

**THE DIRECTION OF CAUSAL RELATIONSHIP BETWEEN FINANCIAL
DEVELOPMENT AND ECONOMIC GROWTH IN NAMIBIA**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN ECONOMICS
OF
THE UNIVERSITY OF NAMIBIA**

ABEL NDAFETWA SINDANO

MARCH 2009

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SUPERVISOR: DR. E KAAKUNGA

ABSTRACT

The study determines the causal relationship between financial development and economic growth in Namibia. In order to test for existence of long run relationship between the variables, the study employs a cointegration and vector error correction model (VECM) technique. Granger causality test was applied to the variables to test for the direction of causation between variables. The study uses quarterly data for the period of 1993 to 2007. Economic growth is proxied by gross domestic product, and financial development is proxied by broadly defined money supply (M2); and credit to the private sector. The result shows that there is a stable long-run relationship between financial development and economic growth. The Granger causality test indicates that the causality runs from economic growth to financial development. The results suggest that the real sector of the economy should be developed further in order to stimulate further development in the economy through policy interventions like industrial development to diversify the economic base, enhance the performance of small and medium enterprises, and, enhance the performance of the tourism sector which has a great potential in promoting growth.

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DEDICATION

I wish to dedicate this thesis to my father, Bishop Johannes Sindano and my mother Mrs. Martha Sindano.

DECLARATION

I, Abel N.M. Sindano, hereby declare 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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Date.....

Abel N.M. Sindano

Acronyms

ADF	Augmented Dicker-Fuller
AIDS	Acquired Immune Deficiency Syndrome
BoN	Bank of Namibia
CBS	Central Bureau of Statistics
CMA	Common Monetary Area
CPI	Consumer Price Index
ECM	Error Correction Model
HIV	Human Immunodeficiency Virus
GDP	Gross Domestic Product
M2	Broad Money Supply
NSX	Namibia Stock Exchange
SWABank	South West Africa Bank
VAR	Vector Auto regression
VECM	Vector Error Correction Model

Chapter One

Introduction

1.1 Background

Financial development is usually defined as a process that makes improvement in quantity, quality, and efficiency of financial intermediary services. The relationship between financial development and economic growth has been comprehensively treated in theoretical and empirical literature, but economists hold different perspectives. In the literature on the relationship between financial development and economic growth, one question has remained inconclusive and that is whether policy makers should first pursue financial development, or economic growth, or whether they should pursue both financial development and economic growth at the same time.

Firstly, Robinson argued that, growth in the financial sector follows rather than leads economic growth (as cited in Arestis & Demetriades, 1996). This view is called the demand-leading approach.

Secondly, McKinnon argued that the financial system plays a critical role in reallocating resources to the most productive investments, which in turn leads to high economic growth (as cited in Arestis & Demetriades, 1996). This latter argument has been supported by empirical work using cross country data by (King & Levine, 1993), among other studies. This view postulates the supply-leading approach.

Thirdly, there are views which contend that both financial development and economic growth are positively interdependent and their relationship could lead to feedback causality. The work of (Luintel & Khan, 1999), among others, is supportive of this argument.

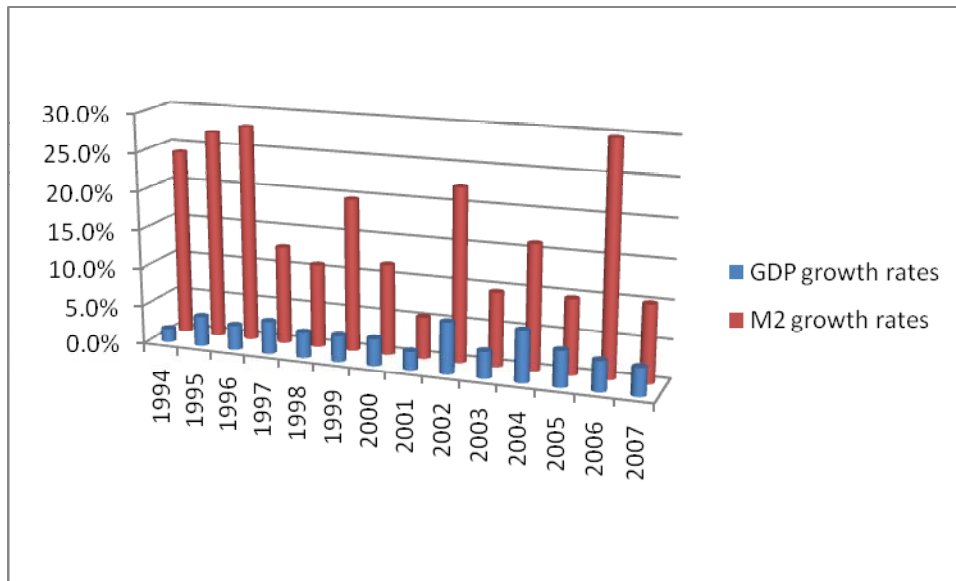
The financial system in Namibia is relatively young and is regarded as well developed compared to financial systems in sub-Saharan Africa. Namibia has a dual financial system made up of formal and informal sectors. The informal sector is made up of cash loan operators, money lenders, pawnbrokers and others.

While the formal sector comprises of the central bank, commercial banks, insurance companies, pension funds, unit trust and others. There are a number of development finance institutions in Namibia that form an integral part of the financial system e.g. Development Bank of Namibia.

The study focuses on the commercial banking sector as it is the most dominant sector in the financial system in Namibia and the one that plays a clearer intermediary role than any other type of financial institutions. Currently there are four commercial banks in the country with total assets valued at N\$36.5 billion as at 31 December 2007, (Bank of Namibia 2007 annual report). The commercial banking system has strong links to the South African system and this is reflected in the strong South African shareholding in the Namibian commercial banks. Financial development in Namibia over the years, as measured by the ratio of the broad money to gross domestic product (M2/GDP), has shown an upward trend. For example the ratio of M2/GDP in 1990 was 22 % and by 1995 the ratio was 35%. Later in the year 2000 the ratio improved to 41% and in 2007 it improved further to 47% (Bank of Namibia & Central Bureau of Statistics)

Figure 1.1 shows annual GDP growth rates and M2 growth rates for the period of 1994-2007. The graph shows a positive growth for both GDP and M2 one of the measures of financial development.

Figure 1.1: GDP and M2 Growth Rates



Source: Author's own computation

During the period 1990-2007, Namibia's economy realised an average annual growth of 3.9 %. The growth rates achieved in the period 1990-2007 were mainly primary sector driven. The primary sector is comprised of agriculture, fishing and fish processing on board, and mining and quarrying sectors.

