

Analysis of key determinants of investment spending in South Africa and Nigeria

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DECLARATION

I, Molebogeng Maphutha, declare that the dissertation entitled: **Analysis of key determinants of investment spending in South Africa and Nigeria**, which I hereby submit for the degree of Masters in Risk Management, is my individual work, and sources obtained have been recorded and acknowledged in the right manner (Harvard style). This dissertation has not previously been submitted by me in its entirety or in part for obtaining any qualification.

.....

Miss Molebogeng Maphutha

...../...../.....

Date

DEDICATION

This dissertation is dedicated to my loving and supporting parents throughout my journey since I have started university, **Makamele Joyce Maphutha** and **Frank Tsheege Maphutha**. The love and patience you have for me, thank you for believing in me. God bless you. To my late Aunt **Molebogeng Kotupo Maphutha**, may your soul rest in perfect peace.

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The following bible verses have carried me throughout my life and without them; I would not have been where I am today,

With God, all things are possible Mark 10:27

All things are possible if you believe Mark 9:2

As soon as I pray, you answer me, you encourage me by giving me strength Psalm 138:3

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ABSTRACT

This study examined the comparative analysis of key determinants of investment spending in South Africa and Nigeria for the period January 2003 to December 2015. The sluggish growth of investment spending in South Africa and Nigeria was investigated using the following determinants (lending rate, price level, real effective exchange rate, gross domestic product, savings, and country risk and trade openness). Conceptualisation of investment spending was analysed, the definition and the importance of both the investment and investment spending, as well as the types of investment were discussed.. The study focused and discussed the theories that are essential for investment spending (Harold-Domar growth model, the accelerator theory, neoclassical theory and Q theory).

The autoregressive distributed lag model (ARDL) was employed as the cointegration method to analyse the interaction between investment spending and different determinants employed for the study. The long-run relationship in South Africa, showed positive relationships exist between gross fixed capital formation (investment spending) and lending rate, GDP and savings, while price level, real effective exchange rate, country risk and trade openness have negative impacts. As compared to Nigeria, lending rate, GDP, savings, country risk and trade openness have a long-run effect on gross fixed capital formation. The short-run analysis found that Nigeria indicates a more rapid adjustment to equilibrium than South Africa. The only determinant that has short-run effect in both countries is GDP. The study concludes that mostly lending rate, low savings and GDP affect gross fixed capital formation in South Africa and Nigeria.

Key words: gross fixed capital formation, determinants, South Africa, Nigeria, ARDL

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lag
AIC	Akaike Information Criteria
BEA	Bureau of Economic Analysis
CPI	Consumer price index
CUSUM	Cumulative sum of recursive residual
CUSUMQ	Cumulative sum of recursive residual squares
DF	Dickey-Fuller
ECM	Error Correction Model
ECT	Error Correction Term
EUI	Economic Intelligence Unit
FDI	Foreign direct investment
GDP	Gross domestic product
IDC	Industrial Development Corporation
IMF	International Monetary Fund
ITRISA	International Trade Institute of Southern Africa
KPSS	Kwiatkowski–Phillips–Schmidt–Shin
NDP	National Development Plan
OECD	Organisation for Economic Co-operation and Development
PP	Phillip-Peron

PPI	Producer price index
RSS ₁	residual sum of squares for sub-sample 1
RSS ₂	residual sum of squares for sub-sample 2
SARB	South African Reserve Bank
SIC	Schwartz Information Criterion
UNCTAD	United Nations Conference on Trade and Development

CHAPTER 1: INTRODUCTION, PROBLEM STATEMENT AND OBJECTIVES OF THE STUDY

1.1 INTRODUCTION

Factors that escalate and attract investment are countless. The factors can include the growing financial sector, large markets, political stability and free market economy (Sani, 2014:10). Investment is a device used to improve the economy and development purposes for each country, spent on financial instruments to help in the future, cover the costs and improve the country's status. Investment spending is an injection into the economy – individuals, governments or corporations use investments to purchase and repair either worn-out machinery or infrastructure in the future production (Keynes, 1936). It is an advantage to have a good flow of capital set aside to use in the future as it reduces long-term costs (Business Dictionary, 2017).

Investment is one of the major determinants of sustainable long-term economic growth and it forms part of the national accounts as part of gross domestic product (GDP). Increased investment spending would decrease the national debt of the country as a percentage of its GDP, reduce government deficit and improve the economic conditions of the country (Mabugu, 2013). Maepa (2015) mentions that the allocation of public resources from government to the public is not always enough to address the development as well as the economic goals set forth by the government. Hence, investment is considered as the best tool for the economy; it boosts consumer and investor confidence. Investment activities can improve and maintain the standard of living for citizens (Bakare, 2011). The study seeks to explore the possible determinants of investment in South Africa and Nigeria.

After 1994, when the reign of apartheid changed to the election of a democratic government, the South African government realised that in order to grow and prosper it should not isolate itself from its neighbours and other economies due to the sanctions that were imposed during the apartheid government. The country exposed itself to international markets. Since the lifting of the apartheid sanctions, investment has played a rather significant role in the growth of the South African economy (Parajuli, 2012:1). Maepa (2015) indicates that investment contributed about 2.7 percent of the total GDP and the increased investment enhanced the innovation of technology for the last 22 years. This has improved knowledge on how to invest and trade with other countries (Parajuli, 2012:1).

The South African 2016 budget review stated that despite the challenges in the economy, the government recognises the need to boost confidence, strengthen and prioritise raising investments of the country by promoting capital projects. The forecasts of deceleration within the economy from 1.3 percent in 2015 to 0.3 percent in 2016 show the outlook of everything in the country. In the state national address, Mngomezulu (2016) states that South Africa cannot prosper under the current economic conditions (large economic deficits, debt burdens, inflation increasing and weak currency) no matter what forecasts they make for the upcoming years. Gross fixed capital formation rose by 1.2 percent within the first three quarters of 2015 compared to 0.3 percent in 2014. This can be due to the weak demand and low levels of business confidence in private and domestic investments.

Mabugu (2013) indicates that the lessons mentioned above concerning what ought to be done to increase investment spending should not be valuable for South Africa only but for every developing country where attention is needed to create jobs and eradicate poverty. To unfold the investment spending behaviour, the study will ascertain a better understanding by spanning the reasons behind the sluggish growth in investment spending.

1.2 PROBLEM STATEMENT

Internationally, there is a reasonably clear relationship between increased investment spending and sustained higher GDP growth, with the level of investment ultimately determining the level of employment (Economic Focus, 2014). The former Minister of Finance in South Africa, Pravin Gordhan, detailed that increased investment in the economy by both public and private sectors is at the heart of creating jobs and growth, which proposes that more requests to increase economic growth will have to exist to have stronger investment in the country (National Treasury, 2014).

After 1994, the trade liberation in South Africa grew tremendously, and the country opened for international trade purposes and investment (National Treasury, 2011). Maepa (2015) motivates that since the South African economy has been open to investments and global markets, global fluctuations have affected investment activities in the country.

From the views of the economists, the greatest constraint to South African growth and development is the economy's low investment rate (Grobler, 2015). In quarter 1, 2014, South Africa's fixed investment spending rose by 2.6 percent per quarter annualised, which is down from 3.1 percent in quarter 4, 2013 (Economic Focus, 2014). Investment in the country seems to be declining since investment spending on infrastructure in South Africa fell from an average of

almost 30 percent of GDP in the early 1980s to about 16 percent of GDP by the early 2000s (NDP, 2016). Because of the environment of rising inflation, high debts and budget deficits that has to be paid up. The key question is how are the investments affected and what makes the investment spending sluggish in South Africa. Fuzile (2016) motivates that the economy of South Africa is monitored by insufficient funds such as level of savings to remain insufficient to fund investments, debt burdens and the country might need help from outside to maintain investment spending.

In general, the rate of fixed investment in South Africa remains below the expected rate of 25 percent of GDP (economic focus, 2014). Currently, South Africa spends 19.7 percent of its national income on capital expenditure and that is insufficient for the country's extensive infrastructure backlog; South Africa should be spending a minimum of 25 percent of GDP on investment activity and maintaining it at that level for more than a year if possible (Economic focus, 2014; Bruggenman, 2009). South Africa has long been considered as the economic powerhouse of sub-Saharan Africa; resources such as gold and diamond have made South Africa an African superpower house in Africa, even though much have not benefited from that (Kangarlou. 2013). Lately, the growth potential in the country has been hampered and constrained by contradictory and ever-changing government policy (Cilliers, 2015). South Africa was overtaken by Nigeria in 2014, when Nigeria was identified as the fastest growing African economy and it has experienced faster growth than South Africa. Its GDP of \$509.9-billion placed it well above South Africa's nominal GDP of \$322-billion (Delloite, 2014).

