R^2 from the auxiliary regression and multiplying it by the number of observations, *T*. The test can be given as:

$TR^2 \sim X^2(\text{m})$

where *m* is the number of regressors in the auxiliary regression (excluding the constant term), equivalent to the number of restrictions that would have to be placed under the *F*-test approach.

4.5.2 Heteroscedasticity test

According to Brooks (2008) one of the classical linear regression assumptions is that the variance of the error term is a constant denoted as Var $\mu_t = \sigma^2 < \infty$. This is referred to as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. Fortunately, there are a number of formal statistical tests for heteroscedasticity and one such test is White's (1980) general test for heteroscedasticity. The test is mostly useful because it makes few assumptions about the likely form of the heteroscedasticity. One of the assumptions is that it assumes that the regression model estimated is of the standard linear. The White (1980) general test for heteroscedasticity tests the null hypothesis that the errors are both hemoscedastic and independent of the regressors and that there is no problem of misspecification. The test regression is run by regressing each cross product of the residuals on the cross products and testing the joint significance of the regression. Since the null hypothesis for the White test is that errors are hemodscedasticity, if we fail to reject the null hypothesis then there is homoscedasticity. If the null hypothesis is rejected then there is heteroscedasticity.

4.5.3 Residual normality test

Normality assumption ($\mu_t \sim$ N $(0,\sigma^2)$) is required in order to conduct single or joint hypothesis tests about the model parameters (Brooks, 2008). A normal distribution is one that is symmetric about its mean and said to be mesokurtic. One of the most commonly applied tests for normality is the Bera-Jarque (BJ) test. BJ uses the property of a normally distributed random variable that

the entire distribution is characterised by the first two moments, namely the mean and the variance. Its test statistic asymptotically follows a X^2 distribution under the null hypothesis that the distribution of the series is symmetric. The null hypothesis of normality would be rejected if the residuals from the model are either significantly skewed or leptokurtic/platykurtic (or both).

4.6. Impulse response

Examination of VAR's impulse responses will be done to determine the response of economic growth to its explanatory variables. Brooks (2008) points out that impulse response traces out the responsiveness of the dependent variables in the VAR to shocks to each of the variables. For each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted. These responses reveal whether changes in the value of a given variable have a positive or a negative effect on other variables in the system, or how long it would take for the effect of that variable to work through the system. If the system is stable, the shock should gradually die away.

4.7 Variance decomposition

Variance decomposition also offers an examination of the VAR's dynamics but in a different way with the impulse response functions. They provide information about the relative importance of each random innovation in affecting the variation of the variables in the VAR. According to Brooks (2008) variance decomposition gives the proportion of the movements in the dependent variables that are due to their 'own' shocks, versus shocks to the other variables. With variance decomposition it is usually observed that own series shocks explain most of the forecast error variance of the series in a VAR. So in this study variance decomposition will give us the proportion movements in economic growth that are due to its own shocks, versus shocks to other variables.

4.8. Conclusion

The purpose of this chapter was to define and explain the variables to be used, and also highlight the method to be employed in pursuing the research objectives. The various research techniques to be applied have been discussed which include tests for stationarity, cointegration, causality and diagnostic tests. Augmented Dickey-Fuller and Philips-Perron tests have been chosen to test stationarity. Both tests will be employed to check the robustness of the results. Both tests give the same conclusion but in the event that conflicting results are obtained in the study, PP test results will take precedence over ADF results as the former test is considered to be more advanced over the latter. For the cointegration test the Johansen method is chosen over

the Engle-Granger because of its several advantages. To establish if there is causality between the different types of finance and economic growth the Granger causality test is used. A number of diagnostic tests have been reviewed, as they must be performed before interpretation of parameter estimates. All the testing procedures explained herein will be conducted using the econometric software E-views version 7.

CHAPTER 5: ESTIMATION AND INTERPRETATION OF RESULTS

5.1 Introduction

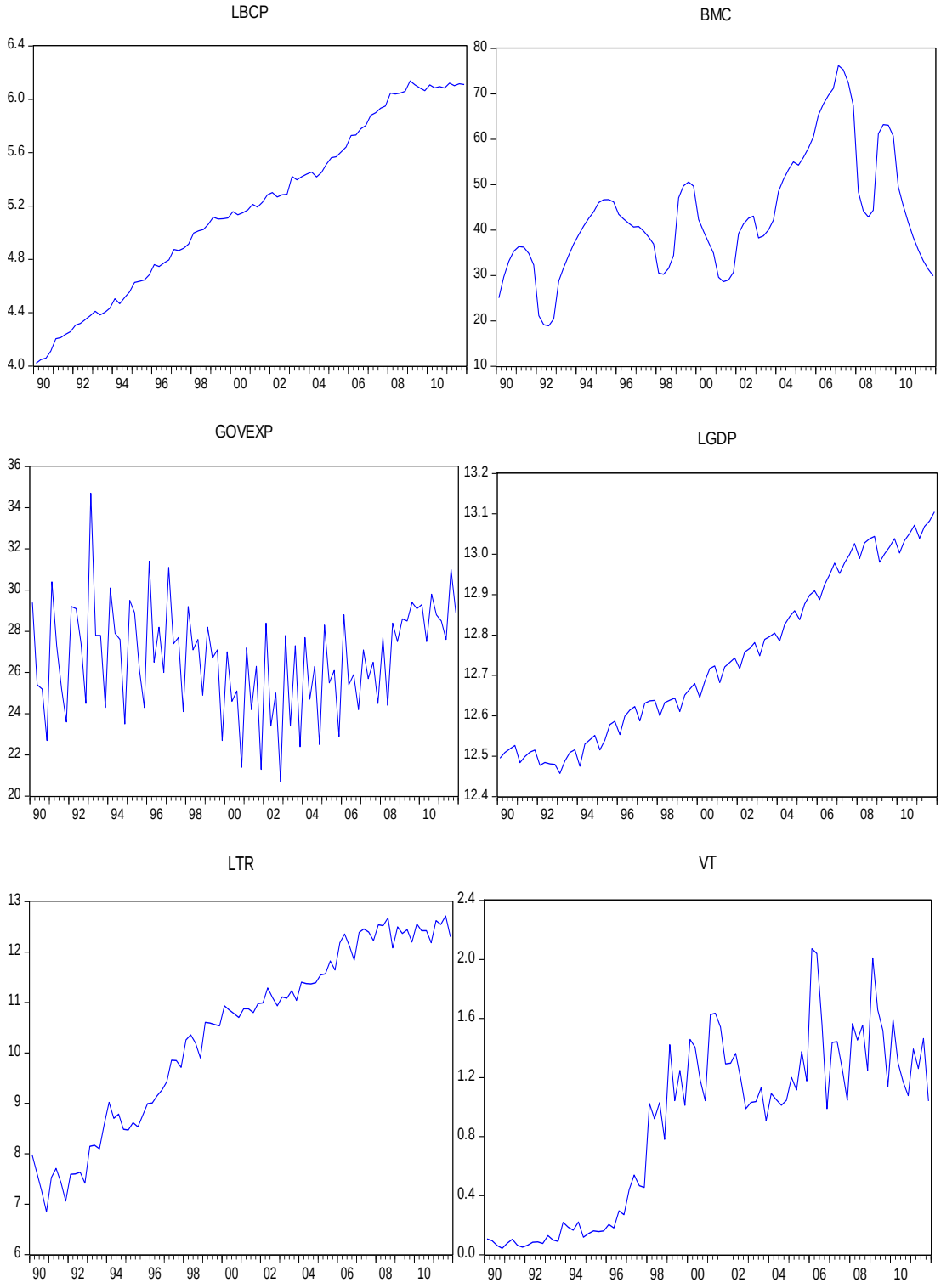
This chapter provides an analysis, interpretation and presentation of the empirical results of the financial structure model discussed in chapter four. The model regresses economic growth against bank credit to private sector, stock turnover ratio, value of shares traded, bond market capitalisation, and government expenditure to answer the questions raised, as well as to achieve the objectives specified in chapter 1. The chapter is divided into six sub-sections, namely stationarity/unit root tests, cointegration tests, granger causality tests, diagnostics checks, impulse response and variance decomposition analysis, and, finally, a conclusion for the chapter.

5.2 Stationarity/unit root test results

Since most macroeconomic time series data are trended, in most cases they are non stationary. Therefore, testing for stationarity is the first step in the procedure to avoid problems with non stationary data such as getting incorrect conclusions from the regressions. Informal test for stationarity which is the graphical method and a formal test using the Augumented Dickey-Fuller and the Phillips-Perron tests were employed. These tests provided an idea of structural breaks, trends and stationarity of the data set. A visual plot of the series was done first before pursuing the mentioned formal tests above. Therefore, the graphical results from the test for data stationarity at level and first difference are presented in figure 5.1 and 5.2 respectively.