1.2 Statement of the Problem

The relationship between the financial development and economic growth is important, because there are conflicting views concerning the role that the financial system can play in economic growth. Notwithstanding the differences in conclusions of cross country studies, this study examines the empirical relationship between the long run economic growth and financial development in Namibia using time series data. The study contemplates on filling the gap created by the absence of comprehensive studies investigating the determinants of growth in Namibia.

The interest in investigating the relationship between economic growth and financial development in Namibia is motivated by two factors. Firstly, a well developed domestic financial sector can contribute significantly to raising the savings rate, the investment rate and, hence, this will transmit to the economic growth (Huisen, 1999). A well developed financial system mobilises savings by channelling the small denomination savings into profitable large scale investments. These savings might not be available for investment without the participation of financial institutions because mobilising savings of disparate savers is usually costly due to the existence of information asymmetries and transaction costs. Secondly, financial development can also affect productivity of capital in two major ways, one, by collecting and processing information needed to evaluate the alternative investment projects hence improving the allocation of resources, and two, by providing opportunities to investors to diversify and hedge risks, thereby inducing individuals to invest in riskier but more productive investment alternatives (Huisen, 1999).

The Namibian economy has experienced a stable economic growth over a period of 1993: I to 2007: IV. The average quarterly GDP growth rate over this period is recorded to be about 4 % (Central Bureau of Statistics). Financial development in Namibia over the years, [as measured by the ratio of the broad money to gross domestic product (M2/GDP)] an indicator of savings mobilisation role of the whole financial system, has shown an upward trend. The ratio of M2/GDP improved from 1.12 in 1993: I to 2.01 in 2007: I (various annual reports, Bank of Namibia).

Although Namibia's economy recorded a moderate average growth rate and an upward trend in M2/GDP over the observed period, there is lack of adequate research which determines if there is a relationship between financial development and economic growth and if it does exist what is the direction of that relationship. The direction of this relationship can be a supply leading view where financial development leads and economic growth follows or a demand leading view where economic growth leads and financial development follows or a twofold causality relationship.

The direction of causality between financial development and economic growth changes over the course of development, thus financial development is able to induce real innovation for investment before sustained modern economy growth get underway and as modern economic growth occurs the supply leading view impetus gradually becomes less and less important as the demand leading view becomes dominant. Given the moderate economic growth experienced in Namibia's economy for the past years as reported by the Central Bureau of Statistics (National Accounts Reports), the demand leading view can be assumed to dominate the supply leading view.

Understanding the causal relationship between financial development and economic growth is important as it enhances the efficacy of policy decisions for a developing country like Namibia. The importance of the debate for developing countries comes from the fact that it has important policy implications whether the policy-makers should first pursue financial development in order to induce higher levels of economic growth or whether they should first concentrate on the development of the real sector in order to stimulate higher levels of financial development.

1.3 Objective of the Study

The objective of this study is to determine the causal relationship between financial development and economic growth in Namibia, and provided that the relationship is found the study also seeks to establish the nature and extent of that relationship.

1.4 Hypotheses

1. H_0 : Financial development does not cause economic growth.
2. H_1 : Economic growth does not cause financial development

1.5 Research Question

1.5.1 Is there a long-run relationship between financial development and economic growth in Namibia?

1.5.2 What is the direction of causality between financial development and economic growth in Namibia?

1.6 Significance of the Study

The study is important in that policymakers may use this information in formulating efficient resource allocation. The study may yield results that will assist in deciding on how resource allocation should be achieved between financial development and the real sector development. An empirical study of this nature is essential in ascertaining whether financial development causes economic growth or vice versa, as the result may assist policy makers in setting up optimal macroeconomics policies to institute competitive growth.

The fact that cross-country type of studies do not properly account for time dimension, and can give a wrong impression of the impact of financial development on economic growth since they assume that the different countries in the model are homogeneous entities. Moreover, since countries may differ greatly with respect to institutions and economic policies used, results may be country specific. Thus, an analysis of causal relationship between financial development and economic growth in Namibia is essential for policy makers.

The study contributes to the existing debate by assessing econometrically the causal relationship between financial development and economic growth nexus, by analysing the time series data for Namibia.

1.7 Organisation of the Study

The rest of the study is organised as follows: chapter two reviews the economic development and financial system in Namibia, chapter three presents theoretical and empirical literature review, chapter four discusses the methodology, chapter five contains the empirical analysis and interpretation, and chapter six entails the conclusions, policy implications and area of further research.

Chapter Two

Overview of the Economic Development and Financial System in Namibia

2.1 Economic Development

Namibia achieved independence on the 21st March 1990. Namibia's population stood at 1.4 million in 1991, it is however estimated to be 2.0 million people in 2007, with an average growth rate of 1.8% per annum, (Central Bureau of Statistics). The unemployment was estimated to be 37% according to the broad definition of unemployment, while by the strict definition it is estimated at 20.2%, (Namibia Labour Force survey of 2004). This was two percentage points higher than the equivalent rate recorded in 2000. A dispersed population, erratic climate, unemployment (partially due to poor educational outcomes), poverty, HIV/AIDS and other contagious diseases such as Tuberculosis are amongst the major challenges facing the country's economy and its population.

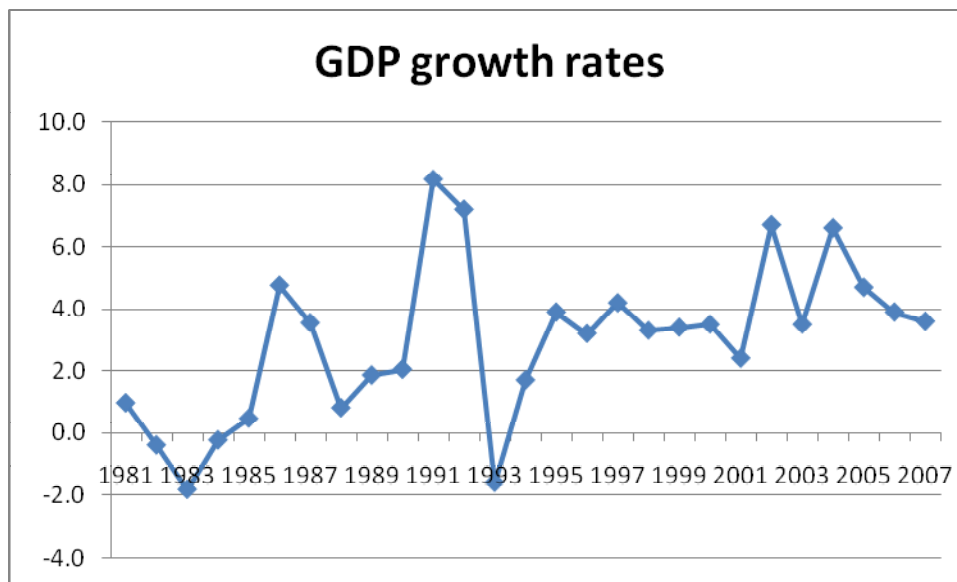
One feature of the economy is the primary industries predominance in the total economic activity. With this strong primary industry, Namibia has an ideal opportunity to develop its secondary industries. The reason why this development did not materialise is that raw materials are exploited and exported in a relatively unprocessed state.

