A Comparative analysis of the determinants and behavior of investment demand between South Africa and Zimbabwe

By

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Dedication

To my late parents, Mr. and Mrs. S. Malumisa

Abstract

The study investigates the determinants of private investment in South Africa and Zimbabwe employing annual data over the period 1980-2006. The focus is on Gross Domestic Product (GDP), Government Debt, Inflation, and interest rate policies. The data is subjected to stationarity and cointegration tests, applied Vector Autoregressive and error correction models to estimate long- and short-run coefficients. The results suggest that GDP for both countries has a positive effect on private investment over the period of study. Government debt has a crowding out effect on private investment for Zimbabwe, for South Africa the effect is insignificant. Inflation for both countries negatively affects private investment. An interesting result supporting data for developing countries is the positive relationship between interest rates and private investment for both countries. Though the result had been expected for Zimbabwe, whose financial market system is repressed, for RSA it was an empirical issue as some years where interest rates were controlled, affected the econometric results. Current increases in interest rates for RSA discourage private investment.

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List of Acronyms

ARCH-Autoregresssive Conditional Heteroskedasticity

ASGISA-Accelerated and Shared Growth Initiative South Africa

BOP-Balance of Paymnet

CAPM-Capital Asset Pricing Model

CPI-Consumer Price Index

CSO-Central Statistical Office

CZI-Confederation of Zimbabwe Industries

DTI-Department of Trade and Industry

ECM-Error Correction Model

ESAP-Economic Structural Adjustment Program

EPZ-Export Processing Zone

FDI-Foreign Direct Investment

GDI-Gross Domestic Investment

GDP-Gross Domestic Product

GDPG-Gross Domestic Product Growth

GDS-Gross Domestic Savings

GEAR-Growth, Employment and Redistribution Strategy.

GFCF-Gross Fixed Capital Formation

GNS-Gross National Savings

GOZ-Government of Zimbabwe

IFC-International Finance Corporation

IMF-International Monetary Fund

JSE-Johannesburg Stock Exchange

MERP-Millennium Economic Recovery Program

MEI-Marginal Efficiency of Investment

MOFED-Ministry of Finance and Economic Development

NEDPP-National Economic Development Priority Program

NERP-National Economic Revival Program

RESET-Ramsey regression Equation Specification Error Test

RBZ-Reserve Bank of Zimbabwe

RSA-Republic of South Africa

SAEPs-Structural and Economic Reform Programs

SARB-South African Reserve Bank

SSA-Sub-Saharan Africa

TIPS-Trade, Industry and Policy Secretariat

UDI-Unilateral Declaration of Independence

UNDP-United Nations Development Program

US-United States

VAR-Vector Autoregressive

WB-World Bank

ZIC-Zimbabwe Investment Centre

ZIMPREST-Zimbabwe Program for Economic and Social Transformation

ZSE-Zimbabwe Stock Exchandge

CHAPTER ONE

Introduction

1.1 Background

In every economy, the development and growth of the private sector is essential since the private sector sets the pace for economic growth. More so for developing countries, the importance of the private sector cannot be overemphasized. It is in this regard that even some international organizations and some of the developed economies have shown interest to improve the performance of the private sector for developing countries. Amongst such we have the International Financial Corporation (IFC), which created the African Enterprise Fund and the United States (US) via its Overseas Private Investment Corporation, set up the African Growth Fund. As such, attainment of optimal investment levels result with the creation of jobs, better living standards, and ultimately improved national output for the beneficiary countries.

South Africa (RSA) and Zimbabwe still face some challenges in addressing factors which lead to desirable levels of investment. Thus the desire to improve the performance of the private sector has shaped the policy making process in developing countries. This has seen the emergence of macroeconomic adjustment policies implemented so as also to attain some economic targets, albeit some ambitious. RSA and Zimbabwe have also implemented some economic reform policies like many other developing.

At the heart of such policies has been the thrust to increase the important role of the private sector. The study reveals that investment in the private sector has not perfomed well. RSA and Zimbabwe thus still face macroeconomic challenges many years after attaining freedom and independence. Investment can mitigate much of the bulk of the challenges faced by these nations as it can redress most of the economic problems faced. These countries are not only trading partners but both have relatively developed and diversified economies in the region.

RSA is Zimbabwe's most important trading partner accounting to more than 20% of the total trade. During the last decade, RSA went through a period of economic and social turbulence. After years of struggle the first democratic elections in 1994 marked the end of the apartheid system. In the same year, GDP growth per capita became positive again after almost eight years of economic crisis. The economy's growth rate then averaged 2.7% in the period 1994-2000 (Carlitz, 2002:248-258). The current government faces the difficult task of formulating an industrial policy aimed at putting the economy on a new path of economic growth and development (Streak 2004). Investment rates in RSA's physical capital have shown a downward trend for a considerable period of time. Average investment stood at 22% in the 1980s and the dropped to 16% in the 1990s. The centrality of investment in physical capital stock as a determinant of economic growth makes such sub-optimal rates a cause for concern.

Most notably, the deteriorating economic performance and the discontent with the inherited economic system called for economic reforms. Initially, the reforms were targeted at macroeconomic stabilizations. To further create and attract an investment climate, the government introduced and implemented amongst others the Growth, Employment and Redistribution strategy (GEAR) and the Accelerated and Shared Growth initiative South Africa (ASGISA). In the period 1995-2000 amongst notable reforms, was the domestic financial liberalization where measures were put in place to continue liberalizing the financial market. As part of other challenges emanating from suboptimal investment has been the unemployment rates which are considerably high at around 26% (IMF, 2007). The country's ability to address these problems and challenges is closely linked to the attainment of high investment levels.

In Zimbabwe, the challenges facing the economy also emanate from investment and have dealt a blow to what had been previously referred to as the bread basket of Southern Africa. With the inflation level topping the charts at 3714% in April 2007 (CSO,2007), very low investment levels and negative GDP growth, a lot needs to be done to restore confidence in the investment turf. To worsen the situation, there is scarcity in foreign currency, negative real interest rates, legal uncertainty citing as an example the alleged

abuse of human rights, and the slump in production in industry and agriculture. Such phenomena inevitably reveal that the economy is facing macroeconomic problems. There is also state control of the economy through expansion of price controls, maintenance of an unrealistic foreign exchange rate, and continued unsustainable deficit spending

The country's credit and investment rates started falling as early as the 1970s and continued to fall from over 30% and 20% respectively in the late 1970s to below 25% and 15% in the mid 1980s. Since independence in 1980, public sector investment, of both central government and the public enterprises, grew in real terms, although, as a proportion of GDP, it remained constant at about 8%. At the same time, balance of payment pressures, surge in government consumption expenditure set the ground for inflation (Oshikoya, 1994:573-596). Private sector fixed capital formation fluctuated in real terms, but fell consistently as a proportion of GDP, from 11% during 1969-79 to 10% during 1980-84 to 8% in 1985-87.

In the years 1982 to 1985, Zimbabwe's fixed investment by the public sector exceeded that of the private sector. The ability of the public sector to finance its expenditure, recurrent spending as well as fixed capital formation later declined. At one time investment did contribute to efficiency gains in the major sectors, and ultimately growth, when channelled towards improvement and enhancement of productive and technological capacities. This was most evident in the manufacturing and mining sectors, where substantial investments were made in new capital intensive techniques after trade and investment liberalization measures were introduced by the government in the early 90s. At that time, the investment rate in the economy had attained levels regarded as commensurate with rapid economic growth, averaging around 22-23% of GDP (Jenkins, 1998:34-61).

Following reforms to the pre-existing control regimes, such as the introduction of new export incentives, based on newly recalculated statistics, the economy grew rapidly by 4% a year from 1986-1990. Perhaps as one of the good outcomes as a result of Economic Structural Adjustment Programs (ESAP) with regard to investment was the phenomenal

increase in investment most notably in 1993 at around 25% level of GDP. Internal and external advocates for adjustment had argued that high government deficits, an overvalued currency, and restrictive access to industrial inputs could only be relieved through ESAP.

However, orthodox analysis concludes that ESAP failed where it counted most: it did not lead to a substantial and sustained increase in investment. Though the drafting of ESAP may have owed more to the World Bank and International Monetary Fund (IMF), the same government failed to cut adequately and restrain on public expenditure, thereby crowding out private investment and generating inflation. Even after adopting numerous economic recovery programs over the past few years, investment still remains low. Investment as a percentage of GDP fell from 16% in 1999 to 13% in 2006.

1.2 The Statement of the problem

In view of the acutely low and or fluctuating investment levels in these countries, it triggers the need to carry out a study on the determinants of investment. As stated earlier, the trend for both countries has been low levels of investment. Citing as examples, Zimbabwe's dismal 12.7% investment level as a percentage of GDP in 2006 which just falls short of the level required to replace depreciated capital (World Bank, 1990) and even RSA's 17.5 % in 2006 are considerably low for countries intending to induce high GDP growth. There is therefore a need to understand the determinants of investment so that viable policies can be formulated. The study seeks to address the problem of low investment by identifying key factors determining investment, which plays a pivotal role in economic growth.

1.3. Significance of the problem

Low levels and fluctuations in investment have considerable effect on economic activity and long term economic growth. Furthermore, a thriving private sector is essential to long-run development and reduction of poverty in less developed economies. This then necessitates the need to find out factors determining investment behaviour in the two

countries. The study comes at the right time as it will contribute to the realization in the academic and non-academic arena from analyzing and interpreting the model, as to which factors must be pushed for in order to attain huge levels of private investment. This is necessary if an economy is to achieve high growth rates. Further than that, these countries are major trading partners, but at different ends of economic health. This necessitates a comparative analysis of factors contributing to their difference, as a way of trying to formulate policies which can reinforce trade.

The factors contributing to their difference in this case will be realised through factors determining investment, an essential component of aggregate demand and key player in economic growth. Even for the economic turnaround programs to be viable, they have to lean on investment and eventually address the macroeconomic problems at hand. The study will also seek to provide an empirical investigation of how macroeconomic policies affected the behaviour of investment over the period 1980-2006[1] for both countries. The study also finds out the contribution of economic reform programs adopted towards enhancing investment for both countries.

1.4. Objectives of the study

The main objective of the research is to come up with an analysis of factors determining the behaviour of investment for the two countries under study over the period 1980-2006. As an extension, it is also intended to evaluate the effects of economic reform programs on investment behaviour in the two countries. The specific objectives for the study are:

- To find out the roles played by economic factors (such as interest rates, domestic capacity, government debt, inflation) in determining investment behaviour for both countries.
- To determine the possible effects of policy reforms on investment behaviour as observed in economic reform programs on the behaviour of investment.
- To find out the effect of uncertainty and political instability on private investment.
- To derive a possible policy recommendation for enhancing investment in the two countries.

[1]Justification for the data characteristics are presented in chapter four, methodology.

1.5. Hypotheses of the study

1.5.1. Domestic capacity positively affects investment where as factors such as interest rates, inflation and domestic debt negatively influences investment behaviour in the two countries.

1.5.2. Structural Reform Programs have had a positive effect on investment levels in both countries.

1.5.3. Macroeconomic and political instability have negatively affected investment in Zimbabwe.

1.6 Layout of the Study

The rest of the study is organized as follows; Chapter 2 focuses on macroeconomic development with regards to determinants and behaviour of private investment in both countries. Literature, both theoretical and empirical is reviewed in chapter 3. Chapter 4 presents the methodology employed and chapter 5 results obtained, analysis and their interpretation. Finally, chapter 6 is the conclusion and recommendations deduced from results.

CHAPTER TWO

Macroeconomic developments in South Africa and Zimbabwe

2.1: Introduction

The chapter presents the macroeconomic developments in the two economies with regards to the structure of each economy and trends in investment to date. Also included are the fiscal and monetary policies in the same period. Furthermore, structural reform programs are incorporated in the chapter. An evaluation of structural reform programs is given to elucidate on their contribution on the behaviour of investment for both economies. As other investment enhancement measures, investment policies and treaties for both countries are presented.

2.2: Trends in Savings and Investment: South Africa and Zimbabwe

South Africa, with a Gross Domestic Product (GDP) of US$255.16 billion in 2006 (IMF, 2007) is one of the richest countries in Africa. However, over the years, as one of the biggest challenges facing this Sub-Saharan African economy has been the composition of investment necessary to induce high growth. The country has to date adopted a number of structural and economic reform programs (SAEPs) necessary to induce investment. The benchmark with SAEPs for this study period is the Growth, Employment and Redistribution (GEAR) framework[2]. The purpose of economic growth under GEAR took form of a demand stimulus which was led by an expansion in private sector investment. Other measures and strides in reform have been phenomenal in fiscal reviews, budget statements, monetary policy review and other economic reviews.

Low levels of investment in the country have been identified time and again as the culprits behind low economic growth rates. From the 1970s investment declined in South Africa. Investment as represented by gross fixed capital formation (GFCF) averaged 26.4% of GDP in the 70s. It then dropped to 22% in the 1980s and dropped further to 16% of GDP in the 90s. As for the twenty-first century, private investment has depicted

[2] GEAR was introduced in 1996

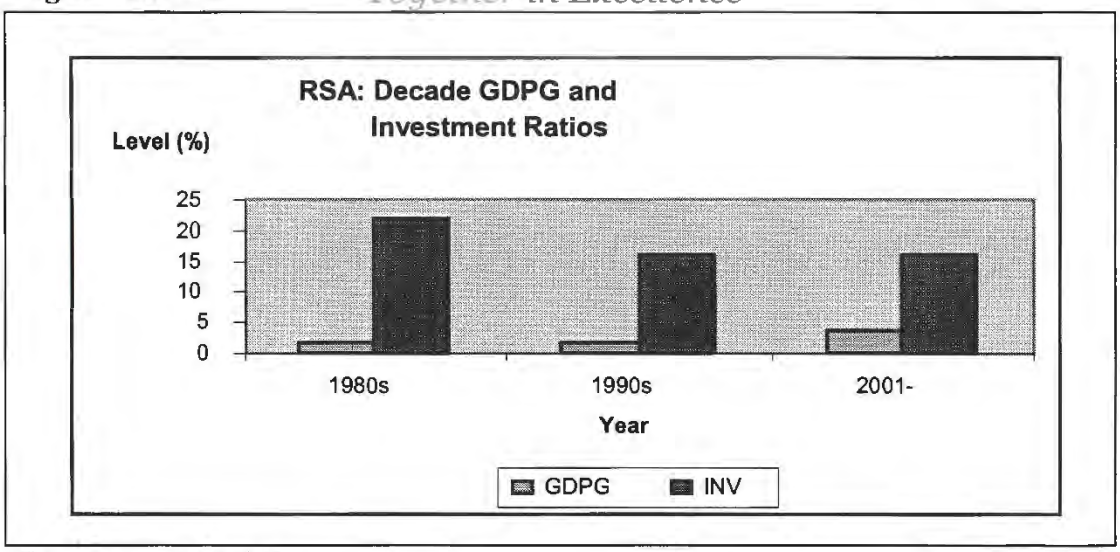
recovery. Deducing from Table 2.2.1 below, we realize that average private investment in the 1980s is higher than the average levels for the 90s and higher than that for the 2001-2006 period. However, an average investment to GDP ratio of 22% was associated with decade growth of only 1.6% in the 1980s. For the 1990s, the 16% investment level triggered growth of 1.8%. As for the twenty-first century , the current average investment level of 16.1% is associated with the average GDP growth of 3.7%.Thus the period 2001-2006 has depicted recovery in the GDP growth due to the attainment of improved levels of investment. Figures 2.1a and 2.1b gives a pictorial view of the effect of decade growth in investment on GDP growth in RSA and Zimbabwe.

Table 2.2.1 Growth and investment in RSA and Zimbabwe

	South Africa			Zimbabwe		
Factor	1981-90	1991-00	2001-06	1981-90	1991-00	2001-06
GDP growth	1.6%	1.8%	3.7%	4.48%	1.15%	-5.03%
GFCF/GDP	22%	16%	16.1%	20%	19%	10.8%

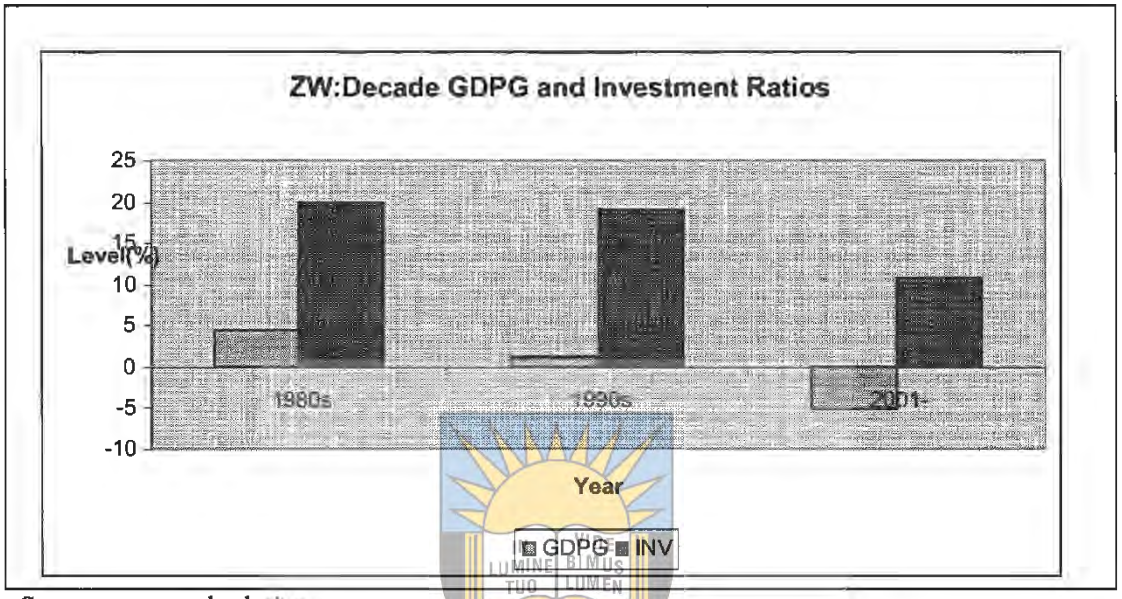
Source: DTI (2007); Earth Trends (2007).

Figure 2.2.1a:



Source: own calculations

Figure 2.2.1b:



Source: own calculations

For the growth in capital stock in RSA, the only phenomenal element is the emergence in the 1990s of the manufacturing sector, as a leader in investment rates in a number of its sub sectors. Factors such as trade liberalization and SAEPs are the causes of changing patterns in capital stock. Also from table 2.2.1 and figures 2.2.1a and 2.2.1b above, we deduce that on average trends, Zimbabwe almost measured up to RSA. Whilst RSA's average real growth was 1.6% for the period 1981-1990, private investment of 20% in Zimbabwe induced real growth of 4.48%. However, for the period 1991-2000, Zimbabwe's growth dropped to 1.15%.The downward trend of investment levels and GDP growth has spilled over to the new millennium for Zimbabwe. Private investment in this period has averaged 11% with a corresponding negative growth in GDP at -5%. South Africa on the other hand realized has recorded GDP growth in the new millennium by far due to the adoption of SAEPs.

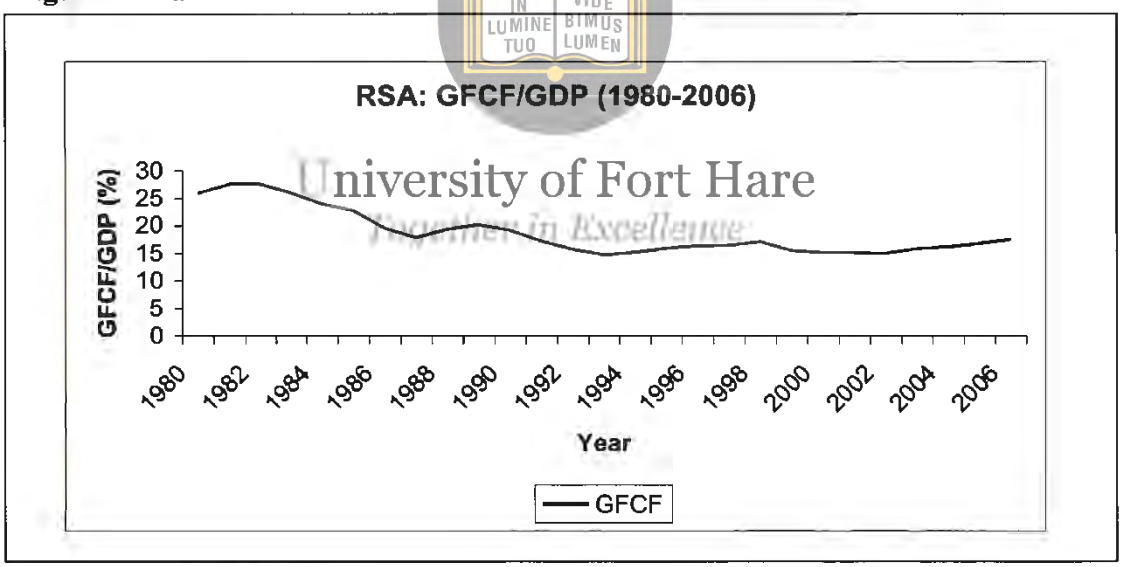
Triggering the low investment levels and GDP growth rates in Zimbabwe has been the rough economic environment. The table below presents the macroeconomic indicators for RSA in the period 1994-2000.

Table 2.2.2a: Macroeconomic indicators, South Africa 1994-2000

	1994	1995	1996	1997	1998	1999	2000
General macroeconomic indicators							
GDP growth	3.2%	3.1%	4.3%	2.6%	0.5%	2.4%	4.2%
Nominal lend. rates	15.6%	17.9%	19.5%	20%	21.8%	18%	14.5%
Exc. Rate (US$/R)	3.6	3.6	4.3	4.6	5.5	6.1	6.9
Inflation rate	8.9%	8.7%	7.4%	8.6%	6.9%	5.2%	5.3%
Budget def/ GDP	-5.6%	-4.6%	-5.1%	-5%	-3.7%	-2.8%	-2.1%
GFC/GDP	15.2%	15.4%	16.3%	16.5%	17%	15.5%	15.1%

Source: Earth Trends (2006), DTI (2006).

Figure 2.2.2a:

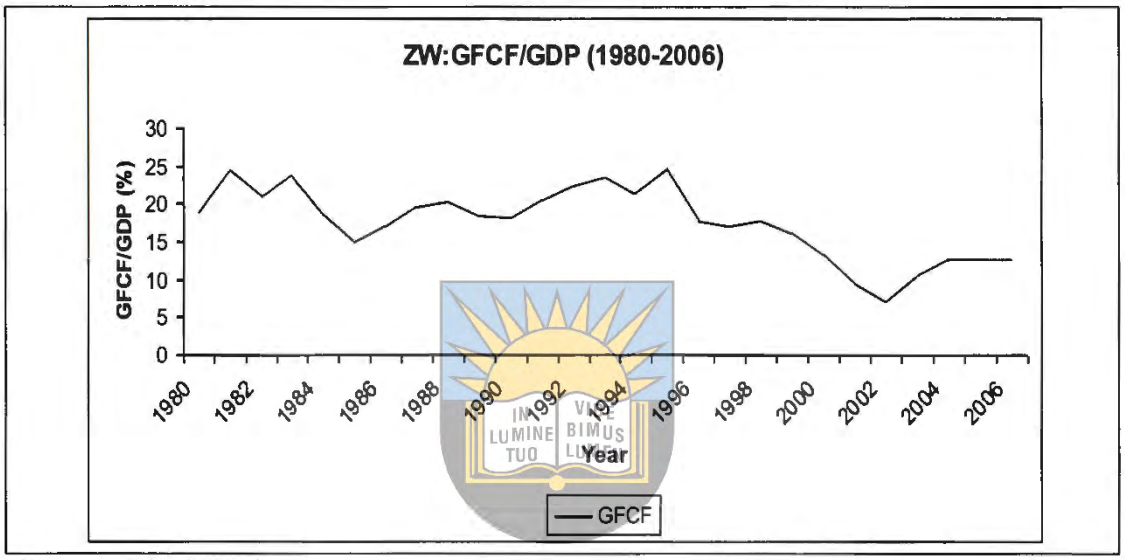


Source: own calculations

Figure 2.2.2a depicts the trend for RSA's GFCF over the years. From the diagram, we can deduce that the trend has been declining, at least until the 1990s. Notably after the adoption of SAEPs, GFCF rose. This saw GFCF picking up to and reaching the present level of 17.5% of GDP (2006). Table 2.2.2a above complements Figure 2.2.2a. The general trend is showing that RSA maintained consistent and later improvements in the ratio of GFCF to GDP. The viable lending rates, stable exchange rate, sustainable budget deficit and a declining inflation rate all played significant roles as these were essential

ingredients towards improving a nation's output. The outcome of such has been depicted as a positive economic growth over these years.

Fig 2.2.2b:



Source: CSO (2007).

By contrast, Zimbabwe's trend shows more fluctuations in the GFCF/GDP ratio. The economy, unlike neighbouring RSA, experienced declining economic growth as a result of low investment induced by unstable macroeconomic phenomena exhibited by a fast depreciating dollar, negative real interest rates, gargantuan government debt and skyrocketing inflation. From the graph we can deduce that investment was high especially in the early 80s before adoption of economic reform and even in the early to mid 90s during the phase of ESAP. Afterwards, economic growth was hindered due to low growth in investment. Since then, investment has been on a downfall even though a host of policy measures have been adopted to try and improve if not resuscitate it. Worse still, the general trend in macroeconomic indicators during the study period as shown in Table 2.2.2b below is that they were not in the right track with regards to promoting investment.

Table 2.2.2b: Macroeconomic indicators, Zimbabwe 1994-2000

	1994	1995	1996	1997	1998	1999	2000
General macroeconomic indicators							
Economic growth	9.2%	0.2%	10.4%	2.7%	2.9%	-3.6%	-7.9%
Nominal lending rates	34.9%	34.7%	34.2%	32.6%	42.1%	55.4%	68.2%
Exchange rate (US$/ZW$)	8.15	8.67	10	12.11	23.68	38.3	44.42
Inflation rate	25%	28%	16%	20%	48%	58%	56%
GFCF/GDP	21.4%	24.6%	17.7%	17%	17.7%	16.1%	13.5%

Source: Earth Trends (2006), SADC Bankers (2006), IMF (2006).