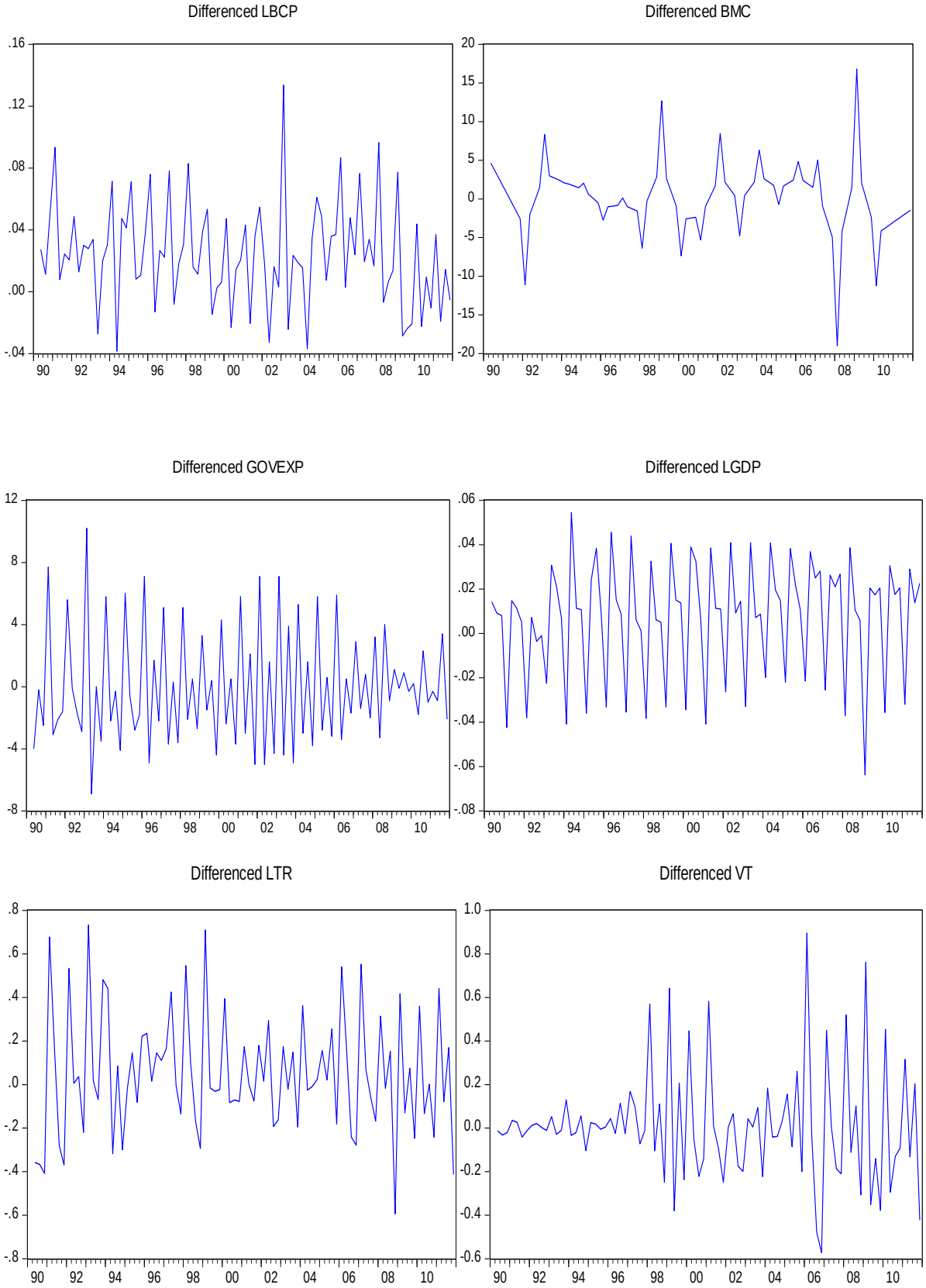
From figure 5.1 below bank credit to private sector (LBCP), gross domestic product (LGDP) and stock turnover ratio(LTR) are trending upwards showing a growth trend but with some fluctuations, while bond market capitalisation (BMC) is showing a downward trend with huge fluctuations and a sharp growth trend from 2003 to 2007. Government expenditure (GOVEXP) and value of shares traded (VT) does not show any trend but huge fluctuations. LBCP, GOVEXP and LGDP could be stationary or closer to the stationary boundary as they seem to be hovering around their means but their variances are clearly not constant over time. The other two variables are clearly non stationary in levels. Figure 5.2 shows that all the differenced variables fluctuate around the zero mean, hence the variables are likely to be integrated of order one I(1) to ensure stationarity because when using the graphical method, data that fluctuates around the zero mean indicates stationarity. The informal test is, however, not good enough to conclude that data is stationary because it is an informal test for stationarity hence the formal tests using the Augmented Dickey-Fuller and Phillips-Perron were conducted to support the results from the informal test. Table 5.1 presents results from the above mentioned formal tests.

Figure 5.1 Unit root tests - Graphical analysis at level for 1990Q1-2011Q4



Source: Author's computation using EViews

Figure 5.2 Unit root tests- Graphical analysis at first difference for 1990Q1-2011Q4



Source: Author's computation using EViews 7

Table 5.1 Unit root tests 1990Q1-2011Q4 at levels and first differences (Δ)

Test	Augmented Dickey-Fuller (ADF)			Phillips–Peron (PP)			Order of integration
	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept	None	
LBCP	-0.990809	-2.22416	-1.960448**	-2.653217*	-2.226353	5.842422***	I(1)
Δ LBCP	-2.871453*	-2.970635	-1.854248*	-10.89359***	-11.08154***	-7.504612***	I(0)
BMC	-2.163785	-1.867108	-0.370355	-2.307232	-2.116576	-0.562493	I(1)
ΔBMC	-2.357092	-2.598050	-2.385335	-5.592006***	-5.603291***	-5.629161***	I(0)
GOVEXP	-0.883992	-0.733762	0.651458	-9.993749***	-9.956354***	-0.271400	I(1)
ΔGOVEXP	-23.00929***	-22.92688***	-22.99162***	-46.65316***	-49.61634***	-46.26764***	I(0)
LGDP	0.080365	-3.176733	2.324759**	1.257664	3.498742**	4.951312***	I(1)
ΔLGDP	2.682994*	2.683473	-1.376084	-14.83775***	-17.08581***	-11.48063***	I(0)
LTR	-2.126716	-1.282617	2.566658**	-0.856457	-3.006409	2.395222**	I(1)
ΔLTR	-4.578605***	-4.976116***	-3.223836***	-15.55757***	-25.58570***	-11.45863***	I(0)
VT	-1.568070	-1.987153	-0.083959	-2.220525	-4.171537***	-0.589564	I(1)
ΔVT	-4.288098***	-4.336066***	-4.202664***	-19.45073***	-23.05183***	-15.42000***	I(0)
Critical value 1%	-3.51	-4.07	-2.59	-3.51	-4.07	-2.59	
Critical value 5%	-2.90	-3.46	-1.94	-2.90	-3.46	-1.94	
Critical value 10%	-2.59	-3.16	-1.61	-2.59	-3.16	-1.61	

Notes:

*** (1% level of significance), ** (5%level of significance) and *(10% level of significance.
Maximum Bandwidth for the PP test has been decided on the basis of Newey-West (1994)
The ADF and PP tests are based on the null hypothesis of unit roots.

Source: Author's Computation using Eviews 7

Both the Augmented Dickey-Fuller and Phillips-Perron tests examine the null hypothesis that the series contains a unit root against an alternative hypothesis that series is stationary. The null hypothesis is rejected if the absolute value of the test statistic is greater than the critical values at all levels of significance. Rejecting the null hypothesis means that we have failed to reject the alternative hypothesis of stationarity. This indicates that there is no unit root, hence the series is stationary. Both tests test variables in intercept, trend and intercept, and no trend no intercept.

For intercept both the ADF and PP tests revealed that all the other variables were non stationary in their levels except for LBCP and GOVEXP which were stationary at 10% and 1% significance levels respectively using the PP test. After differenced on intercept using the ADF test, all the other variables were stationary at 1% significance level except for LBCP and LGDP which were stationary at 10% significance level. With the PP test all the variables were stationary at 1% significance level when first differenced on intercept. For trend and intercept all the six variables were non stationary in their levels using the ADF while with the PP test all the other three variables were non stationary except for GOVEXP, LGDP and VT which were stationary at 1%, 5% and 1% significance level respectively. After being differenced all the variables were stationary at 1% using the PP test on trend and intercept.

