

**AN INVESTIGATION OF THE RELATIONSHIP BETWEEN FINANCIAL
DEVELOPMENT AND ECONOMIC GROWTH IN NAMIBIA**

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ABSTRACT

The study investigates the relationship between financial development and economic growth in Namibia. It employed an auto-regression distributive lag modelling approach on quarterly data for the period 1995 to 2014. The study used the following variables, namely: ratio of broad money supply to gross domestic product, real gross domestic product (GDP), saving and interest rate.

Firstly, the results of the unit root tests showed a combination of integration of order zero and one. Secondly, the results for co-integration revealed the existence of a long-run stable relationship among the variables. Thirdly, the ratio of broad money supply to gross domestic product was found to have a negative and statistical significant relationship with economic activity. This suggests a negative relationship between financial development and economic activity in Namibia. Similarly, real interest rate and saving were also found to have a negative and statistically insignificant relationship with economic activity. On the contrary, the lagged real gross domestic product was found to have a positive and statistically insignificant relationship with economic activity.

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DEDICATION

I would love to dedicate my thesis to my late father, Hon. Sebastian Rukiza Kinyondo, and my children. My father instilled the value of education and that it is the only inheritance for us which we should be proud of, as nobody will take it from us. To my children, I pass on to you, and encourage you to work even harder as the sky is the limit.

DECLARATION

I, Sylvia Kinyondo, hereby declare that this thesis is a result of my own research and that neither part of it has been submitted for a degree in any learning institution.

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ACRONYMS

ADF	Augmented Dickey Fuller
AgriBank	Agricultural Bank of Namibia
ARDL	Autoregressive Distributed Lag
BoN	Bank of Namibia
CBS	Central Bureau of Statistics
CMA	Common Monetary Area
CUSUM	Cumulative Sum of Recursive Residuals
CUSUMQ	Cumulative Sum of Square Of Recursive Residuals
DBN	Development Bank of Namibia
ECM	Error Correction Model
GDP	Gross Domestic Product
RGDP	Real Gross Domestic Product
GIPF	Government Institution Pension Fund
JSE	African Security Exchange Association
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
M2	Broad Money Supply

MRLGHD	Ministry of local government, housing and rural development
NAMFISA	Namibia Financial Institutions Supervisory Authority
NSX	Namibia Stock Exchange
OLS	Ordinary Least Square
PP	Phillips-Perron
RIR	Real Interest rate
SAV	Saving

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CHAPTER ONE: INTRODUCTION

1.1 Orientation of the study

Financial development is broadly known for enhancing economic growth by improving the size, quality, stability and access to financial systems. This has been made possible through financial intermediaries, who receive deposits from investors with extra money and uses the funds to give to those with insufficient amounts. The deposits received is used to carry out major projects that cannot be carried out by individuals. In addition, financial intermediaries encourage savers to save by offering them with more attractive incentives and have been remarkably good at enabling risk sharing through diversifying portfolio. They also manage selling low risk assets and buying high risk assets (Levine, 2005). Liquid capital market let savers hold bonds or equity as it can easily be transformed to cash when the need to access arises (Hicks, 1969). Therefore effective financial systems facilitate growth through efficient allocation of resources.

Since independence, financial sectors in Namibia were categorized as being one of the main contributors towards tremendous growth in the economy. Its contribution to the gross domestic product (GDP) rose from 2.0% in 1990 to 3.6% in 2000, and further to 4.3% in 2010 (BON, 2011). Namibian financial systems like any other country, includes financial institutions which comprises of various financial instruments that smoothen financial transactions. The provision of low information and transaction cost, triggers more savings that translate into investment. Furthermore, the availability of financial services in developing countries especially Africa is very significant as lack of finance to firms hinder investments as well as business opportunities leading to obstruction of job creation through industrialization (Kanbur and Lustig, 2001). The availability of finances is very crucial for Africa whose agriculture is the main continental economic activity.

According to Klein, Meyer, Hannig, Burnett, & Fiebig (1999) the issuing of money by micro lenders to under-privileged, enable individuals to afford buying products that are needed for agricultural activities, henceforth being able to sustain themselves. Beck, Demirguc –Kunt & Levine (2007) highlighted three points associated with financial development. They argue that financial development lowers the Gini coefficient and minimises income inequality. It further increases income share for the poor who contribute to the growth of the total GDP and lastly, it alleviates poverty as it reduces the number of people living below one US dollar a day. Despite its central importance, African financial systems especially those of Sub-Saharan African countries are characterized as being shallow, with limited access to financial services. Bank charges are high because of high interest rates as well as service fees. According to Beck, Demirguc-Kunt & Peria

(2008) customers are required to have a high minimum balance in their account. Schumpeter (1934) initiated the finance-growth nexus and many empirical studies to date have been carried out with regard to the relationship between financial development and economic growth. The results regarding the existence of relationship and the direction of causality have so far been ambiguous. Although some early economists, Meier and Seer (1984), Stern (1989) and Lucas (1988) chose to disregard the existence of the relationship in their studies by negating the presence of any link, numerous studies have supported the relationship between financial development and economic growth. Apergis, Filippidis & Economidou (2007) and Levine (2007) while Van Wijnbergen (1983) claims financial development do not aid growth.

In recognition of the roles played by financial sectors in Namibia, it is therefore indispensable to understand the relationship between financial development and economic growth in Namibia as

it has intense implications for policy makers, researchers and economic participants when attempting to improve strategies to better the economy.

1.2 Statement of the problem

Namibian financial institutions were recorded among the best in Africa, and placed the 7th in sound performance and capitalization. Nonetheless they are characterized by factors that hinder its general performance, like underdeveloped capita market, limited access to financial services and less effective regulations. According to Ahmad (n.d), the small amount of credit given to private sectors especially to mining, fisheries, manufacturing and agriculture is very surprising, given that they are major investment companies from which the country's economy depends. The existence of a few financial sectors is directly proportion to less competition (Andongo & Stork, 2005). Lower competition therefore, may lead to banking sector to be tempted to make more profit by increasing prices, such as interest rates, bank charges and fees, which is counterproductive to financial development and subsequently economic growth. Therefore, it is important to analyse the extent of financial development, in order to help investigate the relationship between financial development and economic growth in Namibia.

1.3.Objective of the study

The main objective of the study is to investigate the relationship between financial development and economic growth in Namibia whilst the specific objective is

- To determine whether there is a short-run or long-run relationship between financial development and economic growth in Namibia.

1.4 Hypothesis

$\beta_0: \beta = 0$, There is no relationship between financial development and economic growth.

$\beta_1: \beta \neq 0$, There is a relationship between financial development and economic growth.

1.5 Significance of the study

The results of the study will be beneficial to regulators and policy makers, as it will guide them in making decisions regarding efficient allocation of resources. Through the increase of investments, the study will also enable investors to realize that they play an important role towards economic development, therefore encouraging them to invest more as they will have more confidence in financial sectors.

1.6 Limitations of the study

A study on the relationship between financial development and economic growth in Namibia was recently done by Sindano (2009) using data from 1993 to 2007. The study employed two indicators as the measure of financial development: credit provided to the private sector by commercial banks as percentage of GDP and the ratio of broad money supply (M2) as a percentage of GDP. This study is different as it used up to date data from 1995-2014, and employed one indicator of financial development which was broad money supply as the percentage of GDP. Saving and interest rate were included as control variables.

1.7 Organisation of the study

The structure of the study is organised as follows: firstly, chapter one introduces the study by briefly summarising the orientation, statement of the problem, objective of the study, hypothesis, significance of the study, and the limitations of the study. Chapter two then presents an overview

of the financial system in Namibia whilst chapter three presents the theoretical and empirical review. Next, chapter four narrates the methodology and data used for the study, thereafter estimation and interpretation of the results are presented in chapter five. Finally, chapter six gives an overall conclusion and policy implications.

CHAPTER TWO: AN OVERVIEW OF ECONOMIC DEVELOPMENT AND FINANCIAL STRUCTURE IN NAMIBIA

2.1 Introduction

The chapter presents an overview of economic development and financial structures within Namibia. This chapter is divided into three sections, the first; discussing economic development in Namibia, the second section discusses the financial structures of Namibia. The last section is the conclusion of the chapter.