During the period of 1980 – 1989 before independence, the economy recorded an average growth of 1.1%. The engine behind this growth was mainly the tertiary industry which recorded an average growth of 3.7%, while the secondary and primary industries recorded an average growth of 0.8% and -1.4% respectively. The low average growth rate was mainly due to poor performance in the mining industry. The growth rate improved to an average of 3.6% for the period of 1990-1998. During this period primary industry on average grew by 3.6%, while the secondary and tertiary industries all grew by 3.5%. This is mainly attributed to good

performance in the fishing industry. Further improvement was recorded during the period of 1999-2007, registering an average growth of 4.3%. For this period the primary industry recorded an average growth of 4%, while the secondary and tertiary industries registered growth of 4.6% and 4.8% respectively.

Figure 2.1, shows annual economic percentage growth rate for the period 1980-2007. The lowest growth was recorded in 1983, registering a decline of 1.8%. The highest growth recorded so far was in 1990 when Namibia got her independence recording a growth of 8.2%.

Figure 2.1: GDP Growth Rates (1995 prices)



Source: Authors own construction from the various reports of national accounts

The structure of the economy has basically remained the same as it was before independence. The contribution of the primary industry to GDP on average was 32.8% for the period 1980-1989, which has since declined to 21.3% and 21.2% for the period 1990-1998 and 1999-2007 respectively. This was mainly due to the mining and quarrying sector which recorded

an average contribution of 23.7% for the period 1980-1989, drastically declining to 11.0% for the period 1990-1998 and registering 11.1% for the period 1999-2007. The secondary industry average contribution to GDP was 15.9% for the period 1980-1989, while for the period 1990-1998 and 1999-2007 the industry recorded average contribution of 15.7% and 16.5% respectively. The tertiary industry is the biggest contributor to GDP recording an average contribution of 45.2% for the period 1980-1989. The role of this industry increased further during the period 1990-1998 recording an average contribution of 52.8%, while for the period 1999-2007 the industry contributed on average 53.7% of the GDP.

Table 2, shows that before Namibia's independence the mining and quarrying sector was the highest contributor to GDP followed by the government services, but after independence the two sectors have changed places with the government sector being the biggest contributor followed by the mining and quarrying sector.

Table 2: Selected Sector's Average Percentage Contribution to GDP

Sector	1980-1989	1990-1998	1999-2007
Agriculture	7.8	6.3	5.5
Mining and quarrying	23.7	11.0	11.1
Manufacturing	10.5	11.3	10.9
Wholesale and retail trade	7.7	8.2	10.7
Government services	16.7	21.7	19.8

Source: various reports of national accounts

Namibia's average annual inflation stood at 13% for the period 1980-1989, since then there has been a decline in inflation with the period 1990-1998 recording an average rate of 10.5%, which further went down to 7.1% for the period 1999-2007. With tight monetary stance

by the Reserve Bank of South Africa in the 1990's, inflation started to decline. Inflation started to pick up as from 1999 as oil prices increased and the introduction of value added tax (VAT) in the last quarter of 2000. Inflation stood at 6.7% in 2007.

2.2 Structure of the Financial System

Namibia has a dual financial system comprising of the formal and informal sector. The formal sector includes the central bank, commercial banks, post office savings bank, insurance companies, pension funds, asset management companies and a stock exchange.

The informal sector comprises cash loan operators, money lenders, pawn brokers and others. In addition, there are a number of development finance institutions in Namibia e.g. Namibia Development Bank etc.

2.2.1 Central Bank

The Bank of Namibia was established by the Bank of Namibia Act No. 8 of 1990. The major objectives of the central bank is to promote and maintain a sound monetary, credit and financial system; to promote and maintain internal and external monetary stability; to serve as the Government's banker, financial adviser and fiscal agent, and to assist in the attainment of national economic goals.

Namibia's monetary policy stance is poised to support the fixed exchange rate system between Namibia Dollar and South African Rand, under the common monetary area (CMA). The exchange rates between the participating countries are fixed to the South African Rand and the movement of capital is free.

The major instrument of monetary policy used by the Bank of Namibia is the Bank rate. The Bank of Namibia adjusts the bank rate in line with monetary policy stance of South African Reserve Bank. However, the Bank of Namibia have the ability to deviate to some extent from the South African Reserve Bank stance by using capital controls and prudential requirements that can be imposed on our financial institutions. It is therefore possible for Bank of Namibia to maintain a repo rate different from the repo of South African Reserve Bank, when so required and gives us discretion to control the domestic money supply.

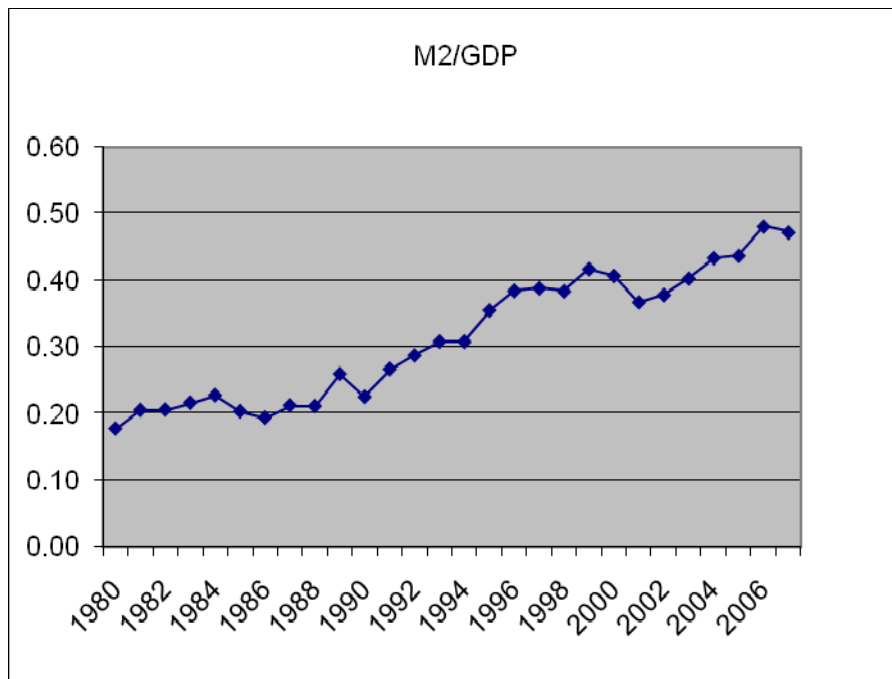
2.2.2 Commercial Banks

The commercial banking sector is the most dominant sector in the financial system in Namibia and plays a clear intermediary role than any other type of financial institutions. There are no formal barriers to entry to the banking sector but high initial capital lay-out required might serve as a barrier to entry.