For the test under no trend and no intercept, using both the ADF and PP test, all the other variables were non stationary in their levels except for LBCP, LGDP and LTR which were stationary in their levels at 5% using the ADF and at 1% using the PP test. When first differenced under no intercept and no trend using the ADF test GOVEXP, LTR and VT were stationary at 1% significance level while LBCP was stationary at 5% significance level. Using the PP test under no trend and no intercept, all the variables were stationary at 1% significance level when first differenced.

In this study the PP test results were considered over the ADF test results, as it was mentioned earlier in the previous chapter that in the event that conflicting results are obtained between the two tests, PP test results will take precedence over ADF results because the former test is considered to be more advanced over the latter. So from the above tests results since the data series were stationary after first differenced we conclude that they are integrated of the same order I (1), therefore it is possible to carry on to cointegration tests.

5.3 Cointegration test

According to Brooks (2008) if two variables that are I (1) are linearly combined, then the combination will also be I (1). Since it is established that the variables are integrated of the same order, this section performs the cointegration test using the Johansen approach to determine the existence of a long-run equilibrium relationship between LGDP and LBCP, LTR, VT, BMC and GOXEXP. It is very important to assess whether there exists long run relationships between gross domestic product and the chosen variables, in order for a viable economic conclusion to be reached from the results obtained. Table 5.2 below presents the results for pairwise correlation matrix to guide the variable selection exercise before the cointegration tests.

Table 5.2 Pairwise correlation results

	LGDP	LBCP	LTR	VT	BMC	GOVEXP
LGDP	1.00	0.97	0.94	0.79	0.57	-0.01
LBCP	0.97	1.00	0.98	0.86	0.58	0.03
LTR	0.94	0.98	1.00	0.91	0.58	-0.02
VT	0.79	0.86	0.91	1.00	0.50	-0.07
BMC	0.57	0.58	0.58	0.50	1.00	-0.10
GOVEXP	-0.01	0.03	-0.02	-0.07	-0.10	1.00

Source: Author's computation using EViews 7

From the pairwise correlation results it is observed that BCP is highly correlated with GDP, followed by LTR, VT and then BMC. These four variables are positively correlated with GDP. This is in line with the theoretical underpinnings which suggest that finance promotes economic growth. GOVEXP has a negative correlation with GDP. This confirms theoretical underpinnings that an increase in government expenditure may have a detrimental effect on the economy which will cause economic growth to decrease.

Since it is one of the requirements of the Johansen technique to determine the lag order and the deterministic trend assumption of the VAR, the Akaike Information Criterion (AIC), the

Schwarz Information Criterion (SC), the Hannan-Quinn criterion (HQ), the final predication error (FPE) and the Likelihood Ratio test (LR) were used to select the lag length. The selection was made using a maximum of 8 lags in order to permit adjustments in the model and to accomplish well behaved residuals.

Table 5.3 below shows the lag length selected by different information criteria. As shown in the table below SC chose lag order 1 while LR, FPE, AIC and HQ chose lag order 5. The information criteria approach has produced disagreeing results and no conclusion can be arrived at using this approach only. Brooks (2008) points out that this problem could arise as a result of a small sample bias. The decision, however, could be made based on the fact that a given criterion produces a white noise residual and conserves degrees of freedom. So the decision was augmented by theoretical underpinnings and the Johansen cointegration test was therefore conducted using 5 lag for the VAR.

Table 5.3 VAR Lag Order Selection Criteria

VAR Lag Order Selection
Endogenous variables: LGDP LBCP LTR VT BMC GOVEXP
Endogenous variables: C
Date: 10/08/13 Time: 11:16
Sample: 1990Q1 2011Q4
Included observations: 80

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-392.7465	NA	0.000860	9.968662	10.14731	10.04029
1	96.95713	893.7091	1.02e-08	-1.373928	-0.123364*	-0.872541
2	141.6334	74.83269	8.35e-09	-1.590834	0.731642	-0.659687
3	185.3347	66.64449	7.16e-09	-1.783367	1.611021	-0.422459
4	262.6733	106.3407	2.74e-09	-2.816833	1.649467	-1.026166
5	322.7464	73.58955*	1.71e-09*	-3.418661*	2.119551	-1.198233*
6	345.9326	24.92514	2.87e-09	-3.098315	3.511809	-0.448128
7	389.9624	40.72758	3.17e-09	-3.299061	4.382975	-0.219113
8	445.5615	43.08929	3.04e-09	-3.789038	4.964910	-0.279330

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's Computation using Eviews 7

Choosing the appropriate model regarding the deterministic component is the next step. The Pantula Principle test was applied to the series and using the trace test statistic, conclusions were drawn on the deterministic trend suitable for this analysis and data. In general five distinct models are considered but the first and the fifth models are not that realistic and implausible in terms of economic theory. Table 5.4 below, therefore, presents results only for models 2, 3 and 4.

Table 5.4 The Pantula Principle test results

R	n-r	Model 2		Model 3		Model 4	
		Trace Test statistic	Critical value	Trace Test statistic	Critical value	Trace Test statistic	Critical value
0	3	135.6224	103.8473	124.5270	95.75366	161.4015	117.7082
1	2	**76.84764***	76.97277	65.88730	69.81889	88.80380	99.53041

Note: * indicates the first time that the null cannot be rejected

Source: Author's computation using EViews 7

The model selection procedure comprises moving from the most restrictive model at each stage comparing the trace test statistic to its critical value, stopping only when we conclude for the first time that the null hypothesis of no cointegration is not rejected. From the results in table 5.4 above, model 2 was chosen to conduct the Johansen cointegration approach. Model 2 is the case where there are no linear trends in the data and, therefore, the first differenced series have a zero mean. The intercept in this case is restricted to the long run model.

After choosing the appropriate model, determining the rank of **Π** or the number of cointergrating vectors is the next step. Two tests, namely the trace test and the maximum eigenvalue test were applied. The trace statistic tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating relations while the maximum eigenvalue tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of r+1 cointegrating relations. Table 5.5 presents the results of trace test and maximum eigenvalue test. The upper part of the table presents the Johansen cointegration test based on the trace statistic test, while the bottom part presents the results of this test based on the maximum eigenvalue test. With the trace statistic the null hypothesis of no cointergrating equation was rejected since the test statistic of 135.6224 is greater than the 5% critical value of

103.8473. The null hypothesis that there is at most one cointegrating equation was not rejected since the test statistic of 76.84764 was less than the 5% critical value of 76.97277. Therefore, the trace statistics specified 1 cointegrating relationship at 5% significance level. The maximum eigenvalue test also rejected the null hypothesis of no cointegration, but failed to reject that at most 1 cointegrating vectors exist, since the test statistic of 26.22104 is less than the 5% critical value of 34.80587. Therefore, it can be concluded that there is one significant long run relationship between the given variables since the two tests failed to reject the null hypothesis of at most 1 cointegrating vector exist.

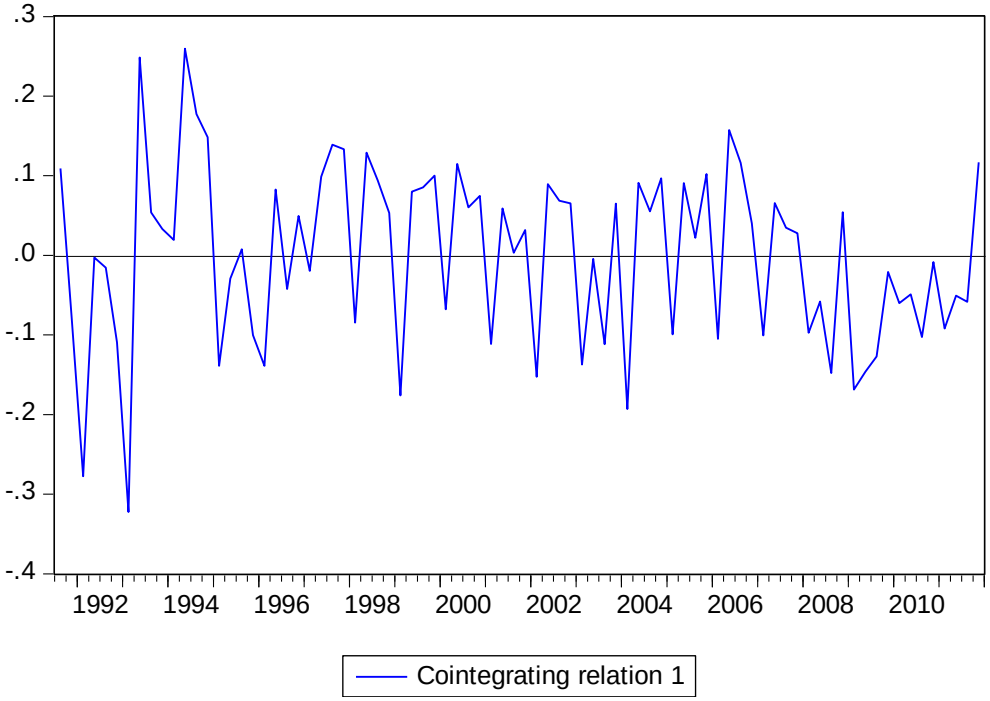
Table 5.5 Johansen co-integration rank test results