2.2 Economic development in Namibia

Namibia is a small middle income economy with the mission of becoming a developed industrialised country by 2030. Endowed with natural resources, it manages to sustain itself through mining activities, livestock, agriculture and fishing. The GDP growth level in relation to other developing countries is recorded as being high and in 2010 it was ruled among the countries with high income inequality of Gini coefficient exceeding 0.6 (Central Bureau of statistics, 2010). In 2009, UN classified Namibia as an upper middle income country based on GDP per capita that resulted from higher GDP and low population (World Bank, 2011). After independence in 1990, Namibia's focus was to thrive by promoting employment and diversifying the economy, which it successfully managed to do. From 1991 to 1995, Namibia experienced a positive growth every year with GDP increasing at 5 percent on average. However, growth in GDP started decreasing to 2.9 percent in 1996 and further reducing to 2.5 percent in 1997, as a result of unfavourable climatic conditions, poor productivity and low prices. After consecutive years of a decline in growth, in 2000, the GDP made a remarkable recovery following a rise of

livestock sector by 10.7 percent and fishing sector by 13.3 percent (National Planning Commission, 2000).

Namibia's economy and export is composed of a primary industry, secondary industry and tertiary industry (National Planning Commission, 2012). Statistically, since 2002, there have been no changes in terms of the industries' contribution to GDP, while the tertiary industry alone contributed 56.9 percent to the GDP from 2002-2012, the secondary industry contribution increased by 2 percent from 16 percent to 18 percent contrary to the primary industry that reduced from 24 percent to 19 percent. During 2002-2006, the economy rose by 6.2 percent while on the other hand GDP growth declined by 3.9 percent in 2007 to 2012. This was driven by the financial crises that occurred in 2009 through 2011 resulting in external shocks which impacted international oil prices and exchange rates. A decline in global oil prices, led to Namibian prices being more lower compared to US prices and because the price trend in Namibia dollar are different from the global prices in the US due to depreciation. This led to consumers not benefiting fully from the price drop as a result of exchange rate. Eventually, a small growth of 6 percent, 4.9 percent and 5 percent was registered in 2010, 2011 and 2012 respectively, presenting the growth of only a half compared to that of 2004 which was 12.4 percent. The primary industry's contribution to GDP is dominated by the mining sector. However, according to the Labour Force Survey (2012), it contributed less than 1.8 percent to employment while agriculture and fisheries contributed 27 percent. The emphasis was made to develop agriculture and land as an initiative to poverty reduction.

Moreover, the manufacturing sector seems to influence the secondary industry accounting to more than one third of its contribution to the industry. From 2008, the manufacturing sector demonstrated a slowdown in its contribution as a result of a decline in industrial activities.

During NDP-3 (2007-2011) the industry registered a growth of 4.4 percent, while that of NDP-2 (2001-2005) grew by 6.34 percent. The reason behind the lowered contribution was in the manufacturing and construction sectors rising at 4.5 percent and 6.2 percent respectively during NDP-3, while during NDP-2 the manufacturing and construction sectors grew by 6.34 percent and 12.6 percent respectively. However, despite the fall, the GDP recorded an increase of 5.9% from the industry in 2012. Moreover, the water and electricity sectors depicted a steady yet slow increase in contribution towards the economy from 2002 to 2012. An increase in the contribution of water and electricity, implied it was high time Namibia reduced the import of electricity of 60 percent and started supplying more water and electricity to serve an increasing demand (National Planning Commission, 2012).

Tertiary education has proven to be the greatest contributor towards GDP and has maintained consistent growth for the past 10 years. During the period of NDP-2, the tertiary industry depicted a growth of 4.8 percent on average with the main drivers towards this being financial intermediation, transport and storage, wholesale, retail and repair. Tertiary industry grew even further by 5.3 percent during the period of NDP-3, with financial intermediation, real estate, business services, and government services being the main engines towards the growth. Despite the financial intermediation sector slowing down, its contribution in 2012 was still listed the highest contributor for the industry. On the other hand, the tourism sector managed to contribute 11 percent to employment within the industry and 7 percent towards total employment. Thus, in 2012 the industry managed to grow by 6.9 percent compared to the 4.5 percent recorded in 2011 (National Development Plan, 2012). A slow growth of GDP was reported in 2014 to be 4.5 percent compared to 5.1 percent in 2013. This decline was influenced by the tertiary and

secondary industries whose growth were recorded as 6.3 percent and 4.7 percent respectively in 2014 compared to 8.1 percent and 7.6 percent in 2013 (Namibia Statistical Agency, 2014).

Inflation trends in Namibia fluctuate although they are yet to be out of control. As a member of Common Monetary Area, the pegging of its currency to South Africa, keeps inflation linked closer to South Africa (BON, 2010). According to the Central Bureau of Statistics (2008), the period 2000-2007, Namibia recorded inflation rates of between 2.5 percent to 11.4 percent with the highest inflation and lowest inflation recorded in 2002 and 2005 respectively whilst in 2008 it rose to 10.4 percent. However, during the early months after the formation of NDP-4, inflation decreased to 6.5 percent and continued declining to 5.4 percent in 2014 (Namibia Statistical Agency, 2014). Namibia has so far been fighting to maintain stability in food prices and transport, with the intention of moderating inflation to avoid uncertain and unnecessary economic decisions that could impact economic development, considering that both higher inflation and zero inflation are not suitable in the economy.

Saving is necessary because it is associated with investment. For saving to take place, individuals need to reduce their consumption so as to save more. In comparison to investment, the Central Bureau of Statistics reported a higher contribution of Gross national saving to GDP between 2001- 2007, compared to 2008-2014 for which investment surpassed saving. In 2014 investment as a percentage of GDP was reported to be 27.9 percent compared to 25.8 percent in 2013, whereas

Gross domestic savings was recorded as 15.8 percent in 2014 compared to 17.5 percent in 2013 (Central Bureau of Statistics, 2014).

2.3 Namibian financial structure overview

The financial system in Namibia is considered very young but at an advanced stage in comparison to other African countries especially Sub-Saharan African countries (Ahmad, n.d). Ahmad further explained that, Namibian financial systems comprise of a dual system consisting of both the formal and informal sector. The formal sector includes Bank of Namibia, Commercial banks, National Housing Enterprise, Agricultural Bank of Namibia, Development Bank of Namibia, pension funds, savings bank, insurance companies, Namibia stock exchange (NSX), the post office and unit trusts while the informal sector comprises of micro lenders. It is therefore important to discuss the role played by these financial institutions considering that they play a significant role towards the growth of the economy.

2.3.1 Bank of Namibia

The Bank of Namibia officially came into existence in 1990 after independence, under section 2 of the Bank of Namibia (Act No. 8 of 1990). Before its establishment, the South African Reserve Bank carried out all the functions served by the central bank. Initially the Bank of Namibia performed its operations as an independent institution but later joined the Common Monetary Area for the purpose of maintaining stability in prices and inflation from which it pegged its currency (Namibian dollar) to South African rand at a ratio of 1:1. The purpose of joining the CMA with the aim of maintaining stability in prices and inflation made Namibia lose direct control and influence over its money supply. According to the Bank of Namibia (2008), its main functions include:

- Maintaining monetary stability both internally and externally
- Enabling efficient payment system mechanisms

- Acting as financial advisor and fiscal agent
- Regulating and maintaining price stability, control reserve and currency
- Sustaining liquidity, solvency and functioning of the system
- Promoting, maintaining and facilitating sound monetary, credit and financial systems in Namibia
- Regulating all banking institutions
- Acting as banker to commercial banks and providing overdraft to commercial banks in the absence of other sources.

2.3.2 Commercial banks

To date, although Namibia has many banking institutions, it only has five licensed commercial banks operating in Namibia; including the First National Bank (FNB), Standard Bank, Bank Windhoek, Bank BIC Namibia Limited and Nedbank Namibia (BON, 2011). According to Ikhide (2000) the financial system in Namibia is dominated by commercial banks with the majority of banks situated in urban areas and regions with more industries and high per capita income. Almost all banks in Namibia are partly South African owned, for example 100 percent of Standard bank shares are owned by South Africans, 78 percent shares of FNB and 43.6 percent shares of Bank Windhoek are owned by South Africans (Ahmad, n.d). The reason could be because there are no obstacles to enter into the Namibian financial industry although high capital is required for the establishment which seems to be an obstacle for entry. One of the functions of commercial banks is to receive deposits from savers and use the funds to give those in-need as a loan, it manages to provide interest rate to savers and charges interest to borrowers. However, more profit is made through bank charges.

