AN ANALYSIS OF MACROECONOMIC DETERMINANTS OF BANKING SECTOR

DEVELOPMENT IN NAMIBIA

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ABSTRACT

This study carries out an empirical investigation of the determinants of banking sector development in Namibia. The study uses quarterly data for Namibia covering the period of 2000: I to 2011: IV, obtained from the Bank of Namibia. The indicator that is used to represent banking sector development is the ratio of credit extended to the private sector by the banks to gross domestic product (GDP). The study uses the autoregressive distributed lag model (ARDL) for the analysis. The bounds test for cointegration is used to test whether a long run relationship exists between the included variables. In addition, an ARDL framework is also used to test whether any of the included variables: real gross domestic product, nominal interest rates, inflation and the ratio of market capitalisation to nominal gross domestic product as a proxy of stock market development, impacts development in the banking sector. The main result from the study is that a long run relationship exists between the variables. Secondly, the estimated coefficients for the variables impacting banking sector development have expected signs. Real GDP, nominal interest rates positively influence banking sector development, while inflation is found to negatively impacts banking sector development. Stock market development is insignificant in determining banking sector development. The results suggest that developing the real sector without keeping interests rates too low could benefit the banking sector development.

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Dedication

I wish to dedicate this thesis to my beloved father Mr Matias Shifotoka and my beloved mother Mrs Selma Shifotoka; and to my sisters, brothers, nieces and nephews. Here is what I have been up to, the last two years.

Declarations

I, Maria Ndapewa Shifotoka, declare hereby that this study is a true reflection of my own research, and that this work, or part thereof has not been submitted for a degree in any other institution of higher education.

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Maria N. Shifotoka

List of Acronyms

ADF   Augmented Dickey Fuller

AgriBank   Agricultural Bank of Namibia

ARDL   Autoregressive Distributed Lag

BoN   Bank of Namibia

CMA   Common Monetary Area

DBN   Development Bank of Namibia

GDP   Gross Domestic Product

HHI   Herfindahl-Hirschman Index

KPSS   Kwiatkowski-Phillips-Schmidt-Shin

MENA   Middle Eastern and Northern Africa

NDP   National Development Plan

SACU   Southern Africa Customs Union

SMEBank   Small and Medium Enterprise Bank

Chapter One

1.0 Introduction

1.1 Orientation of the Study

Financial institutions are firms that provide a mechanism for surplus-lending units to transferfunds to deficit-spending units, (Levine, Loayza, & Beck, 2000). They are often referred to as financial intermediaries. Financial intermediary development, therefore, is the resultant improvement and enhancement in the quality and efficiency of the financial intermediaries. The functions of this part of the financial sector range from capital allocation, mobilisation of savings to monitoring and evaluation of borrowers, (Eita &Jordaan, 2007; Klein & Olivei, 2008). A strong financial sector is also a stable source of funding as compared to capital inflows. These functions enable the financial intermediary sector to contribute to economic development of a country.

The importance of the financial sector in the economy dates back to theories stipulated by Hamilton (1781) who stated that "banks were the happiest engines that ever were invented to spurring economic growth" (as cited in Levine et al., 2000) and by Schumpeter (1912) who argued that "services provided by financial intermediaries are essential for technological innovation and economic development" (as cited in King & Levine, 1993). Developing the financial sector, therefore, became an important development target for countries. Some countries managed to promote development in their financial sectors, while others remained poorly or underdeveloped, (Law & Demetriades, 2006). Countries were, therefore, faced with the challenge of identifying factors that are determinants of financial sector development over the years. In Namibia, a financial sector strategy plan has been formulated, which is aimed at guiding the financial sector into a more competitive, resilient, effective and

inclusive sector, to mention just a few (Bank of Namibia, (BoN), 2011). These targets are in line with those that are stipulated in various national development plans.

Of all financial intermediaries, commercial banks play a principal role as far as channelling and mobilising funds is concerned, especially to the private sector, for investment purposes or for other economic activities. According to literature (Levine et al., 2000; Levine, 2002),commercial banks are, thus, important entities for most emerging economies. Given the fact thatthe financial sector contributes to economic development, (Levine et al., 2000; Eita & Jordaan, 2007), enhancing performance and development of financial intermediaries is, therefore, vital for bringing about accelerated economic growth through facilitation of wealth creation, trade as well as capital formation. The study therefore, focuses on establishing the determinants of banking sector development in Namibia.

The Namibian financial system comprises of the Bank of Namibia as the central bank; four commercial banks, namely, First National Bank of Namibia , Bank Windhoek, Standard Bank of Namibia and NedBank Namibia; a number of other banking institutions which includeNamibia Post Office Savings Bank; development financial institutions namely Agricultural Bank of Namibia (AgriBank), the Development Bank of Namibia (DBN), and the Small and Medium Enterprises (SME) Bank; a range of non-bank financial institutions such as insurance companies and pension funds; the National Housing Enterprise; smaller financial intermediaries in the form of stockbrokers and money market funds; as well as the Namibian Stock Exchange.

Banking sector development in Namibia, as measured according to depth and size, by indicators such as the ratio of broad money stock to GDP (M2/GDP) and the ratio of private credit to GDP (PC/GDP) respectively, has been fluctuating. There is, however, a general upward trend. This is shown below in figure 1.1:

Fig. 1.1 Banking sector development as measured by PC/GDP and M2/GDP
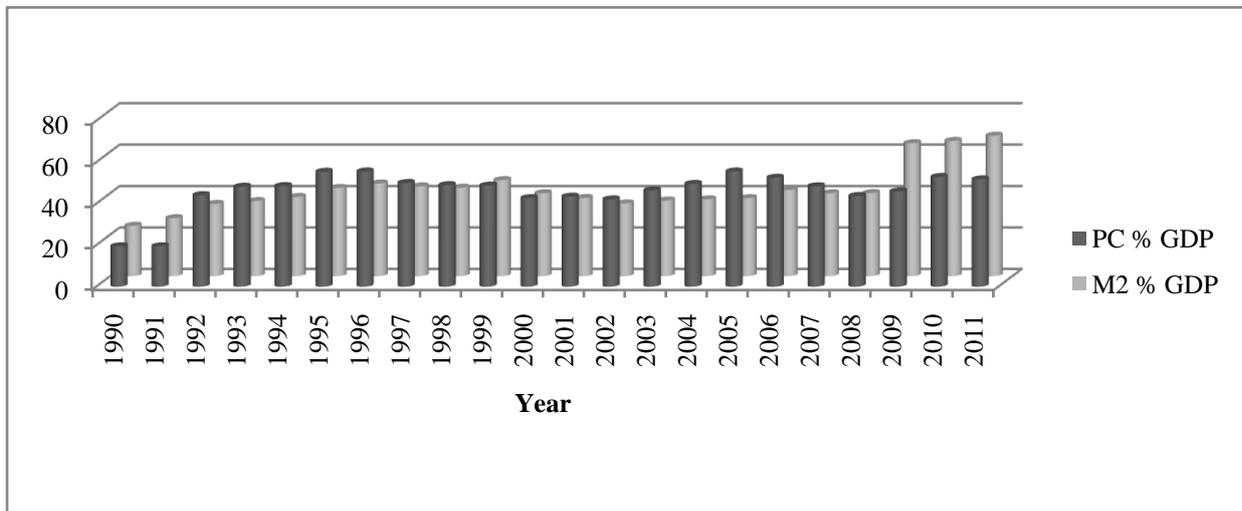
Data source: World Development Indicators (2012)

Figure 1.1 shows that a general upward trend in both indicators of banking sector development, although slowing down during the years 2000 to 2002, has been recorded since the period of 1990 to date. This is due to the favorable performance of the banking sector as well as increases in loans and advances from commercial banks as well as interest-bearing liabilities of the commercial banks.

1.2 Statement of the Problem

The financial system in Namibia is relatively young and is regarded as well-developedcompared to financial systems in sub-Saharan Africa (BoN, 2008). Namibia has a dual financial system madeup of formal and informal sectors. Part of the formal financial sector is made up of the banking sector. The informal banking sector comprises of cash loan operators, moneylenders and the formal banking sector is represented by the central bank, four commercial banks and developmental banks.

The commercial banking sector is the most dominant sector inthe Namibia financial system and it plays a clearer intermediary role than any othertype of financial institutions. At the end

of 2010, the total asset value of the banking sector recorded an 8.0 per cent growth rate, amounting to N$51.15 billion. A total amount of N$5.5 billion of total assets was generated from liquid assets alone.This growth is attributed to increases in loans and advances (BoN, 2010). The ratio of M2/GDP has been increasing since 1990. Although growth slowed down from the period of 2001 it picked up again in year 2006. The highest ratio was recorded in year 2011 after consistent increases since 2006. Similarly, the ratio of PC/GDP has also followed a similar trend since independence, but the highest ratio was recorded between the period of 1995 and 1996 and during 2005. There is, however, a general upward trend.

Whenever financial services are supplied broadly and efficiently, they accelerate economic growth, increase the efficiency of resource allocation and improve the distribution of wealth. Achieving a more efficient, competitive and resilient financial system will be vital for securing the prospects for sustainable economic growth and development.The Bank of Namibia, in its strategy for financial intermediary development plan document, identified key weaknesses within the financial system such aslimited competition, limited financial safety nets, inadequate and less effective regulation, limited access to financial services, low financial literacy and lack of consumer protection, limited financial management skills, and low participation by Namibians and thus dominance of foreign ownership of financial institutions (BoN, 2011). There is no earlier study for Namibia focusing on the determinants of banking sector development.This study aims at bridging the gap brought up by lack of inclusive investigation on determinants of financial intermediary development in Namibia. The purpose of this study; given the performance of the banking sector discussed earlier is, therefore, to identify determinants of the development in this part of the financial sector in Namibia.