Date: 10/08/13 Time: 11:17				
Sample (adjusted): 1991Q3 2011Q4				
Included observations: 82 after adjustments				
Trend assumption: No deterministic trend (restricted constant)				
Series: LGDP LBCP LTR VT BMC GOVEXP				
Lags interval (in first differences): 1 to 5				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.511671	135.6224	103.8473	0.0001
At most 1	0.273683	76.84764	76.97277	0.0511
At most 2	0.219603	50.62661	54.07904	0.0981
At most 3	0.143847	30.29454	35.19275	0.1534
At most 4	0.126880	17.55945	20.26184	0.1130
At most 5	0.075459	6.433508	9.164546	0.1598
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.511671	58.77474	40.95680	0.0002
At most 1	0.273683	26.22104	34.80587	0.3635
At most 2	0.219603	20.33207	28.58808	0.3872
At most 3	0.143847	12.73509	22.29962	0.5826
At most 4	0.126880	11.12594	15.89210	0.2427
At most 5	0.075459	6.433508	9.164546	0.1598
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's computation using EViews 7

Summary of the results in table 5.5 indicated the existence of one cointegrating vector. The cointegration vector represents the deviations of the endogenous variable from its long run equilibrium level. Figure 5.3 below suggests that over the period 1990 to 2011 the deviations of economic growth from equilibrium were stationary and this is critical in its use as an error correction model.

Figure 5.3 Cointegration vector



Source: Author's computation using EViews 7

5.4 Vector Error Correction Model (VECM)

VECM is necessary to differentiate between the long and short run relationship of all the specified variables and economic growth. Using the number of cointegrating relations previously found, collectively with the number of lags and the deterministic trend assumption applied in the cointegration test VECM was specified and estimated. The VECM results are presented in table 5.6 and 5.7 below.

Table 5.6 Results of long run cointegration equation

Variable	Coefficient	Standard error	t-statistic
Constant	-10.88129		
LGDP	1.000000		
LBCP	-1.185147	0.10185	-11.6359

LTR	0.313530	0.03962	7.91341
VT	-0.019398	0.03739	-0.51884
BMC	0.001128	0.00104	1.08858
GOVEXP	0.038922	0.00726	5.36321

Source: Author's computation using EViews 7

The long run impact of banks and financial markets on economic growth as presented in the table 5.6 above is illustrated using equation 5.4

LGDP = -10.881 -1.185LBCP + 0.314LTR - 0.019VT +0.001BMC + 0.0389GOVEXP 5.4

Equation 5.4 shows that if all independent variables are held constant, LGDP will reduce by approximately 10.881. LTR, BMC and GOVEXP are positively signed signifying that in the long run these variables have a positive relationship with LGDP. The negatively signed coefficient of LBCP and VT signifies a negative long run relationship with LGDP. LBCP, LTR and GOVEXP are statistically significant in explaining economic growth since they have absolute t-values greater than 2.VT and BMC are statistically insignificant in explaining economic because their t-statistics are less than 2.

The results suggest that a unit increase in LBCP reduces economic growth by approximately 1.185. The relationship between LBCP and economic growth does not concur with theory which assumes a reinforcing relationship between the two economic variables. Theory dictates that banks are important in identifying good projects, mobilising resources, monitoring managers and managing risk, thereby financing development which will, in turn, foster economic growth. The negative relationship, however, does not mean that the banking sector is underdeveloped but could be explained by the problems in credit allocation in the country. For example most borrowings in South Africa are not channelled for capital development but rather for consumption spending hence does not promote economic growth in the long run. The result is consistent with Ayadi *et al.* (2013) who also found that bank credit to private sector is negatively associated with growth because of deficiencies in credit allocation in the economy.

With the stock market variables the results suggested that a unit increase in LTR increases economic growth by approximately 0.314 while a unit increase in VT reduces economic growth by approximately 0.019. This showed that trading relative to the size of the stock market increases economic growth whereas trading relative to the size of the economy reduces economic growth. The positive relationship between LTR and LGDP emphasises the

importance of liquid markets in promoting economic growth and is in line with the theory which suggest that big, liquid and well-functioning markets foster growth and profit incentives.

Furthermore, the results also suggested that a unit increase in BMC increases economic growth by approximately 0.001. This shows that the overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy wide basis. This also conforms to the apriori expectation.

A unit increase in GOVEXP also was found to increase economic growth by approximately 0.389 in the long run. This positive relationship is compatible with the theoretical underpinnings which suggest that government spending helps in smoothing out cyclical fluctuations in the economy and influences a level of employment and price stability which will, in turn, have a positive effect on economic growth.

Table 5.7 Error correction model results

Error correction	D(LGDP)	D(LBCP)	D(LTR)	D(VT)	D(BMC)	D(GOVEXP)
CointEq1	-0.018972	0.112308	-1.642142	-0.093446	2.135093	-20.57360
	(0.04272)	(0.08010)	(0.72858)	(0.77355)	(13.2441)	(4.19685)
	[-0.44407]	[1.40205]	[-2.25390]	[-0.12080]	[0.16121]	[-4.90216]

Source: Author's computation using EViews 7

The error correction model reveals the speed of adjustments of the variables in response to a standard deviation from long-run equilibrium. It helps to correct any disequilibrium in the short run. The negative coefficient of the Error Correction Mechanism implies that there is a feedback mechanism in the short run. The coefficient of D (LGDP), which is approximately -0.019 shows that the speed of adjustment is around 1.9% implying that if there is a deviation from equilibrium, 1.9% is corrected in one quarter as the variable moves towards restoring

equilibrium. The speed of adjustment is statistically insignificant with a t-value of -0.44407. The low speed of adjustment by economic growth may reflect the existence of some other factors affecting economic growth in South Africa which are not specified in the model.

LTR, VT and GOVEXP also have negative coefficients indicating that these variables converge to their long run equilibrium. LTR and GOVEXP's speed of adjustment is statistically significant while the speed of adjustment for VT is statistically insignificant. LBCP and BMC, on the other hand, have positive coefficients indicating that any disequilibrium in these variables continues to grow. However, it should be noted that a positive coefficient in an error correction model could also signify incomplete specifications.

5.5 Granger causality test

Granger causality was carried out to check the directional relationship between the dependant variable and all the independent variables. The decision rule for Granger causality is that if *p* value is <0.05 we reject the null hypothesis at 5% significance level. A rejection of the null hypothesis implies that the first series Granger-causes the second series and vice versa. The Granger causality results are given in table 5.8 below

Table 5.8 Granger causality test

VAR Granger Causality/Block Exogeneity Wald Tests			
Date: 10/11/13 Time: 12:36			
Sample: 1990Q1 2011Q4			
Included observations: 87			
Dependent variable: LGDP			
Excluded	Chi-sq	df	Prob.
LBCP	5.292709	1	0.0214
LTR	7.598572	1	0.0058
VT	5.536469	1	0.0186
BMC	3.318173	1	0.0685
GOVEXP	84.94007	1	0.0000
All	126.6306	5	0.0000

Source: Author's computation using EViews 7

From the results in table 5.8 above, bank activity represented by LBCP Granger cause economic growth. This suggests that economic growth is encouraged by more saving and lending in the economy. This result is also consistent with the bank-based financial structure

theory which posits that the unique role of banks in identifying good projects, mobilising resources, monitoring managers and managing risks promotes economic growth.

With the stock market both LTR and VT Granger cause economic growth. This shows that both the market size and its efficiency encourages economic growth. This result is consistent with Thangavelu and Ang (2002) who argue that well-developed stock markets result in more mobilised capital, diversified risks and availability of useful information required for investment.

