FACTORS INFLUENCING INVESTMENT: A CASE STUDY OF THE

NAMIBIAN ECONOMY

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Abstract

This study makes use of ordinary least squares (OLS) technique in conjuction with the cointegration and error correction models to determine factors influencing investment in Namibia, using data for the period 1960-2006. The results suggest that in the long run, real investment in Namibia is positively related to and influenced by GDP and investment in uranium mines by Rossing during 1970s, while negatively related to the prime lending rates and the inflation rates. In the short-run, investment is positively influenced by three variables namely; real GDP, domestic savings and prime lending rates. The study recommends a review of the administration of the investment regime with the view to come up with a simpler and transparent regime. It further recommends that quality of governance and property rights protection be maintained to enhance investors' confidence. Finally, recommendation is made for further research incorporating issues of qualitative nature as raised in the limitation of the study.

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Dedication

I dedicate this work to my son, Tonateni, who was born at the time of my examinations.

Declaration

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

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Festus Natangwe Nghifenwa

CHAPTER ONE

1   INTRODUCTION

1.1   Overview

Investment is one of the most important macroeconomic variables because the capacity of production of any economy depends not only on labour but also on the capital available to produce goods and services. The stock of capital increases when firms acquire new tools, buildings, computers, and machines to help produce consumption and capital goods. Investment is thus, a flow that increases capital accumulation in the economy. Capital runs out when it is used. That is, one part becomes rusty; another part gets damaged, while another part is thrown out when it is no longer useful. All of the flows that reduce the stock of capital are referred to as "depreciation".

From time to time, firms need to make some investments to replace the capital that has depreciated. Any other investment above depreciation increases the stock of capital and creates a greater productive capacity. The flow of investment expenditure in any period of time depends on the comparisons the firms do between the potential benefits and the costs of buying capital goods. The potential benefits are measured in terms of the potential yields or rates of return, and the buying costs are measured by the interest rate, no matter whether or not a firm asks for a loan to buy a given capital unit.

If the firm needs to borrow in order to buy capital, it is obvious that the higher interest rates make it less probable to invest through borrowing because paying off the debt would be more expensive. However, even if a firm does have enough money to buy a given unit of capital, higher interest rates make it more attractive for the

firms to deposit the money with a financial institution instead of investing it in capital goods with lower prospective rates of return. The higher the interest rates, the more attractive it is to lend money, the less attractive it is to borrow money. Higher interest rates discourage investment where investors seek to borrow money, while they encourage investors who are seeking interest earnings, mainly in portfolio investment.

Investment is defined as a change in capital stock over a period of time, and is referred to in national economic statistics as gross fixed capital formation. The period dimension makes investment a flow term measured over a period of time, while capital is a stock term measured at a point in time. The term investment involves the acquisition of capital goods that are designed to produce goods and services, while investment spending involves the decision to postpone consumption and instead seek to accumulate capital that can raise the productive capacity of the economy.

The rate of accumulation of fixed capital (business fixed investment) is regarded as a core process by which all aspects of economic growth are made possible. Meier (1976) argues that maintaining a high rate of investment is one of the factors responsible for good economic performance. Accordingly, capital increases by investment, and more investment necessitates more savings in the economy, which in turn serves as the source of investment and subsequently economic growth. This notion is also demonstrated in Solow's endogenous growth model, which predicts that a high investment rate should result in a high economic growth rate (Ferderer, 1993).

In recent years, Foreign Direct Investment (FDI) and private domestic savings have become very important drivers of economic growth and employment creation in many developing countries. Therefore, efforts to attract investment to developing countries like Namibia have been supported with the view that FDI supplements domestic saving, creates employment, supports economic growth, facilitates transfer of skills and technology and helps developing countries to emerge out of the underdevelopment status.

Investment can either be autonomous or induced. Autonomous investment refers to capital expenditure on producer goods unrelated to the level of national income. Induced investment is related to the level of national income. For example, increases in GDP lead to increases in induced investment and leave autonomous investment unchanged.

Investment rate in any economy increases if there is a growing surplus above the current consumption that can be tapped and directed into productive investment channels (Meier, 1976). According to Meier (1976), the process of capital formation occurs in three steps, namely:

1. Increase in the volume of real savings so that resources can be released for investment purposes;

2. Channeling of savings through finance and credit mechanism, so that investible funds can be collected from a wide range of sources and claimed by investors;

3. The act of investment itself, by which resources are used for increasing capital stock.

1.2   Statement of the Problem

Investment constitutes an important element that determines long-term growth of any economy. Since 1960, investment in Namibia underwent periods of turmoil, which were characterised by cyclical fluctuations over time. The level of investment has shown a downward trend over the period 1960-1989, and only recovered slightly over the period 1990-2006. Hence, understanding factors that have long-term influence on investment is vital for economic planning and policy management.

A cause for concern is the fact that in Namibia, the high saving rate has not been adequately translated into high investment and economic growth rates. Thus, substantial amounts of Namibia's savings flow out to finance investment outside the country. The excess savings for Namibia is reflected in a persistent current account surplus, which is an unusual situation for a developing country.

The impacts of incentives introduced since independence are not clear. There have been arguments that there are no adequate investment opportunities in the country to absorb large amounts of savings. This cannot be an adequate explanation, because there could be some other factors inhibiting investment in the country. It is, therefore, necessary that a more comprehensive picture of the determinants of investment in the economy should be examined.

1.3   Objective of the Study

The objective of this study is to examine factors that have influenced investment in Namibia over the period 1960-2006. The specific aim is to establish

whether investment in Namibia has been influenced by factors such as structural breaks; the level of output; savings; capital stock and investment incentives.

1.4   Research Questions

The study attempts to address the question of what really motivate individuals or organizations to invest in Namibia. According to Edwin, *et al.* (2006), it is when individuals and organizations anticipate future cash needs, and expect that their earnings in the future will not meet those needs, that they take a decision to invest and make their money grow. However, before they decide as to where they think they will put their money to grow, they take into account numerous factors and these are the factors that this study attempts to identify. The study attempts to address the following specific questions:

   i. What are determinants of investment in Namibia?

  ii. Were fluctuations in investment rate over the three sub-periods (1960-1979; 1980-1989 and 1990-2006) in Namibia due to structural changes?

 iii. Did incentives play any significant role in the recovery of investment over the period 1990-2006?

 iv. What policies and programmes would be appropriate to stimulate investment in Namibia?

1.5   Significance of the Study

The results of this study contribute to the policy dialogue on improvement of investment regime in Namibia. At the moment, there are proposals on the table to review the whole set up of the country's investment regime, including the review of

some legislations and current incentives offered to investors. This study is, therefore, timely in this regard.

1.6   Limitations

Models used in this study do not include all the variables, because of inherent data problems associated with developing countries like Namibia. In this case, some problems, especially those that are qualitative in nature, such as investors' perception of the Southern African region in terms of politics, corruption, diseases and natural disasters, are excluded from the model.

1.7   Structure of the Study

The study is structured as follows: Chapter 1 deals with introduction. Chapter 2 presents an overview on the investment and economic growth in Namibia. Chapter 3 reviews literature on determinants of investment. Chapter 4 presents methodology and empirical mode used in the study; chapter 5 presents research findings. Chapter 6 presents summary, conclusion and recommendations of the study.

CHAPTER 2

2.   INVESTMENT AND ECONOMIC GROWTH IN NAMIBIA

2.1   Investment

The history of investment in Namibia started back in 1866, when the British arrived in what was known as South West Africa, attracted by the country's natural resources. The British annexed a number of islands off the coast of South West Africa and declared Walvis Bay as part of the British Crown's Territory in 1878.

The British occupation ended in 1884 when the Germans declared the country their colony. The Germans expropriated land from the indigenous people and started investing in mines, agriculture and other industries, while employing locals under the system of a forced labour.

The colonial rule in Namibia was a violent one and it left behind a legacy of a dual economic structure. The German occupiers gained control over land, minerals and other resources. After the war against indigenous people during 1904 and 1908, German colonial power was consolidated and prime grazing land was passed to the white settlers. The German colonization of South West Africa lasted until 1914, when the Union of South Africa occupied the country. A Peace Treaty was signed in 1919, in terms of which the Germans religuished their colonial interest in South West Africa to the League of Nations, which granted the Union of South Africa the mandate to administer the country on behalf of the League and prepare it for independence.

Instead, the Union of South Africa turned the country into a colonial territory and introduced discriminatory laws that were implemented through a divide and rule system. South Africa's mandate over Namibia (then South West Africa) was revoked

by the United Nations (UN) Assembly in 1966 following South Africa's rejection of the UN request to place the territory under a trusteeship agreement. The people of South West Africa stood up against the oppression and segregation rule, and started an armed liberation struggle in 1966. The armed struggle for independence was launched in 1966 by the South West Africa People's Organisation (SWAPO), and eventually resulted in independent Namibia in 1990.

After independence, Namibia adopted an open economy policy. The economy is highly dependent on exploitation of natural resources, which it exports in a raw form, while a significant portion of domestic demand is met by imported capital and consumer goods. Diamonds, uranium, beef, karakul pelt and other minerals are the main export commodities, and these are the industries where domestic investment is concentrated. South Africa has been and remains the largest export market for Namibia's products, followed by Europe. Most goods produced in Namibia are exported in raw form, while a significant portion of consumer goods is imported mainly from, or through, South Africa. The economic base remains narrow, with investment concentrated only in mining activities that are, by their nature, capital intensive. Hence, the economy's absorption capacity is limited and this has resulted in persistent high unemployment and poverty incidence.

The structure of investment over the period 1960-2006 was biased towards tertiary industries, mainly government services, as well as primary industries, with a focus on the mining sector. As a proportion of GDP, investment fluctuated between an average of 28.8 percent during the pre-independence period (1960-1989) and 23.9

percent of GDP over the post-independence period (1990-2006), with the whole period recording an average investment rate of 27.0 percent.

Agriculture has been the biggest employer among all economic sectors, but agriculture wages are below the market rates because the majority of the people employed in the sector are mostly the uneducated. Investment in the agricultural sector is hampered mainly by the fragile nature of the sector and, especially, by frequent occurrence of droughts. The fishing sector has the potential for employment but the sector is also vulnerable to unfavorable oceanic conditions and, therefore, investment in the sector, although lucrative, good returns cannot be guaranteed every year.

The trend of gross fixed capital formation is a good indicator of the current investment climate and of future productive capacity. Real fixed investment in Namibia grew gradually from the 1950s and reached a peak during the mid-1970s. However, a rather rapid decline set in, to a point at which real fixed investment in 1988 was once again at the level prevailing during the late 1950s and early 1960s. However, this should not be interpreted as reflecting the output potential of the Namibian economy. Other economic and political factors have also contributed to the investment trend.