Before independence there were seven banks operating in Namibia, namely SWABank, Trust Bank, Bank Windhoek, Boland Bank, Ned Bank, Standard Bank and Barclays Bank, (Ikhide & Fitchat, 2002). Currently there are four commercial banks (Bank Windhoek, Standard Bank, Ned Bank, and First National Bank) in the country with total assets valued at N\$ 36.5 billion as at 31 December 2007. The commercial banking system has strong links to the South African system and this is reflected by the strong South African shareholding in the Namibian commercial banks. Commercial banks in Namibia basically offer the same facilities, and thus competition in this sector is mainly non-price (not based on interest rate and service charge variation) but rather by way of competitive advertising and improvement of quality product packaging and service.

As shown in Figure 2.2, the degree of financial intermediation increased between 1980 and 2007 and this indicates that the growth of the financial sector is in line with output growth.

Figure 2.2: M2 as Ratio to GDP



Source: Bank of Namibia & Central Bureau of Statistics

2.2.3 Savings Bank

The Namibia Post Office Saving Banks is the only savings bank in Namibia. The savings bank does not give loans to its customers and the Ministry of Finance is the lender of last resort. The products offered include savings accounts, savings certificates, save as you earn accounts and fixed term deposits. The saving banks also offers money transfers.

2.2.4 Development Finance Institutions

There are a number of development finance institutions operational in Namibia. Among the prominent institutions are the Agricultural Bank of Namibia, the National Housing Enterprise, and the Development Bank of Namibia.

2.2.5 Non-Bank Financial Institutions

The non-bank financial institutions under consideration are the pension fund corporations, insurance companies and unit trusts. Commercial banks and the non-bank financial institutions both perform the basic role and function of financial intermediation. The core difference between the banks and non-bank financial intermediaries is that the liabilities created by commercial banks can be used as the means of payment and exchange.

2.2.6 Money and Capital Market

Traditionally money and capital market are distinguished as separate segment of the financial market, according to the maturity profile of financial instruments. Money market instruments are characterised by maturities of up to one year, while capital market has longer maturities (more than one year).

Money markets debts instruments and claims include the following: call deposits with Bank of Namibia, call deposits with commercial banks, inter-bank loans, bankers' acceptances, negotiable certificates of deposit, treasury bills, overdraft with Bank of Namibia and Agricultural Bank Bills.

A capital market is not quite complete without the presence of a stock market, which provides a platform where financial instruments could be traded. The Namibian Stock Exchange (NSX) was established in 1992. Equity, derivatives and interest bearing securities can be listed and traded on the NSX. The NSX is a dual listed stock exchange, implying that companies listed on the NSX can list on other stock markets as well. Government bonds have also been listed on the NSX.

2.3 Summary

This chapter looks at the overview of the financial development and financial system in Namibia. Namibia with a projected population of about 2 million in 2007, gained her independence in March 1990. One feature of the economy is the primary industries predominance in the total economic activity. The structure of the economy has basically remained the same after independence 1990 to 2007 as it was before independence 1980 to 1989. Namibia has a dual financial system comprising of the formal and informal sector. The commercial banking sector is the most dominant sector in the financial system in Namibia and plays a clear intermediary role than any other type of financial institutions.

Chapter Three

Literature Review

3.1 Theoretical Framework

Traditionally, the focus of the economic growth theory was on labour usage and capital accumulation as the cause for long run growth, thus growth is exogenously determined. However, this approach excluded any specific role for the financial sector. During the past twenty years, new theories has been developed that moved away from the view that growth is exogenously determined and therefore government cannot influence it. New theories states that growth is endogenously determined, thus institutions and policies matters for economic growth.

The Exogenous growth model was an extension to the Harrod-Domar model which included the new term, ‘productivity growth’. The most important contributor to this model, Robert Solow; in 1956 developed a relatively simple growth model which fit available data on US economic growth with some success. The key assumption of the Solow growth model is that capital is subjected to diminishing returns. Given a fixed stock of labour, the impact on output of the last unit of capital accumulated will always be less than the one before. Assuming for simplicity no technological progress or labour force growth, diminishing returns implies that at some point the amount of new capital produced is only just enough to make up for the amount of existing capital lost due to depreciation. According to (Sorensen & Jacobsen, 2005) beyond some point, the marginal returns to new capital will be smaller than the marginal cost of adding new capital. At this point because of the assumptions of no technological progress of labour force growth, the economy ceases to grow. Thus, in the exogenous growth models financial markets have no role in promoting the long run economic growth.

Limitations of the model include its failure to take account of entrepreneurship (which may be catalyst behind economic growth) and strength of institutions (which facilitate economic growth). In addition, it does not explain how or why technological progress occurs.

Endogenous growth models are based on two broad approaches, the first one sees all inputs as reproducible, and the second one is based on externalities (in the form of human capital). In both approaches, the savings rate plays a key role in the growth of capital and output per worker.

The first approach assumes that all inputs are reproducible, in particular the state of knowledge through research and development. The diminishing marginal productivity of capital which in the neo-classical model leads to constant steady state values of capital and output per worker is compensated by an increasing quality of machinery. In this approach an increase in the saving rate permanently raises the rate of growth of capital and output per worker.

The second approach is based on the assumption that externalities in the production process such as increase in the output level by one firm positively affects factor of productivity in another firm. In this approach, labour is endogenously determined and it is not just the quantity of labour which is relevant, but the quality of such labour. Households can save by investing in human capital in addition to physical capital investments. Therefore, households will produce labour with skills that will create ideas needed to handle new technologies. In this approach savings occurs in two ways: a fraction is saved for capital accumulation and a fraction is saved to increase human capital quality. With this approach both savings rates have effects on the growth rates. As a result, growth is no longer determined by the arbitrary technological changes, but it is endogenously determined by decision to invest in physical or human capital.

Without introducing financial market explicitly, there are grounds to believe that incentives for the population to save and more efficient channelling of saving can affect growth.

The growth models discussed so far do not have the financial sector intermediation explicitly modelled. The models only state that the share of aggregate output saved by the economy is available for investment. The problem inherent with this assumption is that it does not take into account the leakages and costs associated with financial intermediation process.

However financial development contributes to growth in various ways. For instance, financial institutions are better suited than individuals to identify potentially successful projects, because these institutions are big enough to pay high costs of collecting information about individual projects and to analyse this information more efficiently. To ensure that the saver's resources are used productively, the institutions also do supervise these projects.