On the other hand, the Nigerian economy has undergone a series of changes over time. The country has experienced distortion (political crisis and military coup) in the economic market with external shocks and external debt overhang (Umobong & Akpan, 2013:1). There were no clear economic strategies during 1970s-1990s. However, since 1999 the country reimbursed to the path of civil democratic governance and returned to democratic governance. The sustained uninterrupted democratic rule ensured that economic growth evolved tremendously (Sanusi, 2010). Since 2014, large market jobs were created and investors have been attracted by the larger GDP, but still social investments remained stagnant (Delloite, 2014).

Sanusi (2010) mentions that Nigeria has a poor climate for investment spending, even though it has a good economic growth with the absence of adequate infrastructure. About 3 trillion dollars will be needed for infrastructure investment in Nigeria in the next years; this cannot be achieved as the country is facing challenges and investments are growing at a slow rate lately (African Development Bank, 2015). Unexpectedly, it does not appear as if the increase in economic growth

translated to an increase in investment spending in the country (Kanu *et al.*, 2014; Kanu & Ozurumba, 2014). Despite the economic growth, the country has sluggish investment activities, this forms part of an ailing economy as there is high awareness that high investments create economic growth (Thilwall, 1979; Samuelson *et al.*, 2001; Ahmad, 2012). Despite the fact that Nigeria experienced high levels of growth and overtook South Africa, the investments are still sluggish.

The study attempts to examine the sluggish investment spending in both South Africa and Nigeria. Since both countries have been called upon repeatedly to be the leading countries in the continent (Africa) for several reasons. They are called the economic superpower, South Africa has the largest gold reserve and Nigeria has the largest crude oil producer (Cilliers, 2015), of which are cut above other African countries with sluggish investment spending. The study will investigate the determinants of investment spending in South Africa and Nigeria.

1.3 OBJECTIVES OF THE STUDY

The following objectives have been formulated for this study:

1.3.1 Primary objective

The main objective of the research study is to compare and analyse the determinants of investment spending in South Africa and Nigeria and give an overview of which determinants have an effect on investment spending.

1.3.2 Theoretical objectives

In order to achieve the primary objective of the study, the following theoretical objectives are formulated;

- Provide theoretical explanations on investment;
- Identify the theoretical explanations of determinants of investment spending;
- Identify the link between investment spending and its determinants;
- Provide an overview of theoretical explanation of the determinants of investment spending; and
- Review empirical studies on determinants of investment spending.

1.3.3 Empirical objectives

In accordance with the primary objectives of the study, the following empirical objectives are formulated;

- Review investment spending and its determinants in both countries (South Africa and Nigeria);
- Estimate and compare the long-run relationship between investment spending and its determinants in both countries (South Africa and Nigeria);
- Determine and compare the short-run relationship between investment spending and its determinants in both countries; and
- Determine and compare the direction of the causal link between investment spending and its determinants in both countries.

1.4 RESEARCH DESIGN AND METHODOLOGY

This study comprise of both a literature review and empirical study to accomplish objectives set for the study. The data required to perform the empirical portion of the study was obtained from secondary sources.

1.4.1 Literature review

The secondary sources utilised are thesis, dissertations, journals, several books, Internet search engines and electronic versions of articles to access necessary information. The literature review contains theoretical literature on the key determinants of investment spending in South Africa and Nigeria and provides empirical literature about the determinants of investment spending internationally and in South Africa and Nigeria.

1.4.2 Empirical study

The empirical portion of this study incorporates the following methodological dimensions:

1.4.3 Data collection and sampling

In order to know the determinants of investment spending in South Africa and Nigeria, this research study will make use of secondary data on different variables. These variables include determinants such as the inflation rate (price level), real interest rates (lending rate), real exchange rates, real GDP, real savings, country risk, trade openness and gross fixed capital formation (real investment). The data were collected from the South African Reserve Bank (SARB), International

Monetary Fund (IMF), Economist Intelligence Unit (EUI), World Bank, CEIC Data Company Ltd and INET BFA. Monthly data for the period January 2003 to December 2015 were employed. The choice of data was based on availability of data, especially in the case of Nigeria.

1.4.4 Data analysis

The data were analysed using E-views 9 for Windows. The techniques used are discussed in the section to follow.

1.4.4.1 Data analysis technique

The appropriate statistical method of modelling for this study is autoregressive distributed lag (ARDL). ARDL helps to consider the behaviour of the variables in time, adopted from Henry and Richard (1983). ARDL can be employed if the variables are stationary at I (0) or I (1), it can also be employed if there is a mixture of both I (0) and I (1) (Perasan & Shin, 1998). If the variables are stationary at I (2), then ARDL fails to accommodate them. The study will use the ARDL model, the unit root tests to confirm that the variables are stationary at I (0) and I (1) was conducted, using various tests namely the augmented Dickey-Fuller (ADF), Phillip-Peron (PP) (1988) and Kwiatkowski, Phillips, Schmidt and Shin (KPSS) (1992), to check that the variables are not stationary at I (2). Bound tests and error correction models are some of the econometric models that were utilised throughout the study.

1.5 CHAPTER OUTLINE

The format of the study will compromise of the following five chapters:

Chapter 1: Introduction

This chapter introduces the study. It provides a discussion on the background to the study, the objectives of the study (both theoretical and empirical objectives), outlines the research methodology and concludes by providing an outline of the research.

Chapter 2: Theoretical features of investment and investment spending

This chapter provides and a discussion on the theories of investment worldwide, different types of investments worldwide and how the determinants influence investment spending. It will also outline empirical studies that have been conducted by other researchers in this field on investment and its determinants.

Chapter 3: Overview of South Africa and Nigeria's investment spending climate

This chapter provides a detailed explanation on investment spending in South Africa and Nigeria, discusses the determinants of investment spending between South Africa and Nigeria and provides a trend analysis of investments in both countries.

Chapter 4: Research methodology

This chapter explains the research method for the study; to test the key determinants of investment spending in South Africa and Nigeria.

Chapter 5: Research findings

This chapter analyses and discusses the research findings from the employed model for the study. To identify if the empirical objectives have been met and the findings match the econometric expectations.

Chapter 6: Conclusions and recommendations

This chapter concludes the study and discusses possible recommendations for future research.

CHAPTER 2: THEORETICAL OVERVIEW OF INVESTMENT AND INVESTMENT SPENDING

2.1 INTRODUCTION

This chapter reviews a broad range of the theoretical and empirical literature on the effects of a country's investment climate as an integral catalyst for attracting inflows for development and growth. Ali *et al.* (2012) indicate that ever since the time of Adam Smith and Karl Marx, investment was believed to be both the engine of the economy and the primary cause of economic conditions. Investment is significant as it has profound implications for both economic growth and development of the nation and is a major indicator for policymakers and economists alike. Economic research indicates that in the long-run, investment spending determines economic growth in emerging markets across the world (Grobler, 2015; Sawhill *et al.*, 2006). The economy's greatest constraint is when the investment is growing at a low rate, as this derails economic growth and development of a country (Grobler, 2015). The central role played by investments in the business cycle indicates that this is an essential tool for long and short-run growth (Fazzari & Athey, 1987).

This chapter discusses the global and local investment environment and investment spending. The sections to follow include a broad definition of investment and investment spending and theories relating to investment, as well as the types of risks affecting investments. The countries analysed in this study are the leading countries in sub-Saharan Africa (South Africa and Nigeria). However, the Nigerian economy is growing tremendously in economic terms, which is led by the oil sector. The South African economy is not steady, although it was the leading economy in Africa previously (BBC, 2014:1). The impact of the determinants of investment spending is outlined. Finally, the global empirical studies on investment spending discussion follows.

2.2 INVESTMENT AND INVESTMENT SPENDING

Investment and investment spending accelerate growth and assists the economy to develop. To develop an understanding of both investment and investment spending, the concepts are discussed in this section.

2.2.1 Definition of investment spending and investment

Describing investment spending can be reflected by the following definition; Spending does not necessarily refer to the consuming and purchasing of goods and services, it has many ways in which corporations, individuals and governments spend as a way to grow or improve the country's inflows (Schenk, 2013). Riley (2015) indicates that investment spending is the business-to-business spending on worn-out machinery, changes in inventory and an effort to stimulate either capital or physical goods. Investment spending acts independently as its dependence on national income is not considered. Long-term benefits are incurred if there is a good flow from the capital. Governments, individuals and corporations all have a way to contribute to the national resources (investment spending). Referred as capital accumulation, which is when income is saved and invested to augment future output and income and is done by the mentioned participants. Investment spending comes in two forms (Whiting, 2017), namely replacement and new purchases. Replacement occurs when machinery and equipment are worn out and have to be replaced. This is called capital consumption in investment spending terms and it is the product of depreciation. New purchases benefit companies by ensuring that they are more competitive and profitable. This is because, instead of spending their money to replace machines or equipment, it is better to buy new additional machines. This would create a greater output and productivity.