Leistner and Esterhuysen (eds) (1990) briefly highlighted some factors that are partly responsible for the above situation and among them were firstly the twelve-year deadlock in the constitutional process that caused uncertainty on the country's future and adversely affected investment decisions of entrepreneurs. Some

investors postponed their investment decisions, while others moved into small short-term ventures.

Secondly, the high level of real fixed investment in the mining industry during the mid-1970s was attributable to the commissioning of the Rossing Uranium mine, while the subsequent sharp decline indicates not so much a waning of confidence as the absence of significant new mining investment opportunities.

Thirdly, real fixed investment by the central government declined steadly from the mid-1970s and adversely affected the trend in total real fixed investment. This reflected a considerable shift in infrastructural development during the period after the implementation of the recommendations of the Odendaal Commission. The recommendations of the Commission resulted in the SWA Affairs Act (No. 25 of 1969) in terms of which the South African government took over control of important administrative, fiscal and constitutional matters.

As reflected in Figure 1, gross domestic investments increased from 1960, recording a high average of 32.1 percent of GDP over the period 1960-1979 but it came down substantially to 15.8 percent of GDP over the period 1980-1989, before recovering again to an average of 21.8 percent of GDP over the post-independence sub-period (1990-2006).

Figure 1: **Savings and Investment trends as % of GDP**
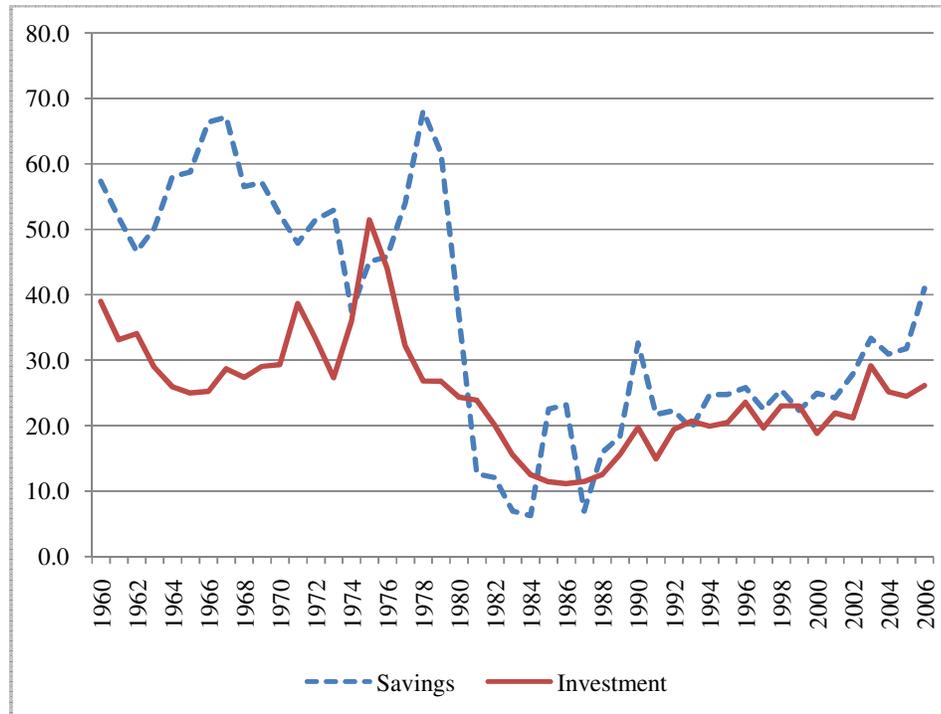
Source: Leistner and Esterhuysen, eds, 1990 and National Planning Commission

This trend was accompanied by a similar trend in gross savings at an average ratio of 54.3 percent of GDP over the sub-period 1960-1979, which came down to 16.1 percent of GDP over the sub-period 1980-1989, before moving in the same direction as investment to 26.8 percent of GDP over the sub-period 1990-2006.

2.1.1 Investment Performance over the Sub-period 1960-1979

The sub-period 1960-1979 was considered as a period over which the South African settlers were consolidating their colonial occupation, supported by institutionalized apartheid system. Investment as a ratio of GDP averaged about 32.1 percent (see Table 1). Investment during this sub-period concentrated more on tertiary industries, which accounted for an average of about 58.2 percent of gross

domestic fixed investment. This was followed by primary industries with an average investment rate of about 28.3 percent, and secondary industries with an average investment rate of 13.5 percent. This was the period when the South African settlers believed that the country belonged to them, and confidently increased their investment in the economy. They also increased the share of FDI in the economy, especially in the mining sector.

Table 1: **Composition of Investment over the period 1960-2006**

Sub-periods	1960-1979	1980-1989	1990-2006
GDP (N$ million)	460	3,322	21,686
GFCF as % share of GDP	32.1	22.2	23.9
Contribution by industries			
Primary Industries	28.3	20.3	24.9
Secondary Industries	13.5	8.0	19.1
Tertiary Industries	58.2	59.7	55.9

Sources: Leistner & Esterhysen (eds), 1990; NPCS, Central Bureau of Statistics, 2006

Over this sub-period, the South African settlers introduced incentives to attract more settlers to Namibia. The incentives included: the provision of subsidies in agriculture; technical assistance; and the establishment of marketing and transport infrastructure. However, Namibia was only used as a producer of raw materials in support of South African manufacturing industries, while all consumer goods were imported from South Africa.

Despite intensified war of liberation struggle, the South African settlers remained defiant, gained more confidence and increased their investment in the economy mainly in the service industries. Investment level reached a peak average rate of 46.4 percent between 1974 and 1979 (Leistner and Esterhuysen (eds), 1990).

Over the sub-period 1960-1979, industrial investment concentrated on service industries mainly on provision of government services. In primary industries,

investment fluctuated between 40 percent in 1962 and 15 percent of total investment in 1971. On average, investment in primary industries was recorded at 28.3 percent of total gross domestic investment. Gross domestic investment in these industries was high in mining, agriculture and fishing sectors. The share of investment in mining sector averaged 16.0 percent of total domestic investment, with the highest rate of 36.5 percent recorded in 1975. The increase in the share of the mining sector in investment in 1975 is attributable to huge investment in uranium mining by Rossing Uranium mine.

Secondary industries had the lowest level of investment, which fluctuated between an average of 7.4 percent in 1961 and 25.6 percent of total investment in 1972. The rate of investment in secondary industries remained constant at about 5.0 percent of gross domestic investment between 1960 and 1969. Investment in manufacturing and construction on the one hand remained constant at 5.0 percent over the whole sub-period. On the other hand, investment in electricity and water increased to an average of 16.7 percent of total gross domestic investment between 1970 and 1972 before it declined to 5.0 percent in 1979. On average, secondary industries contributed about 13.5 percent of total gross domestic investment.

Investment in tertiary industries was the highest, averaging 58.2 percent of total investment over the sub-period 1960-1979 and remaining concentrated in government services. Government services made up a large proportion of total gross domestic investment with an average share of 35.4 percent, while other sectors (wholesale; retail trade and repair; as well as community, social and personal services) together constituted an average of 17.1 percent.

2.1.2   Investment Performance over the Sub-period 1980-1989

The sub-period 1980-1989 was a transitional period to independence and it included years of intensified war of liberation, and the apartheid regime realized that the independence of Namibia was imminent. This was a period when uncertainties about political and economic policies of the South African regime dampened economic activities in the former South West Africa. Coupled with unfavourable climatic conditions, uncertainty about political change affected economic activities and subsequently investment declined over the sub-period. The average ratio of investment to GDP fell to 22.2 percent from 32.1 percent of GDP over the preceding sub-period. This decline is attributable to the uncertainty relating to the implementation of the United Nation's Resolution 435 that led to the independence of Namibia.

This sub-period was not only characterised by declining rate of investment, but also by shifts in the industrial composition of investment. For example, the average share of tertiary industries increased from 58.2 percent of gross domestic investment over the sub-period 1960-1979 to about 59.7 percent over the sub-period 1980-1989, while the average shares of primary and secondary industries declined from 28.3 percent and 13.5 percent to 20.3 percent and 8.0 percent, respectively.

In primary industries, the average share of mining sector in investment remained constant at about 16.5 percent of total gross domestic investment, while the share of agriculture and fishing declined from 12.3 percent of gross domestic investment over the sub-period 1960-1979 to 7.1 percent over the sub-period 1980-

1989. The declines in investment in agriculture and fishing over this sub-period were attributable to unfavourable climatic conditions and political uncertainty.

The share of secondary industries in investment declined continuously from 1981, and reached the lowest level of about 6.0 percent in 1988. This decline was led mainly by electricity and water, manufacturing and construction.

On the other hand, the share of tertiary industries in investment increased from 58.2 percent of total gross domestic investment over the sub-period 1960-1979 to 59.7 percent of total gross domestic investment over the sub-period 1980-1989. The share of investment in government services increased from 35.1 percent over the preceding sub-period to 39.1 percent over the sub-period 1980-1989, with fluctuations between 27.2 percent and 45.3 percent.

2.1.3   Investment Performance over the Sub-period 1990-2006

The sub-period 1990-2006 was an era after independence in Namibia, and the new government faced numerous social and economic challenges. The Government of the Republic of Namibia (GRN) recognised that investment is essential for any economy, whether the economy is developed, developing, under-developed, in transition, based on a market or a command system. As population grows, more goods and services are needed to support the population and more productive capacity is needed for the economy to sustain the growing population.

Government formulated a number of legislations with the aim of encouraging investors to establish their businesses in the country. These included the Code on Investment, establishment of Namibia's Investment Centre in the Ministry of Trade and Industry, White Paper on Namibia's Industrial Development and the enactment

of the Foreign Investment Act, Act No. 27 of 1990 (amended by Act No. 24 of 1993) as well as the Export Processing Zone (EPZ) Act No. 9 of 1995. The common objective of these instruments was to promote industrial development through increased share of value addition activities, import substitution, diversification of the economy, and the creation of employment opportunities in manufacturing.

The average investment rate recovered from 22.2 percent of GDP over the sub-period 1980-1989 to 23.9 percent over the sub-period 1990-2006. This decline was characterized by cyclical and medium-term variations over time. For example, the rate of investment over this period fluctuated between the lowest rate of 15.0 percent in 1991 and the highest rate of 24.5 percent in 2006. In real terms, gross fixed capital formation grew by about 9.0 percent over the sub-period 1990-2006. The main source of funds for financing domestic investment in Namibia has been foreign direct investment and contractual savings, mainly in the forms of pension and life insurance funds.