1.3 Objectives of the Study

In light of the above discussion, the objective of this study is, hence, to identify and establish the macroeconomic variables that bring about or discourage development in the banking sector. This identification requires analysis of the impact that the chosen variables have on banking sector development.

1.4 Significance of the Study

The study is timely, especially since the Government of the Republic of Namibia is working towards achieving an optimal financial sector by the year 2021 (BoN, 2011). Banking sector is an important engine for bringing about economic enhancement. Most emerging countries depend on the banking sector to provide funding for new investment projects. Therefore, an underdeveloped banking sector can delay the development process. To the researcher's knowledge, there is no study of this nature done in Namibia. Therefore, the study may assist policy makers in formulating policies geared towards creating an optimal financial sector in Namibia. The study may contribute to building further on the existing knowledge and literature on financial sector development for Namibia.

1.5 Limitations of the Study

The study is focusing on macroeconomic variables as determinants of banking sector development in Namibia. Other possible factors that may influence the development of the banking sector such as financial literacy as well as culture or institutional factors are not included. These factors are beyond the scope of this study. No interviews were conducted for any input in the study.

1.6 Outline of the Study

The rest of the study is outlined as follows: Chapter two analyses the economic development and financial system in Namibia, Chapter three presents the theoretical and empirical literature review for the study. The methodology of the study and the empirical estimation and result interpretation are contained in Chapter four and Chapter five, respectively. Chapter six contains the conclusion and policy implications of the study.

Chapter Two

2.0 Overview of Economic Development and Financial System in Namibia

2.1 Economic Development

Namibia became independent on March 21ˢᵗ 1990, and inherited well performing physical infrastructure system. Namibia is endowed with an economy rich in natural resources, sound economic management and strong public administration. However, Namibia has also inherited some social and economic inequalities, with a Ginicoefficient of above 0.6 in 2010 (Central Bureau of Statistics, 2010). Namibia's income distribution is, therefore, among the most unequal in the world. Namibia's per capita national income saw the country being rated as a high-middle income (World Bank, 2011). After independence, the country was faced with the need to increase social welfare and raise standards of living for the majority of the people especially living in rural areas. With the millennium development goals framework in place, Namibia, like any other countries, embarked on efforts to address social and economic challenges. Improvements in access to basic primary education, health care, and safe water and sanitation were realised. Namibia's population at independence stood at 1.4 million people and in 2011, it has almost doubled over the years. The 2011 population and housing censusresults indicate that the total population is now 2.1 million people. The rate of economic growth for the 2011 fiscal year was 3.7 per cent (National Planning Commission, 2011).

For the period before independence, 1980-1989, the economy recorded an average growth rate of 1.01 per cent (National Planning Commission, 1991). The driving sector for this growth rate was the tertiary sector, consisting oftrade, transport, finance and governmentservices,which recorded an average growth of 3.7 per cent, while the secondary

sectorwhich includes manufacturing, electricityand water, and construction; and the primary sector,which consists of agriculture, fishing and mining recorded average growths rates of 0.75 per cent and -1.4 per cent respectively.The primary sector recorded negative growth rates because of unfavourable performances in the mining industry. However, shortly after independence, for the period of 1991 – 1998, the primary sector recorded better performance in the fishing industry, which transformed in to 3.6 per cent contribution to the average growth rates of the economy. The tertiary and secondary sectors both recorded improved growth rates of 3.5 per cent. The average growth rate for the economy improved to 3.5 per cent, (National Planning Commission, 2000).

To date, the tertiary sector is the biggest contributor to GDP (BoN, 2010). The 2007 global financial crisis saw the GDP growth rate decline to 1.1 per cent in 2009, primarily as a result of a decline in exports of diamonds and gold and other natural resources. However, the economy managed to pick up again in 2010, recording a growth rate of 6.6 per cent and an average growth of 4.9 per cent in 2011. This strong growth is accredited to expansionary measures by the government since 2009 as well as to high commodity prices as a result of increased global demand of natural resources.

Figure 2.1below shows the annual growth rates of GDP for the Namibian economy, for the period of 1980 to 2011:

Fig 2.1 Annual GDP growth rates
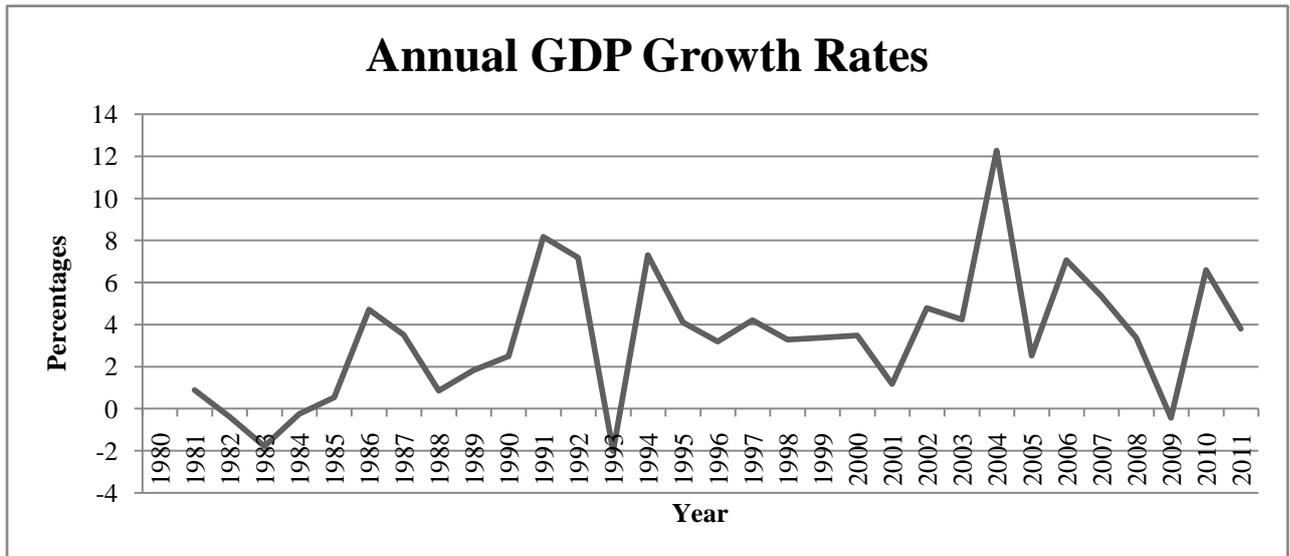
Figure 2.1 Data source:World Economic Indicators (2012)

Figure 2.1 depicts the annual GDP growth rates for the Namibian economy, for the period of 1980 to 2011. Negative growth rates were recorded during the years 1983 1nd 1993, with growth rates of -1.7 per cent and -2.0 per cent, respectively. 1993 recorded the lowest growth rates. On the other hand, the highest annual GDP growth rates were recorded in 2004 with 12.27 per cent.

Namibia's monetary policies are in line with those of South Africa's and the economic patterns are similar. Monetary policy effects from South Africa could still be inherited into the Namibia economy; for example, Namibia's inflation rate is mostly imported from the South African economy (BoN, 2010). Namibia's economy is also closely linked to that of other southern Africa because of trade agreement bodies such as the Southern African Customs Union (SACU), which allows member countries: (Botswana, Lesotho, Namibia, Swaziland and South Africa) to engage in free trade among each other while keeping a common external tariff when trading with the rest of the world (Sherbourne, 2009). Namibia is also a member of the common monetary area (CMA), together with Lesotho, Swaziland

and South Africa. The Namibian dollar is pegged on a one to one basis to the South African rand. Three of the commercial banks in Namibia, namely, First National Bank, Standard Bank and NedBank Namibia have their headquarters in South Africa. Before the 2007 global financial crisis, the Namibian economy has been stable with steady GDP growth rates, moderate inflation and public debt. Namibia's growth rates are mean-reverting, around 4 per cent since independence to around 5 per cent between the period of 2000 and 2008 (BoN, 2008).

2.2 The Namibian Financial System

The Namibian financial system is made up of the formal and informal institutions. The formal sector consists of the central bank, commercial banks, insurance companies, capital markets as well as stock exchange markets operations, whereas the informal sector comprises of cash loans operators, money lenders to mention a few. There are also developmental finance institutions such as the Development Bank of Namibia and the Agricultural Bank of Namibia and the SME Bank of Namibia.

2.3 The Banking Sector

The banking sector comprises of the Bank of Namibia, four commercial banks, a savings' bank and three developmental banks.

2.3.1 The Central Bank

The central bank was established by the bank of Namibia Act 8 of 1990 with the prime objective of providing and maintaining a sound monetary, credit and financial system. In addition the bank of Namibia (BoN) was established to promote internal and external monetary stability, serve as lender of last resort to commercial banks as well as be a banker of the government. The Bank of Namibia is also expected to coordinate and spearhead the

attainment of national goals by means of appropriate monetary policy measures. It is necessary to mention that Namibia's monetary policy regime is geared towards the existing exchange rate system of the common monetary area union in which Namibia, South Africa, Lesotho and Swaziland are member states.