Amidst the happenings in the Zimbabwean economy, the RSA economy, though poised for growth due to relatively stable macroeconomic variables when compared with Zimbabwe, still experienced a decline in savings. This was evidenced by a drop in average savings from 23% of GDP in the period of the1980s to 16% in the 1990 (DTI: 2006). This culminated in low growth rate of fixed capital stock and ultimately low economic growth in the 1990s. Much of the decline in savings was due to falling government savings, which fell by 8-10% of GDP (from 4.5% to -4.5%) between the early 80s and early 90s.

To paint a gloomy picture, RSA attracted only a small share of the overall pool of Foreign Direct Investment (FDI) directed to emerging markets. FDI is essential as it complements the domestic investments in building up an economy's output. Furthermore, some multinational companies release funds to partner local firms in an endeavour to supplement resources for investment purposes. During 1994-2000, FDI averaged less than 1% of GDP. With limited additional foreign resources available, investment thus remained constrained to 15-16% of GDP throughout the 1990s. Such low investment levels also help explain South Africa's poor growth performance over that decade. From 1993 to 2002, total investment as a ratio of GDP increased by almost 2%.

This decline in investment has been worse in some sectors than others. For example, in the service sector investment declined by 9% between 1970 and 2002 yet for the manufacturing sector on the other hand , improvements were noted , particularly in iron and steel, non-ferrous metal, and basic chemicals (Roberts 2004:743-756). The general trend has shown that since the mid 80s, private investment depicted recovery. The same cannot be said about public investment which declined from 11.5% of GDP in 1976 to 4% in 1994 and finally at 5% in 2004 (Ndikumana, 2005).

After such disappointingly low levels of investment, government investment in RSA started to pick up late in 2000 to early 2001. This increase saw the government prioritising investment in capital, particularly infrastructural, such as roads, electricity, buildings. This was a shot in the arm for total investment as it is set to surpass its current level of 17.5% of GDP in 2006.

Turning to Zimbabwe, after the Unilateral Declaration of Independence (UDI) by the Rhodesian Front government, the economy was booming and substantially diversified despite the imposition of economic sanctions by the United Nations (Ndlela 1986). Zimbabwe's post-independence period was quite promising as viable policy measures were in place to promote investment. Amongst the most notable ones:

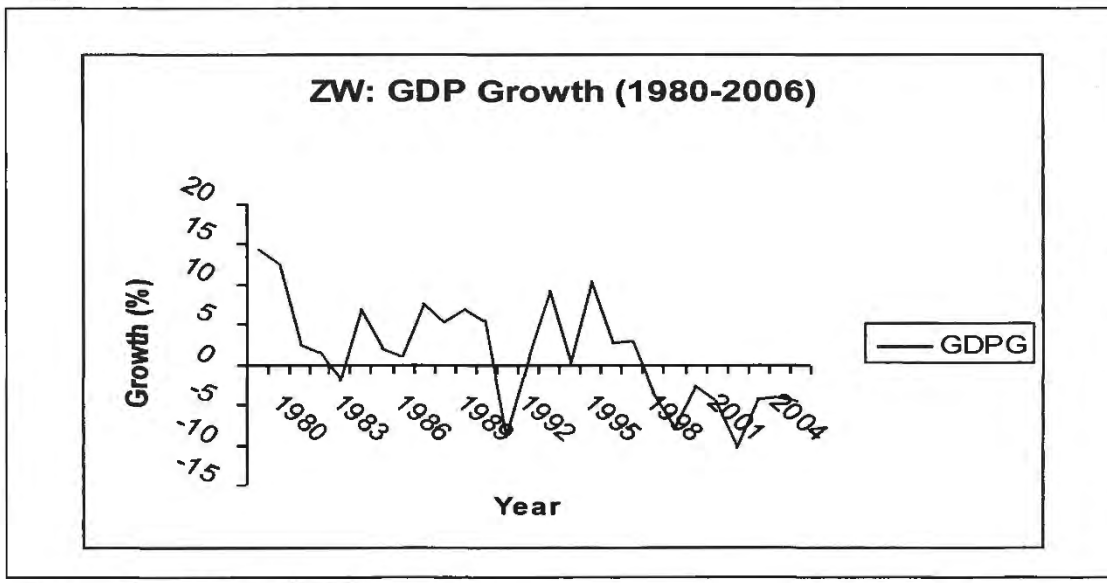
- peace was restored in the country;
- economic sanctions were lifted;
- the country was re-admitted to the international community;

Here was a model country with a well-disposed environment for players in the business fraternity. However, Zimbabwe later on enacted some laws with regard to entry in the financial sector. As a result of such considerably prohibitive policies in the country, savings performed dismally and this transmitted to serious resource shortages which resulted in low levels of investment and economic growth. In this controlled regime, big companies could, as long as they made good profits, finance their investments. This was not the case with smaller companies which were hit by credit shortages.

During the liberation war, investment had fallen sharply. Fortunately enough, a greater part of capital stock was not destroyed. According to Collier and Gunning (1995:233-241), since investment is risky during civil war, savings tend to be shifted into liquid assets, a process which is reversed once peace and confidence return. At most times, rational private agents opt for strong foreign currencies in such trying times. In the case of Zimbabwe, stringent measures were in place to access foreign currency before and even after the war had ended.

Nevertheless, GDP grew in 1980 and 1981 as a result of a commodity price boom and a bumper agricultural harvest. This was of course a major score by the agricultural sector which formed the back bone of the economy. Furthermore, the mineral boom gave a chance for resuscitating investment which had fallen during war. This saw Gross Domestic Investment (GDI) growing in 1980 and 1981. There was a surge in output, with high GDP growth rates on average of 13% per annum in 1980 and 1981. Thereafter, growth was more modest, as the economy was recovering from the 1982 drought. Economic growth thereafter averaged 3% annually (Jenkins 1997). At the same time, private sector fixed capital formation growth fluctuated in real terms, but fell as a proportion of GDP, from 11% during 1969-79 to 10% during 1980-84 to 8% in 1985-87.

Figure 2.2.3:



Source: Earth Trends (2007)

Figure 2.2.3 above shows the trend in GDP growth for Zimbabwe. As can be observed, save for the early 80s where the economy was booming due to mineral price boom and the mid 90s, the graph exhibits a downward trend. Furthermore, the years 1982, 1992 and 2002 were drought years hence the wild GDP growth fluctuations. Exacerbating low and negative GDP growth has been the very low investment rates over the study period which has been identified as the cause of such dismal performance.

In 1991, the Government of Zimbabwe (GOZ), after consultations with the International Monetary Fund (IMF) and World Bank (WB) on the measures to reverse the signs of a shrinking economy, launched an Economic Structural Adjustment Program (ESAP)[3]. Savings and investment had fallen to levels not commensurate with sustained economic growth. Thus at the heart of ESAP were desired levels of savings and investment to kick-start economic growth. The results of ESAP were mixed. Orthodox analysis concludes that even after adopting a number of economic reform programs, investment still remained low in Zimbabwe. For example, during the country's Economic and Social Transformation Programme (ZIMPREST), investment fell from 17.7% in 1996 to around 13.5% in 2000 (CSO 2000). With a phenomenal increase after the adoption of reform programs last seen in 1995, the investment level has been on a downward spiral for this Sub-Saharan African country. Gross investment as percentage of GDP fell further from 16.1% in 1999 to levels of around 12.8% in 2004.

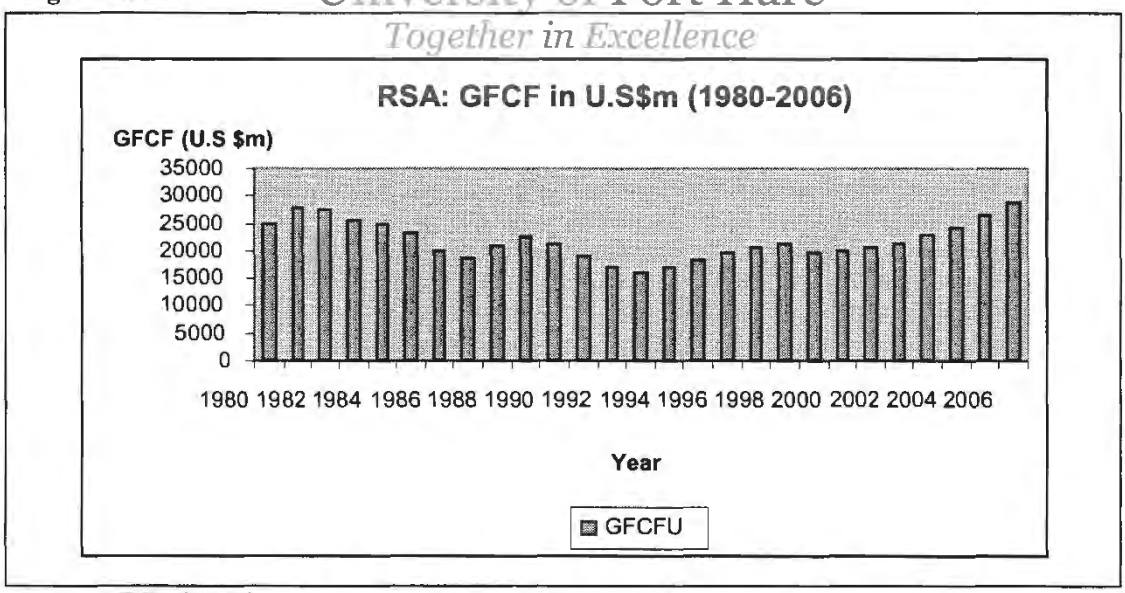
Thus as far as the trends in investment for both countries are concerned, we come to the conclusion that Zimbabwe's past and current investment rates are lower than those for South Africa. Starting from the period of the late 1970s, Zimbabwe's Gross National Savings (GNS) rate was above 18 % and then fell to below 10% in the 1980s. Credit and investment rates also fell from over 30 % and 20% respectively in the late 1970s to below 25% and 15% in the mid 80s. Compared to South Africa's steady growth rates which averaged 17% in the 80s, and currently at 17.5 %(2006), Zimbabwe's investment rate has been undoubtedly dismally low, even reaching negative growth rates.

[3] ESAP was introduced in 1991

2.3: Financial sector and monetary policy.

Financial institutions play a pivotal role in mobilizing credit and funds for purposes of investment. In RSA, the role of financial institutions changed at the infancy stages of apartheid and this positively affected their capability to mobilize capital. The financial sector moved away from over reliance on British traditional banks (for example Barclays Bank and Standard Bank). These had solely emphasized on short term credits which, at that time were not that attractive to investors for industrial expansion. This saw the emergence of other financial institutions, for an example: Sanlam, Nedbank, and Volkskas which offered longer credit terms (Jones 1992:1-19, Verhoef 1992a, Verhoef 1992b:115-153). Beginning in the mid 60s, direct interventions mirrored in credit controls and interest rate caps were introduced (De Kock 1978). This affected the smooth flow of savings for investment purposes. Come the early 80s, there was a speculative bubble in the international price of gold. However this did not serve well with investment as it declined. The figure below illustrates this:

Figure 2.3.1a:

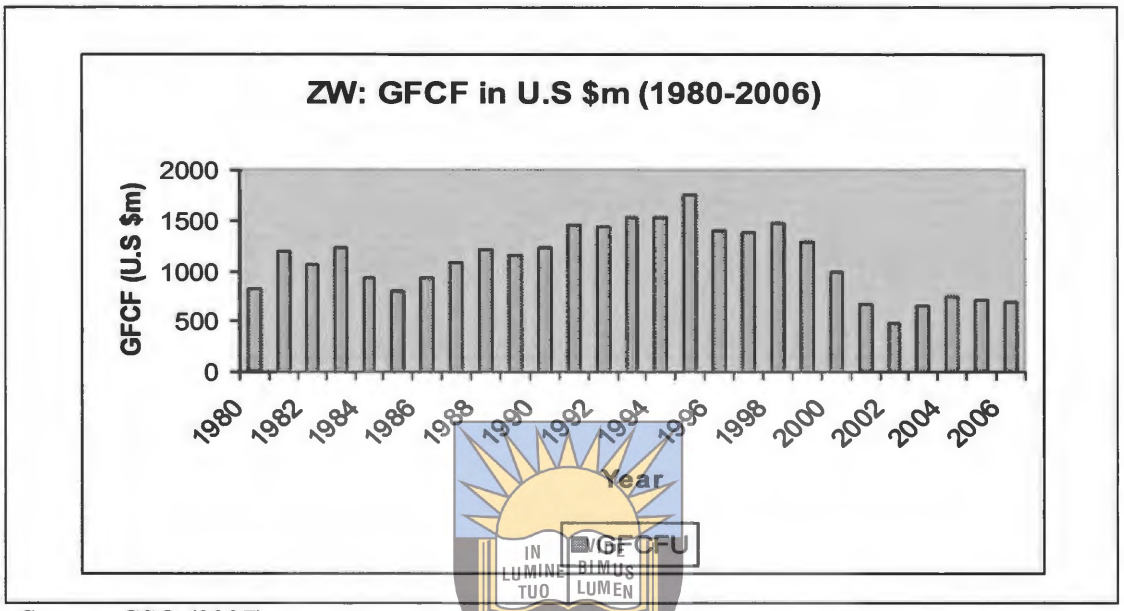


Source: DTI (2007).

From the graph we deduce that over the years the RSA GFCF has been declining.

The diagram below confirms the fluctuating investment trend in Zimbabwe.

Figure 2.3.1b:



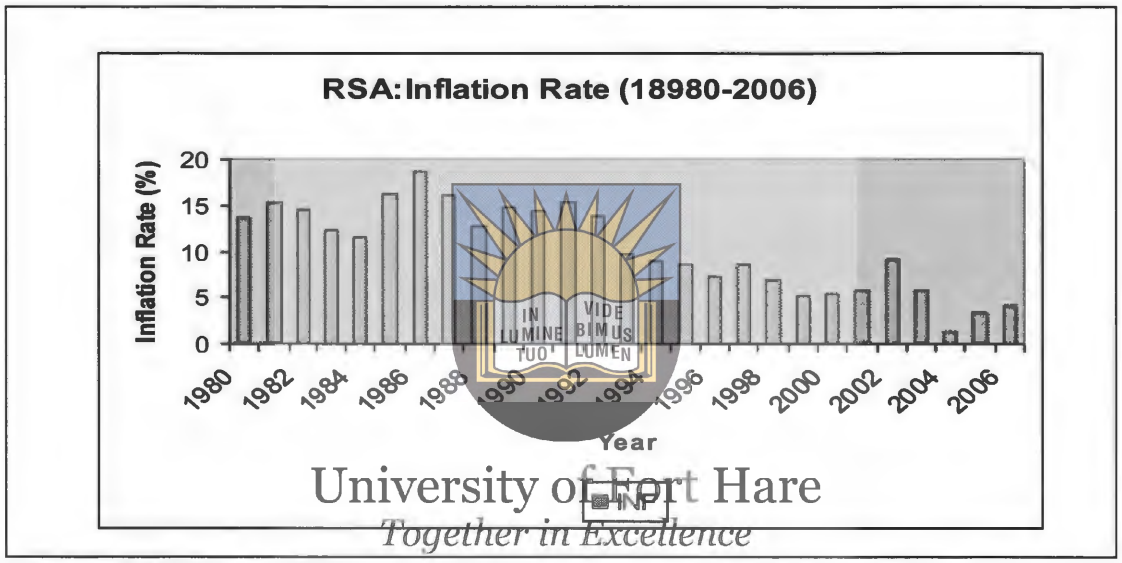
Source: CSO (2007).

Though RSA did experience variability in GFCF, modest improvements occurred, particularly in the 90s during the course and after implementation of economic reform programs. This is in contrast with the Zimbabwe's GFCF which has continued on a downward trend for a longer period of time. Subsidies on investment, an expansionary monetary policy, and an overvalued exchange rate are some of the factors that lowered the costs of capital accumulation and provided the needed access to relatively cheap credit in RSA. This then led to a growth in GFCF. In some sectors (for example transport, energy and communication), the apartheid state was directly involved in establishing and developing key enterprises.

RSA's low real interest rates in the 1980s directed capital to less productive parastatals thus away from the more productive private sector. Following recommendations made by the De Kock commission in 1985, the reserve bank shifted its policy in favour of the cost of reserves based. Before then, the policy in use had been the ratio of liquid assets to deposits as the main tool for monetary policy in controlling money supply and for credit creation. Thus the monetary policy in RSA took on a fundamental change when GEAR completed liberalising the economy by use of a tighter monetary policy and market

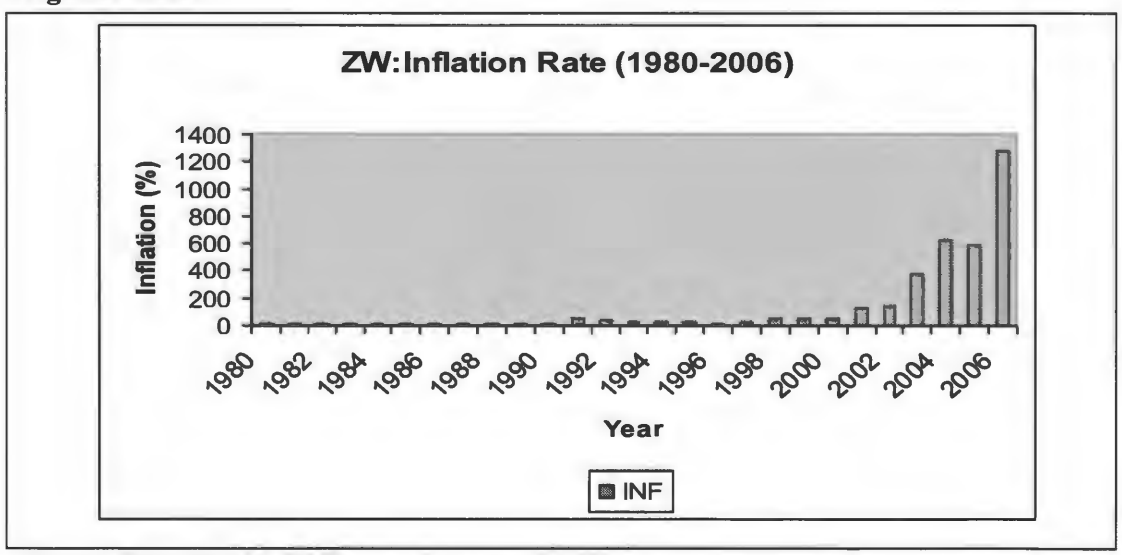
determined interest rates replacing the former policies of credit controls, monetary expansion and interest rate caps (Heintz, 2002). In February 2000, the government adopted use of inflation targeting as a principal objective of the monetary policy. The diagram below shows the inflation rate in South Africa for the period 1980-2006.

Figure 2.3.2a:



Source: SARB Data (2007)

Figure 2.3.2b:



Source: CSO (2000), RBZ Annual reports (2007)

The RSA economy, unlike neighbouring Zimbabwe, has managed to contain inflation, especially after implementing a strategy of inflation targeting by the monetary authorities in 2000, as shown in fig.2.3.2 above. Inflation as a negative factor which affects investment, by containing it, the regime triggered positive expectations from investment. Before then inflation was considerably high, even reaching levels of around 17% in the mid 80s. Low inflation targeting however caused interest rates to be kept high as a way of taming domestic demand. Real interest rates as a result shot up, firms and industry now faced high costs of credit and their desire to accumulate capital faced setbacks. This is explained by a drop in investment especially in the years 1999 and 2000. Thus the South African Reserve Bank's (SARB) monetary policy stance to reduce aggregate demand, constrained investment and output. This tight monetary policy accompanied by high interest rates and the strong currency also hurt exports, thus distorting international competitiveness. Inflation targeting in a way therefore reduced investment, employment and ultimately production capacity.

As for Zimbabwe, the current high inflationary environment shown in Fig 2.3.2b above also came as a result of the 1997 unbudgeted for compensation to war veterans, interventions in the Democratic Republic of Congo, significant increase in civil service wages in the run up to the parliamentary elections in June 2000, gargantuan domestic debt and gross indiscipline in government expenditure. To exacerbate the situation, the country's central bank printed in 2006 ZWD 20.5 trillion in order to buy foreign currency to service IMF arrears. As a result of this money supply growth skyrocketing inflation has been inevitable, reaching 1281% by December 2006.

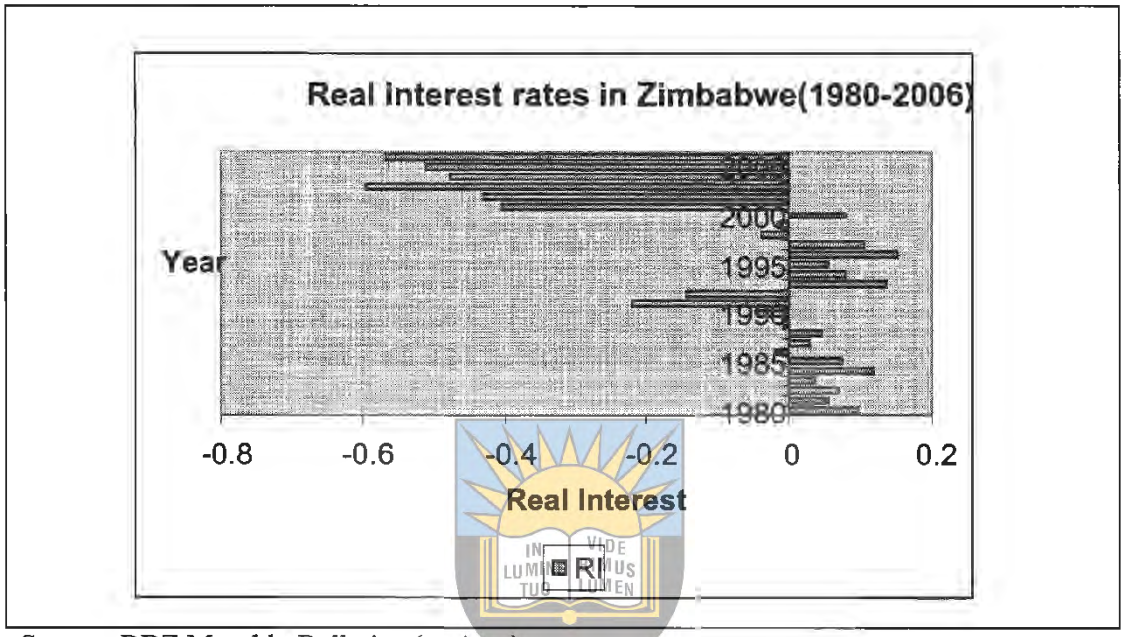
High inflationary pressures have also been exacerbated by supply bottlenecks, foreign currency shortages which forced most raw material importing firms to source foreign currency from the black market. This fuelled cost push inflation. Speculative activities and even inflationary expectations have been other ingredients added in the inflation cake. The high inflation has wearied down savings and investment, distorted resource allocation, and even negatively affected the country's international competetitive position.

On the exchange rate, the rand was pegged in 1978 to the dollar or alternatively the pound (Ndikumana 2005). Political instability did affect the exchange rate in South Africa. Perhaps the most noteworthy political events which had huge effects on the exchange rate were the 1960 Sharpeville massacre, the 1976 Soweto riots and the political instability in mid 1984. These were followed by substantial capital account deficits due to capital outflows and reduction in capital inflows including debt, which resulted in depreciation of the rand against the major trading currencies. These disturbances had disastrous effects on the growth of investment.

The current financial system in RSA without doubt, is highly developed and properly managed. Most institutions in the country are privately owned, the regulatory authorities are firm on regulations and therefore respected, foreign banks operate freely without irregularities, the stock market is the 13th largest in the world and the judiciary system unbiased in settling disputes. However, although the banking sector has met well the demands of big firms, smaller firms have been left wanting as they have limited expansion of deposit facilities. Even efforts to develop wholesale retail networks to provide loans to such smaller groups have been ineffective (TIPS 2001).

Turning to Zimbabwe, in line with world trends, nominal interest rates were raised in 1981. The Reserve Bank of Zimbabwe (RBZ) opted for direct controls on credit expansion rather than using the interest rate to control money demand. Thus the directly controlled credit discouraged savers. Worse still, the inflationary environment prevalent in the country precipitated into negative real interest rates. The authorities in a bid to entice investment had allowed nominal interest rates to be kept low but this was to no avail as savings dwindled. Later on interest rates were reviewed upwards but it did not result with the anticipated upsurge in savings. Thus as a result real interest rates were negative, by far due to interest rates which were and are not timely adjusted to prevalent inflation levels. This anomaly took its highest peak especially after 1998 as shown by the figure below:

Figure 2.3.3:



Source: RBZ Monthly Bulletins (various).

Even now the cheap funds due to negative real interest rates did not trigger investment. However an increase in the nominal interest has been associated with improvement in the supply of savings, transmitting to positive response from investment. This could be as a result of the repressed financial market in the country.

Political instability is another factor inhibiting investment in Zimbabwe. Events leading to the strengthening of some of the opposing political parties and other bodies concerned advocating for regime change, have not served well on investment[4]. Towards the run up to the presidential elections in 2001-2002, farm invasions, paralysing the back-bone of the economy were now common. To exacerbate the situation, there were also company invasions later on; hence stability of the business sector was under threat. All this did not augur well with investment as the firms' activities were now marred by uncertainty mainly due to some mushrooming workers union calling for high salaries against disappointingly low levels of production and sales. Even with scarce foreign currency to

[4] The country's main opposition political party, the MDC, grew in strength in 1999 amid worsening economic and political environment. Furthermore, the country's national constitution assembly (NCA) and some labour bodies like the ZCTU shared the same hope of regime change.

purchase raw materials some companies held on whilst others downsized operations yet others were on the brink of closures, and others closed shop.

At the same time, government used foreign exchange allocations to put a reign on bank lending. Allocations were done administratively, with import licenses and quotas as primary instruments. Thus such foreign currency controls can provide a government with effective control over the private sector's economic activity (Harvey, 1996:8). The stance had a disadvantage to the private sector with regard to investment growth.