The trend of investment in Namibia demonstrates that most investment is undertaken in exploitation of natural resources such as minerals and in semi-processing. This is concomitant with Namibia's factor (natural resource) endowment. Government has introduced a number of legislations to facilitate investment in the country, but the results of these legislations remain unclear. Whether the current level of investment is attributable to these legislations is a question that remains unanswered. This study cover a longer period than any previous work done to assess the determinant of investment in Namibia, however, a number of studies have been done for other countries around the world including some in Southern Africa (see, for example: Bende-Nabende, 2002; Greene & Villanueva, 1991; Lesotlho, 2006).

Prior to 1990, Namibia did not have formal incentives for long-term investment and industrial development, although there were some tax concessions for establishing industries, (First National Development Corporation, 1989). Investors were allowed 100 percent and 20 percent tax deductions on machineries and buildings, respectively, in the first year of operation and 4 percent thereafter.

At independence in 1990, the Government of the Republic of Namibia faced a daunting task of correcting economic imbalances created by the colonial regime. This included expanding economic base and attracting foreign capital into the economy. Government recognized Namibia's growth opportunities presented by the country's resource endowments. However, it also needed to address structural barriers to economies of scale imposed on the local manufacturing sector by the small size of the domestic market. Namibians faced disparities in income and assets distribution as well as access to basic services. Poverty is widespread and inequalities remain high. Limited access to productive assets, particularly land and capital, increased the vulnerability of most households and reduced their access to quality education and health care. This has also resulted in a huge deficit in skills and technical know-how, which has impacted negatively on investment and economic growth prospects. With this in mind, new investment legislations were created and a number of incentives were introduced to attract foreign investment, while encouraging participation of domestic investors, and promoting development of the private sector.

Independent Namibia started with an economy whose manufacturing sector's contribution to GDP was merely about 4.3 percent (average annual contribution for 1980 –1988). The Foreign Investment Act (Act no. 27 of 1990, amended in 1993)

became one of the early instruments aimed at attracting foreign investment to Namibia. This Act established the Namibian Investment Centre (NIC), which together with the Offshore Development Company (ODC) are the official promoters and facilitators of investment in Namibia. These two institutions furnish investors with information, evaluate investment projects and administer numerous investment incentives in conjunction with the Ministry of Finance.

The Government has also recognised that manufacturing needs to be enhanced. One of the early actions taken to address economic dependency on primary activities was the development of an industrial strategy as set out in the white paper on Industrial Development of August 1992. The industrial policy as enshrined in the white paper embraces policies that include private sector development, trade and investment promotion, flexible regulatory framework and increase value addition.

Besides development of foreign investment policies and the industrial strategy, more specific instruments aimed at promotion of manufacturing and exports of manufactured goods have been developed. The incentives for investment have been implemented since 1993. First was the introduction of incentives for registered manufacturers and incentives for exporters of manufactured goods in 1993, followed by the implementation of the Export Processing Zone (EPZ) scheme in 1995 through the enactment of the EPZ Act (Act no. 6 of 1995, amended in 1996). These three types of incentives are collectively referred to as special incentives for manufacturers and exporters.

The legal framework for investment is provided in a number of legislations such as Foreign Investment Act, Act no. 24 of 1993; EPZ Act, no. 9 of 1995; Income

Tax Act and Customs and Excise Act. The Foreign Investment Act, Act No. 24 of 1993 was promulgated to make provision for the promotion of foreign investments in Namibia. The Act provides for equal treatment of foreign and local investors; full protection of investment and openness of all sectors of the economy.

The EPZ Act, Act No. 9 of 1995, was adopted in 1995 as a legal framework for promoting export-led industrialization in Namibia (Namibia Investors Guide, 2006). The EPZ regime was created under the provision of the EPZ Act, and it is aimed at facilitating imports of foreign productive capital, transfers of technology and industrial skills; contributing towards an increased contribution of the manufacturing sector to job creation, and enhance the diversification of the local economy. Incentives under the EPZ regime include exemption from corporate income tax, duties and value added tax (VAT) on imported intermediate goods; equal treatment of local and foreign investors; freedom to locate the business anywhere in Namibia and access to existing business and industrial infrastructure at economic rental rates.

The special incentives for manufacturers provide tax and non-tax incentives to all companies engaged in manufacturing activities in Namibia. Incentives offered to manufacturing are provided for under the Income Tax Act, No. 24 of 1981 as amended. Incentives apply to both local and foreign companies who are registered with the registrar of companies in the Ministry of Trade and Industry. Incentives include corporate income tax rate of 18 percent for 10 years; VAT exemption on purchases and imports of manufacturing machinery and equipment; special building allowance, whereby factory buildings are written off at 20 percent in the first year and the remaining balance at 8 percent for 10 years; transport allowance for land-

based or rail transportation of 20 percent deductible from total cost; export promotion allowance of 20 percent deductible from taxable income; training incentive of between 25 percent and 75 percent deductible from taxable income and industrial studies of 50 percent of costs and cash grant of 50 percent of direct costs of approved export promotion activities.

Despite the generosity of Namibia's incentives regime, investments has not been adequate enough to expand the country's economic base and increase the absorption capacity in terms of employment. The incentives regime has been crippled by the lack of coordination between institutions tasked with administrative responsibilities. Consequently, the incentives regime has produced poor results in terms of attracting new investment as it was initially intended.

Other factors have also been identified as hindering the flow of investment into Namibia. These are: the small size domestic market, low labour productivity, high cost per unit of unskilled labour, shortage of skills, racial and sectoral based private sector and lack of innovation. Efforts have already been made to address some of these constraints and a Task Force comprised of high ranking Government and private sector officials has been set up to oversee all necessary reforms.

Gross investment recorded a moderate average growth rate of 8.4 percent over the period 1990-2006. This moderate growth in investment is hard to explain as the supply factors such as gross savings consistently exceeded investment, while current account balance has also been in surplus. With investment rate averaging 21.8 percent of GDP annually over the period 1990-2006, gross savings has been in excess of investment with an average of 26.8 percent of GDP. This in essence means

that Namibia exports capital to the rest of the world, to finance investment and create employment elsewhere.

Foreign Investment Advisory Services (2006) in its report on review of Namibia's investment legislation, incentives and institutions, found that although Namibia has a relatively good investment climate and ranks favourably along with many other emerging economies, recently there has been slippage in the World Bank's doing business indicators in comparison with competing investment sites. The main concern at the moment is the investment legislation, which is believed to have been obsolete.

The report concluded that the tax incentives structure of targeted benefits for certain sectors that were used to attract investment did not achieve their objectives and need to be removed, while preserving appropriate general tax incentives. Further to that, Foreign Investment Advisory Services (2006) observed also that Namibia's Foreign Investment Act is outdated and need to be replaced, while institutional structures for investment and export promotion need to be improved.

African Development Bank (2004) found private sector business climate in Namibia to be among the most conducive in the African continent. The Bank praised the economy's openness with a high and growing degree of private sector participation where both external and domestic investors face no restriction in terms of currency convertibility or dividend transfers. However, it concluded that although Government investment policies continue to provide adequate incentives to attract investment in a range of activities, there were a number of constraints in the business environment. These constraints include the limited size of the domestic market, low

productivity of labour, high unit costs of unskilled labour force, lack of specialised skills and inadequate entrepreneurial skills, amongst others.

National Planning Commission (2000) outlined Government's commitment to enhancing private sector's role of investing in the Namibian economy during the second National Development Plan (NDP2). In NDP2, Government undertook to promote and strengthen the enabling environment for economic growth and development. This was to be done by putting more emphasis on the importance of enhancing the role of private sector in economic development agenda, while limiting Government's role to creating enabling environment for stimulating and motivating various participants in the development of the Namibian economy. With that in mind, economic policies during the NDP2 were geared towards promoting economic diversification, exploiting linkages between sectors such as tourism, agriculture and fishing, transport sector, financial sector, creating enabling environment for private business and maintaining financial stability in the country.

Government planned to use its budget to stimulate investment and consolidate the foundation of economic development. During the NDP2, Government strived to make use of international linkages to facilitate joint ventures between Namibian and foreign companies to promote scientific and technology transfers, while measures were taken at home to develop, promote and diversify the country's exports. Further measures were introduced to strengthen the development of the informal sector through building and expanding institutional and infrastructural facilities that would promote and enhance entrepreneurial skills.

International Monetary Fund (IMF) & World Bank (WB) (2005) undertook financial sector assessment program, which found that the Namibian financial sector

has capacity to support the process of creating domestic investment opportunities by focusing its role on mobilising and allocating funds, as well as assessing and managing financial risks. The report, however, acknowledged that the process requires a critical mass of asset managers who are skilled in entrepreneurial development, expanding information sharing and monitoring so that there is awareness of risks and returns, strengthening corporate governance and risk management in insurance companies and pension funds. The report found also that there is a well developed Government securities market with active secondary trading in Treasury Bills. Government securities play a significant role in promoting the development of the financial market in the country, while enhancing investment in the local economy.

The IMF & WB (2005) concluded that despite the ability of the financial sector in Namibia to drive domestic investment, there are a number of constraints in the market. These constraints include limited access to financial services due to high cost and collateral requirement, underdevelopment of leasing and factoring services and ineffectiveness of specialised institutions such as Small Business Credit Guarantee Trust.

2.2   Economic Growth

Over the sub-period 1960-1979, Namibia experienced high economic growth with an average rate of about 11.4 percent per year. During this sub-period, economic activities were mainly dominated by primary industries with about 50.9 percent of total GDP, followed by tertiary industries with a contribution of about

36.0 percent (see Table 2). Secondary industries contributed the least to GDP at about 10.1 percent mainly from manufacturing sector.

The strong performance of primary industries was mainly on account of mining activities with a contribution of about 35.1 percent of GDP, followed by agriculture and fishing sectors with about 15.8 percent of GDP. The good performance of the mining sector over this sub-period is mainly attributable to the opening of the Rössing Uranium Mine in 1978. The shares of agriculture and fishing sectors were unstable due to a number of external influences such as climatic and oceanic conditions, fluctuations in international market conditions of supply and demand as well as changes in international commodity prices.

The composition of sectoral contribution to GDP has changed over the sub-period 1980-1989 with tertiary industries dominating with a contribution of about 35.5 percent of GDP, followed by primary industries with about 32.7 percent of GDP and secondary industries with 9.1 percent of GDP. Besides the change in the composition of the sectoral contribution to GDP, overall economic performance also declined, recording an average growth rate of 3.1 percent compared to 11.4 percent in the preceding sub-period.