The Bank rate is the main instrument used by the Bank of Namibia for carrying out the monetary policy. Although adjustable, at times, to be in line the with that of other common monetary area member states' Bank rate, the Bank of Namibia may maintain a different rate tailored to suite the domestic money supply and demand, directly, as per Bank of Namibia Act 15 of 1997. The Bank of Namibia, therefore, regulates and oversees the operation of commercial banks in the economy through monetary policies.

2.3.2 Commercial Banks

Commercial banks also play a vital role in Namibia's financial system, as they also allocate funds for investment projects and mobilise savings. Commercial banks in Namibia operate under the Banks Institutions Act 2 of 1998 which aims to consolidate and amend the laws relative to banking institutions. The Act aims to provide authorisation of a person to conduct business as a banking institution and to control, supervise and regulate banking institution. This act also aims to make provision for the winding-up or judicial management of banking institutions and for the cancellations of authorisations, and also as provision for matters concerning banking institutions in Namibia. The most recent amendment of this Act was made in 2010, Act 4 of 2010, when BoN embarked on activities to strengthen the regulatory and supervisory framework to ensure banking institutions comply with international best practices. This amendment Act includes provisions for permitting the establishment of branches of foreign banking institutions in order to stimulate competition among banking

institutions, as well as provisions to permit the Minister of Finance to issue regulation relating to ownership and citizenship of board of directors, officers of banks and bank controlling companies

In 2010, the value of the banking sector recorded an 8.0 per cent growthrate, amounting to N$51.15 billion of total assets. This growth is attributed to increases in loans and advances. The commercial banks offer various products and services tailored to meet personal financial needs and circumstances. Among services offered by the commercial banks are provision of credit, mortgage loans, vehicle finance, foreign exchange services, debit cards or credit cards accounts, internet and cell phone banking. The ratio of M2/GDP has also shown an upward growth trend since 1990. Credit extended to the private sector has also increased and resulted in increased investment (BoN, 2010).

2.3.3 Savings Bank

The only savings bank in Namibia isthe NamPost Office Savings Bank. This savings' bank was established by the Post and Telecommunication Act 19 of 1992. The Ministry of Finance serves as the lender of last resort to this bank. The savings bank does not give loans to its consumers, but it, however, accepts fixed term deposits and also offers money transfers. In addition, the bank offers savings accounts, savings certificates as well as the save as you earn accounts.

2.3.4 Banking Sector Performance

The following banking sector performance review is made with reference to the Bank of Namibia Financial Stability Report for 2011. This review includes a look at the banking sector assets, profitability, and capital requirement.

The number and size of the banking institutions have an influence on both banking stability as well as access to credit (BoN, 2011). The central bank also reported that in 2011, banking sector assets were fully owned by the operating commercial banks. Even with a satisfactory level of assets, it is reported that during the year 2011, primary indicators of banking sector concentration and market power presented a high degree of concentration from one bank. The Namibian banking sector remains shallow with limited competition as one bank has acquired more market power compared to the other banks. This concentration is indicated by both the Gini and the Herfindahl-Hirschman Index (HHI) which rose from 11.1 points and 2,698 points during the last quarter of 2010 to 11.7 points and 2,883 points, respectively at the end of the second quarter of 2011. The rise in the indices is, therefore, an indication that one of the banking institutions has gained asset market shares at the expense of other banking institutions (BoN, 2011).

A record of fluctuating asset growth could be a result of risks suffered by the banking sector. However, total assets of the banking sector remained on a general upward trend, although slowed down during the second quarter of year 2010. The balance sheet of the banking sector still presented a good picture of the performance of the banking sector. This is depicted in figure 2.1 below, which is only showing the upper half of the covered period of this study:

Fig. 2.2 Banking Sector assets
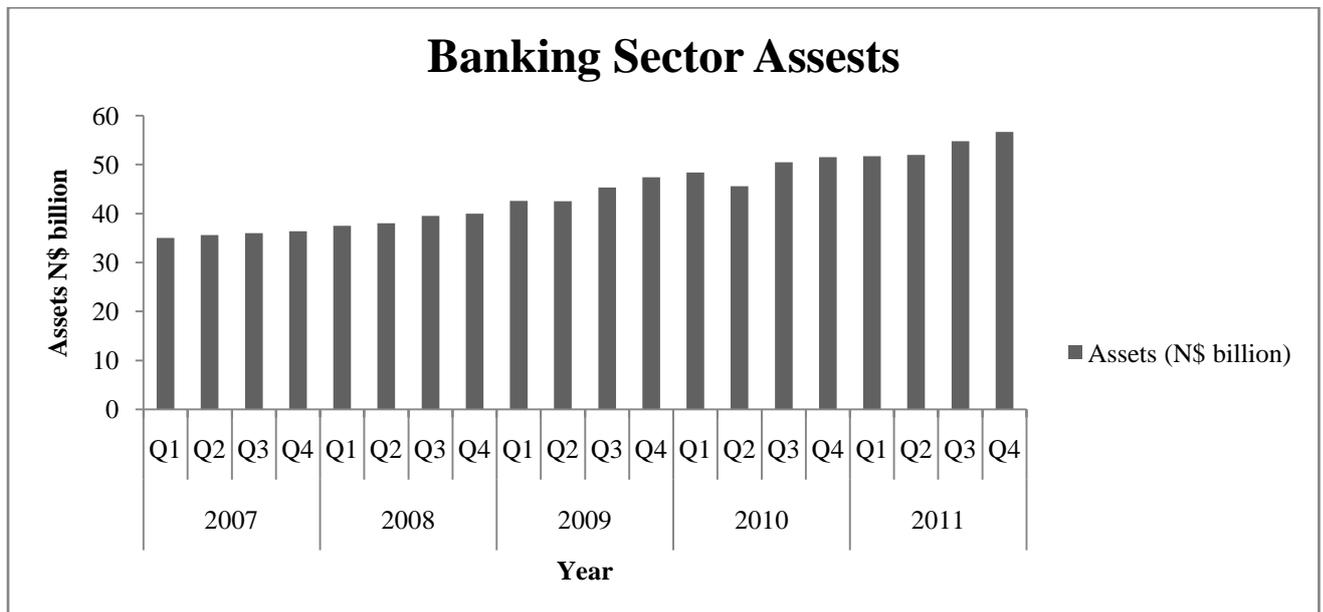
Fig 2.2 Banking sector assets(BoN 2011)

Profitability of banking institutions allows for banking sector to be sustainable and solvent. A solvent banking sector is essential forthe security of the banking system (BoN, 2011). Bank profits declined during year 2011 due to a fall in After-Tax Income. This fall in the After-Tax Income was also detected in the return on assets and return on equity during the same year. Although banking sector profitability has declined, competent banking processes were maintained and the sector kept sufficient capital levels, and the sector, therefore, remained solvent and stable. Bank capitalisation, which acts as a safeguard against unanticipated losses, is an indicator of banking stability. The prevailing leading indicator of capital adequacy is the regulatory risk-weighted capital ratio of not less than 10 per cent (BoN, 2011). The banking sector continued to be sufficiently capitalised exceeding the minimum capital ratio to 19.3 per cent during year 2011, despite profitability setbacks.

2.3.5 Development Financial Institutions

Development Financial Institutions include the Development Bank of Namibia (DBN), the SME Bank, and the Agricultural Bank of Namibia (AgriBank). DBN was established by Act 8 of 2002 to provide for the establishment of the development Bank with a purpose of contributing to economic growth and social development of Namibia, by providing financing in support of key developmental activities and provide for matters related. The SME Bank was founded by the Namibian government after the closure of the Small Business Credit Guarantee Trust which is transformed into a commercial banking institution. The main purpose of this banking institution is to provide well-intended banking and financial services to small and medium enterprises, in order to enable them to grow into global entities. The Agricultural Bank of Namibia was established by means of Act 13 of 1994 to regulate the activities of the bank. The objective of the Agricultural bank is mainly the promotion of agricultural activities and other activities related to agriculture. This promotion entails lending money to persons who wish to pursue agricultural activities; or lending money to financial intermediaries which in turn may extend funds to persons who are in need of money to finance their agricultural projects.

Chapter Three

3.0 Literature Review

3.1 Introduction

This part of the study looks at the theoretical and empirical determinants of financial intermediary development. It includes definitions and some selected empirical evidence provided by studies on financial intermediary development.

It is well-known that financial intermediary development and economic growth have a strong relationship. A number of studies have focused on this relationship, and their findings were that there exists a positive relationship between financial development and economic growth. The direction of this causality, however, remains inconclusive.Some studies suggest that financial intermediaries and financial reforms should be enhanced in order to promote economic growth (Eita & Jordaan, 2007). A study by Sindano (2009) for Namibia, and a study by Seetanah, Ramessur, and Rojid (2007) for Mauritius suggest that economic growth enhances financial intermediary development.

Banking sector development can be measured by a number of factors, like size, depth, access and soundness. It can be measured by examining the performance of banks through a number of products on offer. A high degree of banking sector development in a country broadens the availability of financial services. A well-developed banking system offers lower risk and high returns on borrowed funds (Benyah, 2010). The intermediation function of the banking system can be analyzed by looking at the structure of the sources and the extension of funds in the economy.