2.3.3 Savings bank

The Namibia Post Office Savings Bank is the oldest and the only savings bank in Namibia which has served for over 115 years. NAMPOST saving bank doesn't give loan to its customers but through NamPost Financial Brokers (Pty) Limited which is a subsidiary of NamPost, tripartite finance agreement was signed between DBN, NAMPOST and PostFin from which DBN funds PostFin's micro-lending services through NamPost branches countrywide. With over 135 branches nationwide, Namibia Post Office Savings Bank has managed to offer a variety of services such as postal, banking, courier, philately, agency and money transfer. According to Sindano (2009) further investment products offered by the bank include savings accounts, saving certificates, save as you earn account and fixed term deposits. The bank has grown tremendously. For the period 2009-2014, return on equity on profit before tax was 20.2% yearly on average, and assets managed to grow by 18% on average per year. Further the debtor's day reduced from 122 days to 46 days and profits grew by 48% per year. In addition, the bank managed to facilitate 350 billion parcels and 6 billion letters while all financial services were offered free of charge. Regardless of how fast technology is advancing, the post office savings bank remains a facilitator of both national and international trade.

2.3.4 Development financial institutions

Namibia comprises of various number of development financial institutions, the notable ones includes; National Housing Enterprise, Development Bank of Namibia, and the Agricultural bank (Mushendani, 2007).

The Agricultural Bank of Namibia was established in 1991 and the name changed from Agricultural Bank of South West Africa. The bank provides funds to persons, cooperatives,

financial intermediaries and statutory agricultural institutions with the aim of promoting agriculture and all activities related to agriculture (Agriculture Bank of Namibia, 2014). Meanwhile, NHE is the state owned enterprise under the ministry of local government, housing and rural development (MRLGHD). It replaced the National Building Cooperation in 1993 which has been in existence since 1982. According to Kalili, Adongo & Larson (2008) its main aim is to provide investment opportunities by providing loans to the majority who cannot afford to own and build houses of the standard and cost that is within their reach . It further provides serviced land in order to tackle shortages of houses. On the other hand the DBN was founded in 2004 with the objective of promoting economic and social development that will sustain people's welfare both in the medium-term and long-term by mobilizing financial and other resources from all sectors (Nakusera, Kadhikwa & Mushendami, 2008). It also assists various institutions with funds for their development requirements to be met.

2.3.5 Non-Bank financial institutions

Non-Bank Financial institutions are institutions that do not receive deposits from individuals but facilitate other financial services. Non-bank financial institutions and banks are linked as they all act as financial intermediation but differ in a sense that bank's liabilities can be used as money while that of non-bank financial institutions cannot. They are regulated by NAMFISA which was established in 2001. The three crucial non-financial institutions in Namibia include; pension funds, insurance companies and unit trusts.

Insurance companies are companies that offer a contractual agreement with an individual. According to Petroni (2010) a person pays an agreed amount per contractual conditions on regular basis for the company to later pay for unforeseen incidences that are beyond one's control. A company covers short-term insurance which are associated with accidents, illness, loss

of employment, catastrophes and many others, while long-term insurance or life insurance is covered upon death. Namibian insurance companies are considered less competitive compared to their counterparts in the CMA. However, there have been a growing number of insurance companies especially long-term companies. By 2010, eighteen long-term companies were identified which contributed to 29.6% of GDP meanwhile fourteen short-term companies contributed to 2.8% of GDP (NAMFISA, 2011). By the 31st of December, short-term insurance assets and liability were worth 3.4 billion and 2.6 billion respectively while that of long-term insurance was 36.4 billion and 30.9 billion respectively under the same period of study (NAMFISA, 2014).

Pension funds are the largest investment institutions. By 2004 there were 500 small pension funds administered by external fund administrators, with Alexander Forbes among the largest administrators owning 60% of market shares. Employees from the government and other government agencies are covered by the largest pension fund GIPF which by 2004 was worth N\$ 15.1 billion equivalent to 73% of total pension. By 2010 its assets increased to 63.9 billion amounting to 75.1% of the GDP. As at 2014 the total Namibian pension fund had increased by 13.6% to USD 7.45 billion (Make Finance Work for Africa, 2016).

Lastly, a Unit Trust is defined as a scheme that is associated with collecting the money and investing in assets like shares, government bonds, money market instruments and other securities depending on investment motives and strategies of the fund. Since the establishment of unit trust schemes, the number of unit trusts has increased showing magnificent progress over the years with the oldest being Sanlam founded in 1994. Between the period of 2007-2010 the total fund under management increased from 13.9 billion to 25.9 billion and by the end of the second

quarter of 2014 the fund had increased to 40.4 billion with the main source of fund being natural persons, showing a massive contribution to the GDP (NAMFISA, 2014).

2.3.6 Namibia Stock Exchange

NSX existed as early as 1904 and was officially launched after independence in 1992 with 1 dual listed firm and 1 stock broker. Together with stakeholders and government financial sector it aimed at promoting and strengthening the capital market by enabling investment in the capital market through the provision of tradable instruments, with the expectation of providing the market to companies and for savings to be used appropriately for the purpose of developing the nation. According to Mushendani (2007) equity, interest bearing securities and long term loans are the financial instruments listed and traded on the exchange. Institutions such as unit trusts, life insurance and pension fund companies are known to be active in buying and selling shares in NSX. By the end of 2014, 38 companies were listed with NSX, with total market capitalization of N\$ 1.680 trillion, aiming at claiming the second largest stock exchange by total market capitalization in Africa led by JSE (African Security Exchanges Association, 2014).

2.3.7 Micro Finance Institutions

These are institutions such as cash lenders, and NGO's like Project hope funded by USAIDS and Sack Dwellers Federation of Namibia, who provide small amounts of capital to people incapable of getting a loan from commercial banks. According to NAMFISA there are more than 100 micro lenders in Namibia among which only 80 are registered. Statistically, it shows there is a decrease in the amount of loans given to individuals by N\$ 32.8 million to N\$498.1 million from the end of the second quarter of 2014 in comparison to the first quarter. This could be due to strict conditions imposed when applying for a loan (NAMFISA, 2014).

2.4 Conclusion

The chapter presented the general overview of Namibian economic development and its financial structures. Tertiary, secondary and primary industries are the contributors to Namibian economy, whereas changes in the activities of financial intermediation, manufacturing and agriculture sectors led to GDP contribution to fluctuate during the study period. Nonetheless, the country is regarded as the upper middle income country. The young and dual financial system played a massive role in the growth of the economy.

CHAPTER THREE: LITERATURE REVIEW

3.1 Introduction

This chapter presents literature review on the relationship between financial development and economic growth. The first section explains the theoretical review focusing on theories of economic growth proceeding with a review of the theoretical relationship between financial development and economic growth. The last section presents a review of empirical studies in order to assess if the theory reflects the reality.

3.2 Theoretical review

Two theoretical models are discussed; the Solow growth model and Endogenous growth model.