Table 2: **Average contribution to GDP by broad industrial category**

Sub-period	1960-1979	1980-1989	1990-2006
GDP (N$ million)	**460**	**3,322**	**21,686**
% shares of industries in GDP			
Primary industries	50.9	32.7	21.0
Secondary industries	10.1	9.1	15.8
Tertiary industries	36.0	35.5	49.9

Source: Leistner & Esterhysen (eds), 1990; NPC, National Accounts 2006

It is worthwhile to note that this was a period of political uncertainty with intensified war of liberation as the independence of Namibia became imminent. This could probably explain the dominance of tertiary industries which emanated mainly from Government services.

The sub-period 1990-2006 is a post-independence period after Namibia became a sovereign independent Republic. The objective of the Government of the Republic of Namibia was to undertake immediate policy reforms to ensure high economic growth and encourage development at all levels of the economy. GDP grew on average by 4.3 percent, a recovery from 3.1 percent recorded over the sub-period 1980-1989. Like in the preceding sub-period, tertiary industries dominated economic activities with a contribution of about 49.9 percent of GDP, followed by primary industries with about 21.0 percent and secondary industries with about 15.8 percent.

Macroeconomic policies after independence have been supportive of economic growth and development. With the support of prudent policies, significant progress has been made in delivering basic services such as education, health, housing, water and electricity to the people.

World Bank (2007) observed that Namibia has well functional infrastructure, a strong institutional foundation for economic development, sound economic policies and well organized machinery for public administration. Further to that, the private sector plays a dominant role in key productive industries of the economy, while government plays a regulative role. These are all necessary conditions for investment to excel. The World Bank also pointed out that the absence of diversification in the Namibian economy presents opportunities for economic growth through the

introduction and expansion of investment in new activities in various sectors of the economy. The Bank concluded that trade reforms could play a significant role in stimulating diversification and creating an environment conducive for increased investment and economic growth.

2.3 Gross Domestic Savings

Savings as a source of economic growth features prominently in the neoclassical growth and the AK models such as Solow (1956), Koopmans (1965), Ramsey (1928), Harrod (1939) and Domar (1946). All these models put emphasis on capital accumulation as a major source of economic growth, implying that a high saving rate fosters growth because it translates into a high rate of investment.

Gross domestic savings in Namibia has averaged about 41.6 percent of GDP over the pre-independence period, that is, 1960-1989, and over the post-independence period (1990-2006) it averaged 26.8 percent of GDP. In terms of growth, gross domestic savings grew on average by 15.1 percent per year during 1960-1989 compared to a growth rate of about 10.8 percent over the period 1990-2006, while investment grew by 3.5 percent and 8.4 percent over the period 1960-1989 and 1990-2006, respectively.

Investment averaged 26.7 percent of GDP over the period 1960-1989 and 21.8 percent of GDP over the period 1990-2006. GDP grew on average at about 5.7 percent over the period 1960-1989 and at about 4.3 percent over the period 1990-2006. This implies that there has been excess domestic savings that could not be absorbed by investment, which is a reflection of capital flight. In essence, part of Namibia's domestic savings flow out to finance investment abroad.

CHAPTER 3

3.   LITERATURE REVIEW

3.1   Conceptual Framework

This section gives an overview of the existing knowledge in the area of investment and its determinants. The main focus of this section is to summarize and synthesize the arguments and ideas of others, which form the basis for this study.

The key determinant of economic growth that economists consider when assessing the success or failure of a country in attracting investment is the rate of investment. Economic theory suggests that countries that grow quickly are those that invest substantial fractions of their GDP, and countries that fail to grow are those that fail to invest.

Much of the existing literature suggests that capital accumulation is a core process that facilitates all other aspects of economic growth. Capital increases by investment, while high investment generates more savings, which constitute a more reliable source of investment. For investment to increase, it should be nurtured by a growing surplus above the prevailing consumption level in the economy. Thus, it is this surplus that can be tapped and directed into productive investment.

Van den Berg (2001) confirmed the postulation that both growth theorists and development theorists would agree that investment is important for economic growth. In the same vein, Bowden (1986) argued that for growth to occur, there must be saving, although saving alone is not enough, investment serves to link savings to economic growth.

The theory of investment also implies a relationship that determines investment as a decreasing function of the interest rate, (Hansson, 1986). This means

that in a high interest rate environment, investment tends to be lower and it increases when interest rates falls. The existing literature, however, shows that relatively little empirical work has been done on determinants of private investment in developing countries, despite the importance of investment to their economies, while most available models were developed for developed countries. The reason for this is twofold, namely the scarcity of data as well as the fact that many existing investment theories were developed for industrialized countries and, therefore, do not fit the circumstances of developing countries, (Agénor & Montiel, 1999).

Literature suggests that gross fixed capital formation in developing countries has declined from an average of 26.5 percent of GDP during 1981 to less than 23.5 percent between 1985 and 1988. The decline was attributed to a number of factors, which include falling prices of primary commodities, decline in private external financing, large stock of foreign debt and implementation of adjustment programs designed to restore balance of payments viability (Greene & Villanueva, 1991). Although investment has declined in general during the period indicated above, the ratio of gross investment to GDP varied across countries and regions, being close to 26.5 percent in Asian and European countries and significantly less in other regions of the world.

However, lack of data among developing countries is believed to have hampered a successful establishment of an empirical investment function based on the classical theory for those economies. Because of those inherent constraints, recent studies on investment in developing countries were built on the hypothesis that private sector investment in developing countries is positively related to the accumulation of domestic real money balances, (Greene & Villanueva, 1991). This is

understood to have been based on the assumption of limited access to credit and equity market, which suggests that private investors in developing countries have to accumulate money balances before undertaking investment projects.

Williamson (2002) found a negative relationship between investment and real interest rate. Hence, a key determinant of investment is the real interest rate, as it represents the opportunity cost of investment. Opportunity cost of investment tends to be high when real interest rate is higher, thus leading to a fall in investment. Movements in real interest rate are, therefore, an important channel through which shocks to the economy affect investment. Furthermore, monetary policy, through its influence on the real interest rate, may also affect investment.

The basic Solow Model cites volume of domestic savings as the only source of domestic investment. However, as the model is expanded to an open economy, capital flows are brought on board and this becomes the most noticeable feature of globalization (Sørensen & Whitta-Jacobsen, 2005). Furthermore, Sørensen & Whitta-Jacobsen (2005) found that in an open economy with free capital mobility, Foreign Direct Investment and international portfolio investment became more visible forms of international capital flows. In an open economy, investment and saving may deviate from each other, resulting in either capital exports or imports. Explaining this is the fact that an increase in domestic saving tends to reduce real interest rate, thus inducing savers to invest in their domestic economy.

Agénor & Montiel (1999) considered the expected future values of aggregate demand, the user cost of capital, real wage rate and the initial capital stock as determinants of investment. Hansson (1986) argued that investment level is determined by the levels of output demand and supply, technology and interest rates.

Bhattacharyya (2007) found that the firm's investment decisions are determined by internal liquidity, profitability and the firm's financial strength.

3.2   Empirical Literature Review

The existing literature on Namibia has involved evaluations of specific determinants of investment. For example, Eita and Du Toit (2007) analysed the determinants of investment in Namibia based on the classical model for the period 1971 to 2005. The results of the study by Eita and Du Toit (2007) indicate that investment in Namibia can be raised by increasing GDP, savings and the lagged capital stock, and by decreasing the user cost of capital. The study suggests that expansionary fiscal and monetary policies can be applied successfully to increase investment, while contractionary policies discourage investment.

Odada and Mumangeni (2000) used the Jorgenson theory of investment and concluded that real GDP was the only significant determinant of private investment in Namibia. They found that real GDP increases lead to proportionately bigger increases in private investment.

Similarly, Harupara (1998) found that private investment is positively related to public investment and gross domestic product in the short run, but negatively related to inflation, real interest rate and exchange rate. In another study, Shiimi & Kadhikwa, (1999) found that public investment, inflation, real income and interest rate were significant determinants of investment in Namibia.

Empirical literature on private investment behavior in developing countries seems to have focused on testing several hypotheses advanced to explain variations in private investment in developing economies. For example, Oshikoya (1994) found

that private investment is positively related to the growth of real output. Just as Greene & Villanueva (1991) found that the rate of private investment is positively related to real GDP growth, level of per capita GDP, and rate of public sector investment, and negatively related to real interest rate, domestic inflation, the debt-service ratio and the ratio of debt to GDP. Therefore, they argued that countries with higher per capita incomes could devote more resources to domestic savings, which could be used to finance investment.

Further evidence from Bende-Nabende (2002) found that market growth, export-oriented policy and FDI are the dominant long-run determinants of foreign direct investment in sub-Saharan Africa. It then follows that one has to study the microeconomics of investment behavior of firms that make decisions regarding investment. Firms forgo profit in the current period when they invest so as to have higher capital stock in the future, which allows them to gain higher profit. Firms' investment decisions are based on three factors namely, lower current capital stock, expected high future productivity and lower interest rate.

Empirical work from other countries is almost similar to the Namibian cases. For example, Lesotlho (2006) found that in the short-run, private investment in Botswana is determined by public investment, bank credit and real interest rates, while in the long-run, private investment is determined by GDP growth and real exchange rate. In their study, Naudé, Oostendorp and Serumaga-Zake (2000) concluded that investment in South Africa is determined by factors such as the size of the labour cost, certainty of environment and firms' efficiency. Van den Berg (2001) found a positive relationship between capital stock and investment, that is,

stock of capital increases as investment increases. However, the stock of capital is said to gradually wear out over time in form of depreciation.

3.3   Evaluation of Existing Literature

The existing literature on the determinants of investment in Namibia, although very limited, is quite comprehensive in terms of variable coverage. All available studies considered, as determinants of investment, interest rate, output (GDP), government tax policies, inflation and savings, while some studies cover as many variables as possible. However, Eita and Du Toit (2007) included lagged capital stock and user cost of capital as determinants of investment. Shiimi & Kadhikwa (1999) included budget deficit, public investment, exchange rate, public debt as well as income and wealth. Odada and Mumangeni (2000) and Harupara (1998) used similar variables as Eita and Du Toit, but their findings are slightly different.

All studies have similar, but different interpretations of results. For example, Eita and Du Toit (2007) found that investment in Namibia is positively related to three determinants namely; GDP, savings and lagged capital stock, while being negatively related to tax and interest rates. Odada and Mumangeni (2000) found that real domestic output is the only significant determinant of private investment in Namibia. Shiimi and Kadhikwa (1999) found that interest rate and public investment are significant determinants of investment in Namibia.