The World Bank, in its Financial Development Report (2011), defines financial intermediary development as the factors, policies and institutions that lead to effective financial intermediation, as well as deep and broad access to capital and financial markets. A correct policy mix for factors and institutions that influence financial linkage between financial intermediaries is bound to result in financial deepening of a nation. Banks are, in most African countries, financial intermediaries that link people with financial services. For the banking sector to flourish, a stronger support system needs to be put in place. This system need to oversee the entire operation and regulation of the banking sector. Effective regulation of the banking sector creates an environment conducive enough for banks to carry out the intermediary functions. The World Bank has also outlined several pillars to ensure that the banking system is developed not only for the banks but also for consumers. Three traditional pillars, namely, institutional quality, business environment and financial stabilityare discussed in the following paragraphs.

3.1.1 Institutional Quality

Levine (1998) suggests that legal rules about protecting creditors have a greater impact on banking sector development. Where there are no clear enforcement of property rights, protection of investor and effective regulation, financial intermediaries will be hesitant to operate. This narrows the accessibility of financial services and development of the financial system. Benyah (2010) defines institutional quality as the extent to which procedures by regulatory authorities foster investor protection and enhancing greater access to funds for borrowers. Institutional environment encompasses liberalization of the financial sector, as well as governance, legal and regulatory issues concerning financial markets. Herger (2007) (as cited in Law & Demetriades, 2006) found that one of the main obstacles to financial intermediary development is dysfunctional institutions. Investor friendly countries with

strong institutionalenvironment seem to achieve deeper financial intermediary development. Protection of consumers and ensuring the efficiency of financial systems with effective supervision and regulation enhances the efficiency of the financial system without hampering the development and innovation of the system.

3.1.2 Business Environment

Another aspect of financial intermediary development to consider is the environment the business is being conducted in. A well-defined and equipped environment enhances development in terms of availability of skilled workers, physical, institutional and technological infrastructures as well as costs of doing business. All these help to improve the quality of financial services. Outreville (1999) examined the relationship between human capital development and financial intermediary development and found out that the two are positively related. The degree of training of staff and cost of doing business are strong indicators to measure the strength of the business environment in the economy.

3.1.3 Financial stability

The third important pillar of financial intermediary development is financial stability which ensures that risks do not outweigh returns. Huang (2010) argued that it is important to have a stable financial system in order to measure the extent and depth of financial intermediary development. Controlled and minimized risk of currency crises and systemic bank crisis symbolizes financial intermediary development, and so is the accessibility of commercial and retail access (Kablam, 2010). Banking financial services are also some of the important elements of financial intermediary development. Accurate measurements of the size, efficiency and financial disclosure of the sector are important to consider when evaluating the progress of the financial deepening (World Bank, 2011).

3.2 Theoretical Review

Financial intermediary development is the resultant improvement and enhancement in the quality and efficiency of the financial intermediaries. The functions of the financial sector range from capital allocation, mobilising of savings to evaluation and monitoring of borrowers. It is responsible for providing a mechanism for profitable units to transfer funds to loss-making units (Eita & Jordaan, 2007). Banks perform a crucial developmental function especially in developing countries where sources of finances are inadequate. Banks provide monitoring and screening of borrowers in order to minimise moral hazard problems. This act of monitoring enables banks to remain liquid and that the finances are directed towards profitable projects.

Bank based financial systems emerge to improve the acquisition of financial information and to lower transaction costs as well as allocate credit more efficiently. Allocating credit more efficiently is particularly an important element in developing countries, because banks are more effective than markets, especially because non-banks financial intermediaries are generally less refined. Well-established banks also form closer and stronger ties with the private sector, establishing a relationship that enables them to acquire information about firms more efficiently and to avoid default. Banks are also key players in eradicating liquidity risks, enabling banks to increase investment in high return, illiquid assets and speed up the process of economic growth.

One of the key measures of development of the banking system is size. The larger the banking system, the more capital can be channelled between savers and investors. Efficiency is also an important aspect of the banking system development. Direct measures of bank system efficiency include operating ratios such as operating costs to asset ratios and ratio of

non-performing loans to total loans made. The indirect measure of efficiency is public ownership. This is stemming from the fact that publicly owned banks tend to be less efficient, therefore, disturbing the process of credit allocation and channelling capital. Lack of competition may also explain profitable banks operating poorly in terms of efficiency and size measures. The role of financial information disclosure within the operation of banks is also important for ensuring smooth and accurate operation of the banks (Demetriades & Fielding, 2009). Policies aiming for correct and appropriate information disclosure and that authorise private sector corporate control of banks encourages bank system development. Banks are financial intermediaries that exist in order to minimise frictions in transactions between borrowers and lenders. These frictions include both transaction costs and information costs. This intermediation helps to diversify and share risks. In other words, banks help entities to exploit economies of scale. Banks also exists for liquidity insurance purposes. Financial intermediaries act as a pool of liquidity that provides clients with some assurance against unexpected shocks.

Banking sector development can be measured with various indicators. These indicators measure different aspects of banking sector development in terms of size, depth, access, to mention just a few. Money and quasi-money (M2) and Liquid liabilities (M3) are indicatorsof banking sector development that measurethe size and depth of the banking sector. M3 is made up of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveller's cheques; and other securities such as certificates of deposit and commercial paper, while M2 comprises of the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government, divided by

GDP. The shortfall of this indicator is that it does not represent theeffectiveness of the financial sector in solving information asymmetry problem and smoothing transaction costs. Another shortfall of these two indicators is that they do not measure the capacity of the banking sector to perform its function as a financial intermediary, (Levine et al., 2000). Size based indicators tend to be high in countries with underdeveloped banking sectors since money is the only store of value. These measures also do not distinguish between credit allocated to the public sector and credit allocated to the private sector. Liquid liabilities also include deposits of one financial intermediary into another financial intermediary.

The ratio of commercial banks' assets divided by the sum of commercial banks' and central bank's assets is also an indicator of banking sector development. This indicator, namely Commercial-Central Bank indicator measures the extent to which commercial banks versus central banks allocate society's savings. It is not, however, a measure of quality and quantity of the services provided by financial intermediaries (Levine, et al., 2000). This measure is with the idea that banks can easily identify profitable investment projects and mobilise savings easily with well managed risks than the central banks.

Another indicator for banking sector development is Private Sector Credit. Credit to the private sector measures the size of the financial sector. It equals the value of credit by banks to the private sector for investment (Demetriades & Fielding, 2009). This measure differentiates between credit extended to the private sector from the government, and it excludes credit provided by the central bank. Private credit exclude credit from the development banks and it does not directly measure the improvement in mitigating information and transaction costs. High levels of private credit mean high degree of financial intermediary development (Levine et al., 2000).

Other indicators of banking sector development include Overhead Cost, measured as the ratio of overhead costs to total bank assets. It measures the efficiency of the bank. The Net Interest Margin is also a banking sectordevelopment indicator. It is equal to the difference between bank interest income and interest expenses, divided by total assets. A lower value of overhead costs and net interest margin is frequently interpreted as indicating greater efficiency and competition in the banking sector, (Huang, 2010). The ratio of private credit by deposit money banks and other financial institutions to GDP is also a banking sector development indicator. It is used to measure the depth of financial services. It indicates the credit issued on merit and also the promotion of innovation and research and development in an economy. Banks' concentration as an indicator of banking sector development is measuring the banking structure, as the ratio of biggest dominant banks assets to the assets of all commercial banks in the system (Levine et al., 2000).

Banks are different from other financial institutions because of the complexity of banking activities. The nature of these activities is that banks usually deal with loans and deposits which cannot be easily resold as opposed to financial securities by other financial institutions. Therefore, banks typically must hold these contracts in their balance sheets until the contract expires. Banks stand as centre of payments and their liabilities are viewed as money by the depositors. Banks are the preferred financial institutions as a transmission belt for monetary policies. Therefore, banks are special producers of information, undertaking credit evaluation and monitoring activities which supplement or substitute for the information available through other services.

Access to financial services determines the depth of the banking sector as well as other financial intermediaries. Access to finance, however, does not necessarily translate into the

use of these services. Economic agents may have access to services but may not make use of them either because of lack of literacy and know-hows, or simply because of socio-cultural reasons. Therefore, the depth of banking intermediaries can not only be measured by the availability of financial services, most especially bank access. Bank-based financial services are important for economic growth of an economy as long as they promote productivity through technological progress (World Bank, 2011). Enhancing the accessibility as well as development of the banking system translate into better facilitation of the mobilisation of savings, efficient resources allocation and minimisation of the problem of information asymmetry. This development also helps with the reduction of risks associated with bank failure and inefficient usage of loans from banks.

Financial intermediaries enable the poor to rely on accumulated savings or to spend on income enhancing assets. Bank accounts give the sense of security for poor to prepare against unexpected shocks, (Donia, 2011). In addition, Technological progress is a vital condition for the development of financial intermediaries such as banks, because of the possibility of increasing services and access and improving the standard of living of the people. When financial development takes place in bank-based economy, it is mostly the small businesses and enterprises that benefit the greatest because they have increased access to capital such as loans and advances, and the ability to undertake investment projects. Small businesses and enterprises are essential for reducing unemployment and increases economic growth, (Seetanah, Padachi, Hosany, & Seetanah, 2009).