Creating wealth occurs in different ways across different economies. Worldwide, investment is one of the ways to create wealth in the long term by spending presently to generate value in the future (Ali *et al.*, 2012). Investment is a tool for the economy to grow and integrate into markets globally, a process of creating wealth over a period through an agreement of consuming good or property for future purposes. (Phillips & Ahmadi-Esfahani, 2008:505; Hormants, 2010). Adair *et al.* (1994:32) defines investment as anything that is expected to change the risk position of either an individual, government or corporation decision based on the time pattern of consumption. An investor can be an individual, government or corporation; investing and expecting profit or income from the capital placed to create wealth. The next section summarises the different types of investments.

2.2.1.1 Types of investments

There exist a number of types of investment, the section focus on the discussion of the types of investments as follows;

- **Public investment:** Public investment is the delivery of public services by the government in terms of schools, social infrastructure, hospitals and other public services. Public investment is seen as an important catalyst for economic growth and capital purposes because it shapes choices (IMF, 2014).
- **Private investment:** Private investment is investment spending by businesses and financial institutions rather than by government (Cambridge Dictionary, 2017). Private investment can take many forms, for example, portfolio investment in research and development and it is important for both the individual and the economy.
- **Foreign direct investment:** Foreign direct investment (FDI) is an integral part of an open and effective international economic system in terms of investments. FDI is a major catalyst for development for not only developed countries but also developing countries. FDI does not benefit each nation as countries differ in terms of development and growth (OECD, 2002:3). FDI plays a supporting role in closing Africa's financing gaps, crowds-in domestic investment, and it is an effective policy tool for stimulating local investment (OECD, 2002:8).
- **Domestic investment:** Investments taking place within the borders of the country are regarded as domestic investments. Domestic investment is both the engine and driver of growth in both developed and developing countries (OECD, 2002). UNCTAD (2013) indicates that domestic investment in Africa has not grown at a faster speed, relative to the faster increase in the needs for resources to finance development. This indicates that there is a wide and growing gap between the investments requirements of Africa.

2.2.1.2 Importance of investment and investment spending

Reilly and Brown (2012:4) indicate that individuals, companies and government invest to accumulate return from savings, to get a rate of return during the period of the investment, the expected rate of inflation during the period and to cover for the uncertainty of future cash flows. Public resources from the government are not enough to address the development of the country and the economic goals that are set. Investment is regarded as the best tool for countries as it benefits developing countries and organisations to stimulate the country's status and promote good trading inflows (Maepa, 2015:1).

The main point that needs clarification is how vital is investment spending in economies worldwide. Investment spending is an injection to the economy because it increases the finance of the economy in terms of having capital aside to spend on public resources (Business Dictionary, 2016). The former Minister of Finance, Pravin Gordhan, detailed that increased investment in the

economy by boosting both public and private investments that is at the heart of job creation and growth, which proposes that more requests must be done to boost a stronger investment climate in countries (National Treasury, 2014). Ahmad *et al.* (2012:680) indicate that investment is part of financial planning and is the most volatile component of GDP, in that investment spending makes a direct contribution to economic activities and an increase in investment spending reduces debt (long-term costs), increases competitiveness and raises profit. Investments are regarded as playing a vital role in the financial and economic markets worldwide, it allows producers to take advantage of technological progress, increase the productivity of workers and allows for the permanent change and improvements in the standard of living of the citizens (Prinsloo, 2010:2). The aim is not to create wealth only in the long-term. Additionally, investment creates capital goods in a way that the presence of a high investment rate suggests that capital stock is growing rapidly because investment is a determinant of the economy's long-run productive capacity stock (Kosma, 2015:2). Investment spending aims to ensure a better standard of living for individuals in the future and high standards for the future production for firms (Mankiw & Taylor, 2008:540). Investments happen for other reasons as investors (individuals, government and corporations) invest for either value or growth. Investing for growth means, considering investments with the aim of ensuring a higher value of the investment over the period of time and on the lookout for companies with higher earnings per share growth in the future (Fidelity, 2015; Reilly & Brown, 2012:570). While investing for value is making investments focusing only on the price component (being cheap) or selling securities that are cheap (Farmer & Joshi, 2002:157; Reilly & Brown, 2012:570).

2.3 ROLE OF PUBLIC AND PRIVATE INVESTMENTS

As mentioned in 2.2.1.1, investments can be both public and private. In this section, the study will discuss how public and private investments play a part in investment. Investments refer to investment spending of the entire economy, including government, non-financial institutions, financial institutions, non-profit institutions and households.

2.3.1 Private investment

Individuals, businesses and financial institution investments spend their investments in different ways. From the individual perspective, there are stages in an investor's life cycle, as they go through different stages of investing. Mpofu *et al.* (2013:270) indicate four phases that an investor goes through, namely accumulation phase, consolidation phase, spending phase and gifting phase. The accumulation phase consists of early to middle years of working careers, their short-term

needs (a house and car) and long-term needs (education and retirement). The consolidation phase is the midpoint of careers, most of their debt is paid, individuals are more concerned about education and the long-term plan is retirement. The spending phase begins when an individual retires and the gifting phase is concurrent to the spending phase, as individuals could give their investments to families or charities (Bodie *et al.*, 1992).

The spending phase and gifting phase are affected by the investment spending determinants (Mpofu *et al.*, 2013:270). While attempting to maintain the nominal value of savings, investors ought to balance and protect their capital to shield against a decline in the nominal value of savings due to inflation and taxes during the gifting phase. To cover and protect themselves, investors at this phase need to invest in less risk growth investment, such as common stocks in terms of inflation, exchange rate protection.

2.3.2 Public investments

There are levels in government and different responsibilities for financing the public goods and services. Public investments serve to promote economic growth, through ways of financing public infrastructure projects (housing, roads and hospitals) OECD (2013:81). Mbuli (2008) indicates that investments in road infrastructure reduce transportation costs, which lead to a reduction in market prices. Interest rates, inflation rates and other determinants have an impact on public spending in a way that it takes years and months without progress on infrastructure due to the fact that there is an absence of money. This indicates that if more has been done on public investments, emerging markets will want to involve themselves with countries who have strong investments in their public responsibilities.

Holcombe and Erden (2015) mention that it seems that public investment does not spur growth or development; public investments complement private investment mostly in developing nations but not in developed nations. Public investment in infrastructure is widely believed to have a direct impact on private investment, this might be that infrastructure attracts investors to believe they can invest in a country or organisation. Some studies (Khan & Reinhart, 1990; Khan & Kumar, 1997) found that even though public investment contributes to the economy, private investment has more influence on economic growth in developing nations.

Investors should protect and balance their capital to beat inflation and exchange rate change, the same should happen in public investments in order to have balance in the government responsibilities and increase the chances of emerging markets (Mpofu *et al.*, 2013).

2.4 INVESTMENT RISKS

All investments carry a certain degree of risk and it is vital for investors (corporations, individuals and government) to learn about the financial markets and know which kind of risk will affect their investments (Crouhy *et al.*, 2013). Investment risks can be used as a tool in pursuing financial goals. Investors should learn to recognise and manage investment risks identified.

- Market risk is the likelihood that the value of investments will decrease due to movements in overall markets (Crouhy *et al.*, 2013). Factors include changes in the commodity prices and foreign exchange rates. To avoid market risk, investors should take long-term approach investments, not the ones affected by day-to-day changes.
- Liquidity risk is risk that arises when assets cannot be sold at any price. Some investments may be difficult to sell due to the risks that the investments are exposed to, or due to there being a lack of buyers in the market (Mpofu *et al.*, 2013:6). To avoid these risks, investors can invest in active markets like large capitalisation stock.
- Inflation rate risk occurs when the return on investment can be affected by inflation risk in a way that the return on investment is below that of the current inflation rate, leading to a decline in the return on investment. This type of risk must be considered when evaluating investments such as bonds and money market funds in long-term investments (Cillers, 2004:20).
- Credit risk is loss due to the possibility that the issuer of a financial obligation (bond, loan) will not be able to repay the money on the agreed terms of the contract on a timely basis (Crouhy *et al.*, 2013).
- Longevity risk is the risk of outliving your savings. This is when pay-out levels are higher than expected.
- Interest rate risk is the risk of loss due to changing mismatches on the lending rate. Changes in unmanageable mismatches on interest rates affect investment and equity probability. To reduce the risk, fixed-income investments durations can be diversified at any given time (Investorguide.com, 2017).
- Foreign exchange risk arises from open or imperfectly hedged positions in a particular currency. The volatility of the exchange risk can inhibit investments, sweep away the return from the expensive foreign investments and put the foreign firm at a competitive disadvantage in relation to its foreign competitors (Crouhy *et al.*, 2006:28).