The Solow growth model is an extension of the Harrod-Domar model and was developed by the Economics Noble Prize winner Robert Solow in 1956. Unlike the Harrod-Domar model whose combination of factor of labor and capital were fixed, an exogenous growth model of Solow considered the effect on flexible proportion of factor of capital and labor and technology on the economic growth. Capital accumulation and labor force results in short-run economic growth due to characteristics of diminishing return. Exogenous technology leads to a long-run economic growth through innovation and improved technology. Solow believed that a household spend income by either saving or consuming. Given the aggregate production function,

$$Y = AF(K, L) \dots \dots \dots (3.1)$$

The equation (3.1), shows how output changes with capital (K) and labor (L). Both inputs are assumed to be positive. A rise in any or both inputs will increase output. A- represents technology which is exogenous. Technology does not affect capital or labor, but it positively affects output leading to improvement. Suppose the population, and all inputs are constant except capital, adding one capital to fixed labor will increase output but by less in comparison to the previous increase in output with additional capital. This is depreciation expressed as δ , of which total depreciation is denoted by δK . s can be defined as a fraction of income saved, and sY is total saving.

$$\text{Therefore } \Delta K = sY - \delta K = sF(K, L) - \delta K \dots \dots \dots (3.2)$$

The equation (3.2), refers to a change in capital stock (Net investment) which is equal to total savings minus savings needed to replace the worn out part depreciated. If total savings is greater than savings needed to replace depreciation, then the existence of net capital investment will lead to a long-run economic growth. Mankiw (1992) describes the Solow Growth Model as being determined by saving. Solow stipulated the fact that, a high saving rate will lead to a higher capital stock which translates into a higher level of output growth within an economy and vice versa. The model alludes that higher level of saving leads to a faster growth in economic. Indeed, an increase in savings means that investors within the economy can borrow funds in order to increase the amount of investment for any given quantity of capital stock. Thiel (2001) states that in a competitive economy, the amount of depreciation is determined by the cost of financial intermediation, for instance poor provision of financial services, resources and compensation for the risk undertaken by financial intermediary. Moreover, Harrison and Sussman (1999)

emphasized that with this perspective, for more savings to be transformed into productive investments there should certainly be less wastage of resources. King and Levine (1993) are amongst those who support the relationship between financial development and economic growth as the firms use savers funds to manage physical capital investment. A country with strong financial systems will allocate savings efficiently than less effective financial systems.

In contrast to Solow's growth model, the endogenous growth model is internally determined. The model was developed by Lucas in 1980, who named three factors as core contributors to economic growth. Firstly; human capital which is composed of education, training and experience. Secondly, innovation and thirdly knowledge. Both innovation and knowledge comprise of investments in research and development. Despite research and development being considered a solution to accelerating economic growth, some economists Jones (1995) and Young (1998) have contemplated why there has been a slow economic growth in spite of the increase in research efforts because investing in these factors were considered a major breakthrough to growth and various economists started highlighting them. Lucas (1988) stressed on general human capital while Romer (1990) emphasized on investments that extends the menu of products produced in the economy. Moreover, Prescott and Boyd (1987) prioritized investments in firm-specific human capital. According to King and Levine (1993), a country is considered rich when it has all three types of investments. In relation to the endogenous growth model, different theoretical studies tried to relate financial development and economic growth. Financial intermediaries identified investments projects through which investment could be carried out, the ability to obtaining information on capital risk will help in deciding on the type of capital to invest in, which will translate to effective allocation of resources leading to economic growth. The more inefficient, the fewer the funds will be available for lending. Pagano (1993) concluded by stating that it is the amount of saving that determines growth, and financial

development stimulates growth through transforming savings into investments. Further in attempting to explain how endogenous theory relates to financial development and economic growth, Bencivenga and Smith (1991) spotted financial innovation as one of the determinant between financial development and economic growth because financial innovation foster technological innovation which eventually stimulate economic growth. Moreover, Caporale, Howells and Soliman (2005) advised that advanced innovation generated more growth in the economy and that the lack of financial markets may lead to an individual investing in a more risky project rather than investing in assets that are more fruitful and yet financially illiquid, this way there is a guarantee of getting back the assets with more yields as assets are invested in a lesser risky market. Studies by Neal (1993), Tufano (2003), and Goetzmann (2004) are among the few to narrate the importance of financial innovation in speeding up technological advancement. Berthelemy and Varoudakis (1996) used the lack of education in the banks as one of the obstacle to growth taking into account education is the main requirement for growth and a poor quality education system is likely to hinder financial development. Levine (1991) was among the few who could not differentiate the role of each financial market and its impact on the economic growth. Past researches only considered bond markets, banks and stock markets as intermediaries and not markets, making it difficult to recognize how they bring about economic development. In addition, Lucas (1988) argued that the role played by financial markets on economic growth is overstressed.

Many questions have been asked by economists regarding the relationship between financial development and economic growth. These are; whether there exists a one way relationship implies that financial development stimulates economic growth or vice versa and if there is a two way causal relationship. Patrick (1966) explained two hypotheses in relation to stages of

development; supply leading hypothesis and demand following hypothesis. Patrick further stated that supply leading hypothesis emerge at the early stage of development and that financial development is responsible for economic growth. With high economic development, the economy will have a need for financial services thus demanding for one. Thus the existence of demand following hypothesis better known as growth-led finance hypothesis, where economic growth triggers financial development. The discussed theories spotted two channels through which financial markets lead to economic growth, enhancing efficiency and improved allocation. As discussed by Debreu (1959) and Arrow (1964) regarding enhancing efficiency, capital will be more productive if transparency, low cost of information and monitoring is taken into account before a decision to invest is made. Along with this Diamond and Dybriv (1983) pointed out that financial markets not only offer low cost services but also high returns. Conversely, enhancing allocation will lead to financial development to improving the economy, by increasing savings through cutting inefficiencies in intermediation cost. This was strongly supported by McKinnon (1973) and Shaw (1973) who emphasized saving as the means to increase investment. As it will be discussed later in the empirical studies, some researchers gave a remark on the presence of bi-directional relationship between financial development and economic growth, signifying that not only financial development can cause economic growth but also economic growth may lead to financial development, implying the existence of both supply leading and demand following hypothesis. In addition, another view was addressed by Lucas (1988) emphasizing that both hypothesis are independent of each other, and that no relationship exists between the two.

It is from these hypotheses that many empirical studies have been tested and arguments arose. Mixed findings from different countries on the relationship between financial development and economic growth have been detected.

3.3 Empirical Literature

Many studies have been conducted on investigating the relationship between financial development and economic growth, however using different data, time periods, methodology, financial development indicators, level of income and regions – the relationship between financial development and economic growth have proven to differ.

Kenourgios and Sanitas (2007) study examined the long-run relationship between financial development and economic growth in Poland, using quarterly data for the period 1994:Q1 until 2004:Q4. Dependent variables used for the study were real gross domestic product while value of credit given to the private sector, stock market liquidity, gross fixed capital formation and labor were used as independent variables. The data was tested for stationarity using ADF and PP test while Johansen's test was used to determine the long-run relationship between the variables. Results showed that in the long-run, credit to private sectors and capital formation plays an important role in economic growth while stock liquidity contribution is almost zero. In addition, the financial sector was found to impact economic growth negatively thus incapable of resulting in efficient investment.

Mushendani (2007) studied the causality between financial development and economic growth in Namibia. By making use of quarterly data covering the period 1993 to 2005, the study utilized broad money supply, credit to private sectors, commercial bank branches, inflation and openness index as explanatory variables while gross domestic product (GDP) was used as dependent variable. Using co-integration and the error correction modelling technique (ECM), results revealed the existence of the positive long-run relationship between financial development and economic growth in Namibia. In addition, the Granger causality test revealed that both broad

money supply and credit to private sectors affect economic growth, thus there existed a unidirectional relationship from financial intermediaries to economic development. Unlike inflation the reverse is true, gross domestic product was responsible for inflation. However, causal direction between international trade and economic growth remained equivocal. Since the study found it is financial development that impacts economic growth, a researcher recommended policy makers to boost financial sectors through policy implementations.

Jalil and Ma (2008) examined the relationship between financial development and economic growth by using annual data for China and Pakistan covering the period 1960 to 2005. The study employed bound testing (ARDL) technique to determine co-integration between financial development and economic growth. Using the ratio of deposit liability and that of credit to private sectors as financial development indicators, the results revealed that both indicators had a significant and positive long-run relationship between financial development and economic growth in Pakistan meanwhile deposit liability also experienced a positive and significant relationship in the case of China unlike credit to private sectors which was insignificant.

The study by Djoumess (2009) attempts to determine the relationship and causal association between financial development and economic growth in two Sub-Saharan African countries; Cameroon and South Africa. By using time series data covering the period 1970 to 2006, Autoregressive Distributed Lag bound testing (ARDL) and Vector Error Correction model (VECM) were used to determine the direction of causality. Earlier, the variables were subjected to unit root testing using ADF and PP tests. Taking into account financial indicator variables were regressed on real income, real interest rate and labor force, co-integration test using Johansen Juselius test for both countries revealed an existence of long-term relationship between each financial development and explanatory variables. At the same time, Cameroon depicts that

financial development causes economic growth using both methods, with ARDL South Africa showed no dependent relationship between the two variables rather it was economic growth that caused financial development with the VECM method.