Banks liabilities are short term deposits and their assets are short-term and long-term loans to businesses and consumers. Banks, therefore, become insolvent when the value of their assets falls short of the value of their liabilities. These assets may drop if bank borrowers have a high tendency of defaulting. Defaulting occurs when borrowers are unable or unwilling to pay for their debts. Default can be avoided by appropriate screening of projects. Another

form of ensuring that banks do not lose out on their assets completely is by tying collateral to the loans they make. Collaterals are, however, difficult to establish and monitor since the value is subject to fluctuations. A well-developed banking system, therefore, has the power to minimise or eliminate the problem of defaulting through appropriate allocation of resources, which is made possible by thorough investigation of clients.

Traditional determinants of financial intermediary developmentinclude financial openness and trade openness. Globalized countries who undertake international trades and capital flows benefit largely from financial deepening of their markets (Chinn& Ito, 2005). This allows interest rate to rise to a competitive market equilibrium level. Openness also allows for the financial system to eliminate inefficient financial institutions and creating room for greater improvement in financial infrastructure aimed at alleviating information asymmetry problems and therefore raising credit availability (Oke, Uadiale, & Okpala, 2011). Therefore, establishment of accommodating macroeconomic policies for financial development and liberalization of the capital account as well as inflation and monetary policy efficiency measures are important to develop. This is because these policies will safeguard and protect the local financial markets from foreign competition (Seetanah et al., 2009).

The relationship between inflation and financial intermediary development has been suggested by McKinnon, (1991) (as cited in Seetanah et al., 2009), who argued that economies with high inflation rate tend to have smaller and sluggish markets which may lead to information asymmetry. Price stability is crucial for financial intermediation. High rates of inflation deter long term information asymmetry and moral hazard problems. These problems influence credit markets frictions with negative consequences for the financial sector performances. Low returns discourages agents' motivations to lend which result in the

problem of credit rationing from banks. The financial sector therefore generates fewer loans with ineffective resource allocation.

Other determinants of banking sector development include per capita growth of the country, as well as workers' remittances. A number of studies (Chowdhury, 2011; Donia, 2011; Aggarwal, Demirguc-Kunt, & Peria 2011) suggest that per capita growth and remittances have positive effects on banking sector development. Gross domestic product is also said to have a greater positive impact on banking sector development, (Yu & Gan, 2010). A country's national income is made up of many components, of which one is investments. When gross investment grows, the nation's income is bound to grow too. This investment is amply made up by the growth in qualifying investment projects that are deemed profitable enough by entities that provide funds. These entities include by far the financial intermediaries. Therefore, growth in access to financial services by financial intermediaries through creation of credit has an important influential role, in the nation's economy. Also, cultural factors, which are defined by Outreville (1999) as behaviours and beliefs that shape the actions of the society, could have effects on the performance of the financial sector. If the society believes in using financial intermediaries to generate returns, then usage of these institutions will be broader and deep.

Benyah (2010) defines financial intermediary development as increasing efficiency of allocating financial resources and capital projects through encouraging competition and increasing the potential of financial system. However, the size, structure and efficiency of a financial system determine development. One way that such development has been known to take place is through financial liberalization.

In the 1960's and 1970's, many governments tried to stimulate financial intermediary development through fixed low interest rates and inflationary monetary policies, which were later referred to as repressive policies. These policies followed the works of Keynes who advocated for government intervention in credit markets. It is, therefore, against this background that McKinnon (1973) and Shaw (1973) (as cited in Benyah, 2010) postulated the idea of financial liberalisation, with the reasoning being that these repressive policies act as disincentives to savings mobilisation which, in the long run, negatively affect economic growth. A liberalised financial system plays an important role in redistributing resources to most productive investments. Financial development emanates from effective policies, institutions and factors that lead to effective financial intermediations and markets, as well as deep and broad access to capital and financial markets.

For financial intermediary development to take place, governments need to put up appropriate and sufficient conditions, and improve a number of factors such as policy measures, legal institutions and the business environment as well the socio-cultural behaviours of economic entities. Proper policy measures such as financial and trade openness are said to be determinants of financial intermediary development, (BoN, 2011). In addition, liberalising the financial system from government control allows for a more efficient allocation of resources by financial intermediaries.

3.3 Empirical Literature Review

There are a number of studies that have examined the determinants of financial intermediary development. Most of these studies are measuring financial intermediary development with banking sector development indicators. These empirical studies have also established a number of factors that contribute to the development of the banking sector.

Chinn and Ito (2005) examined what matters for financial intermediary development with particular focus on capital controls, institutions and interaction. This study used panel data for the period of 1980-2000 for 108 countries. Financial development was measured withbanking sector indicator, credit extended to the private sector by the banks. Capital openness as a measure of financial openness was measured using the Chinn-Ito index and is based on the binary dummy variable. The first analysis was to test the impact of financial openness of financial markets and the result showed that high level of financial openness contributes to the development of equity markets only if a threshold of level of general legal system and institutions is attained. Governance quality and law and order as well as lower levels of corruption increase the positive effects of financial openness on financial development. The last investigation was directed to testing the relationship between banking sector development and financial development. The result showed that a well-developed banking sector leads to financial sector development.

Naceur, Ghazouani, and Omran (2007) investigated the determinants of financial sector development in the Middle-East and Northern Africa (MENA) region, for the period of 1960-2006. Variables included in the study were grouped into three groups. The first group consisted of macroeconomic variables, the second was openness of the economy and the third group was for institutional factors. Macroeconomic variables included GDP per capita, inflation, the ratio of government consumption to GDP, savings and investment. Openness variables included were defined as commercial and capital account liberalisation measures. They included the ratio of exports plus imports to GDP as trade openness, and the ratio of capital inflows to GDP. Financial sector development was quantified using both liquid liabilities as a ratio to GDP and the ratio of bank credit to private sector to GDP. The results show that banks and non-bank institutions are affected differently. Growth does not promote banking activities but it promotes development in other financial markets. Institution factors

were found to have positive effects on financial development. Also macroeconomic factors such as investment rates, inflation, savings, trade openness and financial liberalisation are key determinants of financial sector development, especially to the banking sector.

Sufian and Chong (2008) carried out a study for Philippine banks to analyse the determinants of bank profitability in a developing economy like Philippine. The period of the study was annual, using annual bank level data for the period of 1990-2005, with a total of twenty four banks. Variables included in the study were a log of total assets as a proxy of bank sizes; loan loss provision divided by total loans, to measure credit risk; non-interest income divided by total assets, to represent non-traditional activities of banks; total overhead expenses divided by total assets; and book value of stockholders' equity as a fraction of total assets. The findings suggestedthat size, credit risk and expenses preference behaviour are negatively related to banks' profitability, while non-interest income and capitalisation have a positive impact on banks' profitability.

Demetriades and Fielding (2009) explored the factors that promote or discourage the growth of bank assets as well as factors that worsen or eliminate excess liquidity of bank in West Africa. The study used a panel data set for the eight West African countries for the period of 2000-2005. The dependent variables used were loan-asset ratio and real asset growth, which are constructed as the ratio of commercial loans to total assets and annual change in the log of total assets less the annual change in the log of consumer price index, respectively. The resultsindicate that West African bank assets may not grow because of high loan default among borrowers. This is an obstacle to bank balance sheet growth. The result also showed that the greater the information capital of a bank, the more willing it will be to lend. Financial intermediary development is expected to come from the emergence and growth of new banks.

Seetanah, et al. (2009) analysed the determinants of financial development in Mauritius, by means of the auto regressive distributed lag (ARDL) approach. The study utilised time series data for the period of 1970 to 2008. The results were supplemented by a questionnaire to assess the influence of institutional quality to the development of financial intermediaries. The analysis was based on two regression equations, of which financial development was measured with banking sector indicators, liquid liabilities (M3) and private sector credit, both as ratios of GDP, respectively. Variables included in the study were; trade openness measured as total of export and imports divided by GDP; foreign direct investment as ratio of GDP; gross domestic capital formation divided by GDP to estimate the investment rate; secondary school enrolment ratio as a proxy of human capital; the consumer price index which measures the average price of consumer goods and services, used to estimate the inflation rate; per capita GDP; and a dummy variable constructed to denote the number of times the Mauritian government has undertaken financial liberalisation policies. The regression results were that trade openness and financial liberalisations, are important determinants of financial development. In addition to the two factors, investment rates, per capita GDP and literacy rate are also considered to be important factors in stimulating financial development. The results also showed that inflation has a negative effect on financial development both in the short run and long run, and institutional quality is also important for the development.

Benyah (2010) investigated what determines financial intermediary development in all African countries, by making use of cross sectional data and panel data techniques, for the period of 1975-2006. Financial intermediary development is quantified by a banking sector indicator, liquid liabilities (M3), while the explanatory variables were trade openness, financial openness and GDP growth rate. Trade openness is measured as sum of exports and imports as ratio of GDP and financial openness is measured as sum of foreign assets

andliabilities as a ratio of GDP. The cross sectional regression results showed that there is a positive relationship between trade openness and financial intermediary development. GDP growth rate and financial openness are not statistically significant in explaining financial intermediary development. Panel regression results also showed trade openness is important in explaining financial intermediary development, and financial openness negatively influences financial development. The GDP growth rate is insignificant.