Evaluating this body of literature on Namibia, it appears that the studies are comprehensive enough to form the foundation of this study and they offer opportunities to explore other possible factors that are of significance and that may

have influence on investment. However, none of these studies covers a long enough periods as the period this study is intending to cover; the period 1960-2006. This study has attempted to estimate also the impact of the investment incentives introduced after 1990, which were not covered in the previous studies mentioned above.

CHAPTER 4

4. METHODOLOGY AND EMPIRICAL MODEL

4.1 Theoretical Framework

The study uses time series econometric techniques with the applied neoclassical theory of investment to determine the long-run and short-run determinants of investment in Namibia, and explores a number of empirical models. The neoclassical theory of investment determines investment as a part of a dynamic optimization problem that specifies the entire path for capital, (Hansson, 1986). The basis for the current study is the assumption that investment, I_t , occurs at the start of the period and it is immediately productive, but firms face strictly convex adjustment costs in changing their capital stock. Hence, capital stock evolves according to the following equation of motion (Bond & Meghir, 1994):

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

where, t is the time period; K_t is capital stock at the beginning of the period; δ is the constant rate of depreciation; K_{t-1} is capital stock in the previous period; I_t is investment stock in period t.

Under the condition that the value of marginal product of capital should be equal to the rental price of capital, the desired level of capital, K^+, will be obtained by:

$$K^+ = \alpha \frac{PQ}{c}, \qquad (2)$$

where $\frac{PQ}{c}$ is the output; capital ratio; Q is output, p is the price of output; c is the rental price of capital and α is the elasticity of output with respect to capital. Investment stock can be determined using the neoclassical theory of investment if

assuming a constant rate of replacement. Under this assumption, investment behavior would take the form of a lagged change in the desired capital stock. In this case, investment can be calculated as,

$$I_t = \sum_{t=0}^{\infty} \mu_s \Delta K^+{}_{t-s} + \delta K_t ; \qquad (3)$$

where gross investment in a given period, I_t, is equal to a change in a weighted average of past changes in desired capital, $\Delta K^+{}_{t-s}$, and replacement investment, δK_t. The change in desired capital in period t-s is $\Delta K^+{}_{t-s}$; the parameter μ_s is the proportion of the change in desired capital in period t-s that results in investment expenditures in period t.

The distributed lag function gives net investment, N_t, as a weighted average of past changes in desired capital stock:

$$N_t = I_t - \delta K_t , \qquad (4)$$

$$= \sum_{t-s}^{\infty} \mu \Delta K^+{}_{t-s}$$

To estimate the parameters of the distributed lag function, restrictions would have to be imposed on the sequence of coefficients {μ}, hence the following equation:

$$N_t = \gamma_0 \Delta K^+{}_t + \gamma_1 \Delta K^+{}_{t-1} - \omega N_{t-1}, \qquad (5)$$

where $\gamma_0, \gamma_1 \ and \ \omega$ are parameters that characterize the sequence {μ}.

4.1.1 Marginal Efficiency Theory of Capital

The concept of marginal efficiency theory of capital emerged from the notion that the expected rate of return on investment matters when businesses are making investment decisions. Keynes (1936) defined the marginal efficiency of capital as the

discount rate that equates the present value of the expected revenue from an investment in capital with the current supply cost of capital goods. Accordingly, the marginal efficiency of investment postulates that the level of investment is determined by the marginal efficiency of capital relative to the rate of interest. This relation is reflected in the investment function proposed by Keynes as:

$$I = I_0 + I(r); \text{ where I'(r)} < 0 \tag{6}$$

4.1.2 Tobin's Q-theory of Investment

The q-model is a type of neo-classical model that relates investment spending to the ratio of the market value of the firm as determined by an additional unit of capital to its replacement value, (Tobin, 1969). Investment rises when the marginal q exceeds one and declines when it falls below one (Ferderer, 1993). Most empirical literature has focused on the relationship between investment spending and the average q, that is, the ratio of the market value of the firm to the replacement cost of its assets. The relation between average q and gross investment is given by Ferderer (1993), as:

$$I_t = \alpha + \sum_{i=0}^{m} \beta_i Q_{t-i} + \delta K_{t-1} + \epsilon_t, \tag{7}$$

where gestation lags are accounted for by letting *m* exceed zero.

4.1.3 Accelerator Theory of Investment

The accelerator theory of investment suggests a positive relationship between investment and the rate of growth of demand or output. Under the accelerator theory, it is also assumed that there is a desired capital stock for a given level of output and

interest rate. A rise in output or a fall in interest rate may prompt increased levels of investment as firms adjust to reach the new optimum capital stock level. The accelerator model defines the desired capital stock as:

$$K^d = \gamma Y_t, \tag{8}$$

where K^d, demand for capital stock is defined as a proportion of output, Y_t.

Because it takes firms some time to acquire new equipment, capital stock is adjusted optimally to the difference between the capital stock in the current period and actual capital stock in the previous period (Eita, 2007). Then net investment can be written as:

$$I_{net} = K_t - K_{t-1} = \alpha(Y_t - Y_{t-1}) \qquad 0<\alpha<1 \tag{9}$$

where α is the accelerator coefficient, and it represents the desired capital-output ratio (K/Y). This means that given a change in aggregate demand, the accelerator gives the change in capital needed to achieve the desired capital-output ratio.

Assuming that I^*_t is a desired investment determined by the accelerator and if I_t is actual investment, a linear partial rule can be imposed:

$$I_t = \mu I^*_t, \tag{10}$$

where the parameter μ lies between 0 and 1.

Empirical work done on investment theories so far has proved a positive relationship between investment and economic growth. Therefore, investment is believed to be the key to future growth of any economy. This means that for any economy to develop and flourish, it requires a massive amount of capital goods (see, for example: Agénor & Montiel, 1999).

4.2   Empirical Model

The empirical relationship between investment and other explanatory variables has been estimated using ordinary least squares (OLS) technique, and this is expressed as (Gujarati, 2003):

$$I_t = \beta + \gamma \Phi_t + e_t \hspace{4cm} (11)$$

where I_t is investment level in period t; β and γ are parameters to be estimated; Φ_t represents observable variables representing factors influencing investment, and e_t is a random error term representing estimation errors and omitted variables.

Given the review of the investment theories, the following empirical model of investment is estimated for Namibia in this study. The model is the modified version of the model use by Eita and Du Toit (2007):

$$lnI_t = \beta_0 + \beta_1 lnY_t + \beta_2 lnS_t + \beta_3 lnK_{t-1} + \beta_4 lnPR + \beta_5 lnINFL + \beta_6 D_{1t} + \beta_7 D_{2t} + e_t \hspace{1cm} (12)$$

where:

Y_t is real output (GDP); S_t is savings; K_{t-1} is the value of lagged capital, PR is prime lending rate, INFL is inflation rate, D_{1t} is a dummy variable, taking the value 1 for the period 1960-1979 and 0 otherwise; D_{2t} is a dummy variable, taking the value 1 for the period 1980-1989 and 0 otherwise; e_t is a random error term representing estimation errors and omitted variables.

Furthermore, to assess the impacts of investment incentives that were introduced after independence, that is, during the period 1990-2006, a dummy variable is created. Hence, the following equation is also estimated:

$$lnI_t = \beta_0 + \beta_1 lnY_t + \beta_2 lnS + \beta_3 lnK_{t-1} + \beta_4 lnpr + \beta_5 lninfl + \beta_6 DUMMIND + e_t \hspace{1cm} (13)$$

where: DUMMIND is a dummy variable for post-independence investment incentives, taking the value of 0 for the period 1960-1989 and 1 for the period 1990-2006, to take into account the effects of policy incentives.

4.2.1 Data and their Sources

The study has made use of time series annual data covering the period 1960 to 2006. The sources of data are as follows:

i. Gross Domestic Product (GDP): 1960-1983, Leistner and Esterhuysen (eds), 1990;

ii. Gross Domestic Product (GDP): 1983-2006, National Planning Commission, Central Bureau of Statistics;

iii. Gross Fixed Capital Formation (GFCF): 1960-1983, Leistner and Esterhuysen (eds), 1990;

iv. Gross Fixed Capital Formation (GFCF): 1983-2006, National Planning Commission, Central Bureau of Statistics;

v. Savings: 1960-1983, Leistner and Esterhuysen (eds), 1990; 1983-2006, National Planning Commission, Central Bureau of Statistics;

4.2.2 Data Analysis

The models used in this study are based on economic theory and financial theory and rely on historical data for any justification. The analysis in this study uses yearly (annual) data. Data on GDP and GFCF are available for two periods, that is; 1960-1982 (Leistner and Esterhuysen (eds), 1990) and 1990 to 2006 (Central Bureau of Statistics: National Accounts 1983-1995 & 1996-2006) at current prices and at

constant 1980, 1990 and 1995 prices. All the data are converted to constant 1995 prices, to remove the effects of price changes between periods.

The study explores the cointegration technique to test the long term relations between investment and its determinants. The cointegration test has been done with the assistance of computer software, such as "E-view5" software package, where applicable. The study makes use of the Johansen (1995) vector auto-regression (VAR) incorporating the error correction terms in analyzing and assessing the conitegration or long-run relationships between investment and its determinants. The VAR model is chosen because of its simplicity, in the sense that it imposes minimal economic conditions. With VAR, a limited number of variables are distinguished whereas all variables are explained by their own lags and those of other variables. The VAR (p) model is given as:

$$y_t = \beta + \Phi_1 y_{t-1} + \cdots + \Phi_1 y_{t-p} + \epsilon_t, \tag{14}$$

were y_t is a column vector of variables and assumed to be integrated of order 1, I(1). Furthermore, stationarity of time series data has been tested using the Augmented Dickey-Fuller test. This is the basic augmented equation, which includes the lagged value of regressors to allow for autocorrelation. In addition, two other investment models were also explored in empirical work, and these include the Hall and Jorgenson (1967) neoclassical model and the Tobin (1969) q investment model.

CHAPTER 5

5.   RESEARCH FINDINGS

5.1   Introduction

This chapter presents empirical analysis of data and regression results. The estimation techniques used, types of data and the detailed results of the estimation are presented in the subsequent sections.

5.2   Estimation Techniques

The empirical analysis of the data was carried out making use of the Engler-Granger two-step technique. The Engle-Granger two-step estimation was chosen as the appropriate technique. This technique entails the determination of the long-run cointegration relationship between independent variable and its regressors through testing for stationarity of the residuals using Augmented Dickey Fuller test (ADF).