In his study Sindano (2009) examined the causal relationship between financial development and economic growth in Namibia using the quarter data for the period of 1993 to 2007. Broad money supply and credit to private sectors were used as financial development indicators and GDP as dependent variable. After stationarity test were performed, Johansen's test on co-integration revealed a stable long-run relationship between financial development and economic growth. The Vector Error Correction Model (VECM) unveil that all financial development indicators positively affect economic growth while the Granger test showed the direction of causality runs from economic growth to financial development justifying the existence of demand following hypothesis.

Acaravci, Ozturk and Acaravki (2009) carried out a study to examine causality between financial development and economic growth using the sample of 24 Sub-Saharan African countries and annual time series data for the period 1975 to 2005. The study used panel co-integration and panel GMM estimation to determine the causality. The model used variables such as real GDP per capita as dependent variable and the measure of financial development; domestic credit provided by the bank sector as a percentage of GDP, domestic credit to the private sector as a percentage of GDP with non-bank credit to private sector and the liquid liabilities which is broad money supply as a percentage of GDP as independent variables. Co-integration findings revealed that there was no long-run relationship between financial development and economic growth. Causal relationship showed a bi-directional causal relationship between the growth of real GDP

per capita and domestic credit provided by the banking sector as well as a unidirectional causal relationship between domestic credit to private sector and growth of real GDP per capita.

In another study conducted by Estrada, Park and Ramayand (2010) econometric techniques were used to examine the relationship between financial development and economic growth in developing Asia. A cross-country panel data of 125 countries for the period 1987 to 2008 was used. The results reveal that all financial indicators used in the study such as liquid liability relative to GDP, private credit and stock market capitalization affect GDP growth positively. However, control variables like inflation and government size were found to affect the growth of GDP negatively while on the other hand education and trade seem to favor economic growth. Further there had been a slow growth due to the Asian financial crises. Overall the study seem to support economic theories that financial development is crucial for economic growth.

Akinlo and Egbetunde (2010) investigated existence of the long-run and the direction of causality between financial development and economic growth. The author used time series data for ten Sub-Saharan African countries from 1980 to 2005. The study employed the Augmented Dickey-Fuller test (ADF) to test for the unit root. Having used financial development indicators like ratio of broad money supply to GDP, real per capital stock and real interest rate, Johansen-Juelius was used to test the presence of co-integration from which long-run relationship was determined. The Granger causality test within the Vector Error Correction Model (VECM) detected a supply leading hypothesis in Central Africa, Congo, Gabon and Nigeria while demand following hypothesis was found in Zambia. In addition, a two way directional relationship was determined in Kenya, Chad, South Africa, Swaziland and Sierra Leone.

Simwaka, Munthali, Chiumia and Kabango (2012) analysed a causal relationship between financial development and economic growth in Malawi. The annual data for the period 1980 to

2010 on domestic credit to private sector as a percentage of GDP, bank deposit as a percentage to GDP and private sector credit as a ratio of domestic credit were used. An Autoregressive Distributed Lag (ARDL) approach was utilized for analysis and revealed a positive long-run relationship between financial development and economic growth. The Granger causality test helped to determine the direction of causality running from economic growth to financial development specifically, private sector credit as a percentage of GDP and private sector credit as the ratio of domestic credit. The study suggested the need to improve macroeconomic policies as being crucial for financial development.

An empirical study conducted by Al-Naif (2012) explored causal relationships between financial development and economic growth in Jordan. Annual time series data for 1977 to 2008 was used while broad money supply, credit provided to private sector and bank deposit both as percentage of GDP were used as measure of financial development. The Johansen co-integration test revealed the existence of long-run relationships between financial development and economic growth. The Granger causality and the VECM tests indicated the short-run and long-run existence of unidirectional relationships from financial development to economic growth.

Shittu (2012) focused on examining the relationship between financial intermediation and economic growth in Nigeria. The study made use of time series data from 1970 to 2010. It incorporated two widely known indicators for financial intermediation; broad money supply to nominal GDP and the ratio of gross domestic credit to private sector to nominal GDP. Capital stock and trade ratio were added as the control variables while the rate of growth to real gross product was used as explained variable. The unit root, co-integration test and error correction model procedures were used to analyse the model. The results revealed that the fact variables capital stock and trade ratio were found to have a negative impact on economic growth.

However, both financial intermediation indicators were found to affect the economy positively in the short run. It was only broad money supply which was found to be the only significant determinant of economic growth in Nigeria.

Giri and Mohapatra (2012) examined relationship between financial development and economic growth in India by making use of the multi-variable VAR model. The study used time series data and focused on the periods 1970-71 to 2008-09. Among the variables for financial development used were financial activities (FA) emerging from productive investments by private corporate sector as the ratio of Gross Domestic Capital formation, the ratio of financial savings to GDP and financial deepening calculated as the ratio of the liquid liabilities to nominal GDP. Two variables of economic growth were added. The results showed that there was a long-run relationship between financial development variables and economic growth. According to vector error-correction models (VECM), the results showed a one way directional causality from financial development to economic growth in India, meaning there existed supply leading hypothesis. This implied the advancement of the financial sector would improve and develop the economy when monetary authorities liberalize policies related to investment, trade openness and financial infrastructure.

As it is previously explained, the relationship between financial development and economic growth is not certain. Sunde (2013) carried out a study to investigate the relationship between financial development and economic growth in Namibia covering the period 1990Q1-2011Q4. Using Multivariate Granger causality tests, although a unidirectional causality relationship was found just like that of Mushendami (2007) and Sindano (2009), this time financial sectors were found to be insignificant to economic growth.

In another study Ndlovu (2013) sought to examine causal relationships between financial and economic growth in Zimbabwe covering the period 1980 -2006. The variables used were stock market, capitalization ratio to GDP, liquid liability to GDP ratio, ratio of domestic credit, inflation, real interest rate and openness of economy. Time-series technique such as unit root, the Johansen's co-integration and the Granger-causality test were employed. The Johansen co-integration test revealed a long-run relationship between financial development and economic growth. The Granger-causality showed that economic growth led to domestic credit to the private sector and liquid liability, supporting demand following hypothesis. However, the results failed to show any causal relationship between capitalization and economic growth.

A further study by Fille (2013) estimated the regression using the Autoregressive Distributed Lag Error Correction Model in an attempt to examine causal relationships between financial development and economic growth in Tanzania. The Engle-granger approach to co-integration and granger causality tests within the vector auto regression framework were applied to time-series data for the year 1988 to 2012. The study revealed that there exist a long-run relationship among all variables; real GDP per capita growth, broad money to GDP, the ratio of domestic credit to the private sector to GDP and the ratio of bank deposits to GDP. The study confirmed a two way causality between financial development and economic growth, meaning real GDP per capital growth causes financial development and bank deposit influences real GDP per capital growth.

Ali (2013) investigated the empirical long-run relationship between financial intermediation and economic growth in Sudan using the Autoregressive Distributed Lag (ARDL) bound testing approach to co-integration. The study used annual time series data between 1970 and 2011. The study was carried out using various indicators to measure financial development including, the

ratio of liquid liability of commercial bank to nominal GDP, the ratio of credit provided to the private sector by commercial banks as a percentage of GDP and broad money supply as a percentage of GDP. Four variables were included in the model; inflation rate, trade openness, gross investment and government expenditure while real per capita GDP was a dependent variable. The null hypothesis of no co-integration was rejected implying a long-run relationship between dependent and independent variables. Government expenditure, inflation and trade openness were found to have a negative impact on real per capital GDP while gross investment exerts a positive effect. Regarding financial indicators, credit to the private sector and liquid liability were found to have a positive long-run effect, while there was a negative long-run relationship between money supply and real per capita GDP. Although credit to the private sector and liquid liabilities proved to affect per capital GDP positively, credit to the private sector and real per capital GDP remained having weak elasticity. A 1% increase in credit to the private sector leads to real per capita GDP increase by 0.12%. Despite many studies showing a weak link between financial development and economic growth, it was concluded that it is only credit to private sectors that affect the economy of Sudan in the long-run. The error correction model using OLS found no short-run relationship between explanatory variables and real per capita GDP.