Kablam (2010) assessed the determinants of banking system efficiency in Sub-Sahara Africa, and asks what, besides the degree of efficiency, explains the low level of financial development in the region. The sample of his study consisted of 137 banks of 29 African countries for the period of 1998-2002. Method of measurement of efficiency is stochastic frontier analysis for cost-effective frontier as well as the generalised method of moments for explaining financial development. Generalised method of moments makes it possible to take into account simultaneity bias reserve causality by using lagged independent variables as instruments. Variables included for cost-efficiency analysis included ratio of private loans to GDP, GDP per capita, share of rural population as well as capitalisation and bank size ownerships. Variables included for financial development were grouped into five categories, and these are market structure of the financial system, macroeconomic conditions, geography and legal tradition of countries, political environment and the regulation of financial system. The result showed that banks in Sub-Sahara Africa are cost-efficient. Capitalisation has a negative impact and GDP was insignificant, while better regulation and sound credit environment are expected to make Sub-Sahara African banks system more efficient. Rural population density has a negative impact on cost efficiency. Financial development is adversely affected by inflation and heavy dominance of the system by a few banks. A more effective bank system could positively affect financial development, especially if banks played their intermediary roles effectively, and that is to transform deposits into efficient

investment projects. Effective regulation and sound credit environment are key conditions to achieving effective banking systems in the region.

Yu and Gan (2010) examined the determinants of banking sector development in Malaysia using real income, real interest rates, trade openness and financial openness as explanatory variables. The study employed three models of banking sector development namely, liquid liabilities (M3), private sector credit and domestic credit. The analysis was made with ordinary least squares (OLS) method. The findings were that real income encourages banking sector development. Consistent growth in GDP means that business entities respond to the demand of goods and services. This cycle will be brought about by increased lending and borrowing activities. The findings also suggest that financial openness have a negative impact on banking sector development in Malaysia. Real interest rates and trade openness are found to be statistically insignificant in explaining banking sector development in Malaysia.

Chapter Four

4.0 Methodology

4.1 Introduction

The study uses econometrics technique to establish the macroeconomic determinants of banking sector development in Namibia. The study utilizes time series data. The nature of time series data makes it subject to non-stationarity problem. Unit root tests are, therefore, carried out to ascertain the univariate properties of the data, to ensure that inferences from regression analysis are not spurious. The study also employs cointergration test to identify any long run relationships between the variables, and later long run elasticities are estimated, to establish the impact of each of the variables influence banking sector development.

4.2 Data Sources

The quarterly time series data used in this study was obtained from the Bank of Namibia's various quarterly bulletins. The period under investigation runs from year 2000: I – 2011: IV.

4.3 The Economic Model

According to McKinnon (1973) and Shaw (1973) (as cited in Donia, 2011) as well as literature on the endogenous growth model, King & Levine(1993), financial intermediary development is a positive function of per capita real income and real interest rates.

PSC = f (PCGDP, RIR) 1

where PSC is credit extended to the private sector by the commercial banks, as a ratio of GDP. This is used as a proxy of banking sector development; PCGDP is per capita gross domestic product and RIR represents real interest rates.

4.3.1 Model Specification

The methodology and model specification for this study is informed by the reviewed literature on financial intermediary development including(Donia, 2011; Yu & Gan, 2010; Benyah, 2010; Seetanah et al., 2009; and Chinn & Ito, 2005). Reviewed literature informed the choice of a number of variablesto specify the banking sector development model for Namibia. These variables include real gross domestic product, nominal interest rate, inflation, stock market development.

The economic model of this study is therefore as follows:

PSC = f (GDP, NOMIR, INF, STMD) ………………………………2

Where, PSC is private sector credit, GDP is gross domestic product, NOMIR is nominal interest rate, INF is the inflation rate and STMD is stock market development.

Model 2 can be written in an econometric equation in log-linear (*ln*) form as follows:

$lnPSC_t = \beta_0 + \beta_1 lnGDP_t + \beta_2 lnNOMIRt + \beta_3 lnINF_t + \beta_4 lnSTMD_t + \varepsilon_t$ 3

where ε_t is the random error term and all other variables as defined before.

The econometric model, equation 3, has been expressed in natural log form, which removes any uncertainty of non-linear relationships between variables and allows for coefficient interpretations. The variables on the right hand side of the equation are possible determinants of development of the banking sector in Namibia.

4.4 Measurements of Variables

Banking sector development is proxied by private sector credit (PSC) measured as a ratio of nominalGDP. A number of studies have used this indicator to represent banking sector development (Donia, 2011; Levine et al., 2000; Yu & Gan 2010). This ratio measures the quantity and quality of the projects financed by the banking sector. It is the most comprehensive indicator of the activities of deposit money banks because it overcomes the disadvantages of other size-based measures like liquid liabilities or broad money stock as a ratio of GDP. Private sector credit isolates credit extended to the private sector from credit extended to the government and public enterprises. Also it excludes credit issued by the central bank (Levine et al., 2000). It is appropriate for measuring opportunities for new firms to acquire funds for investment projects, (Huang, 2010), and captures the amount of resources channeled through the banking sector to private firms (Cherif & Gazdar, 2010).

A number of studies such as Sindano (2009) and Seetanah et al., (2007) found that economic growth, proxied by real GDP is vital for financial intermediary development. The coefficient of this variable, real GDPis expected to be positive. An increase in economic growth translates into enhancement of the financial intermediary sector. There is, therefore, a positive relationship between economic growth and financial intermediary development. Given this relationship, this study saw it important to include real GDP into the model. Real GDP is also positively related to private investments. An increase in private investments leads to an increase the growth rate which could increase financial intermediary development. Nominal interest rate, (NOMIR) in this study is represented by the lending interest rate. Positive interest rate in the model promotes financial intermediary development through the increased volume of saving mobilization and stimulates growth through increasing the volume and productivity of capital, (Arestis, Demetriades, Fattouh, & Mouratidis, 2002; Yu

& Gan, 2010). The coefficient, therefore, is expected to be positive, because lending rate, from the point of view of the banking sector represents a form of how banks generate income from every credit they extend to the private sector.

Economies with highinflation rates are prone to have smaller, less active and inefficient banks.The coefficient of the inflation variable is expected to be negative. McKinnon (1991)(as cited in Seetanah et al., (2009) claimed that price stability is crucial for financial intermediation, arguing that high inflation rates may cause problems of moral hazards and adverse selections of investment projects. The final variable, stock market development proxied by market capitalisation of listed companies as a ratio of GDP and is expected to positively influence banking sector development. Cherif and Gazdar (2010) pointed out that these two markets may influence each other positively.

4.5 Data Analysis

The study uses E-views software to make analysis of how variables impact development in banking sector. This analysis, therefore, include stationarity tests, as the first step, to ascertain properties of the time series data used; cointegration test to test for long run relationship between variables;an Auto regressive Distributed Lag (ARDL) approach to estimate long run elasticitiesof these macroeconomic variables with banking sector development; and the last step of the analysis is to establish the short run behaviours of the series.

4.5.1 Stationarity

The study uses time series data which is prone to non-stationarity. Time series data is stationary if its statistical properties do not depend on time. In other word, the distribution of a stationary variable is unchanged when changing the time period or rearranging the ordering

of the time index. This is to say that the stationary variable has the same mean and variance for every time period and they do not depend on the time lag. Regressions systems with non-stationary have serious problem. Among these problems is the fact that the t-ratios and the adjusted R-squares tend to be overestimated. Non-stationarity implies that the data is trended. When data is trended, standard ordinary least squares (OLS) regression processes are likely to produce incorrect inferences. It is, therefore, advisable to conduct unit root tests which determine the order of integrations of the variables.

This study uses the Augmented Dickey Fuller (ADF) Test for unit root test. The ADF test statistics tests for null hypothesis of unit root and the alternative hypothesis of no unit root. The ADF assumes that the error term is independently and identically distributed.
The ADF test is thus specified as follows:

$$\Delta Y_t \;=\; \alpha_o + a_{2t} + \rho Y_{t-1} + \sum \beta i \,\Delta Y_{t-i} + U_t \;.....................................4$$

Where Y is the variable whose time series properties are being investigated, Δ is the difference operator and U_t is the random error term.

In addition to the ADF unit root test, KPSS unit root tests proposed by Kwiatkowski, Phillips, Schmidt, and Shin (1992) are also carried out. The KPSS test is used for testing the presence of stationarity and a deterministic trend of the series and it complements the Dickey-Fuller test. Results for these tests are outlined in the following chapter. The KPSS unit root test is specified as follows:

$$Y_t \;=\; \beta^{'} D_t + \mu_t + U_t, \; U_t \sim I(0)...............5$$

$$\mu_t \;=\; \mu_{t-1} + \varepsilon_t, \varepsilon_t \sim N(0, \; \delta_\varepsilon^2)..................6$$

$$D_t = \text{deterministic components (constant/ constant and trend)}$$

The stationary trend has a null hypothesis which states that an observable time series is stationary around a deterministic trend.