2.5 EFFECT OF FINANCIAL CRISIS ON INVESTMENTS

The effects of 2008-2009 financial crisis left a mark within the financial sector as they are still felt around the world (Inklaar *et al.*, 2012:29), but what has not been noticed is that it also affected the economy. Turner (2013) indicates that the financial crisis occurred because there was a failure in constraining the financial system. The occurrence of financial crisis further worsened the difficulties on the path of investments (Boujelbene & Ksantini, 2014).

The 2008-2009 global financial crisis challenged countries to sustain spending that promotes growth and development. Government investments were less affected than social spending during this time. Investments were kept in large numbers in developing countries because of stimulus spending (Brumby & Verhoeven, 2009:198). Boujelbene and Ksantini, (2014) indicate that in 2009 most countries investments were reduced from the average of 24.38 percent in 2007 to 21.08 percent. The year 2008 had the most severe decline in terms of investments during this decade, as the investment averages between 2002 and 2007 were good, but then they fell during 2008 to 2009.

The sub-prime mortgage markets ultimately spread the crisis all over the world's financial markets, worsening investor confidence. The consequences deteriorated the financial status of banks and the holders of these investments, which not only affected the banking sector but stock markets all over the world. The stock market and financial sector became less attractive to investors who rather invested in commodities like oil and minerals (Maswana, 2009:7). During the financial crisis, one of the major impacts, more especially for the sub-Saharan African countries, was the drastic reduction in fixed investments in 2008 from 20.5 percent to 12.4 percent in 2008. The financial meltdown altered investment climates further by experiencing a decline and drying up of capital inflows and trade with international investments (Foreign Direct Investment (FDI), bonds to slow down and raise country risk and damage international trade (African Development Bank, 2009).

Another investment that the crisis hit very badly is FDI; the crisis led to the collapse of FDI worldwide. FDI fell by 14 percent at a global level and the decrease led to 30 percent in 2009, while on the other hand, the developing countries recorded a decline of about 44 percent in FDI. The effects of the financial crisis harmed most economies and is still felt today. The assurance is that every nation is working on how to recover from the crisis. For investors, it is much better as they can seek investment advice from banks and other financial institutions (UNCTAD, 2009:3).

2.6 THE MODELS OF INVESTMENT

For the time being, investment plays a crucial part and is a very important determinant of the long-term competitiveness of the economies markets worldwide, both firms and economies of countries consider investment in the same approach, which is to accumulate wealth in the long-term (Romer, 1996; Dornbusch & Fischer, 1990). There are various theories of investments that are used worldwide, which explain the behaviour of business firms and government. One can distinguish at least some of the theories of investment, namely the Harold-Domar growth model, the accelerator theory, neoclassical theory and Q theory. Samuel (1996) indicates that some of the models (discussed in the study) are useful when considering various factors (like cash flows, capital stocks) in shaping investment decisions. All four theories assume optimisation behaviour on behalf of the decision maker (investor). The models are examined briefly in the following sections and each theory has its own unique insight that relates to the sequence of investment spending.

2.6.1 Harold-Domar growth model

Cited in (Harrod & Domar, 1967), The Harrod-Domar model describes that the economic mechanism by which more investment leads to more growth. For a country to grow the Harrod-Domar model believes that economies must save and invest a certain proportion of their GDP in capital formation. This model stresses the significance of savings and investments as important ingredients for growth in developing economies. The model shows mathematically that growth is related directly to saving and indirectly related to capital-output ratio. Suppose we define national income as Y , growth as G , capital-output ratio as K , saving as S and investment as I , average saving ratio as s and incremental capital-output ratio as k , then we can construct the following simple model of economic growth.

$$S = sY \tag{2.1}$$

Saving (S) proportion of (s) of national income (Y)

$$I = \Delta k \tag{2.2}$$

Net investment (I) defined a change in capital stock K

$$G = \Delta Y \tag{2.3}$$

ΔY that is growth defined as the change in national income - ΔY divided by the value of the national income. However, since the total stock, K bears a direct relationship to total national income, or output Y , as expressed by the capital/output ratio k , then it follows that:

$$K \frac{k}{Y} \quad (2.4)$$

Or

$$K = \frac{\Delta k}{\Delta Y}$$

Or, finally

$$\Delta K = K \Delta Y$$

Finally, since total national saving, S , must equal total investment, this equality must be written as:

$$S = I \quad (2.5)$$

However, from Equation 2.1 above $S = sY$ and from equations (2) and (3):

$$I = \Delta K = k \Delta Y$$

It, therefore, follows that it can be written that the identity of saving equalling investment shown by Equation (6) as;

$$S = sY = k \Delta Y = \Delta k = I \quad (2.6)$$

or simply as

$$sY = k \Delta Y \quad (2.7)$$

$$\Delta Y = G = sY K \quad (2.8)$$

By dividing both sides of Equation 2.7 by Y and later by K , we derive at the growth model $\Delta Y/Y$, which represents the rate of change of national income or rate of GDP (i.e., percentage change in GDP)

Equation 2.8, which is a simplified version of the famous Harrod-Domar equation in the theory of economic growth, implies that the rate of growth of GDP ($\Delta Y/Y$) is determined jointly by the national saving ratio, s and national capital/output ratio, k . More specifically, it says that with the absence of government the growth rate of national income will positively relate to saving ratio. (i.e. the more an economy is able to save and invest out of given GDP, the greater the growth of that GDP. Inversely or negatively relationship to the economy's capital or output ratio (i.e., the higher the k is, the lower will be the rate of GDP growth).

The economic logic of Equation 2.8 is very simple. In order to grow, economies must save and invest a certain proportion of their GDP. The more an economy can save and invest, the faster they can grow, for any level of the rate of growth depends on how productive the investment is.

The constraints and obstacles of this model are (Todaro & Smith 2015:123):

- There are low levels of new capital formation in developing countries. The only time capital accumulation increase is when the economy grows dynamically, which happens after some time in developing countries.
- Poor countries have savings gaps that exist and can be filled by foreign aid or investments. Since the income gained is mostly, spend on consumption rather than saved up.
- The research and development needed to improve the levels of capital or output ratio is often under-funded.

2.6.2 Accelerator model of investment

The model focuses on output growth since it is the determinant of investment decisions and associated with the Keynesian approach in a way that Keynesian approach focuses on quantity adjustments (fixed prices) (Baddley, 2002). The formulation of the accelerator model can be traced back to Clark (1917) as he was the first person to describe the relationship between investment and accelerating output or rate of the growth (Baddley, 2002). What the model undertakes is that if there is a change in the output growth, then the investment level in the economy will also be affected (Gillespie, 2014:370). This model fits perfectly for inventory investment. The model proposes that the correspondence between recent output and productive capacity is the ones that determine investment (Clark, 1917; Chenery, 1952). Superior investment spending is created when the output and sales to capacity are greater. In this model, prices, wages, taxes and interest rates have no independent, systematic influence on capital spending.

Nghifewa (2009:34) indicates that under the accelerator theory, it is assumed that there is an anticipated capital stock for a given level of output and interest rate. A rise in output or a fall in interest rate may quickly increase levels of investments because firms will adjust to reach the new equilibrium of the stock level. Furthermore, the model shows the level of investment and growth, since investment is believed to be the estimated key to the future of any country. To develop and thrive, any economic emerging markets require a massive amount of capital goods and output (Agénor & Montiel, 1999; Maepa, 2015:19).

2.6.3 Neo-classical model

The model is also known as the user-cost model. It clearly assumes profit or value maximisation, the theory assumes firms maximise profits subject to the Cobb-Douglas production technology. The maximisation of the profits in each period yields an optimal capital stock (Eklund, 2013). Assuming that the production function can be written as a conventional Cobb-Douglas function:

$$Y(t) = f(K(t), L(t)) = AK^\alpha L^{1-\alpha} \quad (2.9)$$

Where $Y(t)$ is the firm output, K is capital and L denotes labour, all in a period. Fisher (1930), observed investment as an optimal adjustment path towards an optimal capital stock and then Jorgenson's (1963) neoclassical theory of investment basically formalised the ideas put forward by Fisher (Eklund, 2013). The model is designed for business fixed investment.

The model suffers from several restrictive assumptions, namely constant cost of capital (discount rate), the unitary elasticity of substitution between capital and labour, exogenously determined output prices, reversible investment and malleable stock of capital. Again, the model assumes that depreciation for tax purposes is a constant fraction of the replacement cost of the firm's assets and does not consider the uncertainty that may arise. These assumptions have tended to limit the application of the neoclassical model to developing countries (Twine *et al*, 2015).