In a way the government's system of regulating imports was meant to trigger high private savings, by forcing the postponement of consumption of imports, and by pushing up prices and therefore profits in retained sectors. This tends to shift the distribution of income in favour of those with higher saving rates (Davies *et al* 1994:166). Zimbabwe's trend has shown that from the 1980s onwards, private savings increased, at one time exceeding 20% of GDP in the period 1985-89. For a lower middle-income country like Zimbabwe at that time, this was considerably high (Elbadawi and Schmidt-Hebbel 1991:46).

Up to date Zimbabwe's financial sector in the past four years pulled through difficult times. The most affected were the commercial banks, as evidenced by bank curatorship, closures, liquidation and licence termination for some banks. Some banks tabled mergers as a get away to not meeting the new capital requirements for their operations. To add salt to injury, some firms abused the production sector facility loan as they engaged in speculative dealings in forex. Even some farmers who had accessed the loans for farming diverted the funds for consumption and other non-farming related activities, thus defeating hopes of reviving investment. In another case, this also reflected that the monetary authorities' role of bank supervision at that time was lax as even some banks went on unrestrained to profit in illegal dealings, mostly in forex.

However, the central bank has of late stamped its authority as the apex bank by reinforcing on regulations with the culprit banks being brought to book, risking closure.

One of the main challenges however, has been the negative real interest rates discouraging savings with players in the money market opting to lock their funds in stock. This has diluted funds available for investment.

Compared to RSA, Zimbabwe has depicted an unstable financial sector over the years. This has culminated into low levels of credit being provided to the private sector hence the low levels of investment. Though of late interest rates have been coming down, inflation remains the highest in the world. This is in sharp contrast to South Africa's single digit inflation and interest rates. The ability to contain inflation in Zimbabwe is yet to be achieved as yearly mounting budget deficits and domestic debt have shot down such endeavours. Thus, unlike RSA's economic indicators, Zimbabwe's unattractive economic indicators have discouraged investment.

2.4: Economic reform programs.

In RSA, economic reform programs have been included in structural and economic programs, annual national budgets, monetary policy statements and other national economic strategies[5]. The much publicized turning point with regard to economic reform programs was the initiation of the GEAR framework as earlier mentioned. Faced with mounting pressure and the instability of the rand coupled also with concerns regarding commitment to sound macroeconomic policies, the government introduced GEAR. GEAR sought to address amongst others, two key development outcomes- poverty and inequality reduction, which are dependent on private investment led growth. Box 2.4.1 below presents the targets for economic growth, private investment and employment creation set out in the GEAR policy document.

[5] Other than GEAR and budget statements, some of the reform programs have been highlighted in the Department of Trade and policy support programs (TIPS), Accelerated and Shared Growth initiative for South Africa (ASGISA) discussion papers on the aspects of RSA's economy amongst others.

Box 2.4.1 : The Growth, Employment and Redistribution (GEAR) Framework

The key elements of the GEAR framework as described in Government publications include:

- A faster fiscal deficit reduction program to contain public debt and debt service obligations, counter inflation, and free resources for investment.
- A renewed focus on budget reform to strengthen the redistributive thrust of expenditure.
- A reduction in tariffs to contain input prices and facilitate industrial restructuring, compensating partly for the exchange rate depreciation.
- A commitment to moderate wage demands, supported by an appropriately structured flexibility within the collective bargaining system.
- An exchange rate policy to keep the real effective rate stable at competitive levels
- A consistent monetary policy to prevent a resurgence of inflation.
- Continued gradual relaxation of exchange controls.
- Speeding up the restructuring of state-owned assets (including privatization).
- Tax incentives to stimulate new investment in competitive and labour-absorbing projects.
- An expansionary infrastructure program to accelerate delivery on the backlog of social infrastructure.
- A strengthened tax and incentive system to finance training programs on a scale commensurate with needs.

Source: Department of Finance (1996).

As part of the factors which triggered initiatives like GEAR was the mounting deficit. In 1994 the budget deficit stood at -5.6%, at least doubling that for 1986. The government debt had also shot up to unsustainable levels from around 33% in 1988 to around 50% level of GDP in 1995. GEAR targets for the budget deficit and inflation therefore played significant roles with regard to investment as the reduction in deficit released funds for investment whilst at the same time reducing inflationary pressures.

From 1994 onwards the deficit has been on a downward trend by far as a result of implementing economic reform programs. The fiscal policy affects investment via the cost of capital as influenced by the tax policy. It affects also investment through public infrastructure investment, which reduces private costs of production thereby increasing industry's profitability (Lewis: 2001). This undoubtedly called for measures to tackle the deficit and release funds for purposes of Gross fixed capital formation (GFCF).

As examples from Box 2.4.1 above, infrastructural program and moderate wage demands, theory has shown and empirics have supported, are complementary to enhancing the level of investment. The government program also had salient policy initiations with regard to investment. One of them was the spatial development and industrial development zone initiatives of the department of trade and industry which have attracted private sector investment as their primary goal, but also aimed to create jobs (Lewis & Bloch, 1997:14; DTI, 1997; 1).

As evaluations for structural reform programs, save for the year 1996, actual real GDP growth turned out to be much lower than the GEAR projections. Even by 2000 it had still not reached the 6% mark predicted. As for investment, instead of growing at an annual average of just under 12%, private sector investment only grew by 2.7%. Thus during the GEAR period and immediate post-GEAR period, private investment failed to take off and public investment in capital goods was insufficient for rapid growth. Investment relative to GDP decreased from 25% in 1983 to 15% in 2001. The rate in 2001 was well below economic reform targets (SARB 2002).

Though GEAR produced some of the desired results, there were some shortcomings along the way. For one, the assumption that the budget deficit reductions would kick-start growth via private sector investment responding to lower budget deficit and interest rates. Some researchers argue that in actual fact, there is a weak relationship between deficit reduction, low interest rates and private investment. One cannot therefore rely on private investment to kick-start growth on the premise that interest rates will fall (Weeks, 1999

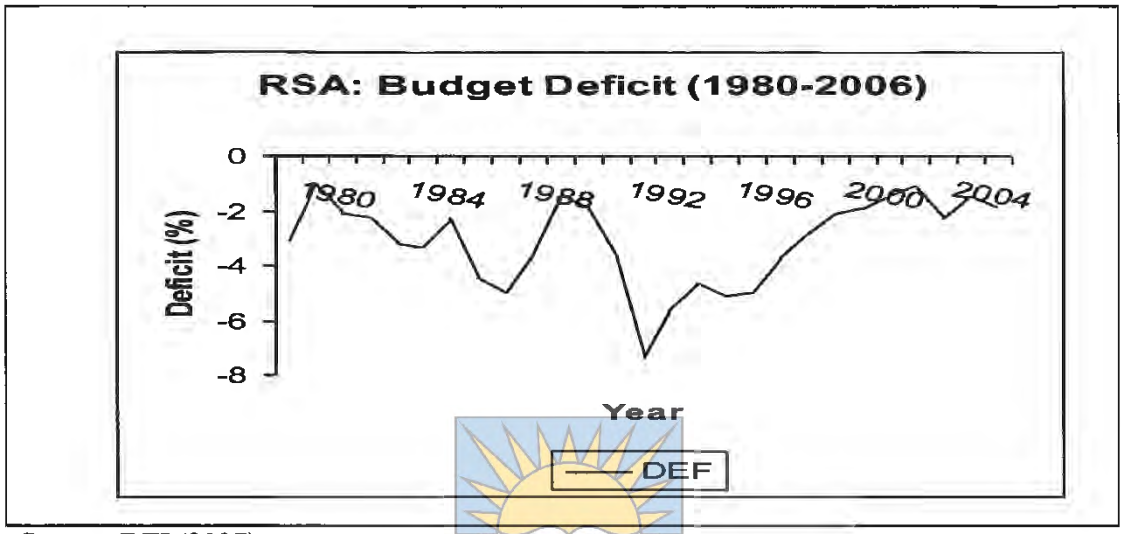
: 801). Even when interest rates do fall, there are other also important determinants of investment to consider. Therefore, confidence tied to a conservative fiscal policy and low interest rates and production costs is suspect as private investment is unlikely to respond (Nattrass, 1997:25-42; Dinkleman & Streak, 1999; Gelb, 2000).

The RSA industry, particularly manufacturing, further faced challenges and uncertainty in the form of government intervention mirrored in strategic investment projects. Some of these projects later turned out not being viable in the long run (TIPS 2000). At the same time, some sectors which had heavily relied on the government showed a decline in investment during the 1990s. For those sectors however which were dominated by the private sector, they experienced an increase in the level of investment. This was also caused by a decrease in crowding out by the government. Ultimately, higher levels of efficiency and production were reached by the private sector. The decreasing role in government's involvement in 'strategic' investments therefore stimulated a restructuring of the economy's capital market.

Another possible reason for improvements in investment rate, particularly in manufacturing sector might be that relative factor prices forced a switch to capital in place of the relatively expensive labour. Economic reform programs further helped to knock down inflation from levels of between 15-20% in the 1980s to below 8% before the mid 1998 'Asian flu 'exchange turmoil. However, the resultant job losses in manufacturing in the 1990s, increase in interest rates, the spectacular fall of the rand in 2001 are all attributed to structural adjustment programs and this also bear testimony of opening up a protected economy more than enough. The GEAR strategy may have flawed in assuming a strong connection between private sector-led growth, employment creation and poverty reduction (Moodley, 2005).

In 1999 the government announced a target for fiscal deficit at 3% of GDP as it sought to achieve fiscal stability by reducing the deficit. The tight fiscal policy in the process promoted private investment as by releasing more funds for investment and raising savings.

Figure 2.4.1a:



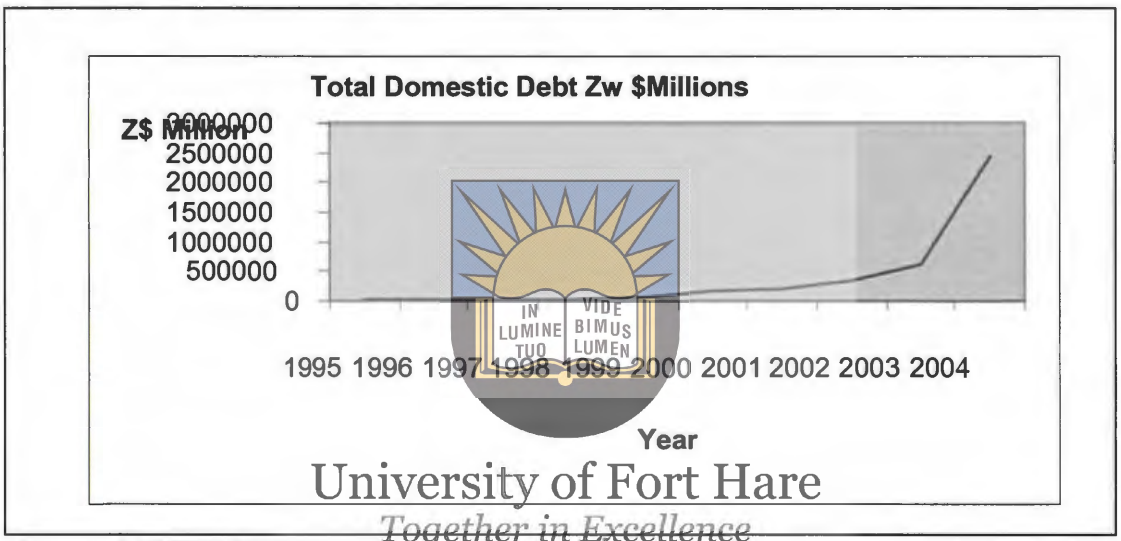
Source: DTI (2007).

From figure 2.4.1 above we deduce that the declining trend in the Budget deficit played a big role in releasing funds for both public and private investment, thus contributing to economic growth in the process. The fiscal policy also promoted investment by improvements in infrastructure like roads and buildings which are complementary to private investment. Further than that, business and investor confidence has been strengthened vis-à-vis the predictability of the fiscal policy as it has shown over the years commitment on the part of government. Although to some extent reform programs might not have performed to expectations, they were successful in improving macroeconomic outcomes. As part of positive outcomes, inflation has been maintained at low levels, even lower than the economic reform targets. Even data on budget deficit as a percentage of GDP suggest that this positive outcome was due to restrictive fiscal policy as a result of implementing reform programs as shown by the decline in the budget deficit especially from 2002 (DTI, 2006).

The budget deficit for Zimbabwe is a different story altogether. Whilst savings and investments have been falling, domestic debt has been on the increase for a long period of time, fuelling the deficit to alarming levels. This increase has been the result of high government borrowings. Domestic debt rose at one time to $623 635.5 Million in 2003

and went further to $2 460 668.8 Million in 2004 as the government now solely relied on domestic debt to finance its ballooning expenditure. The high figures for the domestic debt have been worsened by the high interest rates prevalent in the country over the years. The figure below shows the total domestic debt in the period 1995-2004.

Figure 2.4.1b:



Source: MOFED (2006).

Although private investment in RSA had failed to take off and public investment in capital goods might have been insufficient for rapid growth (Manuel 2002:11), it is impossible to comprehend as to what would have been the outcome if SAEPs had not been implemented. Another area of success has been the declining level of foreign debt. As an example, public sector foreign debt dropped from U.S$1278m in 1993 to U.S$369m in 2000. Thus fiscal restraint and debt reduction in the SAEPs period released resources for public investment in goods and services, this complemented private investment. Even the macroeconomic adjustment and liberalization in foreign trade and investment markets under SAEPs improved the operating environment for the private sector. This was achieved by low interest rates, low inflation, sustainable unit labor costs and creating a more credible macroeconomic policy. All this attracted investment. Still under SAEPs, the importance of a sound fiscal and monetary policy as a means to stimulate private sector investment cannot be overemphasized.

RSA without doubt, faced and overcome some challenges posed by political instability and recovered enough to implement policies to trigger investment. By relaxing restrictions on capital flows, RSA benefited domestic investors and even SADC countries. As part of other incentives to entice investment has been the huge capital projects directed towards exploitation and 'benefits' of mineral resources. Promotion of exchange rate stability is another means which has been used to encourage investment.

Some specific measures encouraging investment in RSA include amongst others: sound macro fundamentals, success by the incumbent regime to bring down fiscal deficit, low taxes and inflation, improved access to information, the financial sector is first class, banks are privately owned and well run, the Johannesburg Stock Exchange (JSE) is the 15th biggest in the world and to cap it all, RSA is a signatory to multilateral treaties. It is valid however to conclude that GFCF has deteriorated sharply after recording high rates in the early 80s.

In Zimbabwe on the other hand, foreign capital inflows had allowed higher rates of private investment and consumption to occur in the early 1980s. The economy's regulations on monetary and exchange control caused a squeeze both in private investment and consumption in the second half of the 1980s (Jenkins 1997:575-602). As if that was not enough, domestic financing was crowding out private sector investment (Elbadawi and Schmidt-Hebbel, 1991:46). Given public sector dissaving, the culture of reliance on foreign savings was groomed. As for the 1990s, private investment slowly responded to economic reform programs and the high interest rates prevalent discouraged borrowing for consumption. In the 1990s therefore, there was a huge increase in domestic saving held by banks regardless of the regime's foreign borrowings.

Zimbabwe launched in October 1991, ESAP which was intended to support economic growth by means of economic and commercial liberation. Internal and external advocates for ESAP had argued that high government deficits, an overvalued currency, and

restrictive access to industrial inputs could only be relieved through an ESAP. Amongst reform measures was the decontrolling of interest rates and removal of credit controls. Liberalizing the financial sector thus came about as a result of consultations with IMF and WB sponsored structural adjustment program in 1991. As part of the agreement, interest rates were raised so as to attract savings into the financial system. To make strides in inducing growth, it was inevitable to adopt measures to resuscitate the low levels of investment; hence the government had to adopt reform programs. Adoption of the program was also a passage to high possibility of sourcing loans for infrastructure and development from the World Bank (WB). The provisions of the government's framework for economic reform and later WB policy framework paper in 1992 included trade liberalization, devaluation, domestic deregulation, financial sector liberalization and the reduction in fiscal deficit. Domestic deregulation involved the phasing out of price controls, expediting investment approvals, flexible retrenchment and wage setting procedures.

Table 2.4.1: Zimbabwe's reform targets by 1995 (in 1990 prices)

Reform targets by 1995 (in 1990 prices)	
Indicator	**Target**
➢ GDP growth	4.6 %per annum
➢ Investment	25% of GDP
➢ Foreign investment	$300 Million
➢ Savings	25% of GDP (46% by private sector)
➢ Government expenditure	38% of GDP(46% in 1990)
➢ Budget deficit	5% of GDP by 1995 (8.9% in 1990)
➢ Inflation	9% (17 % in 1990)
➢ Employment resettlement	108 000 new formal sector jobs.
➢ Lower Tax rates	

Source: GOZ (1991)

Even the economy's tax rates were lowered as they were believed to be exceedingly high at 34% (Jenkins 1997:575-602). Highly leading the pack was the mounting domestic debt. Fuelling the debt was the large public service sector. It was thus of prime importance to offload the redundant posts and structures as a recommendation to bring the levels of debt to acceptable levels. This would then release more funds for investment and hence sustained growth.

Scoring as a first, ESAP abandoned the welfare policies of the 1980s. Perhaps as one of the good outcomes as a result of ESAP with regard to investment was the phenomenal increase in investment most notably in 1993-95 on average at 23% level of GDP. After such a promising growth, investment was on the decline again as the manufacturing sector, undoubtedly contributing high to GDP, succumbed to a decline in output due to low investment levels. Some sectors of the economy, for example agriculture and services which had earlier been expanding began to register low growth. At the same time however, a speculative economy sprouted as shown by the boom of the Zimbabwe stock exchange (ZSE) in the 1990s (Bond 1998). Up to date, the regime has adopted a number of economic reform programs[6].

ZIMPREST sought to attain annual GDP growth of around 6% till year 2000. To achieve such targets, it was expected that savings and investments would reach at least 23 per cent of GDP and the budget deficit reduced to levels under 5 per cent. ZIMPREST also added as part of its goals, socio-political improvements mainly in the quality of democratic institutions; the pursuit of good governance; and the elimination of corruption. The results of ZIMPREST however were disappointing to say the least as set targets were not met. To start with, the Investment/ GDP ratio was a far cry from the anticipated annual 23% as it hovered to below 17% in the period 1996-2000.The ultimate result was that the GDP growth of 6% by year 2000 was not met.

[6] After ESAP then followed ZIMPREST (1996-2000), then MERP, followed by NERP (2003) and then NEDPP (2006).

The Millenium Economic Recovery program (MERP) followed in 2000 but it was short-lived as it paved way for the National Economic Revival Program (NERP) in 2003. Even during the phase of MERP, GDP growth had become negative and accompanied by investment levels of below 15% of GDP. Come 2003 the much awaited NERP was in full swing but also failed to deliver. The GDP in 2004 declined by almost 20% when compared with the 1991 figures much due to the attainment of low levels in investment which stood at 12% of GDP.

During NERP, measures were put in place by the government to promote investment. It was realized that lower than inflation interest rates forced savers to shift their savings portfolios out of productive investments to higher yielding but speculative non-productive investments (GOZ, 2003). The government responded with an upward review on deposit rates. NERP also sought to reign on inflation which is at the centre of macroeconomic stabilization. Furthermore, initiatives were drafted for infrastructure development in roads, rail, communication and energy. All this was meant to promote investment.

The latest reform programme launched in 2006 is the National Economic Development Priority Programme (NEDPP). Drafting the programme, the government admitted that there was a clash of interest in the business fraternity as the economy remains in crisis. The NEDPP was given a 9 month span beginning April 2006 to yield results. The Box below presents some of the challenges as tabled under the NEDPP.

Box 2.4.2: Challenges as tabled under the NEDPP

1. Hyperinflation
2.Foreign currency shortage
3. Fiscal deficits
4. Low savings and investment
5. Deteriorating infrastructure
6. Underperfoming public enterprises

Source: MOFED(2006:2-3)

Zimbabwe, now in its eighth successive year facing shrinkage in national output, has been facing more or less the same problems as outlined in Box 2.4.2 above. Adding to these challenges has been the rising level of unemployment, now estimated at 80%. Most of the highlighted problems can be solved through attainment of high investment levels, the engine of any economy. Amongst the major hindrances to investment has benn the rising level of corruption (MOFED, 2006:23). Thus at the advent of NEDPP, hopes were high that measures will be put in place to put a reign on these unhealthy macroeconomic phenomena. The table below presents the targets of the NEDPP.

Table 2.4.2: Macroeconomic Targets as set in NEDPP

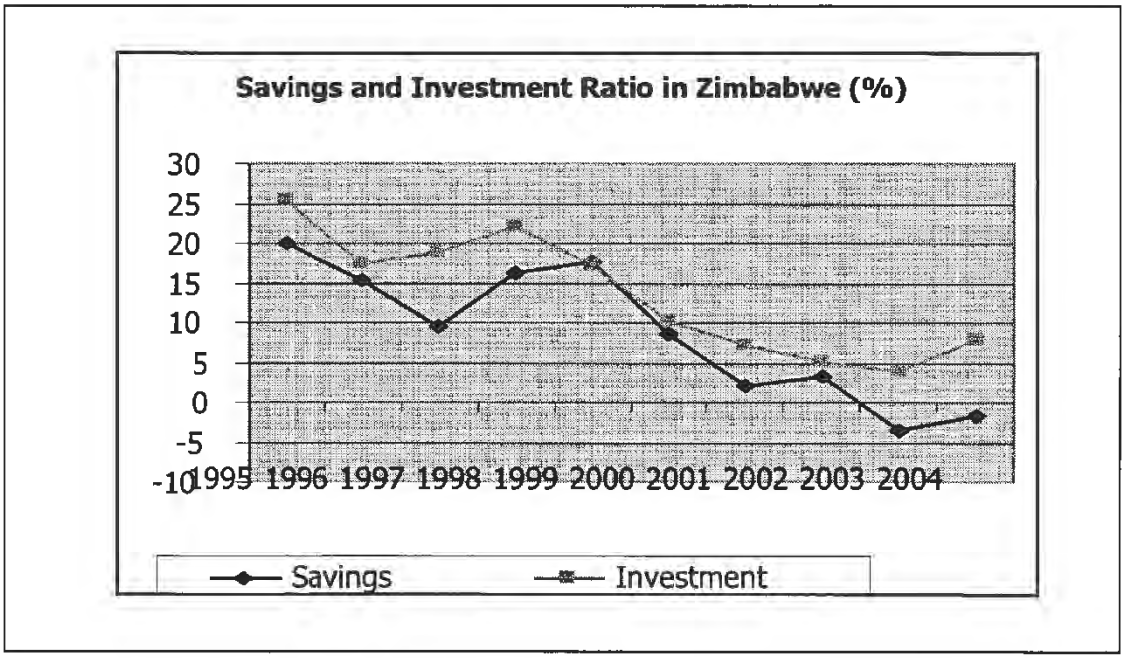
	2005 Est.	2006	2007	2008
GDP Growth (%)	-4.2	1-2	3.5	4.8
MAJOR SECTORAL GROWTH RATES (%)				
Agriculture	-12.1	9	11.5	16
Mining	-10.7	15.2	15.0	15.5
Manufacturing	-7.6	0	1.0	3
Construction	-2.0	0	0	1.0
Tourism	-1.2	1.0	1.1	1.0
Inflation (end period) (%)	586	230-250	20-30	6-9
Savings (% of GDP)	-7.3	10	15	20
Investment (% of GDP)	4.5	15	20	25
GOVERNMENT ACCOUNTS (AS % OF GDP)	2005 Est	2006	2007	2008
Revenue	42.5	36.4	30	30
Expenditure	48.3	41	32.3	32
Deficit	5.8	4.6	2.3	2.0

Source: MOFED (2006:5).

The above targets, had they been met, would have propelled investment to a higher level leading to a growth in national output. However, the time frame given to NEDPP lapsed and the challenges to the economy grew. As examples, the inflation rate ended the year 2006 above 1200% instead of the projected 250%. Investment did not reach the 15% mark as predicted hence the continued negative economic growth. With the current economic instability, the post 2006 forecasts are a far cry from reality unless holistic measures are followed.

As part of economic goals Zimbabwe has long desired savings levels of around 25% of GDP as critical to supporting investment. However, this was not achieved and therefore resulted in the current low levels of investment. Gross investment growth as a percentage of GDP shrunk by -7% from 1998 to 2004 (DTI, 2006). This undoubtedly has contributed to the current economic decline estimated by an economic growth of -4.5% in 2006. The figure below shows the trend in savings and investment in Zimbabwe for the period 1995-2004.

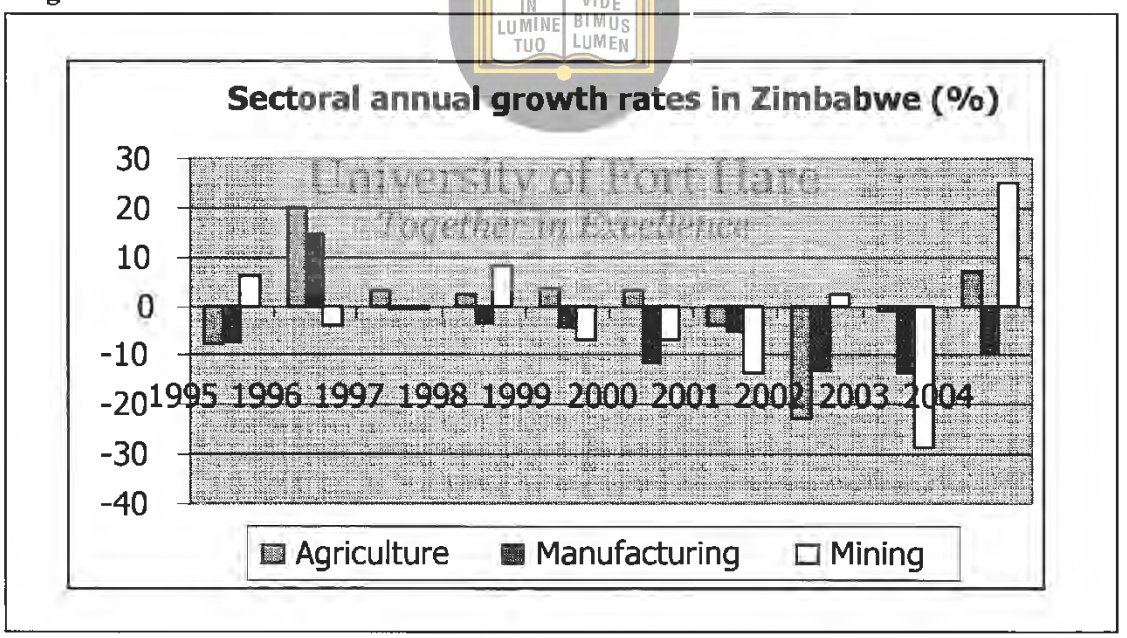
Figure 2.4.2:



Source: CSO (2006), MOFED (2006).