4.5.2 Cointegration

The cointegration test is also performed, using the bounds testing approach advanced by Pesaran, Shin, and Smith (2001), which requires estimation of equation 3 as a conditional autoregressive distributed lag model (ARDL) below:

$$\Delta lnPSC_t = \beta_o + \sum_{i=1}^{n} a_i \, \Delta lnPSC_{t-i} + \sum_{i=0}^{n} b_i \Delta lnGDP_{t-i}$$

$$+ \sum_{i=0}^{n} c_i \Delta lnNOMIRR_{t-i} + \sum_{i=0}^{n} d_i \Delta lnINF_{t-i} + \sum_{i=0}^{n} e_i \, \Delta lnSTMD_{t-i} + \beta_1 lnPSC_{t-1}$$

$$+ \beta_2 lnGDP_{t-1} + \beta_3 lnNOMIR_{t-1} + \beta_4 INF_{t-1} + \beta_5 lnSTMD_{t-1} + \varepsilon_t$$

$$...........7$$

Testing for long run relationships (cointegration) requires the specification of the following null and alternative hypotheses:

H_o: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ (no long run relationships)

H_1: $\beta_1 \neq 0$; $\beta_2 \neq 0$; $\beta_3 \neq 0$; $\beta_4 \neq 0$; $\beta_5 \neq 0$ (long run relationships)

The null hypothesis of no cointegration (no long run relationship) and the alternative hypothesis of cointegration (long run relationship) are tested by means of the bounds testing approach of the F-test proposed by Pesaran et al., (2001), which tests the significance of the lagged levels of the variables. The F-test is developed to have upper and lower bounds. The critical upper and lower bound values appropriate for the sample size of this study is extracted from Narayan (2005), which were generated for small sample sizes of between 30 to 80 observations. If the computed F-Statistic lies above the upper bound, we reject the null

hypothesis and conclude that there exists a long run relationship between the variables. If the F-statistic lies below the lower bound, then the null hypothesis cannot be rejected. The conclusion for not rejecting the null hypothesis will imply that the variables do not have long run relationships. We will however, be unable to make any decisions on cointegration if the computed F-statistic lies between the lower and upper bounds.

The unrestricted error correction model estimated using the ARDL approach for our cointegration test has a number of advantages over other cointegration tests. One is that it does not require variables to be integrated of the same order, for example, integrated of order zero, ($I(0)$) or of order one, ($I(1)$). Another advantage of the test is that it is still applicable even when variable shows any signs of endogenous properties and it makes corrections for any residual serial correlations (Pesaran et al., 2001).

5.4.3 Long run Elasticities

After establishing the long run relationships between banking sector development and its determinants, the next step of estimating long run elasticities is carried out. The maximum lags will be recommended from different information criteria. This is the investigation of the impact of each of the determinants on the development of the banking sector and it will follow the following ARDL model as equation 5:

$$lnPSC_t = \beta_o + \sum_{i=1}^{n} a_i lnPSC_{t-i} + \sum_{i=0}^{n} b_i lnGDP_{t-i}$$

$$+ \sum_{i=0}^{n} c_i lnNOMIR_{t-i} + \sum_{i=0}^{n} d_i lnINF_{t-i} + \sum_{i=0}^{n} e_i lnSTMD_{t-i} + \varepsilon_t$$

............8

5.4.4 Error Correction Model

The next step is to estimate the error correction model, within the ARDL framework. The error correction model results indicate the speed of adjustment back to long run equilibrium after a shock. The error correction model integrates the short-run coefficient with the long-run coefficient without losing long-runinformation. The following equation is a representation of the error correction model, within the ARDL framework:

$$\Delta lnPSC_t = \beta_o + \sum_{i=1}^{n} a_i \Delta lnPSC_{t-i} + \sum_{i=0}^{n} b_i \ \Delta lnGDP_{t-i}$$

$$+ \sum_{i=0}^{n} c_i \Delta lnNOMIR_{t-i} + \sum_{i=0}^{n} d_i \Delta lnINF_{t-i} + \sum_{i=0}^{n} e_i \ ln\Delta STMD_{t-i} + f_i EC_{t-1} + \varepsilon_t$$

...............9

EC is the error correction term and f_i represents the speed of adjustment back to long-run equilibrium after a shock or disturbance. The significance of the long run causal effect is indicated by the t-statistics on the coefficient of the error correction term.

In addition, diagnostic tests for the short run model are carried out to detect problems such as non-normality or serial correlation. These are also conducted in order to produce correct inferences. The ARDL model is verified through the stability tests namely Cumulative Sum of RecursiveResiduals (CUSUM) and Cumulative Sum of Squared Recursive Residuals (CUSUMSQ).

Chapter Five

5.0 Estimation and Results Interpretation

5.1. Unit Root Tests

The study first investigated the statistical properties of the series through unit root tests. Two different unit root tests were conducted in order to test whether the time series data collected was stationary or not. In other words, unit root tests are for testing whether the series is able to provide correct inferences. Stationarity test is essential for standard economic theory since it is the only way to ascertain that regressions provide consistent estimations. The tests used for this analysis were the Augmented Dickey-Fuller test and the KPSS unit root test.

ADF test results

The ADF unit root test specifies the null and alternative hypothesis as follows:

H_o : Unit Root (non-stationary)

H_1 : No unit root (stationarity)

The general decision rule is that if at 5 per cent level of significance, for example, the test statistics computed is greater than the critical values in absolute terms then we reject the null hypothesis and conclude that the series does not contain a unit root. In other words the series is stationary.

Below follows the results of the ADF test in level form, with constant and trend as the model specification:

Table 5.1 ADF unit root results in levels

VARIABLE	T-STATISTIC COMPUTED	CRITICAL VALUE
LNPSC	-2.2896	-3.1882 @ 10%
LNNOMIR	-2.1129	-3.1855 @ 10%
LNINF	-2.5072	-3.1855 @ 10%
LNGDP	-2.6152	-3.1855 @ 10%
LNSTMD	-2.2324	-3.1897 @ 10%

Table 5.1 shows stationarity test results of all variables in level form. At 10 per cent significant level the critical values for all variables are greater, in absolute terms, than the absolute value of the computed t-statistics. At 10 per cent level of significance, the critical value in absolute terms for the LNPSC variableis3.1882. When this value is compared with the absolute value of the computed t-statistic for LNPSC which is 2.2896, we can clearly see that the computed t-statistic is lower than the critical values. This means that the null hypothesis of unit root cannot be rejected. The series contain a unit root. The same conclusion can be drawn for all the variables in the table. This leads us to the conclusion that using the ADF unit root test in level form, time series contain a unit root, in other words, they are non-stationary. Having made this conclusion, the next step will be to re-run the ADF unit root test on the same variables in first difference.

The unit root test results for the differenced variables are depicted in the following table 5.2:

Table 5.2 ADF unit root results in first difference

VARIABLES	T-STATISTIC COMPUTED	CRITICAL VALUE	P VALUES
D(LNPSC)	-8.7846	-3.5107 @ 5%	0.0000
D(LNNOMIR)	-5.5628	-3.5107 @5%	0.0002
D(LNINF)	-4.5628	-3.5130 @5%	0.0015
D(LNGDP)	-5.3824	-3.5180 @5%	0.0004
D(LNSTMD)	-5.6944	-3.5107 @5%	0.0001

Table 5.2 shows the stationarity results for the differenced variables. At all levels of significance, the critical values of all variables are less than the computed t-statistics, in absolute terms. The table shows the 5 per cent critical values. The critical valuefor D(LNPSC), for example, is -3.5107 for the 5 per cent level of significance. The corresponding computed t-statistic for the critical values is -8.7846. In absolute terms, the computed t-statistic is greater than the critical value. This means that the null hypothesis of unit root (non-stationary) can be rejected for this variable, and we conclude that the series is stationary at first difference. The same conclusion can be drawn for all the variables in table. This means that for the ADF unit root test, variables are integrated of order one, that isI(1).

Another unit root test used was the KPSS test which complements the ADF test. The KPSS specifies the null and the alternative hypotheses as follows:

H_o: Stationary (no unit root)

H_1 : Non stationary (unit root)

The decision rule for this test is that at 5 per cent level of significance, for example, the null hypothesis can be rejected if the t-statistic computed is greater than the critical values.

The following table depicts the results for the KPSS unit root test for all the variables in level form and in first difference only at 5 per cent level of significance:

Table 5.3 KPSS unit root results in level and first difference at 5%

VARIABLES	LEVELS		FIRST DIFFERENCE	
	COMPUTED KPSS T-STAT.	CRITICAL	COMPUTED KPSS T-STAT.	CRITICAL
LNPSC	0.1607	0.1460	0.0667	0.1460
LNNOMIR	0.0801	0.1460	0.083	0.1460
LNINF	0.1098	0.1460	0.0594	0.1460
LNGDP	0.1512	0.1460	0.0224	0.1460
LNSTMD	0.1039	0.1460	0.0494	0.1460

The KPSS unit root results show that at 5 per cent level of significance in level form, variables LNPSC and LNGDP have computed KPSS t-statistics that are greater than their corresponding critical values. The t-statistics of variable LNPSC, for example, is0.1607,

which is greater than the critical value of 0.1460; while for the variable LNGDP the computed-statistics is 0.1512 and the corresponding critical value is 0.1460. This means that the null hypothesis of stationary (no unit root) is rejected.

The rest of the variables (LNNOMIR, LNINF and STMD) were stationary in level form. The computed KPSS t-statistics for these variables were all less than their corresponding critical values. The hull hypothesis could not be rejected These variables are, therefore, I(0). In first difference form however, the computed KPSS t-statistics for all the variables are all less than their corresponding critical values at 5 per cent level of significance. The null hypothesis of stationary (no unit root) could not be rejected for all the variables. Variables are, therefore, stationary in first difference.

5.2 Cointegration Test

Autoregressive distributed lag (ARDL) analysis first requires an examination of whether variables are cointegrated to be carried out. This means that when making analysis, the first step is to test for the long run relationship of the variables. This analysis is going to make use of the unrestricted error correction model of equation 7 in the preceding chapter to establish whether the long run relationship exist between the included variables.