2.6.4 Tobin's Q-theory

The q-model extends the neo-classical model that relates investment spending to the ratio of the market value of the firm as determined by an additional unit of capital to its replacement value, in other terms, the q-model is the adjusted version of the neo-classical. The model uses shadow price of capital services, known as the cost of capital, to define the optimal level of capital stock and this implies a high degree of perfection in the capital markets. For example, when organisations maximise profits from current costs, the capital stock will adjust accordingly until no profits are

made. Capital increases by the inflow of investments and decreases are determined by depreciation (Ngifwenwa, 2009:36; Tobin, 1969). Although this theory explicitly connects investment to the objectives of organisations, there has been some criticism on several grounds about the model. For instance, it's great number of simplifying assumptions, such as rational expectations and efficient markets and the possibility of generating different investment behaviour from the specification of the firm's alternative objective and production function (Twine *et al.*, 2015:3). Investment rises when the marginal q exceeds one and declines when it falls below one (Ferderer, 1993).

The investment theories explained differ, as they vary with the investment performance that has been employed. Meaning it depends on the state of the investments. It can be assumed that all the models can relate to the study, as it is all about the growth of investments considering investment decisions and output.

2.7 DETERMINANTS OF INVESTMENT SPENDING

One of the vital roles for any country is improving and creating an enhanced investment climate. Factors underlying investment spending performance varies across the world, hence the choice of determinants differs. Previous studies (Ali *et al.*, 2012; Uremadu, 2008; Bibi *et al.*, 2012; Al-Badry, 1998; Kosma, 2015) reflect determinants of investment or investment spending. The studies reached different conclusions but mostly discussed same determinants. The research draws on the extensive literature on the determinants of investment spending by discussing the determinants in this section.

2.7.1 Expected return on investment

Expecting too much can lead to displeasure. Market expectations adjust according to the prospects of the economy. The expected return on investment is when investors expect a certain return after a period and this involves a lot of uncertainty. The return depends on the state of the economy; there cannot be a huge return on investments while it is clear that developments within the economy are unclear (Daalder, 2015:6-10). When one invests, current consumption is deferred in order to add to our wealth so that we can consume more in the future. An expected return on investment indicates a change in wealth that resulted from an investment, considering all the risks that can hamper the investment. The change can either be positive or negative inflows. For example, inflows or outflows form interest rates, GDP and changes in the price of an asset (Reilly & Brown, 2012).

2.7.2 Exchange rate

Exchange rates have an impact on the investments and growth of each country; it can be either weak or strong as Van der Merwe and Mollentze, (2012:116) indicate that exchange rates play a critical and vital part of investments worldwide. The exchange rate involves converting a currency in relation to another currency, for example dollars, euros and rands (Dornbursch *et al.*, 2011:287-289). Each country has an exchange rate market, where if one has a foreign currency it can be exchanged to domestic currency. In order to explain exchange rate and relate them to investments it is important to consider the different types of exchange rates, namely nominal exchange rates and real exchange rates (Abel *et al.*, 2008).

- Nominal exchange rate indicates how many units of one currency can be purchased with one unit of single currency (Fourie & Burger, 2011:153). When considering this type of exchange rate, inflationary pressure in each exchange rate, respective is not removed or compensated for (Czech National Bank, 2016). These are actual rates charged in the foreign exchange market.
- Real exchange rate is the exchange rate that has been calculated using nominal exchange rate. It is defined as the type of exchange rate that indicates the comparison between the relative price levels of two different countries (Evrensel, 2016).

There are types of exchange rate regimes that assist central banks to pay off the financials, deficits and debts. Countries have adopted and tested various exchange rate regimes (systems) over the last decades in an attempt to ensure price stability, which in the long term would attract foreign investments and fuel economic growth and development (Muzindutsi, 2011:71). The systems are fixed exchange rate and floating exchange rate:

- Fixed floating exchange rate is set by the central bank and two currencies remain fixed. This system eliminates exchange rate risks and discipline is brought into the government policies, promotes foreign investments as investors can predict profits with relative certainty. However, it has a long-run credibility (Mpofu *et al.*, 2013:320).
- Free-floating exchange rate is defined as a regime in which another price of the currency is determined by the forces of demand and supply and the currency price is allowed to move freely with no borders (International Trade Institute of South Africa (ITRISA), 2013:241).

Every country has a specific system that they employ in terms of exchange rate. Exchange rates can either appreciate or depreciate in the economy, a currency that appreciates tends to discourage exports and investments as it is an increase of the value of one currency to another and the

exchange rate that depreciates stimulates investments and exports as it entails a decrease in currency (Mohr & Fourie, 2008:390).

2.7.3 Technological change

The latest advances in technology affect investment, as many investments are done through cable technology. Technological innovation plays a role in the economy, the implementation of new technology needs capital and the demand for it affects investment, as funds are needed for the innovation in technology. Companies will invest in technologically advanced countries to remain competitive in markets where innovation is rapid (Fourie & Burger, 2015:531). Most firms make a decision to invest in foreign countries by expanding their business overseas and contribute to the diffusion of technology to increase the number of local firms, as this can lead to increase in domestic investment and technological infrastructure (Petrochilos, 1989). It is widely recognised that technological leadership and firm growth are related closely to investment capacity. Investment encouragement promotes technological upgrading, in the case of the start-up, marketing and licensing arrangements (De Mello & Sinclair, 1995; Markusen & Venables, 1999).

2.7.4 Inflation rate

The inflation rate is a continued increase in the overall price levels; spending of investments is affected in a way that the returns that have been saved are used to consume goods and services as prices go up. Understanding inflation is essential to investing because it reduces the investment returns (Pimco, 2012:1). The high levels of inflation in different countries are an indication of bad economic policy and management by the host countries (Garner, 1993). Inflation is measured by consumer price index (CPI). There are measures investors can use to track inflation so that they know how it can affect them, namely producer price index (PPI) and consumer price index (CPI) (Pimco, 2012:2):

- PPI measures the prices that are paid to producers; it is reported either monthly or in three quarters measuring the consumer goods while the rest is set for the capital goods account.
- CPI includes all the retail prices of goods and services, including healthcare and transport costs. A bond called treasury-inflation protected securities is linked to inflation; this is because when commodity prices increase, prices of goods and services commonly increase. Investors shift their money over the long term if inflation keeps increasing as this wears away the investment returns.

2.7.5 Interest rate

An interest rate is a price charged, expressed as a percentage of the total outstanding amount on loanable funds; it is where the contractor wants to earn a certain income on invested funds. It is used by reserve banks to control and achieve stable prices (Mohr & Fourie, 2008:329). The interest rate is an important economic variable that plays a vital role in both macro- and micro-economic activities. Western economists believe in the notion that interest rate is linked to savings and investments, hence when interest rates fall (increase), bond prices increase (fall) (Li Suyuan & Khurshid, 2015). Investors have to consider the two different interest rates when investing:

- Nominal interest rate is the annual rate at which many investments are quoted.
- Effective interest rate adjusts the nominal rate based on the frequency of compounding employed and number of days indicated. This should be used when the returns are evaluated.

Hypothetically, high interest rates might attract foreign inflows, which lead to investments in high yields. Investments in foreign securities are influenced by either a decrease or increase in interest rates, it depends if it is for an outlook for long term or short term (Mpofu *et al.*, 2013:45).

2.7.6 Level of savings

The behaviour of savings and investment decisions are made by the sectors of the world economy; individuals, corporations and government (Desroches & Francis, 2006; Prinsloo, 2010:3), which provides the ability for capital formation thus essential for economic development. Savings in a country is the amount of money put away for unforeseen circumstances, not consumed immediately. Putting away savings provides returns for the economy in the future (Prinsloo, 2010:4). Countries that have high saving rates can maintain high investment rates and if there are available funds for investment spending, spending culture will be discouraged, meaning saving will dominate and interest rates will be reduced (Rittenberg & Tregarthen, 2012). One of the economic problems facing developing countries is that they do not have enough savings to finance their investments; hence, savings must be encouraged in most developing countries to encourage investments (Demirhan & Masca, 2008).

2.7.7 Business confidence

Confidence is the ultimate decision driver for today's business leaders (Moffatt, 2014). The common denominator for business success and driver in capital markets is confidence, but confidence can be temporary if there is lack of planning and vision. Business confidence is when

leaders in business make decisions believing there will be no disruption and investing in high priority areas to fuel growth and mitigate risks that could hamper growth. When judging the market, there must be confidence to take investment risks that may arise concerning the time, focus and resources that will drive long-term competitive advantage (Deloitte, 2014).