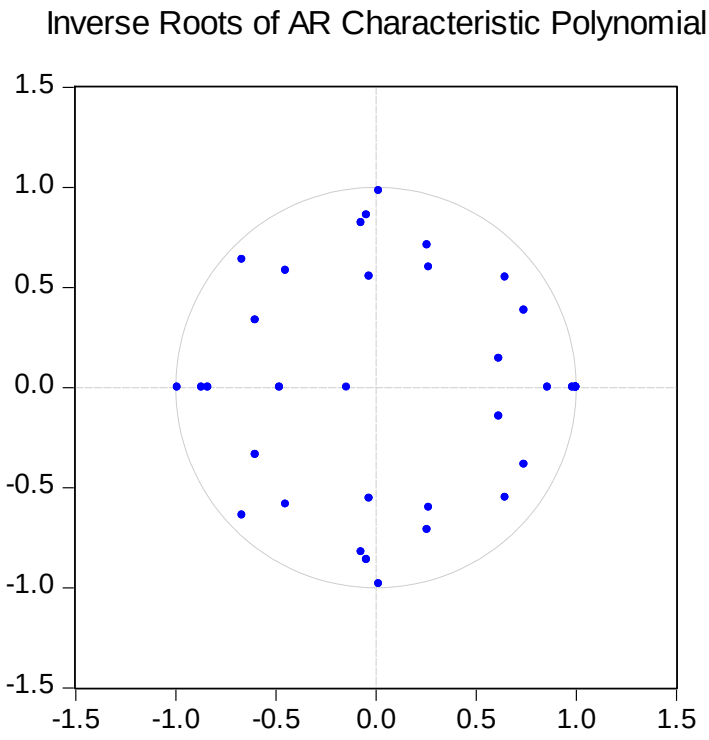
As for the bond market LGDP Granger cause bond market. This implies that the growth of the economy helps in the development of the bond market. This view is supported by Mohanty (2002) who suggested that the potential benefits of a domestic bond market may not be realised if countries are small. With a small and underdeveloped bond market there will be few market players which may reduce competition in the market and distort yields. Turner and Van.t.dack (1996) also argued that the smallness of the market could limit the feasible range of marketable instruments and their effective tradability.

Based on the results it can be concluded that banks and stock markets cause economic growth in South Africa but their impact on economic growth is different due to the different roles they play in the economy.

5.6 Diagnostic checks

Diagnostic checks to validate the parameter evaluation outcomes achieved by the estimated model were done. They are very important in the analysis because if there is a problem in the residuals from the estimated model, it then means that the model is not efficient and the estimated parameters may be biased. The model was tested for serial correlation, normality and heteroskedasticity. AR roots test was also done and the results are presented in figure 5.4. below.

Figure 5.4 AR Roots graph



Source: Author's computation using EViews 7

With the AR test the estimated model is stationary if all roots lie inside the unit circle. Figure 5.4 above shows that all the roots lie inside the unit circle meaning that the VAR model is stable.

5.6.1. Autocorrelation LM test

The Autocorrelation test using the Langrage Multiplier (LM) test was done. The null hypothesis of the test is that there is no serial correlation in the residual up to the specified lag order. Results for LM test are given below on table 5.9

Table 5.9 Langrange Multiplier test results

VEC Residual Serial Correlation LM Tests		
Null Hypothesis: no serial correlation at lag order h		
Date: 10/11/13 Time: 11:52		
Sample: 1990Q1 2011Q4		
Included observations: 82		
Lags	LM-Stat	Prob
1	27.73549	0.8365
2	24.67454	0.9232
3	49.77920	0.0630
4	45.99124	0.1229
5	35.22894	0.5051

6	34.60440	0.5350
7	36.40493	0.4498
8	35.94469	0.4712
9	33.32207	0.5966
10	42.87010	0.2003
11	29.19183	0.7821
12	37.71427	0.3908
13	32.14288	0.6527
14	26.64997	0.8717
15	32.16379	0.6517
Probs from chi-square with 36 df		

Source: Author's computation using EViews 7

With the LM test a zero probability value would indicate the presence of serial correlation and if the probability of the LM statistic is high, we fail to reject the null that there is no serial correlation. In table 5.9 above the probability of 0.5051 at lag 5 is high; therefore, we fail to reject the null hypothesis and conclude that there is no serial correlation among our variables.

5.6.2 Heteroskedasticity test

The heteroskedesticity test using the White test with no cross terms was conducted and the results are shown in table 5.10 below. The null hypothesis for the test is that there is no heteroskedesticity. The null hypothesis is rejected if the probability is less than 5%. From the results below the White test produced a probability of 0.783 hence the null hypothesis cannot be rejected. This, therefore, means the model does not suffer from any misspecifications and hence can be relied on.

Table 5.10 Heteroskedasticity test results

Joint test:		
Chi-sq	df	Prob.
1261.764	1302	0.7834

Source: Author's computation using EViews 7

5.6.3 Residual normality test

The normality test was also done. The null hypothesis for the test is that residuals are multivariate normal. Results are presented in the table 5.11 below.

Table 5.11 Residual normality test results

Null Hypothesis: residuals are multivariate normal		
	Chi-sq	P value
Skewness	0.008843	0.9251
Kurtosis	3.939775	0.4072
Jarque-Bera	3.948618	0.1389

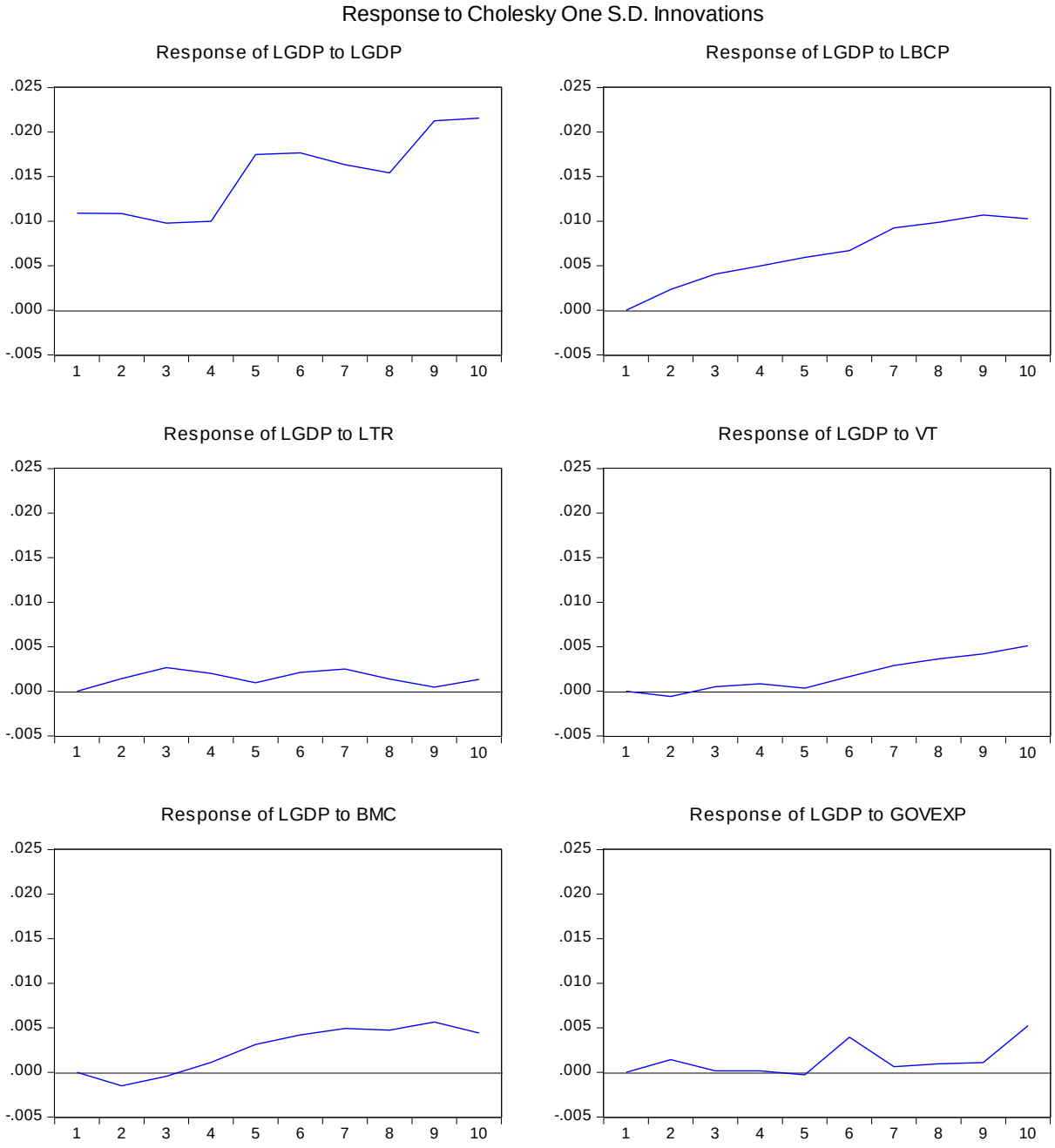
Source: Author's computation using EViews 7

From the results in table 5.11 above we fail to reject the null hypothesis of normality because all the probabilities are above 5%. This is a clear indication of normal distribution.

5.7 Impulse response analysis

Impulse response analysis is important in revealing information on dynamic effects of a model that VECM estimations sometimes do not show. According to Brooks (2008), Impulse Responses Functions (IRFs) trace out the dynamic behaviour of the dependent variables in the VARs to a one standard deviation random shock given to each independent variable. Responses of GDP to banking sector and financial markets variables are shown below in figure 5.5.