Financial markets can also enhance growth, firstly, by mobilising resources from the savers necessary to invest in large projects. Secondly, they facilitate the pooling and hedging of risk inherent in individual projects and industries. Thus, well developed financial markets can generate growth by increasing the pool of funds and by reducing the risk and enhancing the productivity of fund transfers from savers to investment projects.

The relationship between financial development and economic growth has received a great deal of attention in the modern history of economics. This theoretical relationship dates back to the work of (Schumpeter, 1911), who emphasised that financial services are paramount in promoting economic growth.

Several studies have addressed the potential links between financial development and economic growth (Levine, 1997). Alternative views on the links between financial intermediation and economic growth focus on the key functions of the financial systems. These include firstly, acting as an effective conduit for channelling funds from surplus to deficit units by mobilising resources and ensuring an efficient transformation of funds into real productive capital. Secondly, financial intermediation transforms the maturity of the portfolios of savers and investors, while providing sufficient liquidity to the system as the need arises. The third function is risk reduction from the system through diversification and the technique of risk sharing and pooling. By so doing, a modern financial system may spur economic growth. However, despite the rapidly growing literature, the debate concerning the role played by the development of financial intermediaries in economic growth is far from settled.

The early models on financial intermediation and economic growth lacked solid modelling of the exact mechanisms of the relationship between the two variables. In the 1990's many new theoretical contributions on how financial intermediation may affect economic growth emerged (Greenwood & Jovanovic, 1990). The wave of new theoretical models on the relationship between financial development and economic growth has triggered new empirical interest into the relationship between finance and growth (King & Levine, 1993), which extended the cross country framework introduced in Barro (1991), by adding a financial variable to the standard growth regression.

Most of the cross-country studies do not pay much attention to the direction of causality. They seem to implicitly assume that financial development causes economic growth in line with the supply-leading view (Patrick, 1996). However, financial development may also be demand-driven (Saint & Paul, 1996). In addition, there may be a two-way causation where, on the one hand, growth stimulates the creation and growth of financial intermediaries, whereas, on the other hand, these intermediaries contribute to higher growth (Greenwood & Jovanovic, 1990).

Recently, some studies emerged with effort to come around the above-mentioned problems. In these studies, explicit attention is given both to the question of whether sample countries can be pooled and to the time series properties of the data. Moreover, Johansen's method based on vector error-correction mechanisms (ECM) is used to test for long-run cointegration between financial development and economic growth (Fan, Jacobs, & Lensik, 2005). This methodology allows formal testing of short run and long-run causality between finance and growth. By specifying and estimating models for individual countries, these studies show that results are country specific. The studies deny that financial sector development in general is a determining factor in the process of economic development.

3.2 Empirical Literature Review

The majority of the panel and cross- country studies on financial development and economic growth find that financial development has a positive effect on economic growth. These studies also provide some empirical evidence for the hypothesis that it is the overall provision of financial services that is important, and not whether a country has a bank-based or market-based financial system (Levine, 1998). However, the cross-country type of studies is not without problems, since they do not properly account for time dimension. Moreover, cross-country estimates can give a wrong impression of the impact of financial development on economic growth since they assume that the different countries in the model are homogeneous entities. Since countries may differ greatly with respect to institutions and economic policies used, results may be country specific. It is argued that while cross-country studies show evidence for positive relationship between financial development and economic growth, the causality between the two remains unclear.

Empirical work on financial development and economic growth in Botswana shows evidence that supports Schumpeter's view that financial development leads to economic growth (Eita & Jordaan, 2007). These empirical results illustrate that the development of the financial sector in Botswana is important for its economic growth and development. This suggests that financial deepening and institutional reforms should be enhanced to promote Botswana's economic growth.

The empirical results of the study on the causal relationship between financial development and economic growth which used data for South Africa, Kenya, and Tanzania show that the direction of the causality between financial development and economic growth is sensitive to the choice of measurement for financial development (Odhiambo, 2007). A demand-

leading view was found to be stronger in South Africa and Kenya, whilst in Tanzania a supply leading response was found to be strong. These findings are also consistent with Patrick's hypothesis (Patrick, 1966), which postulates that the direction of causality between financial development and economic growth changes over the course of development.

A study examining the causal relationship between financial development and economic growth in Malaysia, found that economic growth leads to financial development (Ang & Mckibbin, 2005).

Findings of the study into the relationship between development of the financial sector and economic growth for Egypt over the time period 1967-1996 confirm the importance of the development of the financial sector and economic growth, with a rise in the ratio of private credit to total credit of 1% leading to an increase of 0.17 % in the real GDP per capita in the long run (Hussein, 1999).

A study examining the causal relationship between financial development and economic growth in Lesotho concluded that there exists no causality between finance and growth in either direction (Mohapi & Motelle, 2007). This is consistent with the findings of Chang, Shan & Morris; and Dawson (as cited in Mohapi & Motelle, 2007) that exhibit no link between finance and growth.

A study done in five MENA countries (Algeria, Egypt, Morocco, Syria, and Tunisia) for the past five decades found no evidence of causality between financial development and economic growth in the short-run, whereas long-run causality tests showed that finance follows rather than leads economic growth (Abu-Bader & Abu-Qarn, 2006). Based on these results, they concluded that the financial reforms that most of the countries have undertaken in the past two

decades were not successful in achieving the desired results of enhancing economic growth, either by improving efficiency or through increasing resources for capital accumulation.

It appears that in some countries finance affects growth, while in other countries growth determines finance or the causality is twofold. Most importantly, these studies argue that generalizations based on multi-country results may lead to incorrect policy advice at the country level. Moreover, there is still a theoretical debate on the relative importance of stock market development (Singh, 1997).

3.3 Summary

Traditionally, the focus of the economic growth theory was on labour usage and capital accumulation as the cause for long run growth, thus growth is exogenously determined. The exogenously growth model has limitations that include its failure to take account of entrepreneurship and strength of institutions which facilitate economic growth. However, during the past twenty years, new economic theories developed moved away from the view that growth is exogenously determined, but endogenously determined. In these models, the savings rate plays a key role in the growth of capital and output per worker. The exogenous models do not have the financial sector intermediation explicitly modelled. However, the financial markets enhance growth by mobilising resources and facilitating pooling and hedging of risk inherent in individual projects and industries.

Majority of the empirical studies on financial development and economic growth find that financial development has positive effect on economic growth. In Namibia however, such an empirical investigation on the causal relationship between financial development and economic growth is not undertaken, as far as we know. Thus the significance of this study to Namibia cannot be emphasised.