2.7.8 Gross domestic product

GDP is one of the most widespread and closely watched economic statistics, used as an indicator for economic activities to provide the basis for the likes of investment and production (BEA, 2015). GDP reflects the total market value of all the final goods and services produced within the borders of a country in a specific period (Van Zyl *et al.*, 2005:9). Theoretically speaking, GDP can be analysed using three methods, namely production approach, expenditure approach and income approach (Callen, 2008):

- Production approach is the sum of value added at each stage involved in the production stage. Value added= total sales-value of intermediate inputs, for example hiring an architect to offer services is an intermediate input and a building is a final product.
- Expenditure approach measures GDP as the sum of consumption expenditure, investments (gross fixed capital formation), government purchases and net exports.
- Income approach sums incomes produced by citizens or corporations in the production of goods and services. The formula that is used = $C + I + G + X - M$.

Where C= Final consumption

I= Gross fixed capital formation

G= Government consumption expenditure

X= Exports of goods and nonfactor services

M= Imports of these and nonfactor services

Two of the most common approaches that are used by Bureau of Economic Analysis (BEA, 2015) are the expenditure and the income approach. As indicated throughout the study, investment plays a vital role in the economy, because in GDP terms, capital increase causes growth and investment growth depends if there are any fluctuations in the economy or not.

2.7.9 Corporate taxes

Debitoor (2017) describes corporate tax as taxable amounts on the level of profits made by companies and organisations. The government can reduce the rate so there is a greater incentive to invest (Riley, 2015). Changing the level of tax allowances will be considerate for businesses to balance their investment spending against future tax bills. Riley (2015) also indicates that the regulations set by the government can influence investments, as there are laws that have to be followed, such as the laws on carbon emissions and business tax laws when investing in a foreign country. The lower the corporate tax, the stronger the offer of incentives for business sectors to invest; hence, corporate taxes.

2.7.10 Country risk

Country risk refers to the possibility that a sovereign government or borrower of a particular country may be unable or unwilling to fulfil their obligations towards foreign trade, which arises in relation to the financial loss on investments and lending due to economic events in the country. It occurs in most case when countries default a purchase (Calverly, 1985:3; Investing answers, 2017; Krayenbuel, 1985:3). Country risk shows the general management of risks when involved in international business, it consists of political and transfer risk (Krayenbuel, 1985:3) discussed as follows:

- Political risk is the risk investors face when a country where they have invested, restricts their investment according to the political decisions.
- Transfer risk is related to the fact that the country, the one that the investments are taking place in may enforce restrictions on remittances of capital or dividends for investors as part of the economic policy set by that country (Krayenbuel, 1985:3).

2.7.11 Trade openness

Trade openness is defined as a measure of economic policies that either restricts or promotes trade between countries. It means countries are given access to either import or export according to their preference (Huchet-Bourdon *et al*, 2011:2). Trade openness is measured by total exports plus total imports to GDP (Charkrabarti, 2001). Trade openness is better for the utilisation of countries, in the long term it can have a positive effect on growth provided that it would lead to an increase in investments rates (WTO, 2013)

2.8 THE EFFECT OF THE DETERMINANTS OF INVESTMENT SPENDING

Determinants of investment spending differ among countries and across sectors of economies around the world. However, the chosen variables in this study are determinants that are more likely to affect investment spending in the world rather than at country level (Magableh & Ajlouni, 2016) as developing countries deal with uncertainty more than developed countries. Determinants that affect investment spending in South Africa and Nigeria will be examined in Chapters 3 and 4. A country that has a good investment environment provides assurance to investors, including foreign investors, to invest in that country as it will promote good flows and improve the public and private investment spending (Te Velde, 2006; Hertzberg & Wright, 2005). In this section, the impact or the relation between the determinants and investment spending was outlined. Factors that contribute to establishing investment spending inflation rate, interest rate, exchange rate, GDP, taxes, savings, country risk and trade openness will be discussed in terms of their effect on investments, in the sections to follow.

2.8.1 Inflation rate-investment relationship

There are various reasons why inflation may hurt investments or the economy as a whole. Lall (1997:22) indicates that a manageable low inflation together with low interest rates attracts more investors and boosts investments worldwide. Inflation occurs when the quantity of money rises and purchasing of goods and services requires money as prices have increased (Friedman, 1989:255). Rusike (2007) mentioned that high inflation rates have a negative effect on FDI inflows, high inflation affects uncertainty, high production costs, which in turn leads to uncertainty regarding business and investments in the country (Naude & Krugell, 2003). Eventually, inflation is good for investments as the effect depends on the low or high inflation rate. High inflation rates impede investments and low inflation rates vice versa.

Investments will be promoted and be stable if inflation rates are lower because even economic growth will be improved, policies to reduce inflation rates and establish political and social stability are needed to sustain and obtain higher rates of investments. The effect of inflation, if negative, can weaken the position of investments and this can be difficult for attractiveness (Chirinko, 1993). Obviously, from the information outlined high inflation rates can be a handicap on the achievement of stable investment spending and low inflation rates promote stable and attractive investment. In the case of this study, a negative relationship can be expected between

investment and inflation. Studies like Acosta, (2005) and Mouawiya, (2005) found a negative relationship between investment and inflation.

2.8.2 Interest rate-investment relationship

Jorgenson (1963) mentions that the effects of interest rates were speculated in the investment equation on private investment spending in his capital behaviour and investment behaviour; while Chetty (2007) remarks that, a backward-bending function exists between investments and interest rates. Changes in either nominal or real interest rates have an effect on investment spending leading to a preferred movement in the real economy. The interest rate is believed to be a key determinant of the level of direction of investment spending and it is believed to influence investment demand (Ferdousi, 2009:5). However, this is not always the case as the study by Ferdousi (2009) found that interest rates have little impact on investments, after testing the relationship between interest rates and capital formation in Bangladesh. Policymakers during the 1970s (McKinnon & Shawn, 1973) supported the notion that real interest rates are frequently negative in developing countries because of the controls of administration on nominal interest rates and heavy regulations set in financial markets, to support financial liberalisation to promote savings and investment. Eregha (2010) examined variations in interest rates and investment determination in Nigeria and deduced that investment has an indirect relationship with interest rate variation and other variables. Kamal (2011) investigates the effect of real interest on investment in Bangladesh and the results showed a negative sensitivity of interest rate to investment.

If interest rates were higher, investments would be expected to yield negative or low return. Falling interest rates mean investments increase, higher interest rates mean investments will decrease. Gilchrist *et al.* (2005) indicate in their study that there is a negative relationship between interest rate and investment. A study by Ghosh and Ghosh (2006) shows an inverse relationship between investment and interest rates. This is since creditors increase the rate of interest, which makes organisations or central banks increase the cost of capital and this, in turn, influences the firm's level of investment.

The impact of interest rates reflects differently across countries, but the effect of interest rates on developing countries must be kept low in order to stimulate private investment, which will lead to savings and investment demand will increase (Jorgenson, 1963). The study points out to expect a negative relationship between interest rate and investment spending, in contrast with the opinions of other studies (Hyder & Ahmed, 2003; Ahmed & Islam, 2004; Williams, 2009; Barder &

Malawi, 2010; Ergha, 2010) confirm that investment inversely and negatively responds to interest rate.

2.8.3 Exchange rate-investment relationship

One of the most important factors to investors when investing abroad is the exchange rate and its uncertainty (Osinubi & Amaghionyeodiwe, 2009). Increased flows of investments were witnessed around the world, but the growth in investments to developing countries like sub-Saharan countries lagged behind in attracting investments, mostly FDI (Kosteletou & Liargovas, 2000).

A study by (Tiwari, 2003) motivates exchange rate as a value that a currency has compared to another currency of a certain country. Movements or uncertainty of exchange rates appear to be important factors that have to be taken into consideration when deciding to invest abroad. Studies have indicated that there exists a negative relationship between exchange rates and investments, in particular studies like Darby *et al.* (1999), which concluded that exchange rate variability has a significant and negative impact on investments, while Campa and Goldberg (1995) and Goldberg (1993) concluded that exchange rate variability has a depressing effect on investments. However, there is a relationship between exchange rates and investment – when the exchange rate is low this promotes increasing investments and when the exchange rate is high investments are discouraged (Harchaoui *et al.*, 2005). The exchange rate volatility on investment decisions depends on the stability of the exchange rate (Atella *et al.*, 2003)

Generally, empirical work for this study tends to imply there is a negative relationship between exchange rate and investment spending, in contrast to the studies of Darby *et al.* (1999), Goldberg (1993), Atella *et al.* (2003) and Ramirez (2008). Investors take notice of exchange rates, especially when involved in international investments; hence, exchange rate is an important factor for either domestic or foreign investment.