Figure 5.5 Impulse response of GDP



Source: Author's computation using EViews 7

The impulse response functions in figure 5.5 above show the dynamic response of economic growth to a one-period standard deviation shock to the innovations of the system and also indicates the directions and persistence of the response to each of the shocks over 10 quarters. Shocks to all the variables are significant although they are not persistent. The variables have varied impact on economic growth. LGDP has a strong permanent shock to LBCP which is positive and significant. The impulse response for LBCP shocks tends to lead to a positive

increase in LGDP. A positive shock is also shown of LGDP to BMC and VT although in the first two quarters a negative relationship is shown. With LTR and GOVEXP transitory shocks with a weak positive effect are shown. Overall, impulse responses indicate that economic growth positively affected BCP, TR, VT, BMC and GOVEXP.

5.8 Variance decomposition analysis

Variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR (Sunde, 2013). It provides information about the relative importance of each random innovation in affecting the variation of the variables in the VAR. The results of the variance decomposition analysis are presented in figure 5.6 and table 5.12. This study allows the variance decompositions for 10 quarters in order to ascertain the effects when the variables are allowed to affect economic growth for a relatively longer time. In the first quarter, all of the variance in economic growth is explained by its own innovations (shocks). In the 5^{th} quarter LGDP explains about 86.7% of its own variation while the other part of about 13.3% is explained by the other variables. Of the 13.3% LBCP explains 9.6%, LTR 1.7%, VT 0.2%, BMC 1.6% and GOVEXP explains about 0.3%.

Table 5.12 Variance decomposition

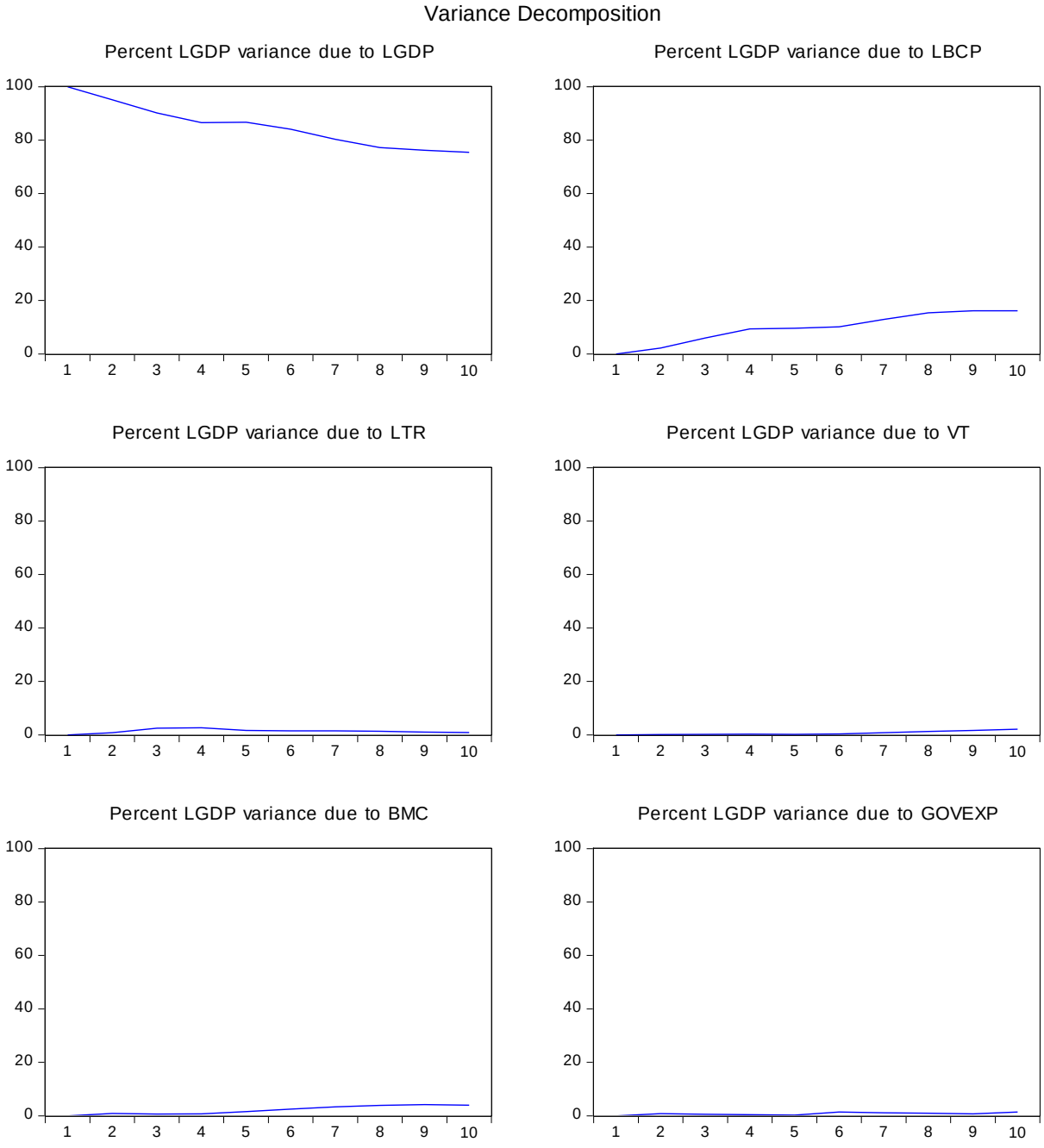
Period	S.E.	LGDP	LBCP	LTR	VT	BMC	GOVEXP
1	0.010902	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.015772	95.10079	2.197441	0.817529	0.132547	0.921788	0.829908
3	0.019193	90.15330	5.972309	2.471581	0.160272	0.675304	0.567229
4	0.022334	86.55823	9.371458	2.635156	0.261358	0.748514	0.425286
5	0.029155	86.70514	9.621141	1.656590	0.167968	1.591057	0.258105
6	0.035315	84.09918	10.14660	1.492700	0.336055	2.505547	1.419921
7	0.040487	80.27630	12.93655	1.518114	0.771047	3.392387	1.105604
8	0.044864	77.18015	15.38056	1.331234	1.284377	3.878100	0.945574
9	0.051280	76.24821	16.12151	1.027200	1.652703	4.179670	0.770711
10	0.057225	75.42549	16.16364	0.878792	2.124674	3.950948	1.456455

Source: Author's computation using EViews 7

After a period of 10 quarters GDP explains about 75.4 of its own variations while the other variables explain about 24.6%. The influence of LBCP increased to about 16.2%, LTR decreased to 0.9%, VT increased to 2.1%, BMC increased to about 4% and GOVEXP increased to about 1.5. Economic growth explains most of its variations followed by LBCP, BMC, VT,

GOVEXP and then LTR. All the variables have a significant impact on economic growth though the impact of LTR is low compared with all the other variables.

Figure 5.6 Variance decomposition



Source: Author's computation using EViews 7

5.9 Conclusion

This chapter presented the results of the estimation techniques that were employed in this study. The unit roots test indicated that all of the variables were stationary at their first difference.

Therefore, the series were integrated of the same order I (1). Long run and short run dynamics between economic growth and the financial sector variables were established using the Johansen cointegration test using a maximum of 5 lags. The results indicated that both the trace and Maximum Eigen value tests reject zero in favour of at least one cointegration vector. The results were significant at the 5% level. The results prove that there is one unique long run equilibrium relationship and this motivated the formulation of an vector error correction model (VECM). LTR, BMC and GOVEXP were found to have a positive relationship with LGDP while LBCP and VT showed a negative relationship with LGDP. LBCP, LTR and GOVEXP were statistically significant in explaining economic growth while VT and BMC were statistically insignificant in explaining economic growth. All the variables except for BMC were found to Granger cause economic growth. A number of residual diagnostics tests were carried out and the results revealed the fitness of the model. The impulse response and variance decomposition were found to be compatible with economic theory. These results guided conclusions drawn and consequently policy recommendations made as outlined in the next chapter.

CHAPTER 6: CONCLUSIONS, POLICY RECOMMENDATIONS AND LIMITATIONS

6.1 Summary and conclusion of the study

Conclusions and policy recommendations from the findings of the study are given in this chapter. The main objective of the study was to establish the financial structure which promotes economic growth for South Africa as outlined in the first chapter. Measures of financial structure were disaggregated into the banking and financial markets sector. Introductory and background information necessary to the study was also given. An overview of the South African financial system and economic growth with more emphasis on trends was given in chapter two. Both the banking sector and the financial market sector were found to have undergone a lot of changes in the past years which have made the South African financial system vibrant and comparable to other industrialised countries.