The computed ADF statistic is compared with the critical values using response surface analysis. If the null hypothesis of no cointegration is rejected, an error correction model (ECM) in the second step can be estimated. The ECM contains the long-run cointegration equation in the form of the stationary residuals from the long-run relationship lagged by one period, and the short-run dynamic structure of the system. The lagged residual is expected to have a negative sign and statistically significant allowing for adjustment towards equilibrium.

5.2.1   Data Used

Real investment is taken as the dependent variable with other variables such as real savings, real value of the lagged capital, real prime lending rate and inflation rate being used as independent variables or regressors. Dummy variables are created

to capture the effects of events during three sub-periods, namely 1960-1979, 1980-1989 and 1990-2006.

The following variables are used in estimated equations, where LN denotes natural logarithm and D denotes first difference of a variable:

LNINV = Natural logarithm of real investment

LNGDP = Natural logarithm of real GDP

LNSAV = Natural logarithm of real savings

LNPR = Natural logarithm of prime lending rate

LNKT_1 = Natural logarithm of the value of lagged capital

LNINFL = Natural logarithm of inflation rates

DLNSAV = First difference, natural logarithm of real saving

DLPR = First difference, natural logarithm of prime lending rate

DLNKT_1 = First difference, natural logarithm of value of lagged capital

DLNINFL = First difference, natural logarithm of inflation rate

The natural logarithm has been applied to represent the output values of all variables and preliminary analyses of these log functional forms are depicted in Figures 2(i)-2(vii). The graphs show that although some variables show upward trends, all display high cyclical fluctuations, suggesting that the trends are not stationary. The horizontal axis shows the time period in years, which the vertical axis depicts the annual percent change in variables.

Figure 2 (i)
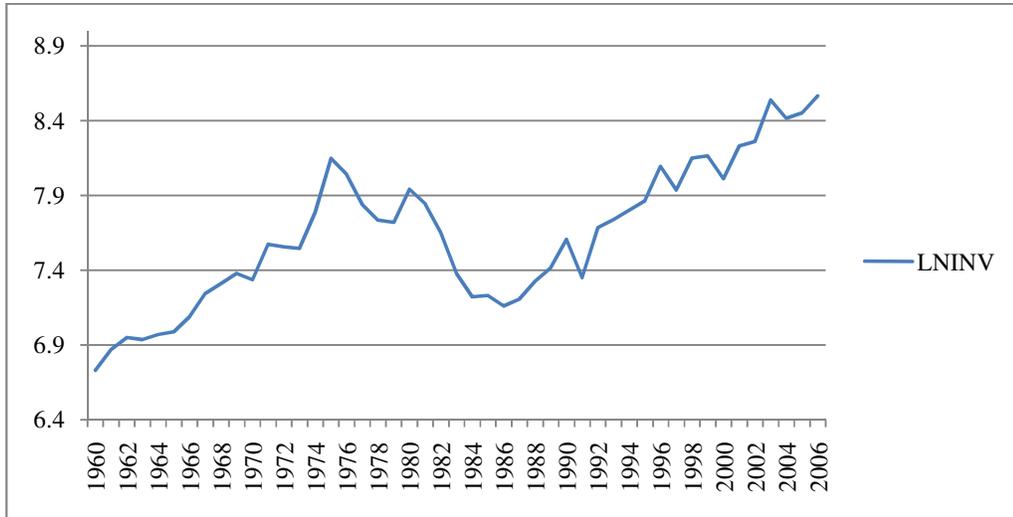
Figure 2 (ii)
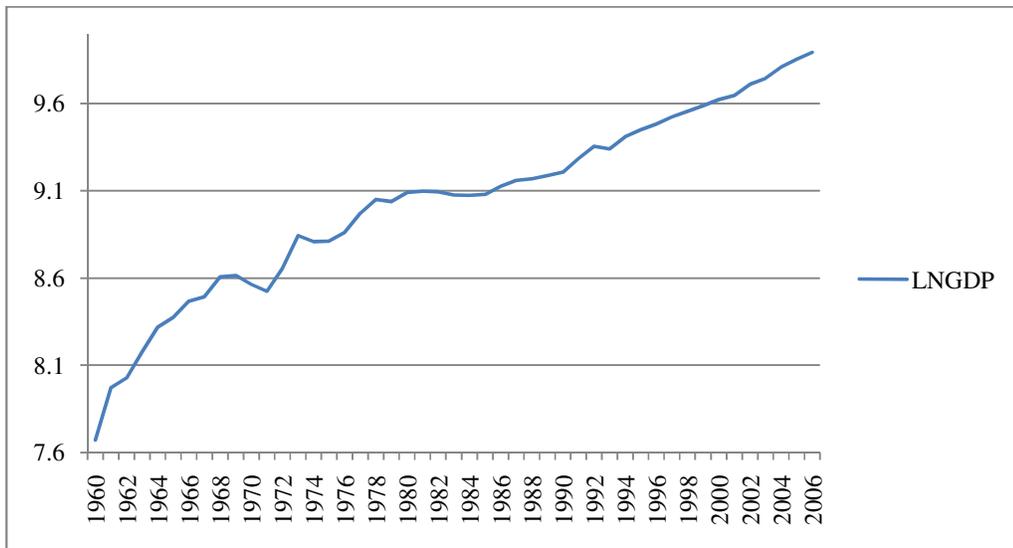
Figure 2 (iii)
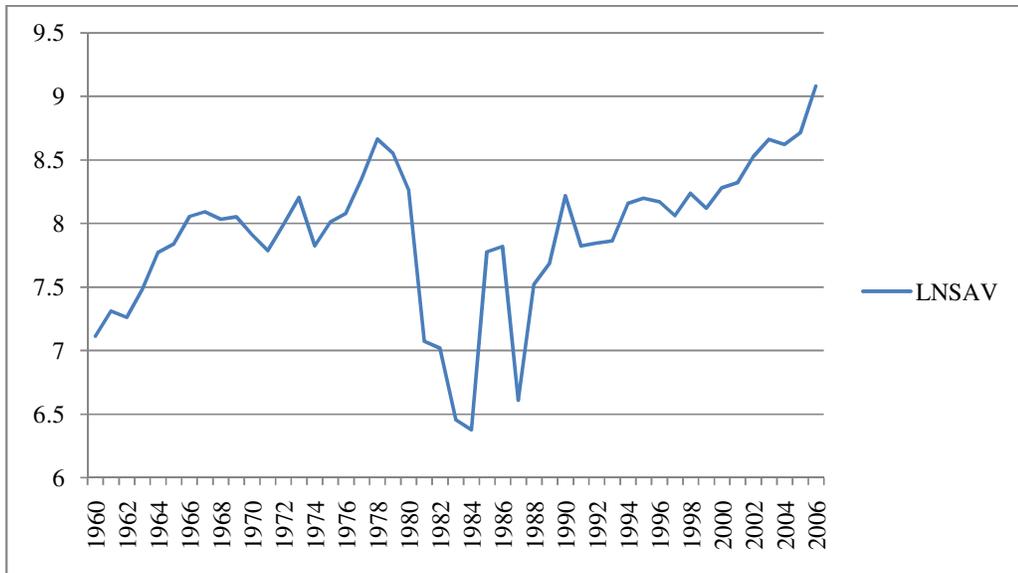
Figure 2 (iv)
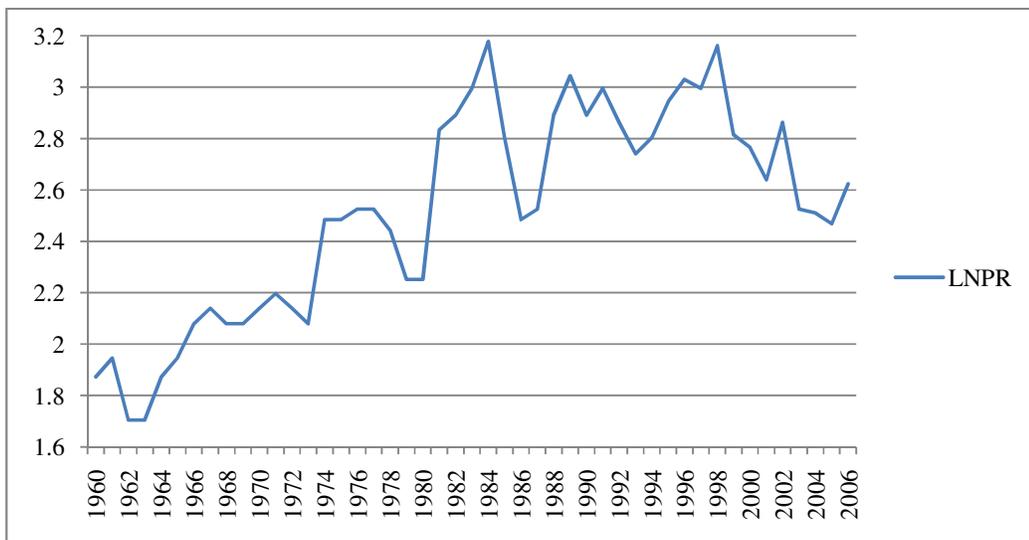
Figure 2 (vi)
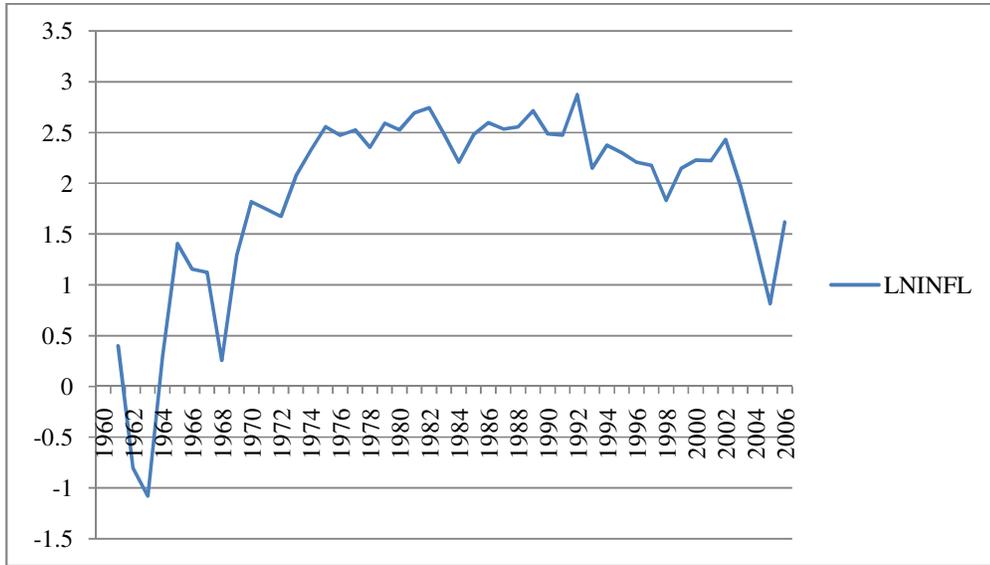
Figure 2 (vii)
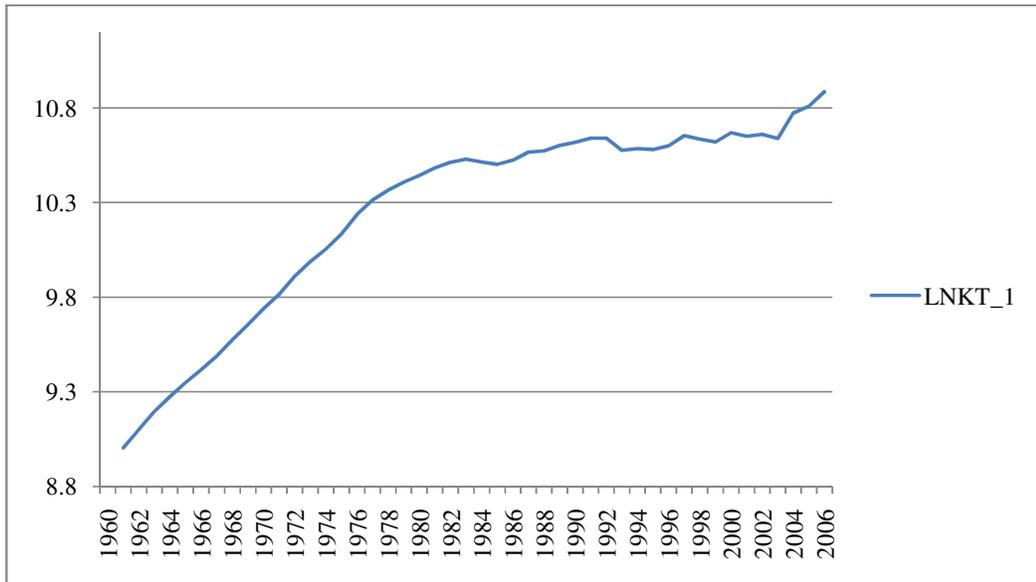
5.2.2 Unit root Tests