Chapter Four

Methodology

4.1 Introduction

The study uses econometric techniques to determine the causal relationships between the variables of financial development and economic growth in Namibia for the period 1993:I - 2007:IV. Since the study uses time series data that is subject to non-stationarity, we employ unit root tests to test for stationarity of the different variables used. The study also employs a cointegration test on the different variables used to establish a long run and short run relationships. The last test is the Granger causality test to determine the direction of the relationship between variables used.

The theoretical basis follows the endogenous growth theory. Endogenous growth theory has focused on the ongoing technological change that raises productivity as the main engine of growth. Technology through expenditure on research and development, and investment in the development of physical and human capital in principle could lead to sustained long term growth because the increase in productivity would be enough to offset the decreases in the productivity from diminishing returns to capital accumulation (Greenwood & Jovanovic, 1990). As a result, growth is not determined by arbitrary technological changes, but is endogenously determined by decision to invest in physical or human capital. Thus, well developed financial markets can generate growth by increasing the pool of funds and by reducing the risk and enhancing the productivity of fund transfers from savers to investment projects.

In this study, the cointegration and vector error correction model is used to examine the direction of causality between financial development and economic growth. This approach has been used in finance - growth causality studies, among others (Eita & Jordaan, 2007; Odhiambo, 2007). The Granger causality test method is preferred in this study to other alternative techniques because of its favourable response to both large and small samples. The conventional Granger causality test involves the testing of the null hypothesis that financial development (FD) does not cause economic growth (Y) and vice versa by simply running the following two regressions.

$$Y_t = \alpha_0 + \sum \alpha_{1i} \Delta Y_{t-i} + \sum \alpha_{2j} \Delta FD_{t-j} + \mu_t \quad (1)$$

$$FD_t = \beta_0 + \sum \beta_{1i} \Delta Y_{t-i} + \sum \beta_{2j} \Delta FD_{t-j} + C_t \quad (2)$$

Where μ_t and C_t is the white noise error term for the two functions respectively. Y_t is the economic growth variable, and FD_t financial development proxies (the ratio of credit extended to private sector to nominal GDP; and the ratio of broad money to nominal GDP).

The null hypotheses to be tested are:

1. $H_0: \alpha_{2j} = 0$, financial development does not Granger causes economic growth.

Rejection of this hypothesis means that financial development Granger causes economic growth.

2. $H_1: \beta_{1i} = 0$, economic growth does not Granger causes financial development.

Rejection of this hypothesis means that causality runs from economic growth to financial development.

If none of the hypothesis is rejected, it means that financial development does not Granger causes economic growth and economic growth also does not Granger cause financial development. This indicates that the two variables are independent of each other. If all

hypotheses are rejected, then there is bi-directional causality between financial development and economic growth.

The use of traditional Granger causality tests suffer from the following methodological deficiencies. First, these standard tests do not examine the basic time series properties of the variables. According to Granger, if the variables are cointegrated, then these tests incorporating differenced variables will be miss-specified unless the lagged error correction term is included (Odhiambo, 2007). Second, the majority of these tests turn the series stationary mechanically by differencing the variables and consequently eliminate the long run information embodied in the original form of the variables.

Given the two methodological deficiency in the traditional Granger causality method, proper statistical inference can be obtained by analysing the causality relationship on the basis of the error correction model (ECM). The error correction model allows for the inclusion of the lagged error correction term derived from the cointegration equation. By including the lagged error correction term the long run information lost through differencing is reintroduced in a statistically acceptable way.

The cointegration equations are stated in equation 3 and 4, while the error correction model equations are stated in equations 5 and 6.

$$Y_t = \delta + \phi FD_t + EC_{1t} \quad (3)$$

$$FD_t = a + \psi Y_t + EC_{2t} \quad (4)$$

$$\Delta Y_t = \alpha_0 + \sum \alpha_{1i} \Delta Y_{t-i} + \sum \alpha_{2j} \Delta FD_{t-j} + \alpha_3 EC_{1t-1} + \mu_t \quad (5)$$

$$\Delta FD_t = \beta_0 + \sum \beta_{1i} \Delta Y_{t-i} + \sum \beta_{2j} \Delta FD_{t-j} + \beta_3 EC_{2t-1} + \varepsilon_t \quad (6)$$

Where Δ represents the difference operator; FD_t represents the two proxies of financial development; Y_t represents economic growth; and EC_{t-1} represents one period lagged error correction term captured from the cointegration regression. The causal inference is obtained through the significance of α_3 and β_3 .

4.2 Measurement of Variables

Economic growth in this study is proxied by real quarterly GDP. Financial development on other hand is proxied by two variables. Financial development is usually defined as a process that makes improvement in quantity, quality, and efficiency of financial intermediary services. This process involves the interaction of many activities and institutions, and it cannot be captured by a single measure.

The first proxy of financial development is defined as the ratio of broad money to nominal GDP (M2/GDP). This monetization variable is designed to show the real size of the financial sector of a growing economy. The ratio is expected to increase over time if the financial sector grows faster than the real sector of the economy and decrease if financial sector grows more slowly than the real sector of the economy.

The second proxy is the ratio of credit extended to the private sector to nominal GDP. Credit extended to the private sector is assumed to generate increases in investment and productivity to a much larger extend than do credit to the public sector (Eita & Jordaan, 2007).

4.3 Data Analysis

The study uses E-view software to analyse data. Since the study used time series data that is subject to non-stationary due to trends, we employ unit root test for stationary of the different variable used. The Augmented Dicker-Fuller (ADF) statistic is applied to test the stationary or non-stationary of the variables and their order of integration. A cointegration test is also applied using the Johansen full information maximum likelihood.

4.3.1 Stationarity

A time series data is said to be stationary if the mean and variance are constant through time and the value of the covariance between the two time periods depends only on the distance or lag between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2003). However, if the mean and variance change in samples for different time spans then, this type of variable is known as non stationary variables. Regression equations with non stationary variables have serious limitations. Among other problems, their t-ratios and the adjusted R-square will be overestimated by a large magnitude. Therefore, all tests become invalid. This is known as the spurious regression problem. In order to avoid the problem of spurious regression, trended data is differenced a minimum of time to generate a stationary series.

Although there are several tests of stationarity, such as the graphical analysis, the correlogram test and the unit root test, in this study we only discuss two tests: (1) graphical analysis and (2) the unit root test.