2.8.4 Savings-investment relationship

The most important factor for any country's investments is the savings made within the borders of each country (Ozcan *et al.*, 2003). If the savings in a country are at a high rate, investment spending is probably going to increase. Prinsloo (2000:1) motivated saving in a country as an amount of income produced within the economy not consumed immediately, but put to use in another way to provide returns to the economy in the years to come. Countries with higher saving rates tend to maintain high investment rates and to frame for good investment spending economic proposers

need to frame savings accordingly and determine interest rates and the cost of investment within the financial sector. The research study includes domestic savings, which includes private households, companies and general government. The classical theory states that an increase in savings and investments will lead to an increase in output (Ramakrishna & Rao, 2012).

Saving is regarded as a mechanism supply of the funds to the capital markets that channel funds into the investment process (Feldstein & Horioka, 1980). (Dooley *et al.*, 1987; Bayoumi, 1990) studies find that most countries with low saving rates have low investment rates. The study by Feldstein and Horioka (1980) indicates that a relationship exists between savings and investment. A positive impact on savings and investment is expected for the study.

2.8.5 GDP-investment relationship

GDP is the primary indicator used to gauge the health of the country's economy and the investments are affected as investment spending forms part of the GDP (Trivedi, 2009). During the times of recession, investments are affected negatively and investment-spending stops completely as there are not enough funds to provide for spending needs, markets suffer due to the recessive behaviour of the market (Kaufmann & Valderrama, 2008). Investments are vital in the functioning of an economy, either developed or under-developed; this is why investment is seen as a propellant for economic growth (Duruechi & Ojiegbe, 2015).

The progress of a country is determined by the performance of investments to encourage and associate with the economic activities to correlate with growth. Neo-classical and endogenous growth models showing that this is the most influential determinant of growth (Petraikos *et al.*, 2007) recognise investment. GDP as a proxy for economic growth in some studies (Solow, 1956; Swan 1956; Barro, 1991) confirmed a significant and positive impact on investments. A study by Adofu, (2010) motivates that there is a strong correlation between investments and economic growth as revealed by theoretical and empirical studies of economists of the world. To attain the goal of obtaining investments, developing countries have to find a way to gauge investments that will lead to economic growth. Concerning the above opinions, for the purpose of the study, a positive relationship is expected for the mentioned variables (GDP and investment spending).

2.8.6 Taxes-investment relationship

The after-tax returns can be tactless and mostly not satisfactory for organisations or individuals. Since developing countries dominate the study, tax enforcement might be an important factor

influencing investment in developing countries (Djankov *et al.*, 2010:42). Arnold *et al.* (2011) motivates that corporate tax is the most hurtful tax followed by income taxes, consumption taxes and property taxes, this leads to a reduction in the incentives to invest. Investments are affected by taxes even when funds for investments are available and returns are reduced, tax rates influence the method of financing a firm uses when investing (TIPS, 2000:6).

Corporate taxes are costs to investments and they have heterogeneous investment effects across firms in an economy. When examining corporate tax rates it is evident in most cases that low corporate tax rates increase investment and high tax rates discourage investments in most situations (Huizinga & Laeven 2008; Dobbins & Jacob, 2016).

The following studies indicated and found the existence of negative impact of taxation on the gross fixed capital formation, (Summer, 1981; Hasset & Hubbard, 1996; Romer & Romer, 2007) indicated that increasing taxes has a powerful negative effect on investment. There is also ambiguous literature about corporate taxes on investments (Yagan 2015; Alstadsæter *et al.*, 2016). It can be concluded that corporate taxes have an ambiguous impact on investment, as supported by the above opinions from different studies.

2.8.7 Trade openness investment relationship

Protectionism and nationalistic tendencies of restricting global trade in some of the economic markets potentially lead to the weakening of trade and investment activities globally (IDC, 2016:3). As investment is a determinant of economic growth, Edward (1992) found that trade openness can accelerate economic growth of a country. Since investment forms part of growth, for the purpose of the study it can be concluded that trade openness can have a negative or positive impact, this is concluded on the basis of the state of the economy.

Domestic and foreign investment encourages the trade sector, specifically export, import trade, and enhance economic growth and development (Adam, 2009). Some empirical literature (Din *et al.*, 2003; Baltagi *et al.*, 2009) reveals that trade openness is the growth factor for economic performance and found a positive relationship between investment, economic growth and trade openness. As mentioned, trade openness and investment have an ambiguous relationship. Contemporary studies (Abbas, 2003; Warner, 2003; Rodriguez, 2007) reveal that trade openness is not associated with economic growth; hence, investment in most cases is not encouraged on economies markets. For the purpose of the study, an ambiguous relationship is expected between trade openness and investment spending.

2.8.8 Country risk-investment relationship

Evaluating country risk is a crucial exercise worldwide when choosing to participate in international business, particularly investments. The overall situation and other risks are included in country risk, which shows the risks involved in the international business (Conkin, 2002). Country risk is considered a diagnosis of the socio-economic potential of the country that receives international economic flows (Dinu & Iliescu, 2011). Country risk is introduced within investment and trade openness more like the open economy as it can be called. Country risk involves political and financial risk, a country that has unstable political and financial results will result in investments suffering as it can be risky for investments to take place (Hayakawa *et al.*, 2012:1).

Some studies have been conducted regarding FDI and country risk, but there is not much literature about country risk and investment studies. Gastanaga *et al.* (1998) found that there is little significant impact on FDI and country risk. Wei (2000) found that corruption in countries significantly impedes FDI inflows, as it is an indication of risk investing in a country with high corruption rates. The impact of country risk on investment can expect either a negative or positive impact on investments, this is because there is a lack of studies to indicate the relationship. Country risk impact will differ across countries, as its impact will be determined by how the countries are rated and how high is the political, sovereign, economic and social risk.

2.9 EMPIRICAL STUDIES REVIEW

On the collection of empirical studies, the research observed that rarely have studies taken investment spending with the determinants between the mentioned countries (South Africa and Nigeria) and not all the mentioned determinants together with investment spending are mentioned in a single study, but in different studies. The first person who introduced and gave attention to the existence of investment function in the economy was Keynes (1936); John M. Keynes and Irving Fisher discovered the theories of modern investment that are known today.

The determinants of investment spending have been well documented in the first part of the literature review. In this section, the study will provide the empirical studies that have been conducted on investment spending and its determinants. The discussion of empirical studies is the purpose of this section and to find what kind of relationship the determinants have on investment spending in other studies.

2.9.1 Empirical evidence from Nigeria

Several studies have been carried out in the area of capital formation in Nigeria. Some of the studies are briefly reviewed below:

Uremadu (2006) explored the possible determinants of capital formation in Nigeria from 1980-2004. Determinants used were foreign private investment, index of energy consumption, total banking system credit to domestic economy, gross national savings, domestic inflation rate, lending rate, debt service ratio and exchange rate. The empirical results revealed that foreign private investment, index of energy and total banking system credit to domestic economy had a positive influence on investments. While national savings, domestic inflation rate, lending rate, debt service ratio and exchange rate showed a negative influence in investment in Nigeria.

Ikhide (2004) examined a study discussing the external shocks, savings and investments. The results showed that growth in real income, increase in public expenditure and exchange rate, the openness of the economy and high savings have a positive effect on investments. While rising inflation and high lending rate equally impede investments in Nigeria.

Duruechi and Ojiegbe (2015) examined the determinants of investments in the Nigerian economy from period 1990-2013, using ordinary least square (OLS) for multiple regression analysis. The determinants were identified interest rate, inflation rate, exchange rate and government expenditure. Only government expenditure had a significant impact on investments. Thus leading the study to conclude that Nigeria is still at low levels and government should pay attention to the inflation rate, interest rate, exchange rate and government expenditure.

Donwa and Odia (2009), considered the impact of globalisation on the gross fixed capital formation in Nigeria from 1980 to 2006, using OLS. Globalisation was substituted by trade openness and the empirical results showed that trade openness was negatively and insignificantly related to gross fixed capital formation. GDP was positive and significant to gross fixed capital formation. While exchange rate had a negative, impact and interest rate had a positive and insignificant relationship with gross fixed capital formation in Nigeria.

Anfofun (2005) investigated the macroeconomic determinants of investment in Nigeria. The debt burden, inflation, exchange rate, political crises and *coup d'etat* empirical results showed that they negatively affect investment. The empirical results demonstrate the major reasons why investors have no confidence in the Nigerian investments climate.

Adetiloye and Adeyemo (2012) examined whether investment and capital formation aids growth in Nigeria by employing secondary data from the central bank of Nigeria. The empirical results confirmed that investments in Nigeria have not translated into capital formation and has not assisted in inflows of growth. The results showed that in Nigeria, there is growth but it is insignificant since the capital formation is not growing.

There is no doubt that many factors influence investments. In a country like Nigeria from the opinions of the studies, investments in Nigeria need much attention.