Onuonga (2014) tested whether there is a relationship between economic growth and financial development in Kenya. Data for the period 1980-2011 on broad money supply, and ratio of domestic credit to private sector were used. The study employed the Augmented Dickey-fuller test (ADF), Philips-Perron (PP) and Perron test to test for stationarity. Then the ARDL bounds testing approach for co-integration was used to determine the presence of long-run and short-run relationships between the variables from which a stable long-run relationship between financial

development, trade openness and economic growth in Kenya was determined. The Granger causality test unfolded the existence of bi-directional causality between financial development and economic growth. This confirmed the existence of both supply leading and demand following hypothesis.

Musamali, Nyamongo and Moyi (2014) used the ratio of credit to the private sector and the ratio of broad money supply to GDP to determine the relationship between financial development and economic growth in Africa. The study used a cross section data of 50 African countries over the period of 1980 to 2008. In examining for causal association between the variables, panel regression and the causality testing approach were used. Regression analysis showed financial development affects economic growth positively in the long-run however private credit and economic growth seem to relate more compared to money supply and economic growth. Meanwhile the test for causality clearly showed the presence of bi-directional relationship between the variables.

Nyasha and Odhiambo (2015) used the Autoregressive Distributed Lag (ARDL) bound testing approach to explore both long-run and the short-run relationship, between bank-based financial development on economic growth in Ghana for the period 1970-2014 based on annual time series data. The study used the variables such as the real GDP growth rate, proxies that measure bankbased financial development comprising of liquid liabilities, ratio of domestic credit extension to private sector by banks to GDP, the ratio of claims of deposit money bank assets on private sector to broad money, ratio of deposit money bank assets to GDP, and composite index of bank-based financial development. The study specified five models, each consisting of one proxy of bankbased financial development. The end results, unveiled the existence of a complex relationship between bank-based financial development and economic growth. The impact on

economic growth was not fixed and varied depending on the proxy used to measure bank-based financial development. All-inclusive, it disclosed that when both the ratio of domestic credit extension to private sector by banks to GDP and the composite index were used as proxies bank-based financial development impacted economic growth positively. On the contrary, the ratio of deposit money bank assets revealed bank-based financial development affected economic growth in Ghana negatively when used as a proxy. Both outcomes applied regardless of whether the study was based in the long-run or short-run. Moreover, as the ratio of claims of deposit money bank assets on the private sector to broad money was used as a proxy for bank-based financial development, bankbased financial development was found to exert a negative effect on the economy in the short run while imposing a positive impact in the long-run. Nonetheless, there existed a positive relationship in the short-run and negative relationship in the long-run when the ratio of quasi liquid liability to GDP was employed. Also the impact of control variables on economic growth in Ghana depended on the model in which they were employed.

In conclusion, empirical literature shows that studies conducted in Namibia on the relationship between financial development and economic growth are insufficient and show contradictory results. Although studies from the two categories of literature shows the existence of positive and long-run relationship between financial development and economic growth, the directions of causality differs as one indicates a supply leading hypothesis and the other a demand following hypothesis. To date, neither Namibia nor any other country has reached an agreement on the direction of causality and the impact that financial development and control variables has on the economic growth.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

The chapter presents the methodology to be followed in this study. In particular the econometric techniques applied are discussed in great detail. The chapter is divided into four sections. The first section provides the data and data sources, while the measurements of the variables are discussed in the next section. The empirical model and model specification are presented in the third section followed by the data analysis. Finally the conclusion of the chapter is provided in the last section **4.2 Data Sources**

Secondary data was collected from Bank of Namibia and the Namibia Statistics Agency for the quarterly data for the period running from 1995-2014. The ratio of broad money supply to GDP

was used as an indicator of financial development while savings and interest rate were added as variables that affect economic growth.

4.3 Measurements of variables

The empirical model shows that economic growth is the function of financial development and control variables. The study uses real growth domestic product (GDP) as dependent variable to measure economic growth, while the ratio of broad money supply to GDP is used as measure for financial development. Savings and interest rate are added as control variables.

The study makes use of the ratio of broad money supply to GDP (M2) as the most commonly used proxy of financial development (Odhiambo, 2005) and (King et al. 1993). It consists of time, savings, as well as currency not within banks. Furthermore, transferable deposits and foreign currencies deposited by residents are also included as part of broad money supply. The higher the ratio of broad money supply to GDP the greater the size of the financial sector (Shittu, 2012). Once the financial sector increases at a higher pace than the real sector, most likely there will be a positive economic growth.

Other variables used in the study are the control variables, real interest rate and savings. Real interest rate is defined as deposit rate minus inflation rate. High interest rate improves financial depth via saving which then promotes growth. On the other hand, saving is described as part of income that the household does not spend. Many studies such as (Krieckhaus, 2002; Sinha, 1999; and Jappelli & Pagano 1994) found that higher savings promotes investments which contributes to a higher GDP growth.

4.4 Empirical Framework and Model Specification

In determining the empirical long-run relationship and interactions between variables, this study utilized the mode Autoregressive Distributed Lag bound testing approach to co-integration (ARDL) as recommended by (Pesaran, Shin & Smith, 2001) and used by (Ali, 2013).

The following econometric model was used;

$$GDP = \alpha_0 + \alpha_1 RIR + \alpha_2 SAV + \alpha_3 FD + \alpha_4 BMS + \epsilon_1 \dots \dots \dots (4.1)$$

Where;

GDP= Economic growth

RIR= Real Interest rate as a percentage of GDP

SAV= Savings as percentage of GDP

FD= Financial development variable representing

BMS= Broad money supply as percentage of GDP

α_0 = Constant

α_1 - α_3 = Respective coefficients

ϵ_1 = Error terms.

It is therefore important to express the model in a log-linear form, for easier interpretation of coefficient. The model will read as follows:

$$\ln GDP = \alpha_0 + \alpha_1 RIR + \alpha_2 SAV + \alpha_3 FD + \alpha_4 BMS + \epsilon_1 \dots \dots \dots (4.2)$$

4.5 Data analysis

E-Views software was used to process and present the data during the investigation of the relationship between financial development and economic growth. Before utilizing the model the unit root test was carried out to determine stationarity of time series data between the variables in an attempt to eliminate the presence of a spurious effect. Co-integration, using the bound testing approach was then employed to determine the occurrence of a long-run relationship among the variables by constructing the Unrestricted Error Correction Model. Then the ARDL and ECM were applied to estimate long-run and short-run coefficients.

4.5.1 Stationarity

Given that the study was dominated by time series data, stationarity and non-stationarity of the data needed to be examined. The data is stationary when properties for mean and variance are constant and covariance between two periods are measured by the distance between two periods and not necessarily the given actual periods (Gujarati & Porter, 2003). Non-stationarity occurs when mean and variance are time-variant, when this happens, errors are likely to occur as t-ratios and R-squares are overestimated. Therefore, before determining the existence of long-run relationship between financial development and economic growth, it is necessary to test for a unit root to confirm the order of integration. Although this study used the ARDL bound econometric model which does not require pre-testing of the variables when the variables are integrated of order 1(0) and 1(1), and since the study dealt with time series data, it was only important to confirm the order of integration by making sure they were not integrated in order 1(2) and above. In order to determine stationarity, this study employed both the Phillips-Perron (PP) test (1988) and (KPSS) test suggested by Kwiatkowski-Phillips-Schmidt-Shin (1992). All tests were employed so as to arrive to the same robust conclusion.

For the PP test, the presence of a unit root means rejecting the null hypothesis of non-stationarity. For the null hypothesis to be rejected, test statistics need also to be greater than the critical value.

PP equation is as follows:

$$\Delta \square_{\square} = \square_0 + \square \square_{\square-1} + \square \dots \dots \dots (4.4)$$

Contrary to the PP test discussed above, the KPSS test for a unit root in alternative hypothesis against null hypothesis of stationarity. In this case rejecting the alternative hypothesis of a unit root does not necessarily confirm stationarity, it can as well be trend stationarity.