Before one pursues formal tests, it is always advisable to plot the time series on a graph. Such plot gives an initial clue about the likely nature of the time series. The most popular test of

stationarity over the past several years is the unit root test. This test was first developed by Dickey and Fuller in 1970 and is named after them. The Dickey-Fuller (DF) test is applied to regression analysis in the following forms:

$$\Delta X_t = \delta X_{t-1} + \varepsilon_t \quad (7)$$

$$\Delta X_t = \alpha_1 + \delta X_{t-1} + \varepsilon_t \quad (8)$$

$$\Delta X_t = \alpha_1 + \alpha_2 t + \delta X_{t-1} + \varepsilon_t \quad (9)$$

where X denotes the variable to be tested and t is the time variable. In each equation, the null hypothesis is that $\delta = 0$ that implies the existence of a unit root, thus the time series is non stationary. Rejecting the null hypothesis implies that the series are stationary. The DF test assumes that the error terms ε_t are uncorrelated, thus the use of the standard DF test critical values would be invalidated if the error terms in the test is correlated over time, violating the white noise assumption of the DF test. This study uses an Augmented Dickey-Fuller (ADF) test that takes into account any auto correlation present by adding the lagged values of the dependent variable ΔX_t .

$$\Delta X_t = \alpha_1 + \alpha_2 t + \delta X_{t-1} + \sum_{i=1}^m \beta_i \Delta X_{t-i} + \varepsilon_t \quad (10)$$

where X_t is the variable, whose time series properties are being investigated, Δ is the difference operator, m is the number of lagged variables, and where ε_t is the random error term.

4.3.2 Cointegration

Cointegration is defined as a long run relation of variables that are linked to form an equilibrium relationship when the individual series themselves are non-stationary in their levels, but become stationary when differenced. Thus, it can be stated that cointegration highlights the existence of a long run equilibrium to which the system converges overtime.

Two of the widely used tests in modern research for cointegration are the Engle-Granger and the Johansen procedures. The Engle-Granger procedures investigate the possibility of cointegration in bi-variate models. One of the limitations of the Engle-Granger approach is that it assumes uniqueness of the co-integrating vector. For more than two variables, the approach does not provide a sufficient framework.

This study uses the Johansen procedure which is based on a vector auto regression (VAR) framework. The Johansen procedure is described as follows. Defining a vector \mathbf{x}_t of n potentially endogenous variables, it is possible to specify the data generating process and model \mathbf{x}_t as unrestricted vector auto regression (VAR) involving up to p -lags of \mathbf{x}_t specified as:

$$\mathbf{x}_t = \mu + A_1 \mathbf{x}_{t-1} + \dots + A_p \mathbf{x}_{t-p} + \boldsymbol{\varepsilon}_t \quad (11)$$

Where

\mathbf{x}_t is an $(n \times 1)$ vector of the variables that are integrated of order one

A are $(n \times n)$ matrix parameters

$\boldsymbol{\varepsilon}_t$ is an $(n \times 1)$ vector of innovations

This VAR can be re-written as

$$\Delta \mathbf{x}_t = \mu + \Pi \mathbf{x}_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta \mathbf{x}_{t-1} + \boldsymbol{\varepsilon}_t \quad (12)$$

where

$$\Pi = \sum_{i=1}^p A_i - I \text{ and } \Gamma_i = - \sum_{j=i+1}^p A_j \quad (13)$$

If the coefficient matrix Π has reduced to rank $r < n$, then there exist $n \times r$ matrices α and β each with rank r such that $\Pi = \alpha\beta'$ and $\beta'x_t$ is stationary. r is the numbers of cointegrating relationships, the elements of α are known as the adjustment parameters in the vector error correction model and each column of β is cointegrating vector. It can be shown that for a given r , the maximum likelihood estimator of β defines the combination of x_{t-1} that yields the r largest canonical correlations of Δx_t with x_{t-1} after correcting for lagged differences and deterministic variables when present.

4.4 Sources of Data

The study utilizes quarterly time series data, which cover the period 1993:I - 2007:IV. The data used in the study is obtained from various issues of the annual and quarterly reports of the Bank of Namibia (BoN), various reports of national accounts from the Central Bureau of Statistics (CBS) and various issues of the consumer price index (CPI) reports from the Central Bureau of Statistics.

4.5 Conclusions

The study employs the stationarity, cointegration and Granger causality test on the variable used to measure financial development and economic growth. Economic growth is proxied by real quarterly GDP, while the financial development is proxied by the ratio of broad money to nominal GDP and the ratio of credit extended to the private sector to nominal GDP.

Various reports from the Central Bureau of Statistics and Bank of Namibia are used as source of data for this study.

Chapter Five

Estimation and Interpretation of the Results

5.1 Stationarity Tests

Time series data in this study is tested for stationarity before running the causality test. The tests were carried out in levels and first difference. The results of stationarity tests are reported in Table 5.1.

Table 5.1: Stationarity Test of Variables in Levels

Variable	Model Specification	Test Statistics		Stationary Status
		Computed	critical	
LNGDP	Constant and trend	-1.669476	-3.494	I(1)
	Constant	1.382588	-2.916	I(1)
LNPC/GDP	Constant and trend	-2.487595	-3.488	I(1)
	Constant	-1.358103	-2.912	I(1)
LNM2/GDP	Constant and trend	-3.344022	-3.488	I(1)
	Constant	-1.775389	-2.912	I(1)

Source: Author's own computation

Note: LN stands for natural log

Table 5.1 shows stationarity test result of all variables in levels. At the significant level of 5% the critical value for LNGDP variable is greater than the computed t-value, the conclusion is that the LNGDP time series is non-stationary; that is, it contains a unit root.

The critical value for LNPC/GDP variable at the significant level of 5% is greater than the computed t-value; the conclusion is that the LNPC/GDP time series is non-stationary.

The critical value for LNM2/GDP variable at the significant level of 5% is greater than the computed t-value, thus the LNM2/GDP time series contains a unit root.

The next step, therefore, is to difference all the variables once in order to perform stationary tests on differenced variables as presented in Table 5.2

Table 5.2: Stationarity Test of Variables in First Difference

Variable	Model Specification	Test Statistics		Stationary Status
		Computed	critical	
Δ LNGDP	Constant and trend	-9.356092	-3.494	I(0)
	Constant	-9.114696	-2.916	I(0)
Δ LNPC/GDP	Constant and trend	-9.698697	-3.489	I(0)
	Constant	-9.684089	2.912	I(0)
Δ LNM2/GDP	Constant and trend	-10.43149	-3.489	I(0)
	Constant	-10.51006	-2.912	I(0)

Source: Author's own computation

Note: LN stands for natural log

The critical value for LNGDP variable as stipulated in table 5.2, at the significant level of 5% is less than the computed t-value, thus, the time series is stationary.

At the significant level of 5 percent the critical value for LNPC/GDP variable are less than the computed t-value, the conclusion is that the LNPC/GDP time series is stationary.

The critical value for LNM2/GDP variable in table 5.2 is less than the computed t-value, thus, the conclusion is that the LNM2/GDP time series is stationary.

Since the variables are I (1), the next step is to test for cointegration using Johansen's full information maximum likelihood.