Applicable theoretical and empirical literature reviewed was given in chapter three. McKinnon (1973) and Shaw's (1973) theory, the endogenous growth model of Pagano (1993) and neostructuralist views were considered in this study. Although these theories disagreed in some of their assumptions, they all advocated the importance of the financial system in providing economic growth. Most of the empirical studies reviewed have been carried out at firm level, industry and cross country studies. Results of most studies at country level, industry level and firm level all tell the same story as their data provided no evidence for the bank-based or market-based views. They found that distinguishing countries by financial structure does not help in explaining cross country differences in long run GDP growth, industrial performance, new firm formation, firm use of external funds, or firm growth. Other studies found that financial structure matters after controlling for the bank development, financial market development, a set of standard controls, and country fixed effects. The results of other studies have shown that variation in both the banking sector and stock market development can explain variation in economic growth, but the degree to which a financial system is market-based or bank-based cannot explain economic development across countries as well as in South Africa.

Based on the extensive review of both theoretical models and empirical studies applicable to the study, variables to use as measures for the banking sector and the financial market sector were identified and an economic growth model was specified in chapter four. The explanatory

variables were bank credit to the private sector, stock turnover ratio, the value of shares traded, bond market capitalisation and government expenditure which was used as a control variable.

Data analysis was performed using the outlined methodology in chapter five. All the variables were tested for stationarity using the Augmented Dickey-Fuller and Phillips-Perron test. All the variables were stationary after first differenced hence they proved to be integrated of the first order. Graphical analysis was also performed to examine the data and to explain the behaviour and trends of the variables over the study period. Long run and short run relationships among variables were determined using the Johansen cointergration test and the vector error correction method. Both the trace test statistic and maximum egeinvalue indicated that at least one cointergrating equation exists at the 5% significance level. With the vector error correction model for long run relationships, all the variables were correctly signed except for LBCP and VT. For short run relationships the results indicated that with LGDP, LTR, VT and GOVEXP there is a feedback mechanism in the short run, meaning these variables converge to their long run equilibrium if any deviation occurs. LBCP and BMC, on the other hand, showed that any disequilibrium in these variables continues to grow.

The Granger causality test was also done and all the variables prove to granger cause economic growth with the exception of BMC which indicated a vice versa relationship. The diagnostic checks performed proved that the economic growth model is quite suitable for capturing the influence of the explanatory variables on economic growth in South Africa.

In summary both the banking sector and financial markets cause economic growth and positively affect economic growth in South Africa but they have different impacts on economic growth due to the different roles they play. So the two different financial structures complement each other in explaining economic growth in South Africa. From this study it can be seen that the financial sector plays a significant role in the South African economy.

6.2 Policy implications and recommendations

Conclusions drawn from this study highlighted a number of policy recommendations for South Africa. Since the study found evidence that financial markets and banks cause economic growth and are also important in explaining economic growth in South Africa, this means that the financial system sector needs to be well developed. To achieve financial development, policies that foster economic growth should be put in place. Measures to improve liquidity, transparency and accessibility of both the banking sector and financial market instruments should be a priority for South African authorities. Taking into account that stock markets in

Africa are underdeveloped and illiquid, authorities should, therefore, encourage stock market development through an appropriate mix of taxes and legal and regulatory policies to remove barriers to stock market operations and thus enhance their efficiency. Strong financial regulation and supervision is also needed more in banks to ensure that credit funds are channelled efficiently to the development of the economy rather than to consumption spending.

Fortunately the South African financial system has undergone massive restructuring in line with market-based liberalization reforms for the past years and these reforms have made South Africa's financial market one of the best in the world. The securities market is a crucial component of a well-functioning financial system. Financial reforms, therefore, represent major progress toward freeing the operation of financial markets. Hence there is need to continue with these reforms in order to enable the financial system to contribute more effectively to economic growth.

From the study it was revealed that banks and markets that are liberalised foster economic growth more. McKinnon and Shaw (1973) support this view, believing that financial repression revealed through administered interest rates would constrain investment and growth because of low savings. Experience, however, has shown that financial liberalisation should be accompanied by a sound regulatory framework to avoid crisis. A policy recommendation that has been given by the IMF and World Bank as central to financial reforms is that of curbing financial repression. To McKinnon and Shaw (1973), a remedy for this is reducing the rate of inflation or raising the institutional nominal interest rates which will, in turn, maximise investment. An inflation targeting policy, therefore, adopted in February 2000, should continue to be effectively managed to keep inflation between 3% and 6% to avoid a large increases in inflation because inflation has detrimental consequences on the progress of any economy, hence the government should address it effectively.

Widening the investor base and market participants is another way the South African authorities can assist the financial system to contribute more towards economic growth. A greater variety and diverse set of participants will make the market more resilient to shocks or to unanticipated changes in interest rates, as well as enable the smooth dissipation of market shocks (Shih, 1996). South Africa is dominated by the big four banks. Opening the market to foreign banks can be one of the ways to widen the investor base and hence improve the number of participants in the market. Entry of foreign banks and securities firms into the finance sector

can increase competition which can lead to the creation of new firms and hence long run economic growth.

BESA should also provide investors with certain facilities to promote higher investments in bonds so as to develop the bond market. More frequent and systematic issuance in the primary market can be used as one of the ways to enhance liquidity in the bond market. Theory argues that big, liquid and well-functioning markets foster growth and profit incentives. So development of the South African bond market can impact economic growth more positively.

The study recommends that policy makers should focus their attention on legal, regulatory and policy reforms that encourage the proper functioning of banks, stock and bond market. Strong financial regulation and supervision in banks especially for all the credits extended to private sector should be a priority of the policy makers to enable funds to be channelled to capital development rather than consumption spending.

6.3 Limitations of the study and areas for further research

The unavailability of quarterly data for some variables suggested by the theoretical model regarding financial structure and economic growth was a challenge as a result the use of interpolated data was unavoidable. Scarcity of wide local literature on financial structure and economic growth also constituted a major limitation of this study though this study is meant to close that gap. Foreign theoretical and empirical literature constitutes the large volume of review yet they may not explain reasons for any identifiable trends in South Africa. The study examined banks, financial markets and economic growth specifically with regard to the casual relationship among the variables. A recommended area for further research is to examine the effects of financial liberalization on the relationship between finance and economic growth in South Africa.

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APPENDICES

A1: Data

PERIOD	LGDP	LBCP	LTR	VT	BMC	GOVEXP
1990Q1	12.49521	4.021651	7.980708	0.107468	25.06069	29.4
1990Q2	12.50948	4.048988	7.622664	0.094871	29.68454	25.4
1990Q3	12.51861	4.060255	7.255591	0.062551	33.11167	25.2
1990Q4	12.5266	4.112313	6.848005	0.04282	35.34206	22.7
1991Q1	12.48421	4.205665	7.526179	0.078748	36.37573	30.4
1991Q2	12.499	4.213514	7.70886	0.104824	36.21266	27.3
1991Q3	12.51033	4.237906	7.428927	0.06344	34.85287	25.2
1991Q4	12.51543	4.258488	7.059618	0.051374	32.29634	23.6
1992Q1	12.47737	4.307086	7.59287	0.064041	21.16602	29.2
1992Q2	12.48455	4.319807	7.597898	0.084398	19.16686	29.1
1992Q3	12.48097	4.349835	7.634337	0.08698	18.9218	27.4
1992Q4	12.47994	4.377651	7.415175	0.076424	20.43085	24.5
1993Q1	12.45744	4.411362	8.148156	0.129104	28.769	34.7
1993Q2	12.48815	4.384011	8.166216	0.10031	31.75624	27.8
1993Q3	12.50921	4.403949	8.097122	0.090097	34.46757	27.8
1993Q4	12.51604	4.434113	8.579041	0.219308	36.903	24.3
1994Q1	12.4752	4.505522	9.019301	0.185663	38.97281	30.1
1994Q2	12.52968	4.467017	8.70118	0.165689	40.89233	27.9
1994Q3	12.54093	4.514408	8.78554	0.222144	42.57182	27.6
1994Q4	12.55166	4.555698	8.486115	0.118557	44.01131	23.5
1995Q1	12.51567	4.626829	8.470102	0.143814	46.04671	29.5
1995Q2	12.53979	4.634907	8.61559	0.161874	46.67179	28.9
1995Q3	12.57814	4.645514	8.53405	0.156818	46.72248	26.1
1995Q4	12.58667	4.684244	8.755422	0.161979	46.19879	24.3
1996Q1	12.55339	4.760185	8.990442	0.205615	43.45207	31.4
1996Q2	12.59892	4.7471	9.005528	0.181611	42.43905	26.5
1996Q3	12.61407	4.773763	9.151333	0.297247	41.5111	28.2
1996Q4	12.62278	4.796083	9.261984	0.271265	40.66823	26
1997Q1	12.58733	4.87417	9.426902	0.440193	40.78897	31.1
1997Q2	12.63122	4.865941	9.852247	0.539279	39.76481	27.4
1997Q3	12.63723	4.884075	9.847076	0.467176	38.4743	27.7
1997Q4	12.63841	4.914465	9.712267	0.455267	36.91743	24.1
1998Q1	12.60007	4.997398	10.2585	1.024681	30.54253	29.2
1998Q2	12.6326	5.013349	10.35857	0.920081	30.27364	27.1
1998Q3	12.63873	5.02469	10.19024	1.03059	31.55909	27.6
1998Q4	12.64374	5.063375	9.896614	0.781429	34.39886	24.9
1999Q1	12.61048	5.116726	10.60666	1.423166	47.09846	28.2
1999Q2	12.65114	5.102045	10.59122	1.043189	49.72468	26.7
1999Q3	12.66615	5.10456	10.56033	1.249219	50.58304	27.1