The cointegration test under the bounds testing approach involves the comparison of the F-statistics against the two critical lower and upper bound value estimated by Narayan (2005). This bounds test for cointegration investigates whether PSC which represents banking sector development has a long run relationship with gross domestic product (GDP), nominal interest rate (NOMIR), inflation (INF) and stock market development (STMD). This approach can be employed even whether variables are purely I(0) or purely I(1).

The model specification for the conducted bounds test was with an unrestricted intercept and no trend. In the Narayan (2005) table for critical upper and lower bound table, this specification falls under case III. Using K = 4 and n = 46 after adjustments, at 5 per cent point, the lower bound is 3.136 and the upper bound is 4.416. The computed F-statistic is 15.387.

The following, table 5.4 depicts the above information:

Table 5.4 Bounds test for cointegration results

F-STATISTIC COMPUTED	CRITICAL BOUNDS AT 5%	
	LOWER BOUND	UPPER BOUND
15.387	3.136	4.416

The F-statistic computed lies above the upper bound. This result implies that the null hypothesis of no cointegration is rejected. A long run relationship therefore, exists between PSC, GDP, NOMIR, INF and STMD.

5.3 Long Run Elasticities

After establishing the long run relationship between banking sector development (PSC) and its determinants, the following step is to estimate the long run elasticities. This is the investigation of the impact that each of the determinants have on the development of the banking sector. This investigation is based on equation 8 in the preceding chapter.

The lag length used in this model was a maximum of one lag, as determined by the Akaike Information Criterion. The estimated results below are based on, therefore, minimizing the Akaike Information Criterion. The empirical results are as follows:

$$lnPSC = 0.0398 + 0.046lnGDP + 0.065lnNOMIR - 0.016lnINF + 0.032lnSTMD$$

T-ratios and p-values are as follow:

Table 5.5 Long run elasticities t-ratios and p-values

VARIABLES	COEFFICIENTS	T-RATIOS	P-VALUES
LNGDP	0.046	1.7027	0.096
LNNOMIR	0.065	2.0726	0.044
LNIFN	-0.016	-1.7083	0.095
LNSTMD	0.032	1.3053	0.199

The estimated coefficients have the correct signs as they were expected to be. The major determinants of PSC are real gross domestic product, nominal interest rates and inflation. The partial elasticities of PSC with respect to GDP, NOMIR and INF are 0.046, 0.065 and -0.016, respectively.

The results show that nominal interest rate is significant at 5 per cent level of significance. There exist a positive relationship between banking sector development and nominal interest rate. This means that a 100 per cent increase in nominal interest rates will lead to an approximately 6.5 percentage increase in banking sector development.Real gross domestic product and inflation are significant at 10 per cent level of significance. This is to say that a 100 per cent increase in real gross domestic product will lead to an approximately 4.5 percentage increase in banking sector development, while a 100 per cent increase in inflation will lead to approximately a 1.6 per cent deterioration of the banking sector. The partial elasticity of banking sector development with respect to stock market development is 0.032. This is, however, insignificant at any reasonable levels of significance. Therefore, real gross

domestic product and nominal interest rate both positively impact development in the banking sector, whereas inflation hampers this development. Stock market development inthis study does not necessarily translate into banking sector development because it showed to be statistically insignificant

5.4 Short Run Behaviour

The final step of this analysis is to estimate the short run behaviour of the banking sector development. This analysis required an estimation of the error correction model of equation 6 in the preceding chapter. Below follows the estimated results:

Table 5.6 Error correction model results

| VARIABLES	COEFFICIENTS	STD. ERROR	T-STATISTICS	P-VALUE
ECM(-1)	-0.3697	0.1324	-2.7907	0.0082
D(LNGDP)	0.0156	0.0788	-0.1978	0.8443
D(LNNOMIR)	-0.0113	0.0458	-0.2463	0.8068
D(LNINF)	-0.0122	0.0117	-0.0554	0.2979
D(LNSTMD)	0.0312	0.0223	1.4920	0.1440

The diagnostic tests for the short run model are:

Adjusted R^2 = 0.2008, Breusch-Godfrey LM Chi-square = 0.269 (0.1980), White's test = 0.132 (0.2540), Ramsey RESET = 0.6583 (0.6196). Figures in brackets are p-values.

The error correction term is significant at all three levels of significance. The coefficient of the error term is negative which means that the feedback mechanism is effective. The speed of adjustment back to the he long run equilibrium after a shock is 0.369. This result means that when disequilibrium or a shock occurs, 36.9 per cent of the deviation from the long run

equilibrium will be corrected in the following quarter. This is to say that full long run equilibrium is attainable in over a quarter.

Diagnostic tests of the error correction model shows absence of major diagnostic problems like serial correlation, heteroscedasticity. Stability tests results of the CUSUM and the CUSUM of Squares tests are as follows:
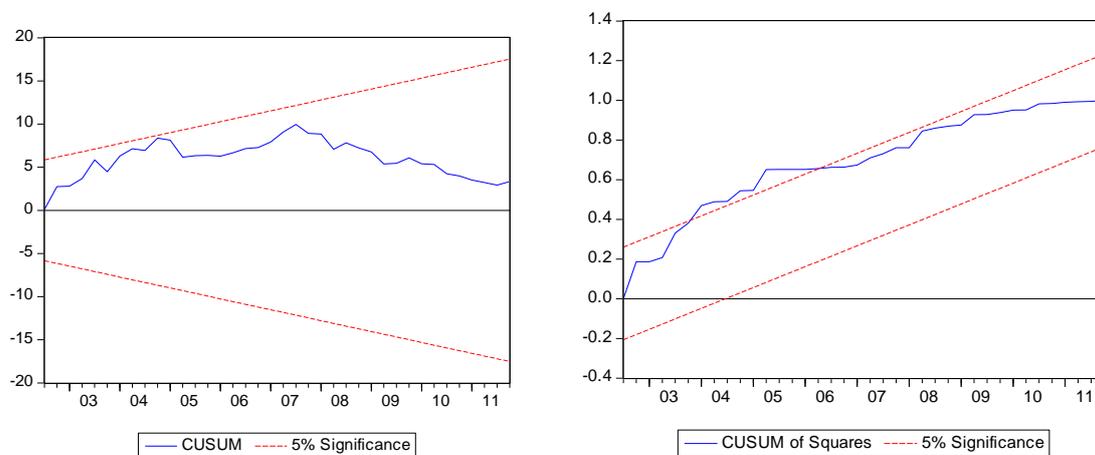
Fig. 5.1. CUSUM and CUSUM of Squares tests for parameter stability for the ECM

Figure 5.1 shows that although the CUSUM test of parameter shows that parameters are stable during the period under investigation, the CUSUM of Squares tests of parameter stability indicate that parameters were not stable throughout the entire period under investigation. This is to say that during the sample period, parameters were stable at first and then became unstable for a short period before becoming stable again for the remainder of the sample period. This is seen clearly in the CUSUM of Squares test result which goes beyond the 95 per cent critical bounds.

Chapter Six

6.0 Conclusion and Policy Implications

6.1 Conclusion

This study carried out an empirical investigation of the determinants of banking sector development in Namibia. The study used quarterly data for Namibia covering the period of 2000: I to 2011: II, obtained from the bank of Namibia. The indicator used to represent banking sector development is the ratio of credit extended to the private sector by the banks to GDP. The approach used for this analysis was the ARDL model. The bounds test for cointegration was used to test whether a long run relationship exist between the included variables.

The main result from the study is that a long run relationship exists between the variables. Secondly, the estimated coefficients for the variable impacting banking sector development have expected signs.Real gross domestic product and nominal interest rates positively determine development in the banking sector, while inflation has a negative relationship with banking sector development.

6.2 Discussion of the results and Policy Implications

The study has established that the real sector should be developed further in order to bring about development in the banking sector. As seen in the literature (Sindano, 2009; Seetanah et al., 2007), a positive relationship between economic growth and GDP exists and has been well documented. The results from this study also conform to the findings in similar studies (Yu & Gan, 2010; Donia, 2011) and confirm that growth in real gross domestic product is vital for bringing development in the banking sector. Positive interest rates are also important

for ensuring that the banking sector develops through increased credit extension and increased profits. According to McKinnon (1973) (as cited in Seetanah et al., 2009), financial intermediaries suffer from financial repression through repressed interest rates. The results from this study suggest that positive interest rate positively determines development in the banking sector. Allowing interest rates to be at their equilibrium level allows for efficient allocation of funds from the banking sector to profitable projects.

High inflation has negative impacts on the development of banking sector. Literature review also showed that economies with high rates of inflation have inactive and inefficient financial intermediaries, (Naceur et al., 2007; Seetanah et al., 2009). This study comes to a similar conclusion. The findings showed that inflation will lead to contraction of the banking sector. Policies aimed at price stability by keeping the inflation rate moderate are necessary for securing development in the banking sector.

6.3 Area for Further Research

Future investigation towards development of the banking sector is strongly recommended. More variables that cover all aspects of the banking sector need to be included in further investigation. Institutional variables that include regulation of the banking sector as well as financial openness measures need to be included in further investigation because literature shows that these are important and traditional determinants of the performance of financial intermediaries. Other indicators of banking sector should also be used to check the robustness of the results between different indicators in order to determine which best represents banking sector development.

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