Even after adopting numerous economic recovery programs amidst fiscal and monetary policies, investment in Zimbabwe did not rise to sufficient levels necessary to trigger growth. Zimbabwe without doubt has produced well formulated policies and strategies. However, the main challenge seems to lie in the monitoring and implementation processes. It is no wonder the GDP growth has been lingering on the negative side for a long period of time. This has been shown by the overall disappointing low levels of economic growth in the period of study. The major sectoral annual growth rates in the period are shown below.

Figure 2.4.3



Source: CSO (2005), MOFED (2006).

Figure 2.4.2 above shows the key sectors which contribute a large portion in GDP. The Agricultural sector has long been regarded as the biggest employer in this agro based economy. However, persistent droughts, mal preparations in the agricultural seasons mainly due to input shortages and of land seizures, have dealt a blow towards maintaining high growth rates in this sector. In the period 1995-2004, the sector grew by less than 0.5%. Also as can be observed from the graph, the manufacturing and mining sectors

reported negative growth with contractions on average of 5.5% and 1.9% respectively. Such disappointing growth rates were phenomenal during the peak of economic reform programs.

Although economic reform programs may have improved efficiency in the previously controlled economies, they have been criticised on the basis that they neglected institutional aspects of reform. As such they have been blamed for putting much reliance and emphasis on interest rates as the sole indicator of liberalisation[7]. Orthodox analysis asserts that it is rationally defensible that liberalising interest rates in an environment of high inflation for example like in Zimbabwe can make the goal of positive real interest rates difficult to achieve. This might be one of the possible reasons why investment is failing to perform in this SSA country.

2.5: Investment enhancement measures

The government has been reviewing and updating the investment regulations in order to reduce bureaucracy and increase the share of capital expenditure in real terms. In 1993 for example, the government of Zimbabwe announced measures to deregulate private investment. This saw the Zimbabwe Investment Centre (ZIC) being established by an act of parliament in the same year for encouraging and promoting investment. Ultimately the ZIC was given responsibility for executing GOZ's investment measures. Other organizations playing pivotal roles with regard to promoting investment in the country include the Export Processing Zone (EPZ), the Confederation of Zimbabwe Industries (CZI) and Empretec, an organization initiated by the United Nations Development Programme (UNDP) and ZIC to stimulate entrepreneurship.

Amongst the key features of the policies were measures to decontrol the repatriation of profit, dividends and even capital. The main thrust of such measures was to relax domestic controls over investments made with "own" funds so that firms could respond to competition and opportunities without facing many hindrances. Some of the specific reform policies in the ZIC, CZI, and EPZ include:

[7]Some excepts from a draft research by Rosalind Mowatt on the Prospects for financial sector reform in the context of regional integration in SADC, University of Witwatersrand.

- Ensuring a viable financial and economic environment within which industry can operate effectively.
- Promote a minimally regulated business environment.
- Promote joint ventures between local and foreign investors.
- Promote and facilitate investment by both domestic and foreign investors
- Deregulation of the labour market, municipal by laws, transport regulations.
- Drafting initiatives for infrastructure development in roads, rail, communication and energy.

(http:www.treasury.gov.za/fiscus/summits)

In addition to these, as part of investment rules in the country; there is no liability for tax on any capital gains arising from the sale of property forming part in an EPZ. Member firms in EPZ also enjoy duty free importation of raw materials and capital goods. Other measures to encourage investment include capital allowances used to enhance productivity of companies.

2.6: Conclusion

Without doubt Zimbabwe had fared better than most SSA countries during the 1980s, at least until 1991. Although fluctuations in economic growth rates were phenomenal at that time, the real annual average for the 1980s was higher than that for SSA as a whole. It was even higher than that for its major trading partner, RSA. At one time Zimbabwe was managing to contain its inflation rate to levels better than her neighbouring countries. In light of this it is therefore, arguable to support the gains of liberalizing the Zimbabwean economy. However, the same cannot be said about South Africa, which experienced a steady growth in the 1990s, as a result of improved levels in investment.

Hitherto in Zimbabwe there was still uncertainty associated with ESAP and plagues in the form of droughts, the loss of subsidies, higher costs. There was also lack of clarity concerning RSA's trade policy towards Zimbabwe as it meant that the risks facing manufacturers were high, hence the low turn out in investment (Jenkins 1997). The Manufacturing sector's share of GDP dropped from around 20% to 16% during the first

phase of ESAP. Some have blamed as the sole cause, the use of inappropriate policy instruments and succession during ESAP, where tariffs were imposed on intermediate inputs to manufacturing (Mabugu, 2001:174-190).

The program's overall impact was deindustrializing, which saw an increase in foreign competition. As an example, whereas final consumption demand for footwear before ESAP had been almost met internally, afterwards "of the 18 million pairs of footwear purchased yearly, almost 10 million pairs were imported cheaply from China, leaving a demand of only eight million pairs for local producers."(Chipika *et al* 2000:56). During that time inflation and decreases in real wages shifted the distribution of income from urban unskilled labour, as wages and salaries as a percentage of GDP fell from 57% in the 1980s to only 45% by 1995 (Mumbengegwi and Mabugu, 2001). However, according to the World Bank, reduced real wages were a "brutal but necessary" adjustment to generate export-led growth (Kanyenze 1995, Knight 2001).

The Gross domestic saving (GDS) rate for the ESAP period 1991-1995 turned out to be 16.8%, which fell short of the figure projected in the reform document (see CSO National Accounts, 1985-1997). Perhaps as one of the good outcomes as a result of ESAP with regard to investment was the phenomenal growth in investment most notably in 1995 at levels of around 24% of GDP. However, orthodox analysis concludes that ESAP failed where it counted the most: it did not lead to a substantial and sustained increase in investment. Though the drafting of ESAP may have owed more to the WB and IMF, the regime of Zimbabwe amongst others, failed to cut adequately and restrain on public expenditure, thereby crowding out private investment and generating inflation.

Even most of ZIMPREST's salient goals were not met. The projected domestic savings of 19.5% (GOZ, 1998:71) was not met. Even the country's current number one enemy, inflation was not tackled by reform targets. This current inflationary environment was prevalent even during the 1995-2004 periods. Not only has the decreasing level of investment negatively affected economic growth, it has also led to an increase in unemployment, currently estimated at 80%. This has also transmitted to social unrest and

crime rates rising. Such unbecoming events discourage investment as current and potential investors tend to be risk averse and worry about the safety of their investments.

Even after implementing measures to attract investment, Zimbabwe is facing acutely low levels in investment. There is, therefore, little on the ground suggesting an improvement in the levels of investment and output as a result of economic reform programs. This is shown by escalating debt and the declining trend in investment in figures 2.7.3 and 2.7.2 above. According to the Central Statistical Office (1998) the extent of poverty increased from 40.4 % in 1990/91 to 63.3 % by 1995/96. Though it may be an irrevocable fact that SAPs, which were designed to address Africa's economic problems, have not perfomed to expectations in addressing the declining trends in investment, the time frame of the economies' response may be central.

According to the World Bank, in its most recent study on SAPs in Africa: "Investment generally responds slowly to adjustment in Africa and elsewhere. This slow response is understandable. Investments cut capital spending as part of their fiscal stabilization - while the private sector adopts a wait-and-see attitude during the early phases of adjustment due to the irreversibility of investment decisions and the reversibility of key policy changes (frequent in previous episodes). The problem is particularly serious where there is no consensus about the importance of private-sector-led growth" (World Bank, 1994:124). In policy matters, Zimbabwe's first majority government failed to deliver as the private sector was granted freedom of choice in pursuing interests. The government faced with ineffective budget restraining measures and coupled with economic imbalances that came about, resolved by use of direct controls. The considerably loose fiscal stance, gargantuan expenditure and dissaving culture were reflected as a nagging deficit in the balance of payment (BOP).

Though RSA is Zimbabwe's major trading partner, it has been revealed from the background that they are at different ends with regards to investment. RSA, after attaining freedom in 1994, has come a long way to tackle and shrug off challenges determining investment and ultimately growth. Though RSA's crime rates are among the highest in the region and with corruption in the government, landslide victories have been

scored in enhancing investment levels. Hitherto, the structural reform programs have been the right dosage as the economy has emerged better after adopting reform programs.

A hospitable economic environment in the country has also played its part towards improving investment. The economy thus has fared positively in terms of investment and output. The manufacturing sector's emergence as the leading runner in investment improvement has hugely contributed to the current investment rate of 17.5% (of GDP in 2006). This rate however is low according to international standards and therefore needs to be improved. An improved rate in investment will also address unemployment challenges, and ultimately output growth. At social level, high employment will mean lower crime rates hence the desire to obtain high investment levels in the country.

Zimbabwe did adopt promising economic turnaround programmes and enticing investment enhancement measures. However, the hostile economic environment coupled with the regime's yearly mounting deficits and unfavourable accompanying economic indicators have discouraged investors to make commitments in fixed capital. To exacerbate the situation, the considerably slack judiciary system and at times underdealings swept financial sector have added to these woes. This has contributed to the current dismal growth in investment levels of -3.4% of GDP (2004).

From the developments in both countries, the following factors have emerge as the possible major determinants of investment: Rates of return, Uncertainty, User cost of capital, GDP growth, inflation, tax rate, Domestic debt, Public sector investment, Budget deficit. The brief summary below of selected factors corroborates this:

1. Rates of return- this is an important factor determining investment since firms, in both countries, will invest where returns promise to be highest. However, this factor becomes complicated when wage costs, the cost of capital, political instability and a host of other variables are included. Variables like political instability can discourage investment despite high rates of return. As an example, political instability in Zimbabwe has discouraged investment.

2. Uncertainty-viable ventures appear unattractive when we bring in policy and political uncertainty. Such factors slow down investment until the policy change is favourable and is expected not to vary in the near future. This analysis holds for both countries.

3. User cost of capital-though what to include as part of the user cost of capital is an economic debate, the generally accepted factors include the real interest rate, corporate tax rate and the depreciation rate. Theory, as will be shown in the next chapter has been corroborated by empirical findings that the user cost of capital negatively affects investment. This is mainly caused by high interest rates that make sourcing credit expensive, thus discouraging investment. However, if financial markets are repressed such that the real interest rate is negative, the sign of the interest rate with regards to investment may be distorted.

4. Demand-demand is an important factor in the behaviour of investment. Demand can be measured by output growth (GDP growth) or capacity utilization. Given a certain level of output, an increase in demand means higher levels of capacity utilisation. As a way of avoiding supply bottlenecks but at the same time enjoying economies of scale, firms will undertake investment in periods of high demand.

5. Infrastructural investment-the public sector investment in infrastructure can complement private investment. For an example, provision of infrastructure such as roads where previously none existed, can increase capital productivity. South Africa is a clear example where public sector investment complemented private investment in the post 2000 period. In scenarios of infrastructure investment, profitability can increase thus leading to higher levels of private sector investment.

CHAPTER THREE

Literature Review

3.1 Introduction

The purpose of this chapter is to address theoretical and empirical literature on investment. Thus literature for the study is developed through taking note of theoretical strides made to date in explaining the determinants of investment, some of the factors influencing investment have been briefly explained in the previous chapter. Furthermore, empirical literature is included to corroborate theoretical literature as valid.[8] Finally, a critical analysis and evaluation of both theoretical and empirical literature is given. This is necessary as it identifies both strengths and shortcomings of theoretical and empirical literature. At times such literature has not been able to explain well some factors as some empirics have refuted theory. Ultimately, such an evaluation inevitably brings into cognisance that literature, though very helpful, is still undergoing evolution.

3.2Theoretical Considerations

The theories which form the basis of this study are first considered. The first one is the Keynesian hypothesis, followed by the Accelerator principle and lastly the neo-classical theory. With the evolution of theory, it is necessary to include new theories based on the foundation of these main theories in the study. This necessitated the specification of uncertainty theories.

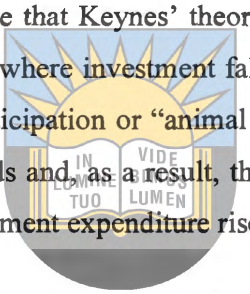
Variables frequently given rigour in investment models can thus be grouped as financial and non-financial determinants. From financial variables we can have as examples, the real interest and bank credit. The non-financial variables include government investment, terms of trade, real output, real exchange rate, inflation, and debt.

[8] Some of the factors influencing investment have been briefly explained in the previous chapter.

3.2.1 The Keynesian Hypothesis

Investment theories can be traced back to Keynes (1936:135-144). According to Keynesian hypothesis, firms are supposed to "rank" various investment projects depending on their "internal rate of return" or "marginal efficiency of investment" (MEI). Thereafter, faced with a given rate of interest, choose those projects whose MEI exceeded the rate of interest. With an infinite number of projects available, this amounted to arguing that firms would invest until their MEI was equal to the rate of interest

It is therefore imperative to deduce that Keynes' theory of investment can be expressed by the naive function $I = I_0 + I(r)$ where investment falls as the bond rate rises and rises when the bond rate falls. High anticipation or "animal spirits" will strongly suggest that all projects will get valued upwards and, as a result, the MEI curve shifts to the right so that the resulting economy's investment expenditure rises.



Under this view, investment projects should be undertaken up to the point at which the expected rate of net profit equals the interest rate. If interest rates are high, only those projects with the highest expected rate of net profit will be undertaken, hence the level of investment will be small. Any factor which increases the expected net profitability of investment will shift the investment demand curve to the right. Conversely, anything which decreases the expected net profitability of investment will shift the investment demand curve to the left. The Keynesian view goes further to assert that savings and investment can be at odds and thereby can result in fluctuations in total output, total income, employment and the price level (Asante, 2000).

3.2.2 The Accelerator Theory

A significant number of investment related studies have used the flexible accelerator model. However, data paucity and structural set up in developing countries has forced some modifications to be made in order for the theory to become applicable in such economies.

According to the Accelerator theory, investment is a linear proportion of changes in output. In contradiction with the Keynesian hypothesis, the accelerator model asserts that

expectations and profitability play no role. Also it says capital costs play no role. According to the Aftalion –Clark Accelerator theory, which finds its roots in the works of Clark (1917), and Bickerdike (1914), investment responds to changing demand conditions. This implies a relation of the following form:

$$I_t = K_t - K_{t-1} = Y_t - Y_{t-1} \quad \text{.....(3.1)}$$

The above is also referred to as the crude accelerator model where; Y_t is aggregate demand at time t, K_t is capital stock and I_t is Investment. However, demand shocks are many and not all permanent. If, for instance, a firm responds to an aggregate positive demand shock at time t by increasing capacity immediately, it might be faced with a dilemma if, at time t+1, there is a negative demand shock: it increased its capacity permanently, yet, at time t+1, much of that was not utilized. Instead of increasing capacity immediately and fully in response to a single demand shock, it will respond gradually as shown by relation of the form:

$$I_t = K_t - K_{t-1} = v(Q_t - Q_{t-1}) \quad \text{.....(3.2)}$$

Here v is the accelerator coefficient and 0<v<1. v can be thought of as the desired capital ratio. Since v is a fraction, a change in demand will require a smaller change in capital.

As a general form of the accelerator theory, we have the flexible accelerator model with the foundations in the 50s and 60s. The major criticism of the early theory was that it did not contain the cost of capital component and therefore it gained little respect. Modifications on this theory hav now defined it purporting that the larger the gap between the existing capital stock and the desired capital stock, the greater will be a firm's level of investment. The assumption is that firms plan to close a fraction of the gap between the desired capital stock K* and the actual capital stock K, in each period. This gives rise to an investment equation:

$$I = \phi(K^* - K_{t-1}) \quad \text{.....(3.3)}$$

Where; I is net investment, K* is desired capital stock, K_{t-1} is previous year's capital stock, and Φ is the partial adjustment coefficient. Within the framework of the flexible

accelerator model, output, or alternatively aggregate demand, the wage rate, initial capital stock, internal funds, cost of external financing, and other variables may be included as determinants of K*. Still, the flexible accelerator mechanism may be transformed into a theory of investment behaviour by adding a specification of K* and a theory of replacement investment.

Though the flexible accelerator theory has undoubtedly laid framework for what determines investment, it has been found lacking when it comes to its applicability in the developing countries. To start with, firms in developing countries face certain constraints that are not captured within the flexible accelerator theory. Most developing countries have embraced economic reform programs, and as such their effect ought to be captured within the framework of the flexible accelerator theory. Amongst reform policies which ought to be addressed in the theory we have trade policies and financial development policies[9].

3.2.3 Neoclassical Theories of Investment

Basing on the assumptions of the accelerator theory, Jorgenson (1967:129-156; 1971:1114-1147) argued that the desired (or optimal) capital stock depends on the level of output and on the user cost of capital (which in turn depends on the price of capital goods, the real interest rate, and the depreciation rate). He therefore advocated that investment is optimal when the marginal return on capital is equal to the user cost of capital. Jorgenson (1963:247-59; 1967; 1971) and Jorgenson and Hall (1971) and others formulated the neoclassical approach, which maintains that a firm's capital stock will increase up to the level where marginal product of capital is equal to the user cost of capital.

From this analysis, an increase in the user cost of capital is associated with a decrease in the level of investment. The user cost of capital includes three implicit costs to the firm. These include the foregone interest of selling the capital and investing the proceeds, the depreciation that results from using the capital, and the changing price of capital. As an equation, the user cost of capital is presented as follows:

[9] See in particular Shafik (1992) and Aysan *et al.* (2006b) for additional references

$$r_k(t) = r(t)p_k(t) + \phi_k(t) - \dot{p}_k(t) \quad \text{.....(3.4)}$$

Where r_k is the user cost of capital, r the real rate of interest, P_k is the real market price of capital, Φ is the depreciation rate, $\dot{p}_k \; t$ is the changing price of capital, and t being time.

We can therefore sum up Jorgenson's conclusions. The first one is that he asserts that the neo-classical neoclassical theory satisfactorily explains actual investment expenditures. Secondly, the tax structure has an important role and so is the cost of capital in the determination investment expenditure. The final conclusion we can highlight is that the neoclassical theory of investment behaviour is by far superior in terms of performance. However, some authors have argued that no investment theory is satisfactory[10]. Nevertheless, according to Jorgenson and Hall (1971), the firm will continue to expand its capital stock as long as the marginal product of capital exceeds the real user cost of capital.

A viewpoint similar to Jorgenson is credited to Tobin (1969:15-29). It is a ratio which hypothesizes that the combined market value of all the companies on the stock market should be about equal to their replacement costs. This view therefore examines investment as the relationship between the market value of capital and the cost of acquiring the capital. Tobin's q shows a number of variables, especially the following:

- The recorded assets of the company.
- Opinions in the market, reflecting, for example, analysts' views of the company's success.
- The intellectual capital of the company.

[10] Takayama (1994:515) concludes that none of the investment theories is satisfactory, irregardless their merits' (A. Takayama, 1994, *Analytical Methods in Economics,* Harvester Wheatsheaf, page 515)

It is thus defined as the ratio of the market value of capital to the replacement cost of capital. The q ratio can be expressed as:

$$Q\ Ratio = \frac{\text{Total Market value}}{\text{Total Asset value}} \quad \ldots\ldots(3.5)$$

In a way this means that for example, when q is low (between 0 and 1), then the cost to replace a firm's assets is greater than the value of its stock. The stock is therefore undervalued. On the contrary, if q is high (that is, greater than 1) then a firm's stock is more expensive than the replacement cost of its assets, which implies that the stock is over valued. This measure of stock valuation is the driving factor behind investment decisions in Tobin's model. The interpretation of q suggests that when q is greater than 1, a firm will wish to increase its capital stock, when q is less than 1, it will decrease its capital stock and when q is equal to 1, no investment in capital stock will take place.

Advances in literature, notably Abel (1983:228-233) have shown that marginal q, which is defined as the ratio of the market value of a marginal unit of capital to its replacement cost, is a more relevant measure than average q, which leads to problems in any empirical investigation.

Another approach dubbed "neo-liberal" (Galbis, 1979: 423) emphasizes the importance of financial deepening and high interest rates in stimulating growth. The proponents of this financial repression theory approach are McKinnon (1973) and Shaw (1973). In a typical economic environment marred by financial repression; there are interest rate ceilings, absence of competitive systems, restrictions on the imposition of asset portfolios, and high reserve and liquidity constraints, to mention but a few.

Thus in view of the above, the consequences range from exorbitant lending rates to savers receiving negative real returns on deposits to a shallow financial sector dominated by commercial banks. Furthermore, financial repression may also lead to a dualistic financial sector. McKinnon and Shaw therefore supported financial deepening, which implies free

market principles in the financial sector. The core of their argument rests on the claim that in typical developing countries, the availability of loanable funds may influence investment behavior independent of the cost of capital. They argue that not only will liberalization increase savings and loanable funds; it will result in a more efficient allocation of these funds, thus contributing to a higher economic growth.

The authors noted that since savings and investment complement each other, the teaching of the orthodox approach is to free deposit rates. Only then will positive real interest rates induce savings; and the end result will see financial institutions obliged to lend more resources for productive investment in a more efficient way. However, higher loan rates, which follow higher deposits rates, will also discourage investment in low-yielding projects and raise the productivity of investment. This accepted view became highly influential in the design of IMF – World Bank financial liberalization programmes which were implemented by most African countries under structural adjustment programs.

McKinnon and Shaw observed that imposing ceilings on nominal loan and deposit rates caused real deposits to be low and at times negative. This therefore repressed savings needed for financing investment. Should such scenarios hold, Shaw (1973) notes that "the immediate goal.....is to induce more rapid growth in real money balances that the public desires to hold...". The authors argued that this is attained through, among other things, letting the interest rates be market determined. Once this is done, both deposits and loan rates will increase, leading to an increase in savings.

In the neoliberal view, investment is positively related to the real rate of interest in contrast with the neoclassical theory. The reason for this is that a rise in interest rates increases the volume of financial savings through financial intermediaries and thereby raises investible funds, a phenomenon that McKinnon (1973) calls the "conduit effect". Thus, while it may be true that demand for investment declines with the rise in the real rate of interest, realized investment actually increases because of the greater availability of funds. This conclusion applies only when the capital market is in disequilibrium with the demand for funds exceeding supply.

Despite the increase in the loan rate, the quantity and quality of investment will increase as more funds are availed, transaction costs are reduced and allocative efficiency improved. Ultimately, economic development is aided.

3.2.4 Uncertainty Theories

Conventional investment theory has paid little attention to uncertainty and instability. However, uncertainty has of late become a powerful investment determinant more so for environments marred with uncertainty. According to the theories of uncertainty, the threshold desired by firms is central to the marginal profitability of capital in order for investment to occur. Thus firms predict that if volatility increases the investment will also rise hence firms will be more reluctant to invest to avoid getting caught with more much than necessary capital, should the future turn out against the fortunes of the firm. On the other hand, if the future turns out better than expected, the rational firm can just add more capital as needed.

As such, investors' perceptions about the probability of reversal become a key determinant of the investment response. The reason is that the possibility of policy reversal creates a value of waiting for investors facing irreversible projects. Thus, lack of confidence can be reflected in a weak and delayed investment response, as it may take time for investors to become convinced that the reforms will be sustained. This pattern is in fact consistent with the 'investment pause" often observed in the aftermath of adjustment programs in developing countries (see World Bank 1994).

Rodrik (1989) introduces another element of uncertainty—policy uncertainty—as a determinant of private investment. When a policy reform is introduced, it is very unlikely that the private sector will see it as one hundred percent sustainable. A number of reasons may be adduced, amongst them the expectation that the political-economic configuration that supported the earlier policies may resurface. There is also the fear that unexpected consequences may lead to a reversal. Investors must therefore respond to the signals generated by the reform so as to make meaningful investments. At the same time however, rational behaviour calls for withholding investment until much of the uncertainty regarding the eventual success of the reform is eliminated.

More recent literature has introduced an element of uncertainty into investment theory due to irreversible investment (Pindyck, 1991:1112). Dixit and Pindyck (1994), claim that the neoclassical investment rule by Jorgenson is insufficient. Thus they suggest it should go further to include on top of a return on capital, a quantity whose magnitude increases with uncertainty. The arguments are that since capital goods are often firm-specific and have a low resale value; disinvestment is more costly than positive investment. According to Pindyck (1991:1112), the net present value rule—invest when the value of a unit of capital is at least as large as its cost as in accordance with Jorgenson's user cost of capital—must be modified when there is an irreversible investment because when an investment is made, the firm cannot disinvest should market conditions change adversely. This lost option value is an opportunity cost that must be included as part of the cost. Accordingly, "the value of the unit must exceed the purchase and installation cost, by an amount equal to the value of keeping the investment option active" (Pindyck, 1991: 1112).

3.3 Empirical review

A sizeable number of researchers have tackled investment related research. Most of these have been in agreement with theory. Up to now, most of the research conducted, even in Africa has been based on national aggregate investment rates, be it of time series of particular countries (for example Jenkins (1998:34-61) and Mlambo and Mhlophe (1995) or international cross-sections (for example, Kumar and Mlambo (1995), Hadjimichael et al (1995), Bigstern et al (1999)).

From theory's perspective, the attainment of profitability goes further to explain a source of internally generated funds for investment by use of retained earnings. Validating the Keynesian hypothesis, a positive relationship between profitability and investment has been widely found for both developed and developing nations (Fazzari et al, (1988:141-195); Hoshi *et al* (1991:33-60); Bond and Meghir (1994:197-222), Tybout (1983:598-607); Athey and Laumas (1994:287-303); and Harris et al (1994:17-47).