Below is KPSS regression:

$$\square_{\square} = \square' \square_{\square} + \square_{\square} + \square_{\square} \dots \dots \dots (4.5)$$

$$\square_{\square} = \square_{\square-1} + \square \dots \dots \dots (4.6)$$

Where: \square_{\square} is constant or constant and time trend, \square_{\square} is 1(0), \square_{\square} is pure random walk and innovation variance.

4.5.2 Co-integration

The study chose to use co-integration test based on Autoregressive Distributed Lag (ARDL) bound testing to examine for a long-run relationship between financial development and economic growth. In contrast to other techniques like Engle-Granger (1987) and Johansen and Juselius (1990), this method is more favored because it can be used without pre-testing the series to determine the order of integration provided the variables are of order 1(0) and 1(1). Furthermore, in order to have optimal lag length per variable, it uses sufficient lags to capture the data generating process. Unlike other techniques that uses the system of equations, ARDL bound

test uses the single reduced-form equation (Duasa, 2007). Moreover, it is suitable for small sample data (Pesaran & Shin, 1998). Two procedures of Autoregressive Distributed Lag was followed to determine the existence of long-run relationships between the variables. These were to determine co-integration between the variables and to estimate long-run and short-run coefficient using associated ARDL and ECMs. Co-integration is determined from equation (4.2) by constructing the Unrestricted Error Correction Model (ECM), from which OLS.

$$\Delta \ln GDP = \alpha_0 + \alpha_1 \ln GDP_{t-1} + \alpha_2 \Delta \ln GDP_{t-1} + \alpha_3 \Delta \ln GDP_{t-2} + \alpha_4 \Delta \ln GDP_{t-3} + \sum_{i=1}^p \delta_i \Delta \ln GDP_{t-i} + \sum_{i=1}^q \gamma_i \Delta \ln GDP_{t-i} + \sum_{i=1}^r \theta_i \Delta \ln GDP_{t-i} + \epsilon_t \quad (4.7)$$

Where; $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ are long-run coefficients and δ_i, γ_i and θ_i are short-run coefficients. F-test is then used to detect the existence of a long-run relationship between the variables by comparing with the critical value. The null hypothesis of no co-integration is tested under the condition $H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$, while Alternative hypothesis of co-integration is tested under the condition $H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$. If the calculated F-statistic is observed to be lower than the lower bound, the null hypothesis of no co-integration is accepted, meaning there is no long-run relationship between the variables and when F-statistic is above the upper bound, then co-integration exist implying existence of long-run relationship between the variables. In the situation where the computed F-statistic lies between the upper and lower level, the test becomes inconclusive.

After successfully obtaining co-integration, the long-run coefficients are estimated through the application of the ARDL method. Through the application of OLS on the restricted ARDL model below, the estimated long-run coefficients will be obtained.

$$\Delta \ln \text{GDP} = \alpha_0 + \sum_{i=1}^4 \alpha_i \text{Ln} \text{M3}_{t-1} + \sum_{j=1}^2 \alpha_{2j} \text{Ln} \text{GDP}_{t-1} + \sum_{k=1}^3 \alpha_{3k} \text{Ln} \text{IR}_{t-1} + \sum_{l=1}^4 \alpha_{4l} \text{Ln} \text{S}_{t-1} + \epsilon_t \dots (4.8)$$

4.5.3 Testing for Stability of Long-run Relationships.

The study used the Cumulative Sum of Recursive Residuals (CUSUM) to test for the stability of estimated coefficient. Even with the presence of long-run relationships, it is very important to carry out the test to determine long-run stability, due to unforeseen changes that may occur in the economy.

4.5.4 Estimating Short-Run Coefficients

After obtaining long-run coefficients and error correction terms, short-run parameters can as well be attained. A short-run coefficient is obtained by applying OLS to ECM equations and is associated with ARDL long-run relationships. The following is the error correction term obtained from equation (4.8).

$$\epsilon_t = \alpha_0 - \sum_{i=1}^4 \alpha_i \text{Ln} \text{M3}_{t-1} - \sum_{j=1}^2 \alpha_{2j} \text{Ln} \text{GDP}_{t-1} - \sum_{k=1}^3 \alpha_{3k} \text{Ln} \text{IR}_{t-1} - \sum_{l=1}^4 \alpha_{4l} \text{Ln} \text{S}_{t-1} \dots (4.9)$$

4.6 Conclusion

The chapter discussed the different tests like stationarity, co-integration, ARDL and ECM that were used to investigate the relationship between financial development and economic growth in Namibia. The variables such as broad money supply were used as an indicator to measure financial development while GDP, interest rate and savings were used as control variables to measure economic growth.

CHAPTER 5: ESTIMATION AND RESULTS INTERPRETATION

5.1 Introduction

The chapter presents empirical estimation results and economic interpretation to analyze the validity of the relationship between financial development and economic growth in Namibia. The first section provides results for stationarity using unit root tests. Long-run relationship among the variables is provided by carrying out co-integration test in the next section and is followed by an outline stability of long-run relationship between the variables. The last section draws the conclusion of the chapter

5.2 Unit root tests

The statistical properties were first explored in this study. Although, ARDL does not require pretesting for stationarity, unit root tests were conducted to make sure that none of the variables were integrated of order two I (2) or beyond. The test was conducted in level and first difference using the PP test and KPSS test. The results are reported below in table 5.1

Table 5.1: Unit root tests, PP and KPSS in levels and first difference

Variable	Model Specification	PP	KPSS	PP	KPSS	Order of integration
		Levels	Levels	First Difference	First Difference	
M2	Intercept	-1.1	0.86	-3.60**	0.1*	1

	Intercept and Trend	-1.66	0.20	-3.58**	0.1*	1
RGDP	Intercept	-2.99	0.08*	-7.73**	0.03*	0
	Intercept and Trend	-1.07	1.09	-4.15**	0.06*	0
SAV	Intercept	-1.07	1.09	-4.15**	0.06*	1
	Intercept and Trend	-2.01	0.15	-4.13**	0.06*	1
RIR	Intercept	-2.42	0.61	-4.48**	0.10*	1
	Intercept and Trend	-3.61**	0.06*	-4.39**	0.05*	0

Source: author's own computation and values are estimated from Eviews.

Notes: ** and * indicate rejection of the null hypothesis at both 5% and 10% as indicated from the table, although some variables are not stationary at levels. The results clearly shows all variables are stationary in the first difference as the calculated KPSS test statistics reveals to be smaller than the critical valued at both 5% and 10%. Therefore, the null hypothesis of stationarity cannot be rejected. The order of integration of both orders I (0) and I (1), permits one to use the ARDL bound testing approach in determining the long-run relationship among the variables.

5.3 Cointegration Test

The following step is to use the ARDL bound testing approach to establish whether co-integration exists among the variables. To establish this, the unrestricted error correction model using ordinary least square method was used to estimate equation 4.7. The existence of long-run relationship between the variables were achieved by comparing the calculated F-statistics test with the upper and lower bound as critical values from Pesaran et al. (2001). Moreover the

optimal lag length was determined using the lag length criterion, from which the lag length of 2 was proposed to be used in the study. In addition, LM test did not show an autocorrelation problem as the probability of each corresponding lag was found to be greater than 5%, thus, not rejecting the hypothesis of no serial correlation.

Table 5.2 Computed F-statistics

Test Statistic	Value	D f	Probability
F-statistic	7.668587	(4, 64)	0.0000
Chi-square	30.67435	4	0.0000

Table 5.3 Critical values from Pesaran (2001)

F Statistics Computed	Critical Value	Lower bound value	Upper bound value
7.669	1%	5.17	6.36
7.669	5%	4.01	5.07
7.669	10%	3.47	4.45

Source: author's own computation and values obtained from Eviews

Table 5.2 shows the calculated value while table 5.3 shows the comparison of the calculated Fstatistics with the critical values. The results reveal that the calculated value 7.669 is greater than the upper bound at all levels of significance, suggesting the presence of co-integration among the variables. This is to say, the null hypothesis of no co-integration is rejected. Henceforth, the existence of long-run relationship between variables exists. This allows for the estimation for the error correction model and the results for the error correction model are presented in table 5.4 below.