5.2 Cointegration Analysis

Having confirmed that all variables included in the causality test are integrated of order one as presented in table 5.2, the next step is to independently test the existence of the cointegration relationship between each of the proxies for financial development and the GDP. The study uses the Johansen's full information maximum likelihood cointegration test procedure. If cointegration is detected between these variables, then the existence of Granger causality in either way cannot be ruled out.

Table 5.3: Cointegration Test Results between LNGDP and LNM2

Null hypothesis	Alternative hypothesis	Test statistics	0.05 critical value	Probability value
<i>Trace statistics</i>				
r = 0	r = 1	46.31031	20.26184	0.0000
r = 1	r = 2	5.894088	9.164546	0.1990
<i>Maximum Eigen value statistics</i>				
r = 0	r = 1	40.41623	15.8921	0.0000
r = 1	r = 2	5.894088	9.164546	0.1990

Source: Author's own computation

Given that the computed t-statistics is greater than the critical value for both trace statistics and maximum Eigen value statistics in table 5.3, we do not reject the alternative hypothesis $r = 1$, that is, there is one cointegrating vector between LNGDP and LNM2.

Table 5.4: Cointegration Test Results between LNGDP and LNPRIV

Null hypothesis	Alternative hypothesis	Test statistics	0.05 critical value	Probability value
<i>Trace statistics</i>				
r = 0	r = 1	30.7560	20.26184	0.0012
r = 1	r = 2	7.535563	9.164546	0.1009
<i>Maximum Eigen value statistics</i>				
r = 0	r = 1	23.22043	15.8921	0.0030
r = 1	r = 2	7.535563	9.164546	0.1009

Source: Author's own computation

The computed t-statistics in table 5.4 is greater than the critical value for both trace statistics and maximum Eigen value statistics, thus we do not reject the alternative hypothesis $r = 1$, that is, there is one cointegrating vector between LNGDP and LNPRIV.

5.3 Vector Error Correction Model

Since there is cointegration as shown in table 5.3 to 5.4, the direction of causality is tested by using the vector error correction model (VECM).

Table 5.5: VECM Results

Variable	β	ECM
a) variable included in the VAR: LNGDP and LNM2		
LNGDP	1.00000	-0.701407 [-2.97231]
LNM2	-1.820397 [-4.25179]	
Constant	-7.438311	
b) variable included in the VAR: LNGDP and LNPRIV		
LNGDP	1.00000	-0.044132 [-3.75172]
LNPRIV	-1.373243 [-4.53144]	
Constant	-8.509466	

Source: Author's own computation

The t-statistics are in brackets

The coefficient (β) of the measures of financial development are interpreted as positive because they still have to be taken to the right hand side of the equations

The VECM results in table 5.5 shows that all measures of financial development have positive influence on GDP. This is evident from the coefficients (β) of the measures of financial development which are negative and significant at 1% and 5 % levels. This shows that there is a long run causal relationship between economic growth and financial development. The results in table 5.5 reveal that the error correction term is negative and statistically significant at 1%, which implies that the measure of financial development and economic growth are adjusting to their long run equilibrium relationship.

5.4 Granger Causality Test

Correlation test does not tell anything about the causal relationship between financial development variables and GDP. Thus the Granger causality test is used to examine the direction of the relationship that exists between the variables.

Table 5.6: Granger Causality Test Results between D (LNGDP) and D (LNM2)

Null hypothesis	Chi-sq	Probability
D(LNGDP) does not Granger cause D(LNM2)	18.7456	0.0021
D(LNM2) does not Granger cause D(LNGDP)	3.8993	0.5640

Source: Author's own computation

From table 5.6 we reject the null hypothesis D(LNGDP) does not Granger cause D(LNM2), as it has the lowest p value, and we do not reject the null hypothesis D(LNM2) does not Granger cause D(LNGDP). Therefore, it appears that Granger causality runs one way from D (LNGDP) to D (LNM2).

Table 5.7: Granger Causality Test Results between D(LNGDP) and D(LNPRIV)

Null hypothesis	Chi-sq	Probability
D(LNGDP) does not Granger cause D(LNPRIV)	78.4972	0.0000
D(LNPRIV) does not Granger cause D(LNGDP)	4.5144	0.4780

Source: Author's own computation

We reject the null hypothesis D(LNGDP) does not Granger cause D(LNPRIV), as it has the lowest p-value, and we do not reject the null hypothesis D(LNPRIV) does not Granger cause D(LNGDP). Thus, the Granger causality runs from D (LNGDP) to D (LNPRIV).

The results in table 5.6 to 5.7 show that the causality runs from economic growth to financial development regardless of the proxy for financial development. The results provide evidence that the relationship between financial development and economic growth follows a demand-leading view in Namibia.

5.5 Summary

Stationarity test on all variables in levels shows the time series is non-stationary, that is, it contains unit roots. While the test of stationarity in first difference shows that the time series is stationary. Cointegration test shows that there is a cointegration relationship between each of the proxies for financial development and economic growth. The Granger causality test reveals that the causality runs from the economic growth to financial development in Namibia.

Chapter Six

Conclusion and Policy Implications

6.1 Conclusion

This study has attempted to gauge the standing of the Namibian economy in the unsettled debate of the role of financial intermediation in economic growth. There is an extensive literature on the relationship between financial development and economic growth, and it is now generally agreed that financial development is important for economic growth. However, the direction of causality between financial development and economic growth is not without ambiguity. Knowing the direction of causality is important because it has a different implication for policy development.

In this study the direction of causality between financial development and economic growth in Namibia is investigated using a time series techniques of cointegration and causality. Two alternative proxies of financial development were paired each with the economic growth variable in the cointegration and causality tests.

Stationarity test on the variables revealed that all variables are stationary at first difference. While the cointegration test revealed that there is one cointegration vector between economic growth and measures of financial development.

Granger causality tests have been carried out in the context of cointegration and vector error-correction mechanisms. Overall, the results support Robinson's argument that 'where enterprise leads finance follows' but not the hypothesis that a bank-based financial system induce long-term growth in the real sector. This is a demand-leading view.

6.2 Policy Implications

The study has established that economic growth Granger cause financial development and thus the study recommends that the real sector of the economy should be developed further in order to stimulate further development in the economy.

The following policy interventions can be considered:

- Reactivate private investment
- Industrial development to diversify economic base
- Enhance the performance of Small and medium enterprises
- Enhance the performance of tourism sector as it has great potential in promoting high economic growth

6.3 Area of Further Research

Due to the time constraint and limited data, further work to be done on the causal relationship between financial development and economic growth is to introduce more variables that measures financial development. Future research may need also to explore further by using indicators of capital market development and examines whether such indicators performs better in predicting economic growth than in bank based ones.

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