According to the flexible accelerator theory, output growth or an increase in demand tends to be associated with high rates of private investment in most models employed (for example Ndikumana 2000:381-400; Solimano 1989). Oshikoya (1994:573-596) on a study of the macroeconomic determinants domestic private investment in Africa, deduced a positive relationship between GDP and private investment. Theoretically, the relationship can be derived from an accelerator model with the underlying assumption that the production function has a fixed relationship between the desired capital stock and a level of real output. Other studies (Hernandez-Cata 2000, Kormendi and Mcguire 1985:141-163) prove beyond doubt that there is a linkage between investment and rate of growth.

Even Ghura and Goodwin (2000:1819-1829) deduced that private investment in developing countries is stimulated by real GDP growth. They were conducting a study on the determinants of private investment in developing countries. They also came to the conclusion that while GDP growth stimulated private investment in Asia and Latin America, its effect was not convincingly significant in Sub-Saharan Africa (SSA). Sioum (2002) did a study on private investment and public policy in Sub-Saharan Africa and found the lagged level of real per capita GDP and its annual rate of growth having a significant positive relationship with private investment in South Africa. The result corroborates the accelerator hypothesis and is in agreement with the findings of most empirical studies on private investment in developing countries. However, a study by Bleaney (1994) concluded that real output had no significant effect on private investment in South Africa during periods of political unrest

At theoretical level the impact of government investment on private sector led investment activity may not be clear. However, a voluminous empirical literature has investigated direct and indirect impacts of government capital expenditure on private investment, recognizing sizeable government and public enterprise sector in Less Developed Countries (LDCs) (Badawi; 2004:1-27, Bljer and Khan 1984; Aschauer 1989:171-188). However, public sector investment that results in large fiscal deficits can crowd out private investment through high interest rates, credit rationing and a higher current or

future tax burden on the household. On the other hand, most developing countries have large portions of government investment concentrated in infrastructural projects like transport, communications and irrigation (Oshikoya, 1994:573-596). These may be complementary to private investment.

Ghura and Goodwin (2000:1819-1829) in their study deduced that while government investment stimulated private investment in SSA, it had the opposite effect for Asia and even Latin America. Other studies also suggest that public investment crowd out private investment (Acosta, 2005:389-406; Badawi, 2004:1-27; Balassa; 1988; Laumas, 1990:377-390). Still some researches maintain that public investment crowds in private investment. A study carried out by Asante (2000), on the determinants of private investment in Ghana found that public investment has a positive effect on private investment. In other words it crowds in private investment. Also to support this conclusion, some studies (Bljer and Khan 1984, Greene and Villanueva 1991:33-58) have shown that public investment in physical infrastructure is complementary to private investment. Though evidence may mount that public investment may crowd out private investment in the short run, the general trend has shown for most countries that public investment positively affects private investment.

Perkins *et al* (2005:211), in their paper analyzed the long-term trends in the development of South Africa's economic infrastructure and focused the relationship with the country's long-term economic growth. They used a database covering national accounts data, railways, roads, ports, air travel, phone lines and electricity. Furthermore, they deployed F-tests to pinpoint directions of association between economic infrastructure and economic growth. Their results validated long-run relationships from public-sector economic infrastructure investment and fixed capital stock to GDP. Their evidence suggested that the relationship between economic infrastructure and economic growth held.

However, Jenkins (1998:34-61) on a study of determinants of investment in Zimbabwe deduced that public sector investment had an either ambivalent role or played no role at

all. While a crowding out effect appears plausible in a country marked by sizeable state involvement in economic activities, generalization is troublesome. Evidence is therefore mixed and country specific. Even Mlambo and Nell (2000:80-109) found that for RSA, a 10% increase in government expenditure results in increase in private investment.

Without a doubt the weak investment environment in Africa has been under the spotlight for a long period of time and still is. Various studies have considered the role of uncertainty and instability as hindrances to investment. Hadjimichael and Ghura (1995) analyzed empirically the performance in private investment for 32 African countries. The study period was for 1986-1992, and they used a specification that included the variabilities in inflation and the real exchange rate as indicators and measures for macroeconomic instability. Furthermore, they introduced an index for political and civil liberties as proxies for property rights. Their estimation results show that either measure of macroeconomic uncertainty has a strong adverse impact on investment, while the political variable had a positive but insignificant effect.

Uncertainty arising from other sources can also have the same effect on irreversible investment decisions, as an expanding literature has underscored. As an example, Ingersoll and Ross (1992:1-29) conducted a study to examine the consequences of interest rate uncertainty. From their results it was deduced that interest rate uncertainty creates a value of waiting; furthermore, a decline in interest rates accompanied by an increase in their volatility can actually reduce investment (see also Tornell 1990:419-444). In order to trigger investment, the stability of interest rates might be more important than their level.

Other authors conducted studies on the exchange rate. In this category we have Dixit (1989) and Baldwin and Krugman (1989) focused on the real exchange rate uncertainty. Their study revealed that sunk costs of entry may discourage firms from moving into export activities that would appear profitable in light of current real exchange rate levels.

In a different but related sense, uncertainty may also be policy-induced. This scenario of uncertain tax policy is addressed by Hassett and Metcalf (1994). They conclude that an increase in the volatility of taxes (specifically, an investment tax credit) has the usual effect of raising the hurdle rate required by investors to undertake irreversible projects. Their study further revealed that the overall impact on investment generally depends on the specific form taken by tax uncertainty. Thus from the policy viewpoint, an extremely important form of uncertainty faced by investors is the imperfect credibility of policy reforms. If reforms are friendly to investment, returns are likely to shoot up. However, if investors believe that reforms will be reversed, this will trigger uncertainty on the part of investors (Serven, 1997:1-43).

Uncertainty induced by socio-political unrests has been given account and discrete variables such as changes in government, number of assassinations, strikes, riots and constitutional changes all appear empirical in investment equations (Stewart and Venieris 1985:557-563). Asante (2000), after carrying out a study on the determinants of investment under uncertainty in Ghana, deduced macroeconomic instability to be significantly negative. Other studies also agree to the view that uncertainty discourages investment (Ingersoll and Ross, 1992:1-29; Hausman and Gavin, 1995).

Hasset and Metcalf (1994) went on further to find that an uncertain tax policy, especially an investment tax credit raises the hurdle rate required by investors to undertake irreversible projects. They concluded that the effect on investment generally depends on the specific form taken by tax uncertainty. Goolsbee (2004:2289-2299) showed that a tax policy can enhance investment levels. This can be in the form of changing the relative prices of capital varieties which will have a direct effect on the quality and composition of fixed capital which firms purchase. Firms in this context will tend to shift investment towards higher quality varieties thus when they receive investment subsidies.

Ibarra (1995:39-60) explored on the other hand the case of the Mexican trade liberalization of the late 1980s which depicted low investment levels. Drawing from cross country evidence, he estimated empirically the path of the probability reform reversal,

and showed that it can contribute to explain a substantial portion of the observed investment slowdown. Serven (1996) used a large cross-country time series data set and found evidence that uncertainty and instability are important factors behind Africa's poor investment record.

Ouattara (2004) of Nottingham University in his research concluded that there is negative relationship between investment and unexpected swings in economic policy. Serven and Solimano (1993:127-140) and Serven (1998, 1997:229-268) estimated investment equations using panel data, finding significant support for the claim that there is a negative investment-uncertainty link. Sioum (2002) found that in his study the indicators of macroeconomic uncertainty, as represented by volatility of the real exchange rate and the terms of trade were significant. To support this view, Acosta (2005:389-406), on the short run and long run determinants of private investment in Argentina, found that investment decisions were determined in the short run by shocks in returns (exchange rate, trade liberalization) and in aggregate demand. Ghura and Goodwin (2000:1819-1829) in their study found that the adverse effects of external shocks were statistically significant in SSA, a result which makes valid the assertion that SSA is vulnerable to such shocks.

It is inevitable to realize that empirical studies on the impact of uncertainty and irreversibility on investment are few. Amongst such, those at firm level have been fewer. Brainard *et al* (1980:453-502), used a sample of 187 firms to find out the effect of a Capital Asset Pricing Model (CAPM) based measure of risk of investment as a substitute for uncertainty found mixed results. Their cross-sectional regressions results yielded both positive and negative coefficients on risk. Ferderer (1993:30-48) used on the other hand a risk-premium to measure uncertainty and arrived at two main conclusions. Firstly, uncertainty had a negative and statistically significant effect on investment expenditure. Secondly, he concluded that uncertainty has a larger effect than the user cost of capital ratio or Tobin's (average) q.

Devaluation has also been seen from empirics as having impacts on investment (Buffie, 1986:361-379). While it has a stimulative effect on private investment in the tradable goods sector, it will depress investment in the non- traded goods sector.

The volume of international trade, as measured by exports or imports, can be used to represent the openness of an economy. Researchers have proposed a significant positive relationship between exports and domestic investment (Levine and Renelt, 1992). Exports can result in an increased expansion of markets for domestic products and also provide the foreign exchange needed to import capital goods. On the contrary, the effect of imports on domestic investment is less obvious. While the assertion that it impedes investment is plausible, imports can also have a positive effect on investment if increased imports imply greater access to foreign capital goods.

The inflation rate is another indicator of macroeconomic instability, which can have adverse impact on private investment. As a variable also influenced by government spending, it can be considered as an indicator of government efficiency. According Oshikoya (1994:573-596), high and unpredictable inflation distorts the information content of relative prices and increases the riskiness of longer time investment. Greene and Villanueva (1991:33-58) found that a higher inflation rate had negative impact on investment (private) for 23 developing countries in their pooled time series / cross sectional study. Studies by other reseachers, for example, Pindyck and Solimano (1993) find a negative relationship between investment and inflation, inflation variability, exchange rate variability, and interest rate variability. Similar studies have also confirmed the negative relationship between private investment and the inflation rate (Oshikoya, 1994:573-596).

Terms of trade are other important indicators of external shocks to an economy. Adverse movements in terms of trade have been identified as causing an increase in the cost of imports relative to income and also reducing the purchasing power of exports. As a result, severe terms of trade may worsen the ratio of current account deficit to GDP-an indicator of external balance and macroeconomic stability, with adverse consequences on private investment (Oshikoya, 1994:573-596).

Some empirical literature has also found that the user cost of capital negatively affects investment. Bljer and Khan (1984), Greene and Villanueva (1991:33-58) in their studies in developing countries deduced a negative relationship between investment and interest rates. Fielding (1997:349-369), after conducting a study on the aggregate investment in South Africa, concluded that investment is a negative function of the real interest rate. Jenkins (1998:34-61), used a two-step Engle-Granger approach to deal with non-stationarity variables whilst carrying out a study on the determinants of investment in Zimbabwe. She then estimated an aggregated demand function that incorporated accelerator variables as well as financial constraints. She found out that in the long run, investment is positively related to the following variables: gross profit, net capital inflows. In the short run investment responded negatively to the relative cost of capital.

Another important result made toward corporate investment and the user cost of capital relationship emanates from a paper done by Chirinko *et al* (1999:53-80). Their estimated user cost of capital elasticity of -0.25 showed that an increase in the user cost of capital leads to a decrease in fixed capital. Fedderke *et al* (2001) on a study of changing factor market conditions in South Africa found that there is a negative correlation between user cost of capital and growth in capital stock. The relationship according to the study also extends to the investment rate, which was negatively affected by the real user cost of capital. Ghura and Goodwin (2000:1819-1829) in their study found that investment is stimulated by declines in world interest rates. These studies conducted corroborate theory.

The availability of credit can also stimulate private investment, especially in developing countries (Blejer and Khan, 1984) as hypothesized by McKinnon (1973) and Shaw (1973). Ghura and Goodwin (2000:1819-1829) found that though this held for Asia and SSA, in Latin America it was on the contrary. Even increases in credit to the government had significant adverse effects on private investment in SSA and Latin America.

Credit constraints may be more binding in developing economies than the interest rate if credit is rationed or its availability is limited in other ways. However, investment can also be inert as a result of the cost of capital after the structural adjustment reforms implemented in most developing nations. Such reforms led to increases in real interest rates (Greene and Villanueva 1991; Guncavdi, Bleaney, and McKay 1998). Thus, the cost of funding investment projects as well as the unavailability of credit can be expected to play inhibiting roles on private investment in developing countries.

Hussain *et al* (2002) used a time-series study on African countries and deduced that the availability of credit positively affected investment in some African countries among them RSA and Zimbabwe. Another study by Sioum (2002), in agreement with the neo-liberal view also deduced that credit to the private sector had a significant positive relationship with private investment. Several studies have found similar results for a diversified group of developing countries and it happens to hold even for SSA.

Some studies have been unable to discover the effect of changes in real interest rate on domestic saving in developing countries. For example, Giovannini (1985:197-217), examined this issue for 18 developing countries and concluded that for the majority of cases, the response consumption growth to the real interest rate was insignificant. Ultimately, one should expect negligible responses of aggregate saving to the real rate of interest.

To support the above findings, Bandiera *et al* (1998) constructed an index of financial liberalization. They used 8 different indicators; interest rates, pro-competition measures, reserve requirements, directed credit, bank ownership, prudential regulation, securities market deregulation and capital account liberalization. The data they used spanned from 1970 to 1994 for Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey, and Zimbabwe. Amongst their key findings in their estimation, there was no evidence of positive effect of the real interest rate on saving. In most cases, the relationship they deduced is negative, and significantly was so in the case of Ghana and Indonesia.

Other empirical findings have confirmed theoretical postulations of the positive relationship between interest rates and investment (Badawi, 2004:1-27). In a study by Hussain *et al* (2002) in their investment study on African countries found that of the 25 countries in the sample, the real interest rate had a positive impact on total saving in the case of 15 countries. The coefficient on the real interest rate was positive and statistically significant, at the 10 percent level of confidence, in 8 cases. Countries in this category were Burkina Faso, Gabon, Mauritius, Nigeria, Swaziland, Zaire, Zambia, and Zimbabwe. This positive and significant relationship between the real interest rate and total saving, suggested that in the case of these countries the positive substitution effect of real interest rates outbalances the negative income effect. In the same study, the supply of credit was found to be positively related to investment in South Africa and Zimbabwe.

Furthermore, for Zimbabwe, the interest rate was found to be positively related with investment though insignifiant with a t-value of 1.5. The sign was also positive for Burkina Faso, Morocco, Niger, Sierra Leone, Senegal, Swaziland and Tanzania. As discussed before, a positive and significant relation between the real interest and investment implies that saving is positively related to the real interest rate. However it was negative for Gabon, Kenya, Madagascar, Mali, Mauritius, Nigeria, South Africa, Togo, and Tunisia.

Elsewhere, some studies have documented a close connection between low investment rates in developing countries and low domestic savings (Bayoumi, 1990:360-387; Dooley, Frankel and Mathiesen 1987:503-530; Feldstein and Horionka, 1980:314-329). As such these studies found that countries with low savings also had low investment. The positivie relationship between saving and investment is associated with imperfect international capital flows (Ndikumana, 2005: 381-400)

On debt, Jenkins (1998:34-61) on a study in Zimbabwe deduced that the debt to GDP ratio was found to be negatively affecting investment. Sioum (2002) also arrived at the same conclusion that government borrowing from the domestic banking system undermined private investment in the region indicating the existence of financial

crowding out. Also, Mbanga and Sikod (2001) on their study in Cameroon deduced that debt crowds out private investment.

Going further, the relationship between investment and the country's indebtedness to the international community has been highlighted in many empirical investigations. It was shown how mounting debts and services 'overhang' private initiatives and thereby hamper productive expansion and prospects for future growth and prosperity (Dooley 1986; Iyoha 2000; Sachs 1990:19-29).

Oshikoya (1994:573-596) from his empirical findings, agrees that the presence of large external debt burden constitutes another source of uncertainty in the macroeconomic environment. However, Ghura and Goodwin (2000:1819-1829) could not confirm in their study the significant adverse effects of external debt on private investment. Nevertheless, high debt to GDP ratio has a strong and negative impact on the private investment rates in developing countries as debt services to the international community crowd out resources for investment Ghura and Goodwin (2000:1819-1829).

Some studies have shown investment as affected by labour. Fielding (1997:349-369), found a positive correlation between labour costs and investment. This suggested a substitution between capital and labour. Labour costs encourage capital-labour substitution if labour costs are rising faster than labour productivity.

As other notable findings, foreign aid flows have been associated with increased investment in some empirics. This happens if donors use it to provide private credit via local institutions and non-governmental organizations (Oshikoya 1994:573-596). Another quite interesting result relates to an important role played by education which was seen as stimulating private investment (Ghura and Goodwin, 2000:1819-1829).

It is widely contended that investment is not only responsive to measured observable factors, but is also a determinate of macroeconomic and institutional settings in which investment and its determinants interact. Some empirics have deduced that if financial

markets are repressed and hence not sound, credit policies will discourage and affect private sector investment. This is via the stock of credit available to firms that have access to preferred rates of interest (Oshikoya, 1994:573-596). Even socio-political changes affect investment behaviour. Macroeconomic instability has received a prime attention, with a view asserting the unfavourable impact of macroeconomic instability on private investment (for example Aryeetey 1994:1211-1221). Investment determinants are therefore multi-dimensional.

As one of the factors not given much consideration in most investment related research has been the role of institutions. These, some empirics have shown, may play pivotal role in inducing private investment. In this scenario, institutions that protect and foster market exchange, like the protection of property rights, minimal barriers to trade, low taxes, and minimal regulatory barriers, as such are likely to encourage private investment.

De Haan and Siermann (1998), on their study on the relationship between economic freedom and economic growth, compared various indices of economic freedom constructed by Scully and Slottje (1991) and Gwartney, Lawson, and Holcombe (1999) and found that the measured effect of these institutions on economic growth depends on the measure used. Dawson (1998), using the economic freedom index by Gwartney, Lawson, and Holcombe (1999), found that market institutions had a positive impact on economic growth, and therefore encouraged aggregate investment. A similar result was deduced by Vamvakidis (1998) undertook an analysis on eight African countries using the Gwartney, Lawson, and Holcombe index and showed that various components as well as the summary measure of economic freedom had a positive relationship with the share of aggregate investment in GDP.

3.4 General assessment and evaluation of the Literature.

In general, literature on investment tries to explain how firms, given a set of motives, select their optimal capital stock and how the selected optimal capital stock is affected by variations in the degree of uncertainty about future prospects. Thus, theoretical literature can be defended as being diverse. Some theories, in their ability to address the

accumulation of fixed capital by the private sector; however have given more attention in models formulated for industrialized and developed economies.

The main components in investment behaviour from theoretical analysis can be classified as the expected profits theory, accelerator theory, and neo-classical theory. Without doubt, the neo-classical flexible accelerator theory has been the most popular. Empirical tests of this theory using data from several countries have been extensively applied. However, salient and underlying assumptions of some theories, for example perfect capital markets and little or no public sector investment do not recur in most developing countries. Furthermore, institutional and even data restrictions in developing countries have made it difficult for empirics to be done satisfactorily on neo-classical theory. Data on some variables like labour force, wages, and real financial rates for debt are not readily available for perusal. Zimbabwe is a typical example.

Although theoretical literature has provided valid assertions on the determinants and behaviour of investment, it has failed to some extent to offer a practical explanation of determinants of investment. From analyzing theory, variables that may be included in the Keynesian tradition include growth rate of GDP, internal funds (for example, change in credit to the private sector) and capacity utilization. A major setback to the Keynesian view is that even though it asserts the rate of return as an influence to investment, the hypothesis becomes complicated by factors such as political uncertainty which may discourage investors despite a high rate of return.

Moving to the neoclassical determinants of private investment we have Tobin's Q, real interest rate, and user cost of capital. Also found wanting in this theory is a presumption asserting that investment takes place up to when the marginal cost equals the marginal return of capital. As a weakness of this assertion is the fact that potential variability of future expectations in returns and costs are ignored (TIPS 2000:1-123).

Empirical literature has identified investment as the most important determinant of economic growth. This strong relationship between investment and growth has aided

researchers to realize that low investment is the cause of slow growth in developing countries (Collier and Gunning, 1999:64-111; Greene and Villanueva, 1991:33-58).

The general trend in empirics has depicted few earlier studies on investment associated with African countries. The main cause highlighted for these few countries is data paucity. As examples, Greene and Villanueva (1991:33-58), Fitzgerald et al (1992) and Serven and Sollimano (1991) each has three to four African countries in their sample. However, the study by Serven (1998:229-268) boasts of the largest number of African countries. Of these, 40 belong to SSA in a model comprising of 84 developing countries.

Studies have confirmed the ambiguous nature of some variables. For example, Ghura and Goodwin (2000:1819-1829) deduced the unambiguous nature of public investment. However, it is tenable to conclude that public investment may crowd out private investment when they compete for the same resources. The effect might be significant when public investments are made in state enterprises that produce output that competes with the goods and services provided by private sector.

In other circles, empirical findings have refuted some of the theoretical claims. As an example, Hadjimichael and Ghura (1995) in their study could not find the strong adverse effect on investment of macroeconomic uncertainty indicators like inflation and exchange rate. Even Ghura and Goodwin (2000:1819-1829), deduced that while in Asia GDP growth stimulated private investment, its effect was not significant in SSA. These results in a way have violated the uncertainty and accelerator theories of investment.

Even as early as in the 1990s, many developing countries without doubt have had to consent with policies of financial reform and liberalization intended to promote capital markets. Despite the fact that standard economic theory asserts the negative relationship between investment and the rate of interest, the effect of changes in the real rate of interest on private investment in some developing countries may depend on the level of financial sophistication. As an example, in a typical financially repressed economy, an

increase in the rate of interest may bring about a flow of deposits that enable increased investment to be undertaken (Fry 1988). Whilst it is tenable that a higher real interest rate may raise the cost of capital and impede investment, empirical evidence on the importance of the real interest rate variable is country specific and mixed (Gibson and Tsakalotos 1994).

Going further, even though some approximations for political instability have been widely used in cross-country growth models, their explanatory power has been proved limited. Serven (1998:229-268) included as proxies for political instability seven indicators. However, none of these indicators were statistically significant, with only three of them bearing expected negative signs. Hadjimichael and Ghura (1995) also found in their study positive and significant relationship between private investment and an index of political and civil liberty for 32 African countries for the period 1986-1992. This adds to the list of factors found in studies refuting theory.

As another potential weakness of most empirics is the fact that some studies go only a little further beyond identifying statistical relationships. Thus they provide little analysis of policy options and therefore do not give sufficient attention to challenges facing policy makers especially in developing countries. In spite of such, theory has stimulated empirical studies. Most of these studies have corroborated theory and furthermore, some results tend to be sensitive to a specified model, study period and country group.

Box 3: List of some outstanding factors affecting investment.

Factor	**Theory**	**Empirics, effect on investment**
Profitability	Keynesian Hypothesis	**Confirmed, positive.** Harris et al (1994:17-47), Bond and Meghir (1994:197-222)
GDP growth	Accelerator theory	**Confirmed, positive.** Ghura and Goodwin (2000:1819-1829),

		Sioum (2002).
Public Investment		**Confirmed, ambiguous.** Ghura and Goodwin (2000:1819-1829), Jenkins (1998:34-61).
Uncertainty	Rodrik (1989), (Pindyck, 1991:1112)	**Confirmed, negative.** Ingersoll and Ross (1992:1-29), Hausman and Gavin (1995)
Macroeconomic Instability	Rodrik (1989), Jorgenson (1967:129-156; 1971:1114-1147).	**Confirmed, negative.** Oshikoya (1994:573-596),Greene and Villanueva (1991:33-58), Fielding (1997:349-369), Jenkins (1998:34-61)
The effect of interest rates on Investment.	McKinnon-Shaw Hypothesis	**Can be country specific.** Demirgüç-Kunt and Detragiache (1998). Bandiera, Caprio, Honohan and Schiantaselli (2000), Husain *et al* (2002) and Asante, (2000).

Theoretical literature has shown how firms make investment related decisions after considering the variables affecting thereof. The variables therefore range from the measurable profitability to the often immeasurable institutional settings and political environments.

Empirical considerations have made progress towards supporting major theoretical considerations. However, as shown from the literature evaluations, some empirical findings have refuted theory. Nevertheless, validity of theoretical literature has gained ground by most empirical works on investment, which undoubtedly have corroborated theory. Other empirical findings however have shown that theory still has to offer more as shown by some findings which were not given regard in theory but have proved

empirically to influence fixed capital formation. As examples, the roles played by foreign aid and education in stimulating investment.

From theoretical and empirical findings in the two countries under study, variables not usually given rigor in the past studies include amongst others; uncertainty and instability. Also from the empirical literature above, the most useful work to this intended study is that of Badawi (2004:1-27) for his study conducted in Sudan. However, the study did not capture some of the valid factors explained by theory and proven by empirical studies such as debt, Inflation and political instability. In the case of the two countries to be studied, these factors are likely to hamper investment and therefore rigorous analysis of them should be given attention in the investment equations. It is important that as part of the determinants of private investment that lie in the range of policy interventions, they are also analyzed to detail to improve reform measures on investment.

CHAPTER FOUR

Research Methodology.

4.1 Introduction

The previous chapter outlined the theoretical and empirical considerations of factors affecting investment demand. In this chapter we formulate a model explaining as to what extent these factors affect investment for the countries under study. The research uses models reformulated to expound on the behavior of investment demand in RSA and Zimbabwe. The general objective is to find out the determinants of investment behaviour. Further than that, the study also seeks to be more comprehensive by including economic and socio-political uncertainties in the investment model for this study, an aspect not rigorously addressed in many investment demand models tested for RSA and Zimbabwe.

4.2 The General Model Specification

The research methodology employed involves specification, estimation and analysis of investment demand models for both countries. Based on the discussion in the literature review, here we specify the determinants of private investment. The model incorporates elements of neoclassical, Keynesian traditions, neo-liberalist views and it also emphasizes the role of demand as a determinant of investment.

The reformulated model differs from the one used by Badawi (2004:1-27) for his study conducted in Sudan on fixed capital formulation. The study used a cointegrated vector autoregressive (VAR) model combining cointegration analysis and vector autoregressive time series processes. For this study, the reformulated model adopts an error correction model. As such, it eliminates spurious correlations among variables. Furthermore, using an error correction models (ECMs) encompassing the cointegrated VAR technique differentiates between long-run and short-run impacts of explanatory variables, hence providing an invaluable tool for policy analysis.