Table 5.4 Error correction model estimates

Variable	Coefficient	Std. Error	t-statistic	Prob
C	0.043076	0.031413	1.371248	0.1753
D(LNRGDP(-1))	0.158904	0.110849	1.433512	0.1568
D(LNM2)	-7.380453	1.528063	-4.829942	0.0000
D(LNM2(-1))	1.672373	1.904507	0.878114	0.3833
D(LNRIR)	-0.002693	0.115407	-0.023337	0.9815
D(LNRIR(-1))	0.033717	0.091925	0.366785	0.7150
D(LNSAV)	-0.136753	0.391639	-0.349182	0.7282
D(LNSAV(-1))	-0.093885	0.374461	-0.250720	0.8029
EC(-1)	-0.304944	0.079056	-3.857303	0.0003
R-squared	0.458056	Mean dependent var		0.005979
Adjusted R-squared	0.386982	S.D dependent var		0.293371
S.E. of regression	0.229696	Akaike Info criterion		0.015404
Sum squared resid	3.218382	Schwarz criterion		0.304496
Log likelihood	8.460877	Hannan-Quinn criter		0.130234
F-statistics	6.444732	Durbin-Watson stat		2.065678
Prob(F-statistic)	0.000005			

Source: author's own computation and values obtained from Eviews

Table 5.4, shows that the lagged variable real GDP positively affects economic growth though the relationship is statistically insignificant. In particular, the coefficient of 0.158, simply means an increase in the lagged real GDP by 1% will lead to economic growth to increase by 16%. On

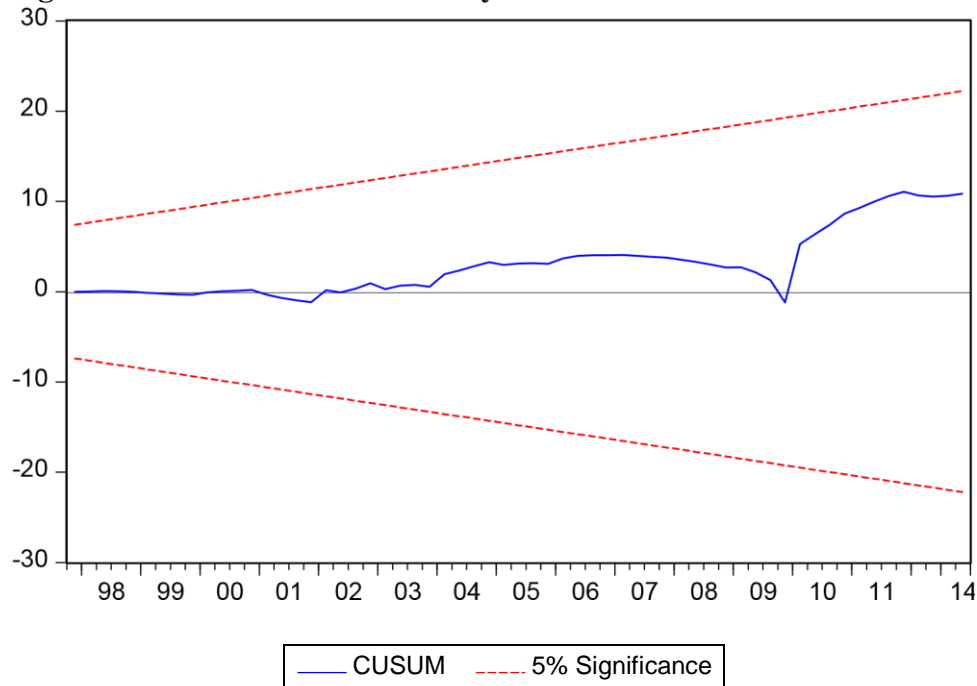
the contrary, the ratio of broad money supply to GDP influences real GDP negatively, though statistically significant. However, it has a positive and statistically insignificant positive influence on economic growth when it has a lag of one period. Furthermore, saving is found to have a negative and statistically insignificant relationship with economic growth. Statistically, it clearly shows that saving has no impact on the economic growth in Namibia. This could be attributed by Namibia experiencing strong income inequality, from which fewer wealthy individuals manage to save for investment while the majority of the poor fail to afford financing investment in education. Similarly, the real interest rate has a negative and statistically insignificant relationship with economic growth, though when it is lagged for one period it conveys a positive relationship with economic growth. A 1% increase in real interest rate, will lead to 3.3% decrease in real GDP. The Error Correction Model from the table is represented by expected negative coefficient of less than one in absolute terms, showing the speed at which the variables adjust to long-run solution to influence short-run movement (rate of convergence to equilibrium). The negative expected sign is due to a lack of 100% guarantee on adjustment. Furthermore, the coefficient is statistically significant. The coefficient of adjusted R-squared implies 39% of the variations in real GDP are explained by the overall effect of all the variables. Therefore, in conclusion, the ratio of broad money supply to GDP is found to have a higher and negative influence on economic growth. This could be associated with the problem of uncontrolled money supply that leads to excessive inflationary tendencies.

5.4 Stability of Long-run relationship

Having established the long-run relationship, it is necessary to establish whether this relationship is stable or not. In this regards, the cumulative sums (CUSUM) was used to test for the stability of the model. During the study period, results for CUSUM revealed that at 5% level of

significance, stability of the coefficient of the model were stable since they lied within the critical bound.

Figure 5.1 CUSUM test for stability



5.5 Conclusion

This chapter provided estimation of data and results interpretation. The above results briefly explained that there is indeed a long-run relationship between financial development and economic growth in Namibia and that an increase in the ratio of broad money supply to gross domestic product leads to a decline in economic growth.

CHAPTER 6: CONCLUSION AND POLICY IMPLICATION

6.1 Introduction

This chapter presents three sections as follows: the first section presents the conclusion followed by an explanation of policy implication and the last section presents the areas for further research.

6.2 Conclusion

The study examined various literature in order to explore the existing debate regarding the existence of the relationship between financial development and economic growth in Namibia. The study used the variables of broad money supply as the measure of financial development while real interest rate and saving were used as control variables. It is from these variables that the relationship with the economic growth had to be determined using quarterly data for the period 1995 to 2014 from the Bank of Namibia and World Bank.

A cointegration test was conducted after unit roots were found to be stationary and integrated of order zero and one using PP test and KPSS test. Co-integration results showed the existence of a long-run relationship between real GDP, broad money supply, real interest rate and saving. While, the ratio of broad money supply to gross domestic product was found to have a negative and statistically significant relationship with the Namibian economy, savings and real interest rates proved to have a negative and statistically insignificant relationship with economic activity. Moreover, both lagged real GDP and lagged real interest rate were found to have a positive relationship with economic activity.

6.3 Policy Implication

The study has established that real GDP plays a very important role in the economy, and since real GDP growth performance is attributed to tertiary, secondary and primary sector, It is therefore recommended by the National Planning Commission for the government to invest more in real sectors like manufacturing, mining, fishing, and farming, taking into account agriculture is the backbone for the majority of Namibians. In addition, investment being important, United Nations Development Programmes (UNDP) in Namibia calls for the government to ensure almost all Namibians are educated and protected at work places. Evidence from Ravallion (2013), confirms inequality contributes highly to poverty and that a 1% increase in income in many unequal countries reduce poverty by merely 0.6% while equal countries yield up to 4.3% reduction in poverty. This may explain the reason why Namibia has Human Development that grows at only a 10.7% compared to global of 20% between 1990 and 2015. This will work towards reducing high income inequality, from which poor people can start saving and investing. Moreover, the government must be encouraged to support unemployed individuals with small and medium enterprises for self-sustenance.

6.4 Areas for Further Research

More research is recommended on additional variables. Economists must be encouraged to explore new financial development indicators that have not yet been studied like stock market capitalization to GDP, return on assets of commercial banks and Non-Bank financial institutions, Non-performing loan ratio, Commercial-Central bank which measure the degree to which commercial banks versus central bank allocate society's saving and other variables for economic growth. This will help policy makers to know what exactly they should focus on and direct the

resources efficiently in bringing about economic growth, thus solving the problem of availability of limited resource.

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