1999Q4	12.67983	5.110713	10.53736	1.011815	49.67351	22.7
2000Q1	12.64538	5.158043	10.93191	1.458144	42.32058	27
2000Q2	12.68437	5.13494	10.8491	1.406417	39.74553	24.6
2000Q3	12.71686	5.149321	10.77883	1.18414	37.27282	25.1
2000Q4	12.72326	5.169891	10.7014	1.043039	34.90246	21.4
2001Q1	12.68239	5.212953	10.87542	1.625956	29.5891	27.2
2001Q2	12.72092	5.192424	10.87307	1.635313	28.64155	24.2
2001Q3	12.73219	5.228411	10.79661	1.542239	29.01449	26.3
2001Q4	12.74319	5.28304	10.97683	1.293058	30.7079	21.3
2002Q1	12.71682	5.301309	10.99259	1.297606	39.18052	28.4
2002Q2	12.75767	5.268427	11.28705	1.363464	41.33139	23.4
2002Q3	12.76682	5.284629	11.09416	1.18837	42.61924	25
2002Q4	12.78136	5.287746	10.93212	0.98923	43.04408	20.7
2003Q1	12.74838	5.421354	11.10691	1.031701	38.27003	27.8
2003Q2	12.78925	5.396966	11.08575	1.036989	38.70319	23.4
2003Q3	12.79642	5.420508	11.23397	1.130712	40.00769	27.3
2003Q4	12.80507	5.439469	11.03891	0.90782	42.18352	22.4
2004Q1	12.78517	5.455005	11.40094	1.091942	48.49543	27.7
2004Q2	12.82588	5.418087	11.37548	1.050001	51.10804	24.7
2004Q3	12.84541	5.452609	11.36736	1.01202	53.2861	26.3
2004Q4	12.86018	5.513644	11.39155	1.045271	55.02961	22.5
2005Q1	12.83821	5.562369	11.54685	1.200552	54.30907	28.3
2005Q2	12.87647	5.569764	11.56798	1.115084	55.99525	25.5
2005Q3	12.89852	5.605591	11.82387	1.376206	58.05867	26.1
2005Q4	12.90925	5.642633	11.64308	1.177385	60.49933	22.9
2006Q1	12.88778	5.72942	12.18372	2.073339	65.34468	28.8
2006Q2	12.92464	5.73219	12.35577	2.039737	67.72883	25.4
2006Q3	12.94966	5.779982	12.11417	1.560513	69.67924	25.9
2006Q4	12.97775	5.804006	11.83544	0.988724	71.1959	24.2
2007Q1	12.95225	5.880493	12.38719	1.437703	76.22331	27.1
2007Q2	12.97853	5.899892	12.45561	1.442448	75.29469	25.7
2007Q3	12.99951	5.933807	12.39427	1.256456	72.35452	26.5
2007Q4	13.02623	5.950552	12.22684	1.046302	67.40281	24.5
2008Q1	12.98924	6.047031	12.54098	1.565991	48.38968	27.7
2008Q2	13.0278	6.040323	12.52291	1.453987	44.23484	24.4
2008Q3	13.03822	6.046565	12.67524	1.555535	42.8884	28.4
2008Q4	13.04414	6.060165	12.08161	1.249189	44.35037	27.5
2009Q1	12.98033	6.137567	12.49828	2.010392	61.17318	28.6
2009Q2	13.00081	6.108925	12.36834	1.658645	63.23099	28.5
2009Q3	13.01813	6.085149	12.44386	1.51873	63.07624	29.4
2009Q4	13.03859	6.064396	12.1969	1.140876	60.70893	29.1
2010Q1	13.00296	6.108213	12.55642	1.594231	49.48343	29.3
2010Q2	13.03351	6.085723	12.42321	1.299701	45.34924	27.5
2010Q3	13.05107	6.095164	12.42402	1.169689	41.66074	29.8

2010Q4	13.07158	6.08472	12.18278	1.077975	38.41793	28.8
2011Q1	13.03956	6.121613	12.62406	1.393331	35.6208	28.5
2011Q2	13.06851	6.102328	12.54549	1.261329	33.26936	27.6
2011Q3	13.08229	6.116779	12.71529	1.464107	31.36361	31
2011Q4	13.10486	6.111301	12.30171	1.041062	29.90354	28.9

A2: VECM results

Vector Error Correction Estimates
Date: 10/08/13 Time: 11:19
Sample (adjusted): 1991Q3 2011Q4
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LGDP(-1)	1.000000
LBCP(-1)	-1.185147 (0.10185) [-11.6359]
LTR(-1)	0.313530 (0.03962) [7.91341]
VT(-1)	-0.019398 (0.03739) [-0.51884]
BMC(-1)	0.001128 (0.00104) [1.08858]
GOVEXP(-1)	0.038922 (0.00726) [5.36321]
C	-10.88129 (0.14538) [-74.8496]

Error Correction:	D(LGDP)	D(LBCP)	D(LTR)	D(VT)	D(BMC)	D(GOVEXP)
CointEq1	-0.018972 (0.04272) [-0.44407]	0.112308 (0.08010) [1.40205]	-1.642142 (0.72858) [-2.25390]	-0.093446 (0.77355) [-0.12080]	2.135093 (13.2441) [0.16121]	-20.57360 (4.19685) [-4.90216]

A3: Granger Causality Results

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 10/11/13 Time: 12:36
Sample: 1990Q1 2011Q4
Included observations: 87

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
LBCP	5.292709	1	0.0214
LTR	7.598572	1	0.0058
VT	5.536469	1	0.0186
BMC	3.318173	1	0.0685
GOVEXP	84.94007	1	0.0000
All	126.6306	5	0.0000

Dependent variable: LBCP

Excluded	Chi-sq	df	Prob.
LGDP	6.639594	1	0.0100
LTR	0.003053	1	0.9559
VT	5.194316	1	0.0227
BMC	1.699831	1	0.1923
GOVEXP	58.95719	1	0.0000
All	100.2850	5	0.0000

Dependent variable: LTR

Excluded	Chi-sq	df	Prob.
LGDP	14.16681	1	0.0002
LBCP	30.81339	1	0.0000
VT	1.651891	1	0.1987
BMC	0.499244	1	0.4798
GOVEXP	27.81767	1	0.0000
All	49.43649	5	0.0000

Dependent variable: VT

Excluded	Chi-sq	df	Prob.
LGDP	2.636546	1	0.1044
LBCP	4.090634	1	0.0431
LTR	0.062267	1	0.8029
BMC	0.600392	1	0.4384
GOVEXP	19.24784	1	0.0000
All	32.28492	5	0.0000

Dependent variable: BMC

Excluded	Chi-sq	df	Prob.
LGDP	0.116965	1	0.7323
LBCP	0.021039	1	0.8847
LTR	7.74E-07	1	0.9993
VT	0.982603	1	0.3216
GOVEXP	0.018192	1	0.8927
All	2.499581	5	0.7766

Dependent variable: GOVEXP

Excluded	Chi-sq	df	Prob.
LGDP	3.275206	1	0.0703
LBCP	21.88830	1	0.0000
LTR	13.30140	1	0.0003
VT	4.126881	1	0.0422
BMC	1.283466	1	0.2573
All	44.67264	5	0.0000

A4: Editor's Declaration

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27 November 2013

TO WHOM IT MAY CONCERN

I hereby confirm that I have proofread and edited the following Masters thesis using the Windows "Tracking" system to reflect my comments and suggested corrections for the student to action:

> *Financial structure and economic growth nexus: comparisons of banks, financial markets and economic growth in South Africa* by Praise Godza, a dissertation submitted in fulfilment of the requirements for the degree of MASTER OF COMMERCE ECONOMICS in the Faculty of Management and Commerce at the University of Fort Hare.

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