The model for the time series analysis consists of some of the variables in the equation which is an autoregressive distributed lag investment equation used by Badawi (2004:1-27) for the

study conducted in Sudan. This is the general model to be used for the study and is written as follows:

$$Z_t = A_0 D_t + A_1 Z_{t-1} + A_2 Z_{t-2} + \ldots\ldots + A_k Z_{t-k} + \in_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

The above is the general equation to be followed and in this equation, Z is an $n.1$ vector containing all n variables in the system. Included under Z are the variables determining investment. D in this case is a vector representing deterministic terms. Here we find intercepts, trends and dummies. $\in$ is an n dimensional vector of multivariate random errors with mean zero and covariance matrix Σ.

However, Badawi's model is reformulated as it does not capture some of the economic variables which play roles in determining investment behaviour in the countries to be studied. Amongst such variables we have the government debt, the inflation rate and political instability. Badawi's model is modified hereunder and the specific equation for this study is thus stated as:

$$I_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 GovD_t + \alpha_3 Inf_t + \alpha_4 r_t + \alpha_5 I_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.2)$$

$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ are the coefficients for the explanatory variables are and ε_t is the error term at time t.

Where: I_t = current year private investment,

GDP_t = real output, as according to the accelerator theory. Empirical studies have verified the positive relationship between an economy's output and investment (Ghura and Goodwin, 2000:1819-1829; Ndikumana 2000:381-400 and Sioum, 2002). We therefore expect a positive relationship between I_t and GDP_t.

$GovD_t$= Government debt. Its effect on investment is expected to be negative since empirics have verified that high debt overhand private investors' initiatives. High government domestic debt also discourages firms to make long term investments. Jenkins

(1998:34-61) on a study in Zimbabwe deduced that the debt to GDP ratio was found to be negatively affecting investment. Further than that, a country's debt obligations to the international community, empirics have revealed, can drag investment (Dooley 1986; Iyoha 2000; Sachs 1990:19-29). In light of this we expect Government domestic debt to negatively affect I_t.

Inf_t=Annual inflation rate. As an indicator of macroeconomic instability, inflation can hamper investment. Also influenced by government spending, inflation spells out the level of government efficiency. According to empirics, (Oshikoya, 1994:573-596, Greene and Villanueva, 1991:33-58), high and unpredictable inflation distorts the information content of relative prices and increases the riskiness of longer time investment. We therefore propose a negative association between inflation and investment.

r = interest rate which in this case is a proxy for the user cost of capital component. Some studies have supported the neo-classical theories, hence the negative relationship between r and I_t (Fielding, 1997:349-369; Jenkins, 1998:34-61). However, for some developing countries the effect of the interest rate remains an empirical issue and hence can be positive (Asante, 2000; Badawi, 2004:1-27) therefore holding the neo-liberalists theory as valid. In such cases, the data supports the McKinnon-Shaw hypothesis for developing countries.

I_{t-1} = private investment lagged one period, which we expect to be positively related to current year private investment. This assertion we consider to be valid since investors, rational as they are, do consider previous year's level of investment. All these variables are in natural logarithm. Under VAR system of equations, Eq. (4.2) is one of the equations where all variables were defined in terms of other variables and their lagged values and variable's own lagged value. The error correction representation of equation (4.2) can take the form:

$$\Delta Z_t = A_o D_t + \Pi Z_{t-1} + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 Z_{t-2} + ... + \Gamma_{k-1} \Delta Z_{t-k+1} + V_t \quad \text{.....(4.3)}$$

(Badawi, 2004:1-27)

Thus equation (4.3) shows how long run impacts on elements of Z are incorporated in short term dynamics or forces. There are some variables that are associated especially with both economies more so with the Zimbabwean economy, but because of data paucity could not be captured in time series methodology. From quantitative variables we have foreign aid inflows, budget deficit, labor, the number of strikes and related disturbances to production, the real exchange rate. On the qualitative variables affecting investment we have policy uncertainty and negative perceptions about the economy which cannot be easily quantified and therefore will be captured as a dummy variable.

4.3 Definition of variables and Data Characteristics.

4.3.1: For RSA and Zimbabwe:

Total Private Investment (I_t) is GFCF. GFCF is the aggregate of the corporate sector expenditure on fixed assets. These include amongst others: construction of buildings, purchase of machinery and equipment.

For this study, *GDP* depicts RSA and Zimbabwe's output in real value. It is thus Gross Domestic Product at constant 2000 prices measured in United States million dollars (U.S $M).

Government debt (GovD), an indicator of indebtedness is represented by government domestic debt. The bulk of the debt comprises of treasury bills (TB) and the accompanying interest payments due.

Inflation is the annual increase in the consumer prices as represented by the consumer price index excluding mortgage for RSA (CPIX) and CPI for Zimbabwe.

The *interest rate* to be used will be the nominal bank lending rates. For RSA, the proxy used is the annual repo rate and for Zimbabwe it is the nominal bank lending rate.

The model is estimated for RSA and Zimbabwe for the period 1980-2006, thus covering economic and political significance as both countries went through economic revival programs. RSA attained freedom in 1994 after going through economic and political instability. Two years later it adopted structural and economic programs to reverse the signs of a shrinking economy. It is therefore important that the study period captures all these years so as to assess the impact of these events and their influence on investment and ultimately economic growth.

Zimbabwe's independence came in 1980. However, economic reform programs were introduced 10 years down the line as the economy's macro pointers showed continued signs disrupting economic growth. The study finds out the contribution of economic reform programs adopted towards enhancing investment in the country. In these 27 years of study the research seeks to enlighten on the factors contributing to the fluctuating and of late very low levels of investment. Further than that, policies to be availed to ensure sustained increase in investment for both countries will be deduced from the results.

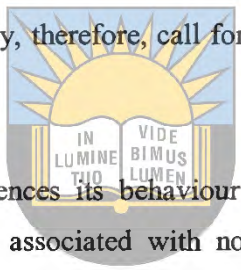
For this study, Secondary data is used as it is readily available and allows time series investigation. Annual data for both countries is employed also as to accommodate Zimbabwe whose monthly and quarterly statistics are not consistent. The main data sources, apart from the Reserve Bank of Zimbabwe and Central Statistical Office for Zimbabwe and South African Reserve Bank and Statistics South Africa for RSA are the World Bank World Tables and World Debt Tables; IMF Publications, International Financial Statistics, and SADC bankers. The underlying trend for these data sources exhibits a similar pattern.

Highlighting the paucity of the data, especially more so for Zimbabwe, some of the factors which were suggested by theory and proven by empirical studies had to be dropped. Very wide data lapses were the fundamental reason to drop such variables, as this made inferencing difficult. For some variables, data would be missing for up to ten observations, yet in others up to twelve and fifteen observations. Amongst such variables were Domestic credit, real exchange rate and foreign aid.

4.4: Model Estimation

4.4.1 Stationarity and Unit Root Testing

This study makes use of the Dickey – Fuller (D F) and the Augmented Dickey – Fuller tests (Dickey and Fuller, 1979:427-431) to test for series stationarity for both countries as data ought to be stationary when entering the system. South Africa experienced economic instability, especially in the early 1990s. Such instability then means that the macroeconomic data is not stationary for such periods hence the need for stationarity tests. In a more extent than South Africa, Zimbabwe has hosted at least for the past nine consecutive years, very unstable macroeconomic indicators. These are more likely to exhibit a non stationary trend. They, therefore, call for stationarity tests so that a proper model can be fit.



The stationarity of a series influences its behaviour and properties. As an example, obstinate recurrence of shocks is associated with non stationary series. Furthermore, another phenomina associated with non stationarity is spurious regressions. Here for example if two variables are trending over time, regressing them could produce a high R^2 even if the two do not have any relationship. Thus if the variables are not stationary, we cannot make hypothesis tests on the parameters since the t-ratios for variables in the regression model will not be following the t-distribution, hence the need for stationarity tests. According to Granger and Newbold, if $R^2 >$ Durbin-Watson (DW) value, "this is a good rule of thumb to suspect that the estimated regression is spurious" (Gujarati, 2003:807). Thus, to solve for non- stationarity, if say, a non-stationary series, y_t must be differenced d times before it becomes stationary, then it is said to be integrated of order d. We write $y_t \sim I(d)$. It follows that if $y_t \sim I(d)$, then $\Delta^d y_t \sim I(0)$. Thus an I(0) series is stationary. An I(1) series contains one unit root, for example $y_t = y_{t-1} + u_t$

The usual norm is that I(1) and I(2) series stray a long way from their mean values and they rarely cross the mean. I(0) series, on the other hand should cross the mean frequently. The majority of economic and financial series contain a single unit root, although some are stationary. To estimate a formidable model, the data enters the model stationary. We therefore expect the variables to enter the model in the first difference.

4.4.1.1 Three forms for the DF Test Regressions

For this study, the Dickey-Fuller test will be used to test for stationarity of the series. Dickey Fuller tests are also known as tau tests(τ). The null (H_0) and alternative (H_1) hypothesis in each case are

1. H_0: $y_t = y_{t-1} + u_t$

   H_1: $y_t = \Phi y_{t-1} + u_t$, $\Phi < 1$

   1 is a test for a random walk against a stationary autoregressive process of order one (AR(1))

2. H_0: $y_t = y_{t-1} + u_t$

   H_1: $y_t = \Phi y_{t-1} + \beta_1 + u_t$, $\Phi < 1$

   2 is a test for a random walk against a stationary AR(1) with drift.

3. H_0: $y_t = y_{t-1} + u_t$

   H_1: $y_t = \Phi y_{t-1} + \beta_1 + \beta_2 t + u_t$, $\Phi < 1$

   3 is a test for a random walk against a stationary AR(1) with drift and a time trend.

The decision rule of rejecting the null hypothesis therefore means that the data is stationary otherwise if the null is not rejected, then the data is I(1), thus has a unit root.

Therefore the decision rule is to reject the null hypothesis of a unit root in favor of the stationary alternative in each case if the test statistic is more negative than the critical value. Thus in computing the DF statistic, we have to write in the form $\Delta y_t = y_t - y_{t-1}$. The alternative hypothesis is expressed as $\Delta y_t = \Phi y_{t-1} + u_t + \beta_1 + \beta_2 t$. Here, $\beta_1 = \beta_2 = 0$ in the first case, and only $\beta_2 = 0$ in the second case and finally $\beta_1 \neq \beta_2 \neq 0$ in the third case. $\Phi = p-1$. These tests are based on the t -ratio on the y_{t-1} term in the estimated regression of Δy_t on y_{t-1}, plus a constant in the second case and a constant and trend in the third case. The test statistic is defined as

$$= \frac{\hat{\sigma}}{SE(\hat{\sigma})},$$

Where $SE(\hat{\sigma})$ is the standard error of Φ.

However, this test statistic does not follow the t-distribution under the null hypothesis as the null is one of non-stationarity. It follows rather, a non-standard distribution. Critical values are derived from Monte Carlo experiments in for example, Fuller (1979:427-431). The null hypothesis of a unit root is rejected in favour of the stationary alternative in each case if the test statistic is more negative than the critical value.

4.4.1.2 The Augmented Dickey-Fuller Test.

The DF test is valid if u_t is white noise. Nevertheless, u_t is autocorrelated if there was autocorrelation in the dependent variable of the regression (Δy_t) which is not modeled. In other words, in the DF test it was assumed that the error term u_t was uncorrelated. The solution here is to "augment" the test using m lags of the dependent variable. Thus the alternatives for the three cases become:

$$\Delta Y_t = \phi Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta y_{t-i} + u_t \quad \text{.....(4.4)}$$

$$\Delta Y_t = \phi Y_{t-1} + \beta_1 + \sum_{i=1}^{m} \alpha \Delta Y_{t-1} + u_t \quad \text{.....(4.5)}$$

$$\Delta Y_t = \phi Y_{t-1} + \beta_1 + \beta_2 t + + \sum_{i=1}^{m} \alpha \Delta Y_{t-1} + u_t \quad \text{....(4.6)}$$

Here, u_t is a white noise error term and $\Delta y_{t-1} = (y_{t-1} - y_{t-2})$, $\Delta y_{t-2} = (y_{t-2} - y_{t-3})$. Thus equation (4.4) is for the first case under ADF and (4.5) for the second case and finally (4.6) is the third case, with constant and drift. The ADF also tests whether $\Phi=0$ and hence it uses the same critical values as those from the DF tables. A problem however arises in determining the optimal number of lags of the dependent variable. There are two ways of doing this. One way is to use the frequency of the data to decide. The other alternative is to use information.

The main idea behind introducing the lags is to include enough terms so that the error term is serially uncorrelated (Gujarati, 2003:817). To be more precise on the optimal number of lags for the ADF, including too few will not remove all of the autocorrelation while using too many will increase the coefficient standard errors. The latter arises since an increase in the number of parameters to estimate uses up the degrees of freedom. Therefore, this will result in a reduction in the power of the test, implying that for stationary process the null hypothesis of a unit root will less likely be rejected than would had been the case otherwise (Gujarati, 2003:822). In this case using annual data, empirics have favoured one lag in the case of a small number of observation (in this study 27 observation) so as to avoid the danger of running into a problem with the degrees of freedom.

4.4.2 Tests for Cointegration

Literature on cointegration has focused on the case in which each variable contains a single root. The reason being that traditional regression and time series applies when variables are I(0). Empirics have shown that few economic variables are integrated of order higher than unity. Stock and Watson (1988:1097-1107) observed that cointegrated variables share common stochastic trend. This is useful in understanding cointegration

relationships. The essence of their argument is that cointegrating vectors must be such that they purge the trend from the linear combination.

Variables are cointergated if they have a long-run, or equilibrium relationship between them. From Engle and Granger's definition, cointegration refers to variables that are integrated of the same order. As Granger notes, "A test for cointegration can be thought of as a pre-test to avoid 'spurious regression situations"(Granger, 1986:226). To estimate the investment function for both countries, this study uses the technique of cointegration and error correction (Engle and Granger, 1987, Hendry, 1994).

Cointegration thus refers to a linear combination of non-stationary variables. But not all integrated variables are cointegrated. Such a lack of cointegration implies no long run equilibrium among the variables, so that they can wander arbitrarily far from each other. Cointegration analysis therefore seeks to establish the maximum number of linearly independent relationships in the system; in other words to determine the rank of the long-run matrix$\prod$. Matrix $\prod$ is thus split two matrices α and β. Where as the matrix α contains long-run adjustment coefficients, matrix β contains longrun coefficients or elasticities. Therefore, the major reasons behind carrying out cointegration analysis are:

(i) Test for presence of long-run stationary relationship(s) between variables. This is done so as to deduce whether in the long run there are spurious relationships.

(ii) To identify estimate long-run relationships in the system by use of cointegrating vectors (βs) or parameters.

(iii) To estimate long-run coefficients of adjustments αs (loading coefficients).

(iv) Employ long-run information to estimate VECMs which describe short-term dynamics. (Badawi, 2004:1-27)

Some data however can be non-stationary but yet still, possibly cointegrated. Three common tests for cointegration are briefly discussed below.

4.4.2.1 The Engle-Granger 2-Step Method

The Engle–Granger two-step method proceeds as follows. In the first step, theory and econometric evidence are used to determine whether the data contain unit roots in the individual time series. If so, the analyst estimates the long-run relationship, $\hat{\beta}$, in a first-step static cointegrating regression of y on x, where x may be a vector:

$$Y_t = \alpha + \beta X_t + \upsilon_t \quad \text{.....(4.7)}$$

If the residuals from the cointegrating regression exhibit short memory, then the time series are said to be cointegrated and we may proceed with the second-step regression. In the second step, changes in y are regressed on changes in x and the previous period's equilibrium error (the residuals from the cointegrating regression) to estimate the equilibrium rate, $\hat{\gamma}$, and short-run dynamics, $\hat{\lambda}_2$:

$$\Delta Y_t = \lambda_1 + \lambda_2 \Delta X_t - \gamma \hat{u}_{t-1} + \eta_t \quad \text{.....(4.8)}$$

Additional or alternative lags (and deterministic terms) may be included as well. We know that estimates of the long-run relationship and inferences drawn from these estimates using the Engle–Granger two-step estimator perform well only under limited conditions. Furthermore, the Engle-Granger 2 step suffers from a number of problems;

1. The usual finite sample problem of a lack of power in unit root and cointegration tests.

2. There could be a simultaneous equations bias if the causality between y and x runs in both directions, but this single equation approach requires the researcher to normalize on one variable, in other words to specify one variable as the dependent variable and the others as the independent variable. The researcher is forced to treat y and x asymmetrically, even though there may have been no theoretical reason for doing so. If there is an error in the model specification at stage 1, this will be carried through to the cointegration test at stage 2, as a consequence of the sequential nature of the composition of the cointegration test statistic,

3. It is not possible to perform any hypothesis tests about the actual cointegrating relationship estimated at stage 1.

However, problems 1 and 2 are small sample problems that should disappear asymptotically. Problem 3 is addressed by another method credited to Engle and Yoo (Brooks, 2002:393-395).

4.4.2.2 The Engle and Yoo 3 step Method

This method takes the first two steps from the Engle-Granger technique. Then Engle and Yoo add a third step giving updated estimates of the cointegrating vector and the accompanying standard errors. The Engle and Yoo step is however algebraically technical and also suffers from all of the remaining problems of the Engle-Granger approach (Engle and Yoo, 1987:143-59). A superior method than these two above exists and is discussed below.

4.4.2.3 The Johansen Technique

According to Enders (2004:354-366), an interesting aspect of the Johansen procedure is that it allows for testing restricted forms of the cointegrated vector(s). If there are r cointegrating vectors, only these r linear combinations of the variables are stationary. Other than these, other linear combinations will be non-stationary. Johansen (1991:155-180), proved that if the test statistic is large enough, then it becomes more likely that the null hypothesis of an intercept in the cointegrating vector(s) is rejected and conclude therefore that there is a linear trend in the variables.

The Johansen test centres around an examination of the Π matrix. Π is interpreted as a long-run co-efficient matrix. The test for cointegration between the Ys is calculated by looking at the rank of the Π matrix via its eigenvalues. The rank of a matrix is equal to the number of its characteristic roots (eigenvalues) that are different from zero. The eigenvalues are put in ascending order. Thus $\lambda 1 \geq \lambda 2 \geq \ldots\ldots \lambda g$. If the λs are roots, they must be less than 1 in absolute value and positive, and $\lambda 1$ will be the largest closest to 1. on the other hand, λg will be the smallest closest to zero. If the variables are not cointegrated, the rank of Π will not be significantly different from zero, so that $\lambda i \approx 0 \; \forall \; i$.

the test statistics incorporate ln (1-λi), rather than the λi themselves but still, when λi=0, ln(1-λi)=0.

If the eigen value is non-zero, then ln(1-λi)<0 ∀ i>1. That is, for to have a rank of 1, the largest eigenvalue must be significantly non-zero, while other eigen values will not be significantly different from zero. Two test statistics for cointegration are employed under the Johansen technique and are formulated as:

$$\lambda \text{ trace (r)} = -T\sum_{i=r+1}^{g}\ln(1-\hat{\lambda}_i) \quad \text{and}$$

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

where r is the number of cointegrating vectors under the null hypothesis and $\hat{\lambda}_i$ is the estimated value for the i^{th} ordered eigenvalue from the Π matrix. Therefore, the larger is $\hat{\lambda}_i$, the more large and negative will be the test statistic. Each eigenvalue will have associated with it a different cointegrating vector, which will be eigenvectors. A significantly non-zero eigenvalue indicates a significant cointegrating vector. λ trace is a joint test where the null hypothesis is that the number of cointegrating vectors is less than or equal to r against the alternative that there are more than r. It starts with p eigenvalues, and then successively the largest is removed. λ trace =0 when all the λi =0, for i=1…..g.

λ max conducts separate tests on each eigenvalue. The null hypothesis is that the number of cointegrating vectors is r against the alternative of r+1. Johansen and Juselius (1990) provide critical values for the two statistics. The distribution of the test statistics is non-standard, and the critical values depend on the value of g-r, the number of non-stationary components and whether constants are included in each of the equations. Intercepts are included either in the cointegrating vectors themselves or as additional terms in the VAR. The latter is equivalent to including a trend in the data generating process for the levels of the series.

Thus the maximumum eigen value provides an alternative to the trace statistic for the number of cointegrated variables. Johansen and Juselius observe that the maximum eigen value is more reliable then the trace test in identifying the number of cointegrated variables. The tests can reveal that a long term relationship exist between the variables

If the test statistic is greater than the critical value from Johansen's tables, we reject the null hypothesis that there are r cointegrating vectors in favour of the alternative that there are r+1 (for max) or more than r (for trace). The testing is conducted in a sequence and under the null r=0,1,….,g-1 so that the hypotheses for λ max are:

$H_0 : r = 0$ versus $H_1 : 0 < r \leq g$

$H_0 : r = 0$ versus $H_1 : 1 < r \leq g$

….. … …….. .. …..

$H_0 : r = 0$ versus $H_1 : r = g$

The first test involves a null hypothesis of no cointegrating vector (corresponding to Π having zero rank). If this null is not rejected, it would be concluded that there are no cointegrating vectors and the testing would be completed. However, if $H_0 : r = 0$ is rejected, the null that there is one cointegrating vector (that is $H_0 : r = 1$) will be tested and so on.

Thus the value of r is continuously increased until the null is no longer rejected. r therefore is the rank of Π. Π cannot be full rank (g) since this would correspond to the original Y_t being stationary. If Π has zero rank, then by analogy to the univariate case, ΔY_t depends only on ΔY_{t-j} and not on Y_{t-1}. Hence there is no cointegration. For 1< rank (Π) < g, there are r cointegrating vectors. Π is then defined as the product of two matrices, α and β' of the dimension (g x r) and (r x g), respectively, that is $\Pi = \alpha\beta'$

Matrix β' captures cointegrating parameters and α is the matrix of weights with which each cointegrating vector enters the n equations of the VAR. Matrix α can also be viewed as the matrix of the speed of adjustment parameters. Due to the cross equation restrictions, it is not possible to estimate α and β' using OLS.

In order to properly execute the Johansen method, as a starting point, the relationship between the dependent variable and the explanatory variables is explored using the usual Ordinary Least Squares (OLS) techniques so as to identify long-run cointegrating relationships and error correction mechanisms (Frain et al, 1996:1-43). As the next step, we estimate a VAR without imposing a structure on the data. Tests of cointegration are then carried out using the Johansen method so as to identify long-run relationships in the system. The cointegrating vectors thus obtained are examined and, if appropriate, incorporated into a parsimonious model of the VAR system in first differences - i.e. an I(0) system.

4.4.3Cointegration and Error Correction Model (ECM)

In an ECM, the short term dynamics of the variables in the system are influenced by the deviation from equilibrium (Enders, 2004:329). There is a class of models that uses a combination of first differenced and lagged levels of cointegrated variables as a way of obtaining long run solution amongst variables. Considering the model below:

$$\Delta Y_t = \beta_1 \Delta X_t + \beta_2 (Y_{t-1} - \lambda X_{t-1}) + \mu_t \quad \text{.....(4.9)}$$

The above model is known as an ECM or alternatively an equilibrium correction model. It is explained as follows. The term $Y_{t-1} - \lambda X_{t-1}$ is known as the error term. A necessary condition is that Y_t and X_t are cointegrated with the cointegrating coefficient λ then $(Y_{t-1} - \lambda X_{t-1})$ will be I(0) even though the constituents are I(1) (Brooks, 2002:389). It becomes valid then to use OLS and standard procedures for statistical inference on the equation above. It is also possible to have an intercept in either the cointegrating term, for example $Y_{t-1} - \alpha - \lambda X_{t-1}$ or in the model for ΔY_t for example,

$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t + \beta_2 (Y_{t-1} - \lambda X_{t-1}) + \mu_t$ or both. Whether a constant is included or not could be determined on the basis of financial theory.

The ECMs can also be interpreted as follows. Y is purpoted to change between t-1 and t as a result of changes in the values of the explanatory variables, the Xs between t-1 and t and also in part to correct for any disequlibrium that existed during the previous period. The error correction term $(Y_{t-1} - \lambda X_{t-1})$ appears in (4.9) with a lag. It would be unreasonable for the term to appear without any lag $(Y_t - \lambda X_t)$ for this would mean that Y changes between t-1 and t in response to a disequilibrium at time t. λ defines the LR relationship between X and Y. β_1 on the other hand describes the SR relationship between the change in X and the change in Y. β_2 describes the speed of adjustment back to equilibrium, and its strict definition is that it measures the proportion of last period's equilibrium error that is corrected for. Therefore, an ECM can be estimated for more than two variables. For example in this study, if there were five variables, Y_t, X_1, X_2, X_3, X_4, that were cointegrated, a possible ECM would be of the form:

$$\Delta Y_t = \beta_1 \Delta X_1 + \beta_2 \Delta X_2 + \beta_3 \Delta X_3 + \beta_4 \Delta X_4 + \beta_5 (Y_{t-1} - \lambda_1 X_{1t-1} - \lambda_2 X_{2t-1} - \lambda_3 X_{3t-1} - \lambda_4 X_{4t-1}) + \mu_t \quad (4.10)$$

To further give much importance of cointegration and ECM, some authors argue that cointegration and ECM are isomorphic. They further purport that this isomorphism only holds when series are integrated. As such, they see error correction models as unsuitable for stationary data (Durr 1993a:185-228; Smith 1993:249-254). Smith (1993) reasons that even though error correction models predate the theory of cointegration, the data modeled with early error correction mechanisms have tended to be cointegrated. The error correction model is thus particularly powerful since it allows an analyst to estimate both short term and long run effects of explanatory time series variables.

4.4.4.Diagnostic Tests

4.4.4.1Test for Autocorrelation

If we have a linear regression model of the form:

$$y_i = \beta_1 + \beta_2 x_{2i} + \beta_3 x_{3i} + ... + \beta_{ki} x_{ki} + \varepsilon_i (\text{I} = 1,2,...\text{n}) .....(4.11)$$

we then make the following assumptions about the error term, ε_t:

1. $E(e_t) = 0$
2. $E(e_t) = \sigma^2$
3. $E(e_t e_{t+5}) = 0$

From the above assumptions, if the third assumption does not hold valid then we have the problem of autocorrelation. Thus in time series econometrics, autocorrelation is the correlation of the errors associated with different observations (Gujarati, 1995). Autocorrelation can lead to an upward bias in estimates of the statistical significance of coefficient estimates, such as the t statistic. Autocorrelation can result from:

1. Excluded variables
2. Incorrect functional form
3. Lagged variables and inertia.

In this case the study uses OLS. If there is autocorrelation the estimates of the βs are unbiased and consistent but inefficient. Furthermore, the standard errors will tend to be underestimated, the R^2 overestimated, and the confidence intervals too narrow. There are basically four methods of detecting autocorrelaltion which are; graphical methods, the runs test, the Durbin-Watson (DW) Statistic and the Durbin's h statistic (if the explanatory variables included the lagged dependant variable). The regression packaged used for this study calculates the DW statistic.