Gujarati (2003) states that if a time series data set is stationary, its mean, variance and covariance remain the same no matter at what point they are measured. In other words, they are time invariant. In that case, the series would tend to return to its mean and fluctuations around the mean would have broadly constant amplitude.

Testing for stationarity is done to try to avoid spurious results of the OLS estimates. For example, it is less clear whether or not interest and inflation rates have stationary distributions and this cannot easily be determined by inspection of a time series plot. If the level of the series is non-stationary but the difference of the series is stationary then the series is said to contain a "unit root", be "integrated or order 1", or be "difference stationary" (Sherris, M, Tedesco, L. and Zehnwirt, B., 1997).

The preliminary analysis from the plots in Figures 2(i)-2(vii) seems to suggest the possibility of non-stationarity in the trend series. Hence, the study employed the ADF test to verify these indications. The results of the ADF tests are as follows:

Table 3 (a): **Unit root test for DLNINV**
**Dickey-Fuller regressions include an intercept and a linear trend.**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINV(-1))	-1.043460	0.153813	-6.783966	0.0000
C	0.031022	0.049887	0.621855	0.5374
@TREND(1960)	0.000351	0.001813	0.193544	0.8475

95% critical value for the ADF statistics = -3.513%

Table 3 (b): **Unit root test for DLNGDP**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	-0.865322	0.188279	-4.595961	0.0000
D(LNGDP(-1),2)	0.061607	0.128935	0.477818	0.6354
C	0.054949	0.021684	2.534078	0.0153
@TREND(1960)	-0.000731	0.000644	-1.136294	0.2626

95% critical value for the ADF statistics = -3.516%

Table 3 (c): Unit root test for DLNSAV

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNSAV(-1))	-1.088582	0.154362	-7.052127	0.0000
C	0.003481	0.132063	0.026359	0.9791
@TREND(1960)	0.001624	0.004836	0.335770	0.7387

95% critical value for the ADF statistics = -3.513%

Table 3 (d): Unit root test for DLNPR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPR(-1))	-2.852323	0.447215	-6.377966	0.0000
D(LNPR(-1),2)	1.587020	0.370059	4.288557	0.0001
D(LNPR(-2),2)	1.202866	0.295426	4.071629	0.0003
D(LNPR(-3),2)	0.762196	0.220238	3.460782	0.0015
D(LNPR(-4),2)	0.511276	0.153564	3.329404	0.0021
C	0.231651	0.072643	3.188889	0.0031
@TREND(1960)	-0.006911	0.002452	-2.819132	0.0080

95% critical value for the ADF statistics = -3.524%

Table 3 (e): Unit root test for DLNKT_1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNKT_1(-1))	-0.695484	0.158713	-4.382023	0.0001
C	0.056842	0.018541	3.065826	0.0038
@TREND(1960)	0.001173	0.000529	-2.218032	0.0322

95% critical value for the ADF statistics = -3.516

Table 3 (f): Unit root test for DLNINFL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINFL(-1))	1.029463	0.146227	-7.040174	0.0000
C	0.297999	0.146637	2.032222	0.0486
@TREND(1960)	0.009909	0.005332	-1.858228	0.0703

95% critical value for the ADF statistics = -3.516

Table 3 (g): Unit root test for Residuals

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RESIDINV(-1))	-3.991419	0.521313	-7.656481	0.0000
D(RESIDINV(-1),2)	2.015477	0.439407	4.586811	0.0001
D(RESIDINV(-2),2)	1.305417	0.305045	4.279420	0.0002
D(RESIDINV(-3),2)	0.615937	0.145835	4.223536	0.0002
C	0.003344	0.046745	0.071534	0.9434
@TREND(1960)	0.000150	0.001580	-0.095063	0.9249

95% critical value for the ADF statistics = -3.533%

5.2.3 Cointegration Test

The approach used in the study is that before estimating the equations, relationships between the dependent variable (real investment) and explanatory variables (regressors) are explored using the ordinary least squares (OLS) technique. The test for cointegration is applied to try to identify the long-run relationships between variables.

The concept of cointegration was suggested by Engle and Granger in 1987 and they also developed tests for cointegration. The concept of cointegration captures the notion that two or more series "move together" in some fashion. Each series, if looked at individually, need not have long run equilibrium but their relative values might. The series have common stochastic trends.

5.2.4 Error Correction Model

If a number of series are co-integrated then they have common stochastic trends and move together through time following a long-run equilibrium. This long run equilibrium is disturbed by random shocks that are short term or have temporary effects. The series eventually adjusts for these. This short term adjustment process is referred to as an error correction process.

The error correction model captures both the short term departures from the long run equilibrium and the long run equilibrium in the model structure. The series that appear to be co-integrated are the interest rate series and the prime lending rate so that a multi-variate error-correction model can be estimated for these series. An investment model should incorporate such an error-correction structure. This will ensure equilibrium exists in the model between the levels of the interest rate. Otherwise if differences in interest rate are modelled as stationary variables with no error-correction structure then the levels of interest rate will have stochastic trends and "shocks" to interest rate will be permanent. In such a model, interest rate could "wander" off to arbitrarily high and low levels in a manner inconsistent with the historical data.

5.3   Estimation Results

The results of the long-run equation (15) indicate that in the long-run, real gross domestic product (GDP) and events during the sub-period 1960-1979, represented by the dummy variable (D60_79) were positive and significantly contributed to real investment. This means that an increase of 1 percent in real GDP would increase real investment by about 1.185 percent. In the same vein, events that happened over the sub-period 1960-1979 caused an increase of about 0.495 percent in real investment. The main event during this sub-period was investment by Rossing Uranium in 1975.

$$LNINV = -3.441 + 1.185LNGDP + 0.038LNSAV - 0.050LNPR - 0.005LNINFL$$
$$(-2.182) \quad (5.564) \quad\quad (0.335) \quad\quad (-0.250) \quad\quad (-0.080)$$
$$+ 0.495D60\_79 - 0.0486D80\_89 \quad\quad\quad\quad\quad\quad\quad (15)$$
$$(2.604) \quad\quad\quad (-0.353)$$

R^2 = 0.8141   Adjusted R^2 = 0.786   DW = 1.001. (The numbers in

parentheses represent the t-statistics).

The coefficient of domestic savings (LNSAV) was positive but insignificant. The positive sign indicates the potential role that saving could play as a source of domestic investment, but its insignificance could be attributed to weak institutional set up and lack of property right protection during the colonial period. Furthermore, Namibia was administered as a province of South Africa, and, therefore, the effect of domestic savings may only be traced on the South African economy. The value of lagged capital (LNKT_1) turned out with an unexpected sign but since it was statistically insignificant, it was dropped. The coefficient of the prime lending rate (LNPR) and inflation (LNINFL) rate were all negative as expected, but statistically insignificant.

Equation 16 takes into accounts the investment incentives introduced after independence, which is represented by a dummy variable (DUMMIND). The results show that real GDP (LNGDP) and domestic savings (LNSAV) are determinants of real investment. A 1-percent increase in real GDP will cause real investment to increase by approximately 0.982 percent.

LNINV = -0.397 + 0.982LNGDP + 0.249LNSAV - 0.065LNPR + 0.038LNINFL
           (-0.257)   (2.418)   (2.467)   (-0.278)   (0.460)
– 0.263LNKT_1 - 0.104DUMMIND   (16)
   (-0.671)   (-0.651)

R^2 = 0.769   Adjusted R^2 = 0.733   DW = 0.73

This result confirms the theoretical view that sustainable real GDP growth enhances the economy's ability to generate more resources that could be reinvested into productive projects. Real domestic savings (LNSAV) has a positive and

significant coefficient, meaning that saving contributed to the real investment. This is in line with the hypothesis that domestic savings have positive effects in countries that are not too close to the technological frontier, in that high savings in these countries increases the number of projects that can be co-financed by local banks with the participation of foreign investors (Aghion, Comin & Howitt, 2006).

The realationship between the prime lending rate (LNPR) and real investment is negative and statistically insignificant. The effects of incentives introduced after independence, as represented by the dummy variable (DUMMIND) appear negative and statistically insignificant. These results agrees with the findings of the report by Foreign Investment Advisory Services (2006), which concluded that investment incentives introduced after independence did not achieve the results that they were intended for. The report cited administrative bottlenecks and the lack of institutional arrangements as some of the obstacles to the success of the incentives.