4.4.4.2The Autoregressive Conditional Heteroskedasticity (ARCH) Test

The ARCH test (Engle, 1982:987-1008) model considers the variance of the current error term to be a function of the variances of the previous time period's error terms. It thus relates the error variance to the square of a previous period's error. The testing procedure involves

- Tests for non-normality. Thus if the normality assumption is used to describe the conditional error distribution then a property of ARCH is that the unconditional error distribution will be non-normal with high values for kurtosis.

- The autocorrelation structure of the residuals and the squared residuals are inspected. An indication of ARCH is that the residuals will be uncorrelated but the squared residuals will show autocorrelation. The test statistics are given by Ljung-Box-Pierce portmanteau tests on the residuals and the squared residuals.

- A test based on the Lagrange multiplier (LM) principle can be applied. As an example, if we have the null hypothesis of no ARCH errors against the alternative hypothesis that the conditional error variance is given by an ARCH(q) process. The test approach proposed in Engle (1982:1008) is to regress the squared residuals on a constant and q lagged values of the squared residuals. From the results of this regression, a test statistic is calculated as:

$(N-q)*R^2$. There is evidence to reject the null hypothesis if the test statistic exceeds the critical value from a chi-square distribution with q degrees of freedom.

4.4.4.3 The Normality Test

The normality test is used to find out whether the random variable is normally distributed or not. This test can be applied to residuals from a linear regression model. If they are not normally distributed, the residuals should not be used in Z tests or in any other tests derived from the normal distribution, such as the F-tests and chi-square tests. If then the

residuals are not normally distributed, then the dependent variable or even one of the explanatory variables may have the wrong functional form. This can also entail that some important variables may be missing. Correcting one or more of these systematic errors may produce residuals that are normally distributed.

Normality tests include the Jarque-Bera test, the Anderson-Darling test, the Pearson's chi-square test, and the Shapiro-Francia test for normality. Another way of determining whether the random variable is normally distributed is to compare a histogram of the residuals to a normal probability curve. The actual distribution of the residuals (the histogram) should be bell-shaped and resemble the normal distribution (Hamilton, 1994).

4.4.4.4 Test for Heteroskedasticity

A sequence of random variables becomes heteroskedastic if the random variables have different variances. In this study, application of the OLS means making a number of assumptions as well. One of such is that the error term has a constant variance. This will be true if the observations of the error term are assumed to be drawn from identical distributions (Hamilton, 1994). Heteroscedasticity is thus a violation of this assumption.

For example, the error term could vary or increase with each observation, something that is often the case with cross sectional or time series measurements, the latter of which is used in this study.

4.4.4.5 The Ramsey regression equation specification error (RESET) Test

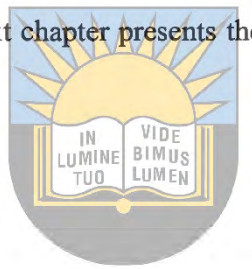
The RESET test (Ramsey, 1969) is a general model specification (misspecification) test for the linear regression model. It thus tests whether non-linear combinations of the estimated values help explain the exogenous variable. The intuition behind the test is that, if non-linear combinations of the explanatory variables have any power in explaining the exogenous variable, then the model is mis-specified.

The model uses the F-test to determine whether the null-hypothesis that all regression coefficients of the non-linear terms are zero. If the null is not rejected, then the model suffers from mis-specification (Cameron and Trivedi, 1998).

4.4.4.6 Conclusion

The above chapter expounded on the approach to be used in obtaining the regression results for the study. There was mention of various forms of stationarity, cointegration, error correction and diagnostic tests to be used. Also there was justification of these methods and the study period and data characteristics.

Diagnostic tests briefly explained above go a long way to affirm the validity of the investment models should the models pass a number of these tests. Fortunately enough, the econometric package used, P.C Give Version 10, calculates the values for all these forms of diagnostic tests. The next chapter presents the results obtained from use of the above methods.



CHAPTER FIVE

Presentation and Analysis of results

5.0 Introduction

The chapter presents results obtained from the methodology employed as explained in the previous chapter. The results thus obtained comprise of stationarity results, cointegration regults and the regression results on the investment demand models for both RSA and Zimbabwe. For stationarity results, the Dickey-Fuller and the Augmented Dickey-Fuller are employed. The Johansen technique is used for cointegration as highilghted in the previous chapter for its superiority. For the investment demand equation the econometric package used is PC Give version 10.

5.1 Stationarity results

As stated earlier the variables entering into an econometric model ought to be stationary so that a proper model can be fit. Below presented are the stationarity results for South Africa and Zimbabwe.

Table 5.1.1 Stationarity tests for South Africa

Variable	Dickey-Fuller			Augmented Dickey-Fuller			Order of Integration
	No trend and no constant	With constant	With constant and trend	No trend and no constant	With constant	With trend and constant	
LGFCU	0.09948	-1.038	-0.5634	0.1923	-2.068	-1.683	I(1)
DLGFCU	-2.906**	-2.844	-3.692*	-3.475**	-3.394*	-4.492**	I(0)
LGDPU	4.589	-2.805	-0.5138	2.559	1.825	-0.6175	I(1)
DLGDPU	-2.527*	-3.783**	-5.039**	-1.39	-2.905	-4.065*	I(0)
LGOVD	0.623	-1.529	-0.2935	0.4005	-1.361	-0.1787	I(1)
DLGOVD	-4.598**	-4.579**	-5.246**	-1924	-1.902	-2.331	I(0)

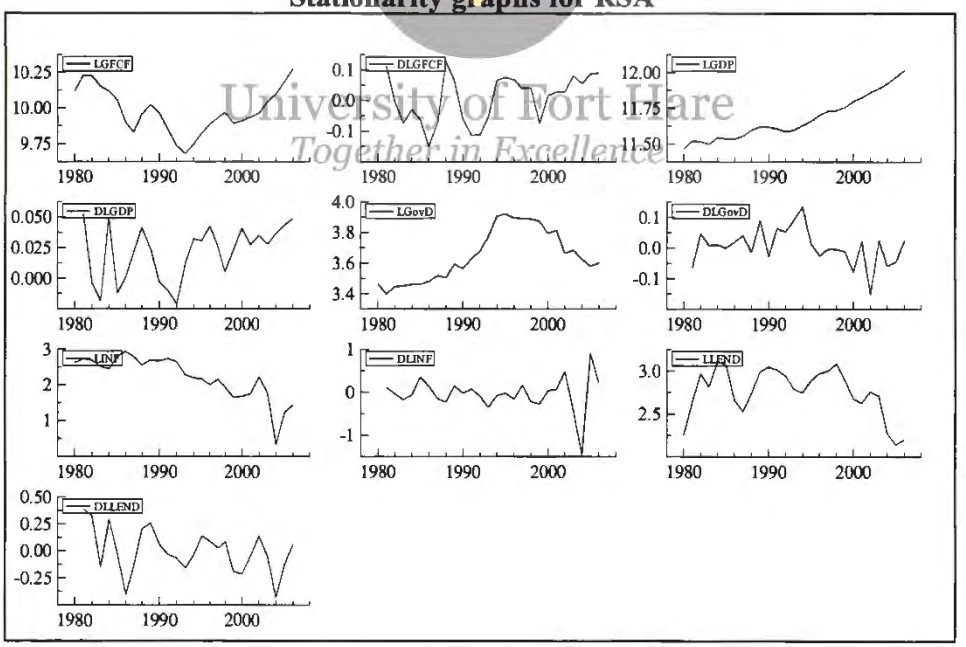
LINF	-1.023	-1.586	-3.578	-1.029	-1.338	-3.839*	I(1)
DLINF	-5.64**	-5.636**	-5.517**	-5.885**	-6.467**	-7.006**	I(0)
LLEND	-0.563	-1.223	-2.143	-0.8923	-1.829	-2.378	I(1)
DLLEND	-4.132**	-4.071**	-4.065*	-5.102**	-5.091**	-5.364**	I(0)
Critical Value 1%	-2.66	-3.72	-4.374	-2.665	-3.734	-4.394	
Critical Value 5%	-1.955	-2.985	-3.603	-1.956	-2.991	-3.612	

* represents a stationary variable at 5% level of significance.

** represents a strationary variable at 1% level of significance.

Figure 5.1.2

Stationarity graphs for RSA



The table and graphs above presents the stationarity tests for South Africa for the variables to enter the regression system. Variables were first entered in their log values and the DF and ADF were obtained. Starting with the paramount variable in the system, GFC, its value in logarithm does not pass the less stricter version of DF at both 5% and 1% levels of significance. It also fails the ADF at these levels. We can safely conclude

that it is not stationary. As for the first differenced LGFC, it satisfactorily passes both DF and ADF. Even the graphs confirm that DLGFC and not LGFC, is stationary, it will therefore enter the model in first difference.

The logged value of GDP fails to pass all tests of stationarity and therefore will not enter the system. The first differenced LGDP however satisfactorily passes the tests of stationarity. Drawing a horizontal line on the y-axis at y=0, we realise that the graph cuts this line more frequently than that for LGDP.

As for the government debt, here represented as GovD, its value in log is not stationary. However, when first differenced, LGovD thus becomes DLGovD hence stationary. Even graphical presentation confirm the stationarity of DLGovD. The government debt will therefore enter the regression system in first difference.

The yearly inflation rate in log values is not stationary as can be seen from the seemingly wild fluctuations in the graphical presentation. The first differenced LInf is stationary and supports the stationarity tests which show that DLInf passes all tests of stationarity at 1% level of significance.

From the tabular presentation, the interest rate r, represented as LLend fails all tests of stationarity where as DLLend passes all tests of stationarity. Graphical presentation even confirms this assertion as LLend wanders away whereas DLLend is stationary.

Table 5.1.3 Stationarity tests for Zimbabwe

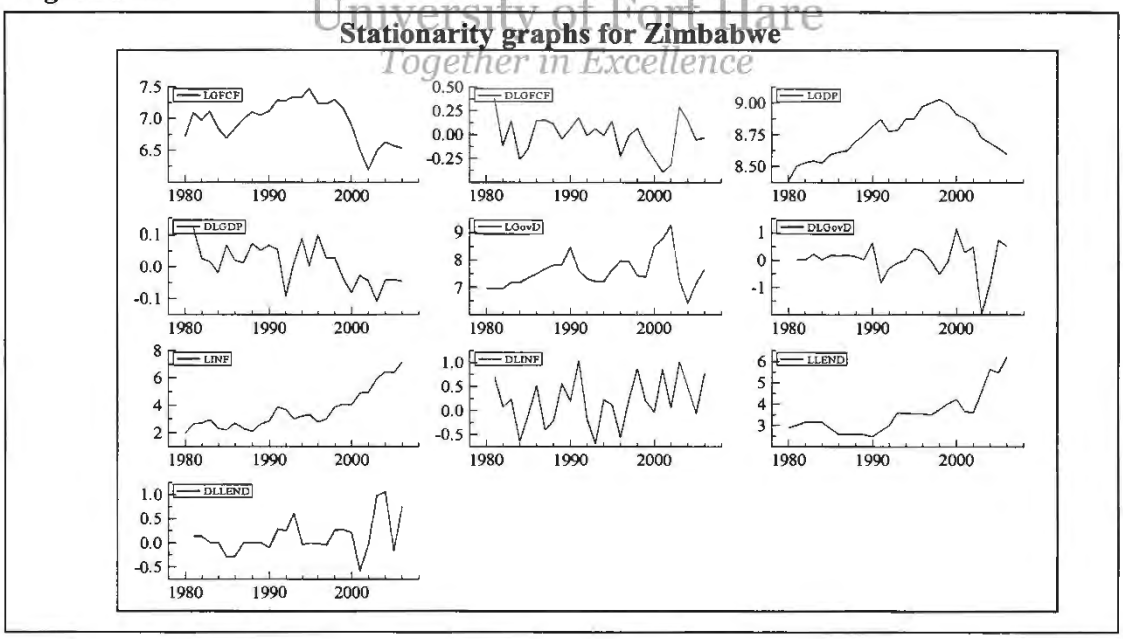
Variable	Dickey-Fuller			Augmented Dickey-Fuller			Order of Integration
	With no trend and no constant	With constant	With constant and trend	With no trend and constant	With constant	With trend and constant	
LGFCU	-0.6761	-1.006	-1.312	-0.4293	-1.412	-1.776	I(1)

DLGFCU	-4.658**	-4.612**	-4.502**	-3.288**	-3.243**	-3.33	I(0)
LGDPU	0.3096	-1.333	0.461	0.315	-1.426	0.04131	I(1)
DLGDPU	-3.652**	-3.523*	-4.323*	-2.307*	-2.202	-3.103	I(0)
LgovD	0.02746	-2.829	-2.772	0.00206	-3.952**	-4.019*	I(1)
DLGovD	-4.345**	-4.261**	-4.176*	-4.508**	-4.404**	-4.405**	I(0)
LINF	2.032	0.8669	-1.185	2.022	1.029	-1.065	I(1)
DLINF	-4.533**	-5.051**	-5.61**	-3.184**	-3.84**	-4.81**	I(0)
Llend	1.932	1.137	-0.7691	1.437	0.7412	-1.235	I(1)
DLLend	-3.351**	-3.648*	-4.231*	-2.888**	-3.273*	-4.375*	I(0)
Critical Value 1%	-2.66	-3.72	-4.374	-2.665	-3.734	-4.394	
Critical Value 5%	-1.955	-2.985	-3.603	-1.956	-2.991	-3.612	

* represent a stationary variable at 5% level of significance

** represent a stationary variable at 1% level of significance

Figure 5.1.4



The GFC in log values fails all tests of stationarity where as DLFGFC passes five out of six tests. The graphical presentation also reinforce that DLGFC enters the model as it is stationary.

As for the GDP, stationarity results reject LGDP as being a non-stationary variable as it failed the stricter ADF and even the non-stricter DF tests. From the graphs we can deduce that DLGDP is stationary and therefore enters the system.

The country's government debt has been growing at a fast rate. The tests of stationarity reject LGovD as a non-stationary series since the critical values are more negative than the calculated values. As for DLGovD, it is accepted as a stationary series as it passes all tests and by looking at the graphical presentation one is able to deduce that indeed it is a stationary series.

Zimbabwe's high inflation rate is not stationary in log levels. By also looking at the graphical presentation, one can tell that LInf is wildly fluctuating. However, first differenced LInf is a stationary series as the graphical presentation of DLInf supports the tests which show that DLInf passes all tests of stationarity at 1% level of significance.

Finally, LLend does not pass any test of stationarity, from the stricter version ADF to the less stricter DF. However, DLLend passes all the DF and the stricter ADF tests. The graphical analysis confirms this assertion.

5.2 Cointegration Results

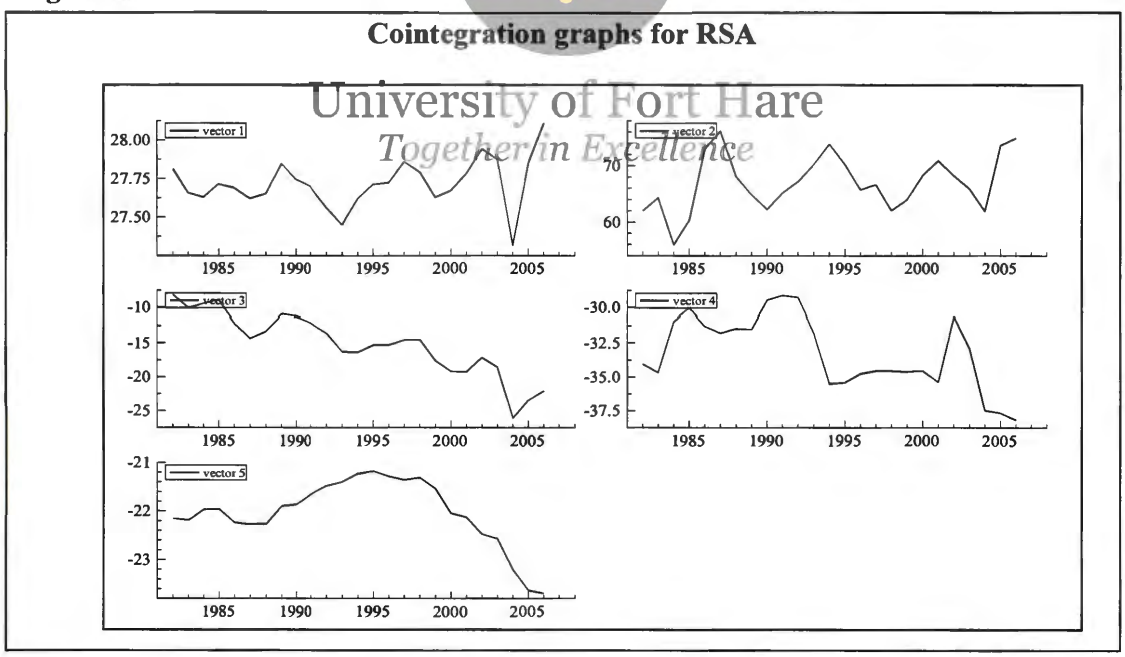
Cointegrated variables ensure that we eliminate spurious relations and as such share common stochastic trends. Further than that, they enable us to formulate an error correction model as we determine the long-run relationship among the variables.

After highlighting the weaknesses of the first two methods above, here we present results of the third method, the Johansen technique.

Table 5.2.1 Cointegration tests for South Africa

		Maximum Eigen Value Statistic		Trace Statistic	
Rank	**λ**	**-Tlog (1-λ)**	**λ_{max}95%**	**-Tlog (1-λ)**	**λ_{trace}95%**
P=0	0.881895	53.4**	33.5	102.1**	68.5
P≤1	0.627386	24.68	27.1	48.73*	47.2
P≤2	0.424512	13.81	21.0	24.05	29.7
P≤3	0.310545	9.296	14.1	10.24	15.4
P≤4	0.036954	0.9414	3.8	0.9414	3.8

Figure 5.2.2



The table and graphs above are the cointegration results for South Africa. From the table as presented the λs are put in ascending order and λ1 > λ2 >λ3 and son on. λ1 is by far greater than 0 and closer to 1. On the other hand, λ5 is closest to zero. The null hypothesis that there is no cointegrating vector is rejected by both the maximum eigen value and the trace statistic methods as the test statistic is greater than the critical value

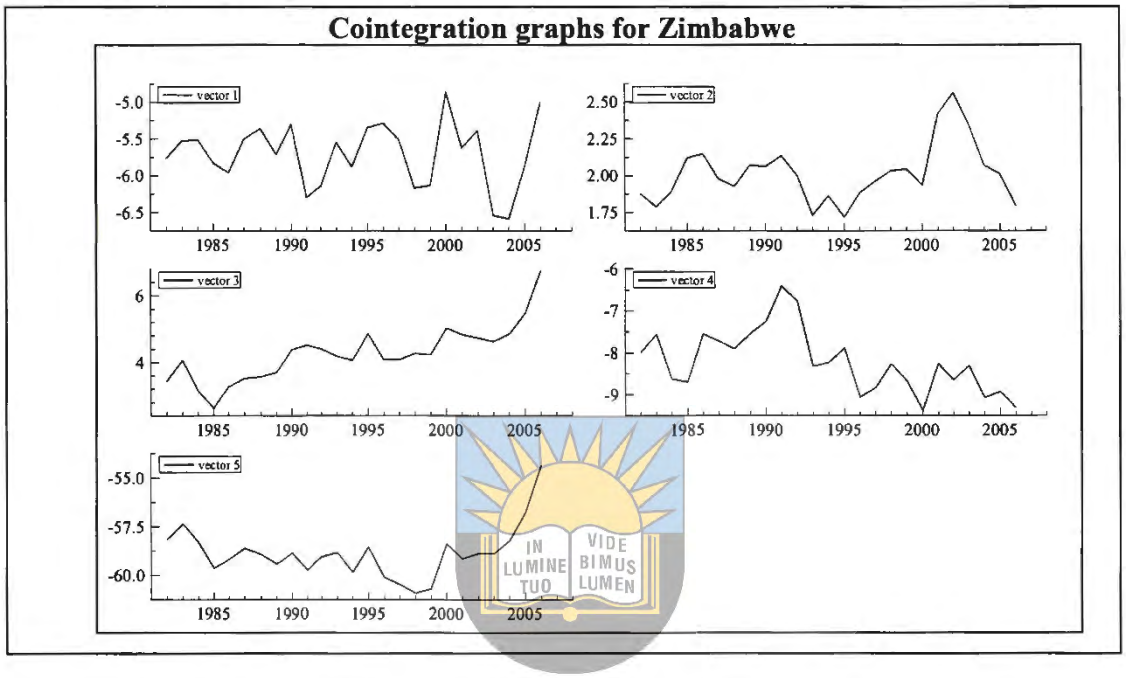
from the Johansen tables. Using the maximum eigen values we come to a conclusion that there is one cointegrating vector as the alternative hypothesis that there are two cointegrating vectors is rejected since 24.68< 27.1.

If we use the trace statistic we come to the conclusion of two cointegrating vectors. Here the null hypothesis of no cointegrating vector is rejected and the null hypothesis of one cointegrating vector is rejected also though now weak since 48.73 is slightly greater than 47.2. However, encompassing the graphs we realise that there is only one cointegrating vector. This assertion thus supports Johansen and Juselius' view that the maximum eigen value is more reliable than the trace statistic in identifying the umber of cointegrated variables. We conclude therefore that there is one cointegrating vector for South Africa.

Table 5.2.3 Cointegration tests for Zimbabwe

		Maximum Eigen Value Statistic		Trace Statistic	
Rank	**λ**	**-Tlog (1-λ)**	**λ_{max}95%**	**-Tlog (1-λ)**	**λ_{trace}95%**
P=0	0.786242	38.57*	33.5	86.21**	68.5
P≤1	0.596918	22.72	27.1	47.64*	47.2
P≤2	0.424784	13.83	21.0	24.92	29.7
P≤3	0.357396	11.06	14.1	11.1	15.4
P≤4	0.0161679	0.04045	3.8	0.04045	3.8

Figure 5.2.4



The table and graphs above present the cointegration results for Zimbabwe. From the table as presented the λs are put in ascending order and λ1 > λ2 >λ3 and son on. λ1 is closest to 1. On the other hand, λ5 is closest to zero. The null hypothesis that there is no cointegrating vector is rejected by both the maximum eigen value and the trace statistic methods as the test statistic is greater than the critical value from the Johansen tables. For example using the maximum eigen value, the test statistic is 38.57 and the critical value is 33.5. When we use the maximum eigen values we deduce that there is only one cointegrating vector as the alternative hypothesis that that there are two cointegrating vectors is rejected since now 22.72< 27.1.

Nevertheless, basing our decision on the trace statistic we come to the conclusion of two cointegrating vectors. The null hypothesis of one cointegrating vector is rejected since though weak, 47.64>47.2. If we encompass the graphical presentation we realise however that there is only one cointegrating vector, thus supporting Johansen and Juselius' view that the maximum eigen value is more reliable than the trace statistic in identifying the umber of cointegrated variables. We can safely also conclude therefore that there is one

cointegrating vector for Zimbabwe. The cointegration results therefore suggest that for both countries under study, there exists one cointegrating vector for each.

5.3 Regression results on Investment demand for RSA and Zimbabwe

Table 5.3.1 Regression results on Investment for RSA and Zimbabwe

	RSA			Zimbabwe		
Variable	**Coefficient**	**t-value**	**Part. R^2**	**Coefficient**	**t-value**	**Part. R^2**
DLGFC_2	0.136409	1.01	0.0603	0.337952	1.67	0.1667
Constant	-0.0703038	-5.96	0.6895	-0.0183870	-0.593	0.0245
DLGDP	1.72687	4.69	0.5792	0.768807	1.36	0.1172
DLGDP_1	1.82007	4.70	0.5799	_	_	_
DLGDP_2	_	_	_	1.09097	2.06	0.2324
DLGovD	_	_	_	-0.212492	-3.49	0.4647
DLGovD_2	-0.0432093	-0.307	0.0059	-0.110384	-1.83	0.1930
DLINF	-0.0481033	-2.37	0.2605	_	_	_
DLINF_2	_	_	_	-0.160760	-2.20	0.2575
DLLEND	0.129129	2.60	0.2965	0.162151	1.82	0.1917
D1999	_	_	_	-0.210674	-1.47	0.1335
ECT_1	-0.263229	-2.22	0.2351	-0.575454	-3.15	0.4145

	RSA	**Zimbabwe**
Sigma	0.0344964	0.114964
RSS	0.0190400592	0.185035326
$R^{\wedge 2}$	0.865286	0.747902
F(7,16) ; F(9,14)	14.68[0.000]**	4.615[0.006]**
Log-likelihood	51.6166	24.3286
DW	1.93	1.86
Number of observations	24	24
Number of parameters	8	10
Mean(DLGFC)	0.00199368	-0.0181337

Var(DLGFC)	0.00588905	0.0305825

A number of trials were made for equations for both countries. Both models are generally robust. The signs are in agreement with theoretical postulations. The conventional tests of the model in R^2 , F statistic and the standard error confirm the strength of the models. It was also necessary to consider the statistical properties for both models. Both models were tested for autocorrelation, autoregressive conditional heteroskedasticity, normality, heteroskedasticity and specification error test (RESET). The results, reported in table 5.3.1 below, suggest that the models are well specified. The diagnostics indicate that the residuals are normally distributed, homoskedastic and serially uncorrelated. Furthermore, the fitted and actual values and the scaled residuals to the validity and versatile strength for the models[11].

Table 5.3.2 Diagnostic Tests for South Africa and Zimbabwe

	South Africa	**Zimbabwe**
AR 1-2 test	0.13550[0.8744]	F(2,12)=0.56552[0.5825]
ARCH 1-1 test	0.0033540[0.9546]	F(1,12)=0.029699[0.8660]
Normality test	Chi^2(2)=1.3570[0.5074]	Chi^2(2)=1.8003[0.4065]
Hetero test	F(14,1)=0.13393[0.9838]	_
RESET test	F(1,15)=2.5318[0.1324]	F(1,13)=0.12887[0.7254]

Though not significant, DLGFCF lagged twice yielded the expected positive sign for South Africa. Like for RSA, Zimbabwe's DLGFCF lagged twice is also positive and furthermore, is significant at 5%. Therefore, this entails that private investors in Zimbabwe whilst making current year investment expenditure, also consider previous year's investment expenditure as well. We can further interpret this result that an increase in investment two years back by 10% will most likely increase the current level of investment by 3.3%

[11] The actual and fitted values for GFCF for both countries are shown in the appendices.

The country's annual output, as represented by DLGDP has a positive effect on investment. DLGDP and DLGDP lagged once are both significant at 1% level. The coefficient suggests that a 1% increase in GDP will increase the investment by 1.7%. Thus an increase in Gross domestic product will increase the nation's investment levels. So to maintain the current growth in investment, the country has a challenge to grow the national output. The preferred levels of investment no doubt hover around 20%. RSA has yet to reach this 20% mark and therefore emphasis has to be put on increasing GDP.

As for the annual output in Zimbabwe, econometric evidence shows that DLGDP has a positive effect on investment. DLGDP though positive is insignificant according to the results. However, DLGDP lagged twice is significant at 5%. The coefficient suggests that a 10% increase in GDP will increase investment by almost 11%. Thus an increase in Gross domestic product will increase the nation's investment levels. So to a more extent than RSA, the country has a challenge to boost its levels of output if it is to attain sustained levels of investment. With the current low yearly levels in national output, a lot needs to be done. As an agrobased economy measures ought to be in place to develop growth in the agricultural sector. Diversification should also be on the cards as much reliance on agriculture can prove costly in the long run with the current not so conducive tide in the weather and economic challenges emanating from a wide spectrum of angles.

Government debt, theory has postulated, has a negative association with investment. In the case of RSA, it is negative though insignificant. The government debt sign bears the expected negative role of crowding investment but is insignificant. This can suggest that RSA government debt is maintained within sustainable levels. This is not the case with Zimbabwe whose government debt crowds out investment.

In the case of Zimbabwe, DLGovD and DLGovD lagged twice negatively affect investment. DLGovD is significant at 1%. The coefficient for this variable suggests that a 10% increase in Govenrment debt will reduce the country's investment by 2.1%. DLGovD lagged twice is significant at 5%. With the current growth in govenrment domestic debt reaching unprecedented levels of growth at 600% since January 2007, the

results serve as a good omen of the situation on the ground. It is therefore inevitable that investment has been declining as government debt has crowded out private investment. Leading the pack on factors fuelling the government debt has been amongst others, exceedingly high growth in money supply as money not backed by production has been printed yearly.

The money has been used chiefly to cater for salary increments for the country's civil servants as mounting inflation took its toll. Other contributors to this debt have been the parliamentary elections, costs related to revamp some ministries, albeit some not efficient, senate related expenditure, unbudgeted compensation to pay liberation collaborators and mounting interest and debt payments to domestic and the international community. The other reason for the high government debt has been that since the government has lost favor with external borrowers because of its failure to meet debt obligations, it has solely relied on the [illegible] market to source funds. Use has been made of Treasury Bills (TB). With lending rates currently above 500% and an inflation level beating that for war torn countries, it is no wonder the debt has ballooned yearly.

The inflation rate, as an indicator for macroeconomic instability has a negative sign and it is significant at 5%. This coefficient means that a 10% increase in the inflation rate will shrink investment by 0.5%. This result suggests that the economic tide in RSA did encounter instability before. Especially the early 80's where the inflation rate was high above 15% contributed to low investment. Even the current inflation rate which has surpassed the target range pose a threat to investment related goals and ultimately economic growth. The coefficient of inflation suggests that a 10% increase in the annual inflation rate is associated with investment decreasing by 1.6%. With the inflation rate at 3714% in April 2007, the current economic environment prevailing in the country does not augur well for investment. Thus Zimbabwe's inflation rate is a sharp contrast when compared to RSA's 4.2% for 2006.

To add on the inflation cake, inflation in Zimbabwe has become the sole influence of inflation as businesses from almost all sectors have developed a habit of increasing

prices, though at times unjustifiably. With a majority of businesses relying on fuel and its products for daily operations, foreign currency shortages have also dealt a big blow to the viability of their businesses. Some have resorted to sourcing foreign currency for importing fuel at the black market rates. This has led most of them, rational as they are, to pass on the high costs to the final consumer of their products, hence inflation. Others still, whilst importing raw materials have been forced to resort to the black market for foreign currency and the story has been the same, with the final consumer being at the receiving end in terms of high prices paid on goods and services offered.

The nominal lending rate is significant and positive. Some empirical studies for developing countries have found interest rates to be positively related with investment (Badawi, 2004:1-27; Hussain *et al*, 2002). The sign of the interest rate is also an empirical issue and depends on whether the data support the McKinnon–Shaw hypothesis or the neoclassical model. The McKinnon–Shaw hypothesis deals with the deposit rate but the lending rate is highly and positively correlated with the deposit rate. The lending rate has a positive sign in for the data used and is significant at 5%. This result suggests that an increase in the lending rate by 10% will result with investment increasing by 1.2%.

In the case of RSA, the real user cost of capital fluctuated prior to 1980. Between 1980 and 1983 it declined as the real interest rate fell to negative levels. Since 1983, it has shown an upward trend, though with declines again in 1987 and 1988. This is partly because the rapid depreciation of the rand raised the price of imported capital goods. Importantly, the real interest rate has risen rapidly and became positive as interest rate ceilings were removed. Thus, the data does support the McKinnon–Shaw hypothesis. This may be due to the fact that, previously, interest rates were controlled and therefore lending rates were very low, hence discouraging savings. However, the liberalized system and the high interest rates now pose problems for the corporate sector.

Like for RSA, the nominal lending rate in Zimbabwe is significant and positive. Thus, the data does support the McKinnon–Shaw hypothesis. This may be due to the fact that,

previously and even currently, interest rates were and are controlled as the financial market was and is still repressed. With negative real interest rates the interest rates in the country are controlled. Data for Zimbabwe reveals the negative real interest rates.

To a more extent than RSA, the econometric evidence for Zimbabwe presented above suggests that a 10% increase in nominal lending rates will increase investment by 1.6%. This proves valid the assertion that the real interest rate in Zimbabwe lies below equilibrium. This scenario is caused by controlled interest rates in the country which have discouraged savers, most of whom have opted to transfer their monies to the equity market and whilst some have preferred locking their funds in property.

Political instability did affect investment in Zimbabwe. In this study political instability was represented by the dummy for 1999. However, the result though bearing the expected negative sign is insignificant. There are also some political uncertainties prevalent which could not be captured but did affect investment in the country.

Finally, the error correction term for RSA carries a negative sign that suggests a non-explosive situation. The speed of adjustment is approximately 26%. This implies that in one year approximately 26% of the deviations from the long run equilibrium are eliminated in the following year. The result of the error correction term further suggest that there are other factors inhibiting investment in the RSA economy but could not be revealed in this study. A further study is therefore imperative, with the sole aim on deducing some other constraints retarding the growth of investment in the country.

For Zimbabwe, the error correction term carries a negative sign that suggests a non-explosive situation. The speed of adjustment is approximately 58%. This implies that in one year approximately 58% of the deviations from the long run equilibrium are eliminated in the following year.

5.4 Conclusion

The above chapter presented results deduced from the methods employed. As can be observed, the variables entered the econometric model as stationary levels. After determining the stationary variables, we conducted tests for cointegration to find out whether there was long term relationship amongst variables. The results from cointegration suggested that there is one cointegrating vector for each country. Finally, the investment regression results were produced. The results were supported by economic theory and empirics.

CHAPTER SIX

Summary, Conclusions and Recommendations

6.1: Summary and Conclusions

The study investigated the determinants of investment between RSA and Zimbabwe in the period 1980-2006. The macroeconomic background for both countries was presented and literature surrounding investment theories and the accompanying empirics were also expounded in the study. Use was made of the time series study and the Dickey-Fuller method to address the issue of unit root faced in time series analysis. Further than that, the long run estimate of the private investment demands functions for both countries were derived using the Johansen cointegration technique and the ARDL bounds approach. Finally, an ECM was estimated.

Results from the study revealed that that private investment is positively stimulated by the GDP for both countries. Both countries have a challenge to maintain optimal levels of the GDP. Unlike RSA which over the past few years registered growth in GDP, Zimbabwe has been experiencing declines in GDP which dropped by almost 30% since 1999. Government debt, the study revealed, has a negative though insignificant role in South Africa. However, for Zimbabwe the government debt was found to be having a high inhibiting role on private investment. The high government debt in Zimbabwe has not only crowded out funds that could have been availed to the private sector but has also fuelled inflation, riding high at 3714% (April 2007).

Government debt was found to be significant in the case of Zimbabwe. This result also revealed that Zimbabwe's inflation battle continues as mounting government debt shot down efforts to contain inflation. As for RSA, government debt is within sustainable levels, a lesson to be learnt by neighbouring Zimbabwe.

Econometric evidence also suggested that private investment is negatively affected by inflation in both countries. This result was most expected for Zimbabwe where inflation

is also fueled by the gargantuan government debt. RSA's inflation was within the target range for the study period. However, the current pressures fanning inflation in RSA have been brought largely by an upsurge in consumer spending over the past few years. As a reult, they are likely to force interest rates upwards, leading to low levels of investment and economic growth.

The nominal interest rate for both countries supported the literature for developing countries which asserts that interest rates positively affect investment, especially in a repressed financial market. Though this result was much expected for Zimbabwe, it was not expected for RSA, where interest rates are market determined and the financial sector is under the smooth legislature from the central bank. The conclusion on interest rates does not fully accept the financial liberalization theory as the interest rates in this study are not the major determinants of investment. In the light of these conclusions it is permissible to assert that over manipulation of the real interest rate is not a good policy instrument for mobilizing resources for the purpose of increasing investment levels.

Quite a number of studies conducted in Africa (Hadjmichael and Ghura1995, Fischer, Hernandez-Cata and M.S. Khan 1999, Hernandez-Cata 2000) have deduced that uncertainty discourages private investment. These studies have verified that the reason for the low level of private investment is the perception by both domestic and foreign investors of a low after tax, risk adjusted rate of return on capital (Collier and Patillo 2000). Uncertainty can also be induced by some political disturbances. Some political related factors affecting private investment in Zimbabwe could not be easily captured. A proxy was used in the form of a dummy. Though it bared the correct negative sign, it was insignificant.

The lagged private investment was positive though insignificant for RSA. As for Zimbabwe, the lagged private investment was positive and significant. For Zimbabwe this might suggest that the investment climate constitute an indicator for the investment decisions. The beta coefficients reveal that for RSA the most important variable is the

GDP in terms of influencing private investment. As for Zimbabwe, it is the GDP and the ballooning government debt which play big roles in dictating the levels of investment.

6.2: Recommendations

The main policy recommendations that may be inferred from these results are as follows: expanding credit volumes to the private sector are well connected to financial and the needed reforms targeting the whole institutional and regulatory framework of the banking sector. More so in the case of Zimbabwe, policy recommendations should lean more on measures to ease the private sector's financial constraints and as such should promote credit expansion. The current financial market in Zimbabwe exhibits the evidence of a repressed financial market and has lessons for RSA of an impact this stance can have on shooting down any means of reviving investment. As such, it has made savers to turn a blind eye, citing very low interest rates and preferring to lock their funds in stock, thus leaving the banks with insufficient funds for lending investors for the purpose of expanding their fixed capital base.

The country's monetary authorities have a big task of balancing the inflationary pressures whilst at the same time expanding credit to the private sector. Amongst areas needing taming are the regime's appetite for funds as also the econometric evidence has shown, high government debt worsens the inflation rate. Zimbabwe's policy prescription could also include targeting the terms on which banking sector advances are advanced to private investors. For RSA, the monetary authorities have a challenge in considering raising interest rates so as to tame consumption which if left unabated, will most likely lead to inflation settling well above the target range.

Macroeconomic instability empirics have supported theory that it negatively influences investment. This at most is as a result of unsustainable fiscal deficits and consequently inflation and unstable exchange rates. This is typical of the current environment in Zimbabwe. However, for policies to improve private sector response for both countries, all four components of macroeconomic instability (real exchange rate, inflation rate, debt burden and the black market premium) must be addressed simultaneously. However for

this study only two components of macroeconomic instability were examined as a result of data paucity. Another critical area of concern relates to inadequacy of legal systems under which there is failure of enforcing contracts and property rights in a country.

Again here we find Zimbabwe not having properly spelt property rights with a quite slack judiciary system. Another problem is the civil unrest. As examples, warnings of looming strikes and hence paralyzing activities in industry do not augur well on investment. As such, all these factors distort the environment needed to nurture private investment. It is inevitable to conclude that Zimbabwe, unlike RSA has to address all these factors which are not economic but having a bearing on investment. Amongst such factors are the perceived inadequacies in the legal system, failure to enforce contractual obligations and property rights land issues, and uncertainties due to possible civil unrest. Finally, an environment conducive for investment, the reputation of borrowers and incentives for investment, are major determinants of investment which need investigation.

The study focused on selected macroeconomic variables determining investment. This may entail leaving other macro pointers such as foreign aid, the current account balance, the real exchange rate and the budget deficit that can be considered vital in other similar research areas. Some of these variables were dropped as a result of data paucity, more so for Zimbabwe. The study also focused on investment behavior and determinants from the whole economy point of view. This can create a problem in that there is a likelihood of insufficient analysis on the determinants of investment at sector level for both countries.

Another useful extension of the present study would be also to empirically examine the effect of private investment on economic growth, unemployment and poverty reduction for both countries.

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Appendices

Appendix A.1 General Model for South Africa

EQ(1) Modelling DLGFCF by OLS (using Data1)
The estimation sample is: 1983 to 2006

	Coefficient	Std.Error	t-value	t-prob	Part.R^2
DLGFCF_1	-0.844631	0.3535	-2.39	0.044	0.4165
DLGFCF_2	0.102654	0.1931	0.532	0.609	0.0341
Constant	-0.159304	0.03920	-4.06	0.004	0.6737
DLGDP	2.31713	0.7430	3.12	0.014	0.5487
DLGDP_1	2.77787	0.7853	3.54	0.008	0.6100
DLGDP_2	2.50564	0.8652	2.90	0.020	0.5118
DLGovD	0.425228	0.2635	1.61	0.145	0.2455
DLGovD_1	0.154631	0.1550	0.998	0.348	0.1106
DLGovD_2	-0.0584558	0.1656	-0.353	0.733	0.0153
DLINF	-0.0827231	0.03193	-2.59	0.032	0.4563
DLINF_1	-0.0921424	0.03312	-2.78	0.024	0.4918
DLINF_2	-0.0401094	0.03915	-1.02	0.336	0.1160
DLLEND	0.162807	0.05458	2.98	0.018	0.5266
DLLEND_1	0.0950334	0.07803	1.22	0.258	0.1564
DLLEND_2	-0.0999842	0.07890	-1.27	0.241	0.1672
ECT_1	-0.113045	0.1451	-0.779	0.458	0.0706

sigma	0.0314871	RSS	0.00793147471
R^2	0.944888	F(15,8) = 8.97e [0.002]**	
log-likelihood	62.1251	DW	1.56
no. of observations	24	no. of parameters	16
mean(DLGFCF)	0.00199368	var(DLGFCF)	0.00588905

Appendix A2 General Model for Zimbabwe

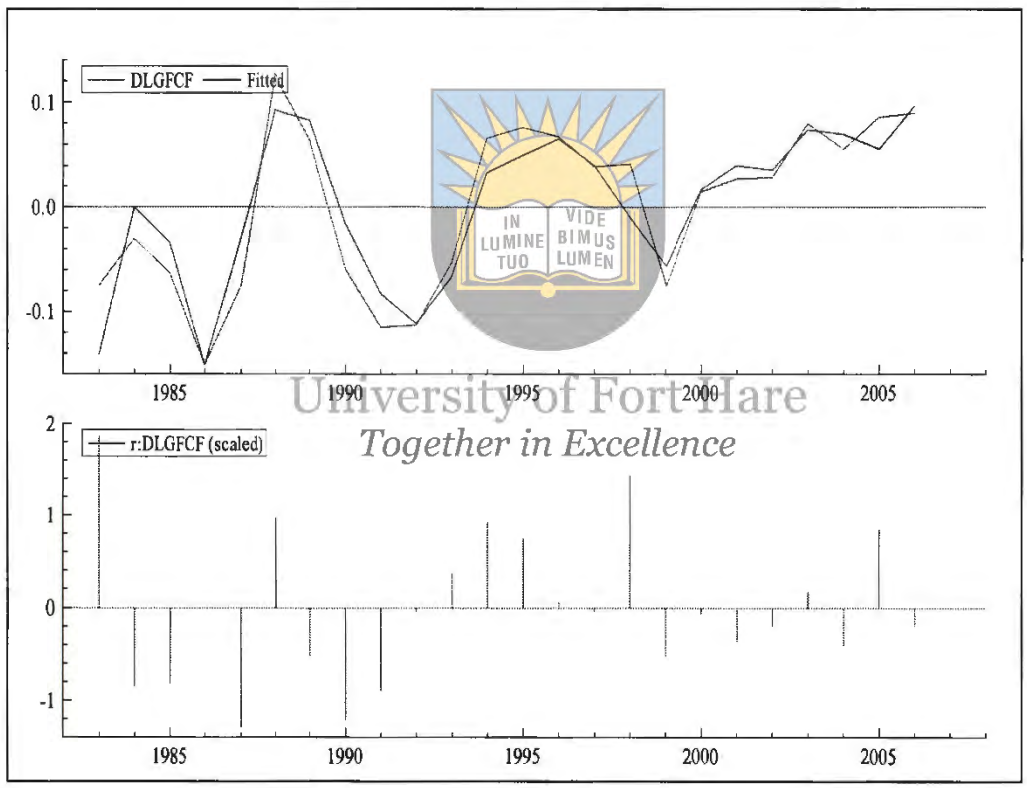
EQ(1) Modelling DLGFCF by OLS (using Data1)
The estimation sample is: 1983 to 2006

	Coefficient	Std.Error	t-value	t-prob	Part.R^2
DLGFCF_1	0.150409	0.3709	0.405	0.696	0.0201
DLGFCF_2	0.381065	0.4418	0.863	0.413	0.0851
Constant	-0.0326071	0.08035	-0.406	0.696	0.0202
DLGDP	0.965346	1.020	0.946	0.372	0.1006
DLGDP_1	0.680138	1.047	0.650	0.534	0.0501
DLGDP_2	0.311912	0.8941	0.349	0.736	0.0150
DLGovD	-0.217701	0.1309	-1.66	0.135	0.2570
DLGovD_1	0.0331650	0.2384	0.139	0.893	0.0024
DLGovD_2	-0.0877222	0.1665	-0.527	0.613	0.0335
DLINF	-0.0375995	0.1573	-0.239	0.817	0.0071
DLINF_1	0.0453605	0.1407	0.322	0.755	0.0128
DLINF_2	-0.0667554	0.1644	-0.406	0.695	0.0202
DLLEND	0.175128	0.1794	0.976	0.358	0.1064
DLLEND_1	-0.0699594	0.3212	-0.218	0.833	0.0059
DLLEND_2	0.00986891	0.2859	0.0345	0.973	0.0001
ECT_1	-0.663571	0.5515	-1.20	0.263	0.1532

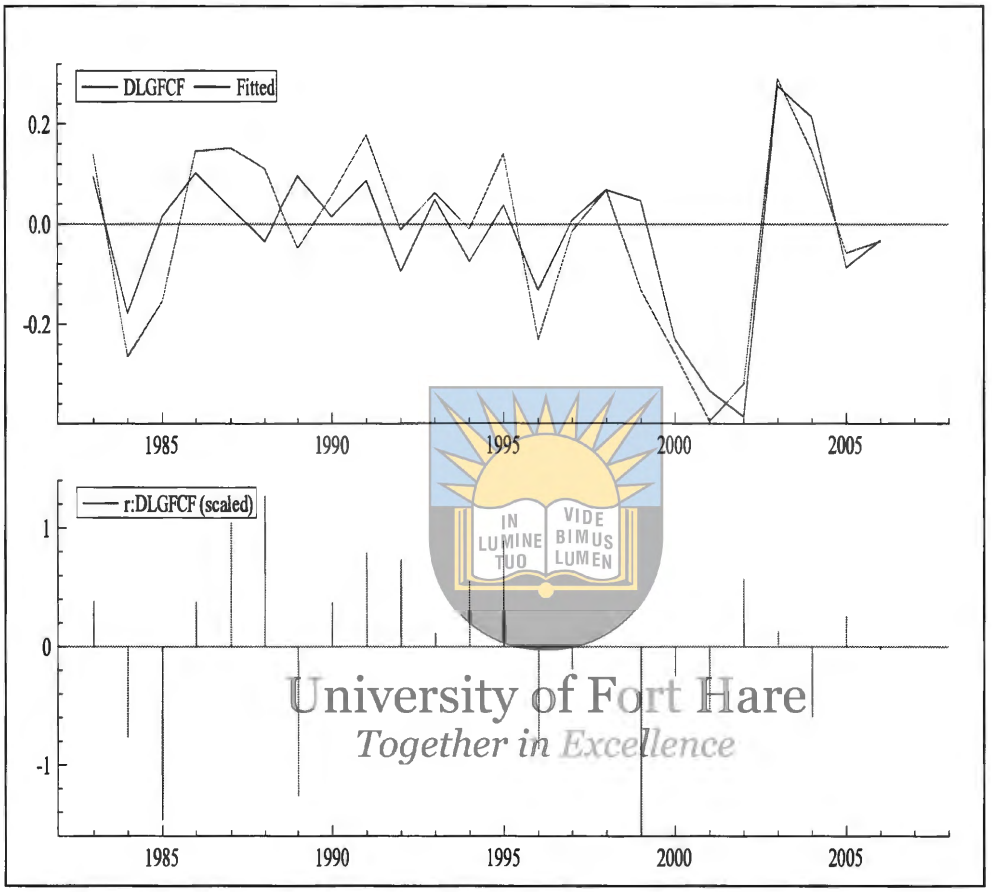
sigma	0.14462	RSS	0.167320471

R^2	0.772037	F(15,8) =	1.806 [0.201]
log-likelihood	25.5363	DW	1.6
no. of observations	24	no. of parameters	16
mean(DLGFCF)	-0.0181337	var(DLGFCF)	0.0305825

Appendix B1 : Actual versus fitted values and scaled residuals for RSA



Appendix B2 : Actual versus fitted values and scaled residuals for Zimbabwe



Apppendix C1 : Data for South Africa

Year	GFCF	GDP	GovD	INF	LEND
1980-1	24735	95503	31.9	13.66	9.5
1981-1	27671	100622	29.9	15.254	14
1982-1	27565	100237	31.3	14.639	19.33
1983-1	25580	98386	31.5	12.303	16.67
1984-1	24817	103402	31.8	11.527	22.33
1985-1	23290	102150	31.8	16.294	21.5
1986-1	20025	102168	32.4	18.655	14.33
1987-1	18568	104314	33.7	16.161	12.5
1988-1	21087	108695	33.2	12.78	15.33
1989-1	22482	111298	36.3	14.731	19.83
1990-1	21191	110945	35.3	14.321	21
1991-1	18888	109815	37.6	15.335	20.31
1992-1	16872	107468	39.6	13.875	18.91
1993-1	15992	108794	43.5	9.717	16.16
1994-1	17071	112312	49.7	8.939	15.58

1995-1	18414	115812	50.4	8.68	17.9
1996-1	19690	120799	49.1	7.354	19.52
1997-1	20459	123997	48.9	8.598	20
1998-1	21313	124638	48.7	6.881	21.79
1999-1	19774	127577	48.1	5.181	18
2000-1	20065	132878	44.4	5.339	14.5
2001-1	20613	136513	45.3	5.702	13.77
2002-1	21205	141373	38.9	9.164	15.75
2003-1	22964	145342	39.8	5.859	14.96
2004-1	24269	150737	37.5	1.385	9.7
2005-1	26438	157369	35.8	3.4	8.5
2006-1	28916	165237	36.65	4.2	9

Appendix B2 Data for Zimbabwe

Year	GFCF	GDP	GovD	INF	LEND
1980-1	825	4376	1045.186	7	17.54
1981-1	1201.7	4925	1045.186	14	20.19
1982-1	1066.2	5054	1045.186	15	23
1983-1	1225.999	5134	1295.331	19	23.08
1984-1	940.4079	5037	1295.331	10	23
1985-1	806.8228	5386	1545.476	9	17.17
1986-1	933.1803	5499	1789.621	15	13
1987-1	1086.454	5563	2149.272	10	18
1988-1	1213.951	5983	2448.048	8	15
1989-1	1156.837	6294	2500.947	14	13
1990-1	1225.588	6734	4731.901	17	11.71
1991-1	1463.836	7106	2038.842	48	15.5
1992-1	1448.384	6466	1511.194	40	19.77
1993-1	1541.788	6533	1351.228	20	36.33
1994-1	1527.318	7137	1356.18	25	34.86
1995-1	1758.408	7148	2069.429	28	34.73
1996-1	1396.353	7889	2888.09	16	34.23
1997-1	1377	8100	2815.168	20	32.55
1998-1	1475.118	8334	1686.204	48	42.06
1999-1	1293.474	8034	1605.785	58	55.39
2000-1	998.865	7399	4879.998	56	68.21
2001-1	673.1065	7199	6461.048	132	38.02
2002-1	488.693	6883	10404.8	139	36.48
2003-1	653.702	6167	1426.788	385	97.29
2004-1	756.224	5908	608.3098	624	278.92
2005-1	714.118	5671	1258.941	586	235.68
2006-1	689.97	5416	2102.56	1281	500