The results of stationary test on residuals from equation (15) produced a t statistics of -7.656, which is significant at 1 percent. This suggests that residuals series is stationary where the null hypothesis may be rejected, hence, it allows for the specification of the error correction model (ECM). The estimation of the error correction model produced results on equation (16), the t-values are in parenthesis.

Table 4: **Estimation of Error Correction Model**
Independent variable D(LNINV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID01(-1)	-0.282292	0.095375	-2.959829	0.0056
D(LNSAV)	0.099298	0.047819	2.076533	0.0455
D(LNPR(-2))	-0.324667	0.110190	-2.946418	0.0058
D(LNGDP(-3))	0.991723	0.386206	2.567864	0.0148
D(LNKT_1(-2))	0.871560	0.568319	1.533577	0.1344
D(LNINFL(-3))	-0.019651	0.044992	-0.436769	0.6650
DUMMIND	0.084711	0.049164	1.723028	0.0940
C	-0.072960	0.045370	-1.608113	0.1171
R-squared	0.485658			
Adjusted R-squared	0.379764			
S.E. of regression	0.125757			
Durbin-Watson stat	2.024956	Prob(F-statistic)		0.001076

From the results of the ECM estimation (Table 4), the coefficient of residuals is negative and statistically significant, indicating that the equation used is well specified and justifies the reason to reject the null hypothesis of non-stationarity. This is also confirmed by the diagnostic tests below.

Table 5: Diagnostic statistics (probabilities in squared brackets)

Normality: *JB(2) = 2.400*   *[0.300]*

Serial correlation: *LM(2) = 0.036*   *[0.964]*

Heteroscedasticity: ARCH(1) = 1.569   *[0.218]*

                White(1) = 0.704   *[0.743]*

Stability: *RESET(2) = 0.309*   *[0.581]*

CHAPTER 6

6.   SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1   Summary

The study used the ordinary least squares (OLS) technique combined with the error correction model to empirically establish whether variables such as GDP, domestic savings, prime lending rate, value of the lagged capital and inflation rate are important determinants of investment in Namibia. The short-term and long-term relationships between real investment and the above mentioned explanatory variables have been examined for the period between 1960 and 2006.

This study found that the coefficients of determination of the short-term model ($R2 = 0.49$ and $R2 = 0.77$) indicate that 49 percent and 77 percent, respectively, of the variations in real investment in Namibia is explained by the explanatory variables which include real GDP, real savings, prime lending rates, lagged value of capital, inflation rate and structural breaks over the period 1960-1989, in the short-run and long-run. The analysis produced almost all the expected coefficient signs of all the variables in the empirical model. For example, the results show that real GDP and real savings have positive effects on real investment in the short run, while the lagged prime lending rate, lagged value of capital, dummy variables representing post-independence investment incentives and inflation rate have negative effects.

6.2   Conclusion

As mentioned above, the results of the short-term estimation confirm that three variables namely; real GDP, real domestic savings and post-independence

investment incentives are positively related to real investment and have been significant determinants of real investment in Namibia. In the long-run, real savings and GDP are the only variables that significantly determine real investment. This in essence means that increases in real GDP over time leads to significant increases in real investment, while savings serve as a source of investment funds.

The results show also that Namibia sustained excess savings over investment and, as expected, saving data produced a positive coefficient, suggesting that domestic savings have a positive effect on real investment in the long-run.

Analysis of structural breaks that were represented by two dummy variables (namely D60_79 and D80_89) for the period between 1960 and 1979 shows that events which happened during 1960-1979 had positively and significantly influenced real investment, while those of the period 1980-1989 where insignificant.

Over the post independence period (1990-2006), Namibia experienced high levels of the prime lending rate ranging between the lowest of 11.8 percent in 2005 and the highest of 23.6 percent in 1998. The results show a negative and significant relationship between the interest rate and real investment.

6.3   Policy Recommendations

The results of the study have revealed the importance of sustainable growth in GDP as an important determinant of real investment in Namibia both in the short-run and long-run. Namibia maintained macroeconomic and political stability since independence and this created investors' confidence in the country, and the prospects of economic growth remain reasonable despite the current global financial crisis. This suggests that the country has the potential to further increase and maintain high

levels of investment in the future. This would, however, be enhanced with appropriate policy measures that promote sustainable GDP growth. The country should maintain the current sound fiscal and monetary policies.

The results produced positive and significant relationship between domestic saving and real investment. This suggests that domestic savings has potential to drive the growth in real investment in Namibia and this requires Government to formulate policy measures to divert much of Namibia's savings into domestic investment projects. Government therefore, needs to formulate a policy that supports joint ventures between local investors and foreign investors who can combine locally sourced finance and foreign direct investment.

The current business environment in Namibia seems to be conducive and does not discriminate between local and foreign investors, and incentive package offered by Government to attract foreign direct investment to Namibia is one of the best in Africa. However, Government needs to review the current administration of investment regime with the view to making it simpler and more transparent. There is a need to introduce policy packages to encourage investment in technology sector, while development of specialized skills should be a high priority. Because investment in education and training is crucial in developing new industries, the current Government education programme, "Education and Training Sector Investment Programme (ETSIP)", should be adequately financed and its programmes should focus on entrepreneurial and technological skills development.

To enhance the investors' confidence in the Namibian economy, Government needs to maintain quality of governance, taking into account issues of property rights, the unpredictability of bureaucratic requirements and corruption. Government

and its institutions need to formulate and maintain predictable economic policies and political responses as these are considered a prerequisite for FDI inflows. Further research that incorporates quantitative variables mentioned on the limitation of this study is recommended.

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APPENDIX

Appendix 1: Data set

Period	INV	PR	GDP	SAV	kt_1	D60_79	D80_89	CPI	Infl
1960	836.2	6.5	2,146.1	1,230		1	0	5.0	
1961	959.3	7.0	2,895.5	1,499	8,126.8	1	0	5.1	1.49
1962	1,042.9	5.5	3,060.2	1,426	8,947.9	1	0	5.1	0.45
1963	1,027.7	5.5	3,552.1	1,781	9,855.3	1	0	5.1	0.34
1964	1,064.0	6.5	4,098.6	2,378	10,667.0	1	0	5.2	1.34
1965	1,083.2	7.0	4,334.7	2,547	11,475.7	1	0	5.4	4.08
1966	1,198.3	8.0	4,755.6	3,155	12,285.0	1	0	5.6	3.18
1967	1,398.5	8.5	4,872.0	3,271	13,196.0	1	0	5.8	3.08
1968	1,493.6	8.0	5,459.0	3,083	14,372.4	1	0	5.8	1.29
1969	1,599.9	8.0	5,507.0	3,147	15,622.2	1	0	6.1	3.64
1970	1,535.0	8.5	5,236.9	2,737	16,977.2	1	0	6.4	6.17
1971	1,946.7	9.0	5,034.6	2,411	18,305.7	1	0	6.8	5.72
1972	1,909.8	8.5	5,744.7	2,957	20,141.1	1	0	7.2	5.33
1973	1,890.9	8.0	6,918.8	3,660	21,773.8	1	0	7.7	7.95
1974	2,406.1	12.0	6,690.6	2,505	23,253.9	1	0	8.5	10.19
1975	3,453.8	12.0	6,712.9	3,022	25,147.4	1	0	9.6	12.89
1976	3,107.9	12.5	7,058.3	3,234	27,924.9	1	0	10.7	11.84
1977	2,535.6	12.5	7,877.5	4,254	30,126.7	1	0	12.1	12.51
1978	2,284.7	11.5	8,518.4	5,797	31,756.6	1	0	13.4	10.55
1979	2,251.3	9.5	8,416.0	5,184	33,056.3	1	0	15.1	13.32
1980	2,813.0	9.5	8,858.0	3,868	34,280.3	0	1	17.0	12.48
1981	2,552.0	17.0	8,944.0	1,182	35,693.4	0	1	19.5	14.80
1982	2,104.0	18.0	8,909.0	1,120	36,755.3	0	1	22.6	15.54
1983	1,595.0	20.0	8,746.0	638	37,421.9	0	1	25.3	11.97
1984	1,368.0	24.0	8,725.0	589	36,852.9	0	1	27.6	9.10
1985	1,378.0	16.5	8,766.0	2,390	36,344.2	0	1	30.9	11.96
1986	1,286.0	12.0	9,184.0	2,492	37,187.1	0	1	35.0	13.40
1987	1,347.0	12.5	9,510.0	743	38,822.4	0	1	39.4	12.59
1988	1,519.0	18.0	9,587.0	1,846	39,028.9	0	1	44.5	12.87
1989	1,663.0	21.0	9,766.0	2,179	40,153.2	0	1	51.2	15.11
1990	2,008.0	18.0	9,965.0	3,716	40,907.5	0	0	57.4	12.03
1991	1,554.0	20.0	10,779.0	2,502	41,790.6	0	0	64.2	11.90
1992	2,171.0	17.5	11,554.0	2,559	41,795.5	0	0	75.6	17.69
1993	2,291.0	15.5	11,372.0	2,604	39,198.3	0	0	82.1	8.58
1994	2,447.0	16.5	12,204.0	3,495	39,573.9	0	0	90.9	10.77
1995	2,599.0	19.0	12,706.0	3,641	39,344.6	0	0	100.0	9.97
1996	3,272.0	20.7	13,112.0	3,545	40,086.0	0	0	109.1	9.10
1997	2,796.7	20.0	13,665.0	3,172	42,355.0	0	0	118.7	8.80
1998	3,460.8	23.6	14,115.0	3,787	41,614.9	0	0	126.1	6.23
1999	3,512.1	16.7	14,591.0	3,368	40,950.2	0	0	136.9	8.56
2000	3,019.2	15.9	15,100.0	3,947	43,028.4	0	0	149.6	9.28
2001	3,753.2	14.0	15,462.0	4,108	42,213.9	0	0	163.4	9.22
2002	3,865.3	17.5	16,494.0	5,042	42,663.0	0	0	182.0	11.38
2003	5,109.4	12.5	17,069.0	5,779	41,754.6	0	0	195.1	7.20
2004	4,522.6	12.3	18,201.0	5,551	47,740.4	0	0	203.2	4.15
2005	4,680.9	11.8	19,051.0	6,083	49,472.9	0	0	207.8	2.26
2006	5,251.5	13.8	19,802.0	8,790	53,396.1	0	0	218.3	5.05