2.9.2 Empirical evidence from South Africa

In South Africa, there is, however, no research attempting to explain the determinants of investments in order to understand the behaviour of the country's investment spending determinants: hence, the reason for this study. Although much research has been conducted beyond the South African borders, the literature regarding investment spending and the determinants in South Africa is little. Most research on investment spending discusses and mostly concerned about the relationship interest rates, savings and investment (TIPS, 2000). Some research involves identifying FDI with the determinants and some of the determinants are analysed independently on studies.

Kasongo and Ocran (2016) conducted a study on the determinants of households saving in South Africa using the Bayesian vector autoregressive model, in a bid to explain the downward trends. The results showed that there is a negative and significant correlation between rate of household savings and real GDP. A negative long-run relationship between saving and government balance was found, the inflation rate and financial deepening have a negative influence on household savings. And the interest rates were positive but insignificant.

TIPS (2000) examined a research on the determinants or variables that influence investment spending in South Africa: A sectoral approach. The discussion was based on the manufacturing sector.

Mokete (2009) formulated an index that captures the investor sentiment in the economy by analysing the determinants of private investment in South Africa. Using total gross fixed capital formation as a dependent variable, independent measures consist of variables representing aspects of economic markets, capital markets and foreign markets.

Gray (2011) conducted a study on the internal determinants of Foreign Direct Investment. Using time series and panel data analysis. Market size, exchange rate, infrastructure and GDP are statistically significant to FDI in South Africa. When conducting the panel data analysis education and labour productivity as chosen variables are statistically significant. The conclusion by the study, mentioned that policy makers and change policies that affect the determinants highlighted by the analyses must improve FDI in South Africa (exchange rate, market size, openness, GDP, education and labour costs).

2.9.3 Empirical evidence internationally

Degryse and De Dong (2001) conducted a study about investment spending in the Netherlands. The study examined the relationship between the cash flow and availability of investment spending in an attempt to analyse if there is a positive relationship between managerially discrete and asymmetric information; therefore, a panel data set of Dutch non-financial firms that will help identify which one is driving the cash flow investment spending in the Netherlands. The results show that both the variables are different as they are exposed to different variables and their relationship to investment spending differs.

Amaya and Rowland (2004) utilised a panel data and cross-sectional framework to check the determinants of investment flows into emerging markets using interest rates, inflation, savings, real GDP, GDP per capita and other variables. The mentioned variables are the ones the study believes measure the real good flow into investment. The regression results indicated that a considerable amount of specific right-hand side variables are needed as they showed unstable results between all the chosen variables and the study used many variables, the interest rates, and GDP and trade openness showed no significant relationship.

Ucan (2014) conducted a study in Turkey on the determinants of investment amongst G7 countries using panel data analysis. There are major empirical studies that mention the majority of investment determinants are real GDP, foreign trade, external debt, interest rates and capital flows. The main aim of the study was to find if there are any financial developments that have contributed to investment together with external debt, real GDP, etc. to the contribution of the increasing level of investment in the G7 countries. The study utilised cointegration and there was a long-run relationship, lastly, it indicated interest rates and real GDP are the variables that have a significant positive relationship with investment and the other variables were negative.

Ali *et al.* (2012) conducted a study on the macroeconomic determinants of investment: empirical evidence from Bangladesh, analysing the determinants of investment, which are GDP at constant prices, lending interest rate, inflation and foreign exchange rate. The paper used Engle-Granger and Jansen for cointegration and it was found that there is a short- and long-run relationship between investment and its determinants in Bangladesh. The paper concluded that investment quickly responds to actions of the determinants and they are stable in the long run.

Tadeu (2014) examined determinants of private investment in developing countries, including Brazil. The results show the negative impact of high inflation rates, interest rates, exchange rates and international crisis on private investment.

In the study by Johnson (2015), in conjunction with co-integration and ECM using OLS was employed in the study to determine the factors of investment in Namibia. The results indicated a positive relationship between investment and GDP both in the long run and short run, negatively related to the interest rate (lending rates) and inflation in the long run. This supported the studies detailed in Section 2.8 about the relation of the determinants on investments.

Agu (2015) discussed the determinants of private investments in Nigeria from 1970-2012. The purpose of the paper was to review how to increase domestic-private investments and found growth in disposable income and interest rates on bank deposits to have a correlated relationship with investments. The results also indicated the movement of the slow rate in investments in Nigeria is impacted by an increase in some of the determinants such as lending rates, reduced savings, political stability and the inadequate of infrastructure.

Kolade (2014) conducted an Auto-regressive Distributed Lag (ARDL) model on the macroeconomic determinants of private sector investments in Nigeria. The result suggests that the determinants of private investment used in this study, namely aggregate demand in the economy (GDP), real interest rate, real exchange rate, inflation rate and credit to private sector have not been able to contribute effectively or boost private investment in Nigeria.

Eita and Du Toit (2007) found that investments in Namibia are correlated to GDP, savings and lagged capital, while on the other hand taxes and interest rates are negatively correlated to investments. The studies all have similar results even though they used different economic models, time series data etc.

Naa-Idar *et al.* (2012) found that inflation, GDP, trade openness and exchange rate have a positive impact on the investment in Ghana. Lesotlho (2006) found that GDP growth, credit to the private sector, real interest rate and real exchange rates affect investment positively.

Studies on the determinants of investment spending in South Africa and Nigeria studies have not been conducted together as countries but independently. The reason for conducting the combined analysis was to investigate what impacts the slow rate of investment spending in the fastest growing economies in Africa as developing countries by identified the determinants (factors) impacting investment spending.

2.10 Summary

Chapter 2 gave a detailed discussion about investment spending and investments theoretical discussion. The theoretical objectives mentioned in Chapter 1 were discussed in this chapter:

- Provide theoretical international explanations on investment (Section 2.2);
- Provide an overview of theoretical explanations of determinants of investment spending (Section 2.7);
- Identify the link between investment spending and its determinants (Section 2.8); and
- Review empirical studies on determinants of investment spending (Section 2.9).

Investment spending includes private household, companies and the general government as a whole and is regarded as an important factor for the growth of a country as it is considered an engine for growth. Types of investments were discussed and how they relate to catering for the needs of spending especially in social spending (education, hospitals and infrastructure). The importance of why investments are needed have been outlined and reviewed. The risks involved when investing have been outlined to give an indication of what types of risks are involved in investments.

The model of investment theories has been outlined and discussed in detail. Definitions and their effects on investments have been outlined. Every determinant has a different relationship with investments as referred to Section 2.8. The empirical literature, which was conducted about the determinants of investment spending and investments, has been outlined and the impact differs across the determinants used. As there is no clear study about all the mentioned determinants, the relationship between the determinants will be outlined in Chapter 5 to see if the observed theoretical indication matches with the tested variables. The next chapter will discuss the

investment spending in South Africa and Nigeria, to know which determinants dominate in both countries and see the trends of investment spending within both countries.

CHAPTER 3: OVERVIEW OF SOUTH AFRICA AND NIGERIA'S INVESTMENT SPENDING SITUATION

3.1 INTRODUCTION

This chapter will observe the outcomes of what has been deliberated in the previous chapter by applying them to South Africa and Nigeria. South Africa and Nigeria are sub-Saharan African countries. Both developing countries have undergone a substantial series of changes to get where they are today under varying regimes. Like any other nation, these countries witnessed a series of violations of social, political and economic freedom over the years. During which time it was difficult to trade and have good investment flows. After the restrictive political regimes fell, both countries had the freedom of international interaction in markets and investments (Ajide, 2014). Investments grew as their involvement in the global market grew. However, investment growth and investment spending have been growing at a slower rate recently for both countries, hence, the investigation of the determinants of investment spending in both countries.

The motivation of this study is to analyse the determinants of investment spending in South Africa and Nigeria. Despite the recognition of how important investment spending is, there is little analytical research on South Africa and Nigeria on the determinants of investment spending. The chapter reviews the detailed trends and determinants of investment spending in both Nigeria and South Africa. The determinants of investment spending include interest rates (lending rate), exchange rates, GDP, savings, trade openness, country risk and inflation rate (CPI). After the discussion of determinants, the trends of investments in both countries are discussed. Finally, a summary of findings will be presented.

3.2 INVESTMENT SPENDING

While countries like China, India and Malaysia, to name a few, enjoyed economic and financial growth, sub-Saharan Africa has been facing serious headwinds, largely due to general commodity prices, weaker demand and reduced fixed investment spending according to the Industrial Development Corporation (IDC, 2016). Investment spending is regarded as the gross fixed capital formation of spending on new capital goods for a given period both by private and public sectors. It includes either replacing or adding to machinery, equipment and structures (Ali, 2015). Economic growth cannot be sustained by anything less than 27 percent if development has to be retained. It has been predicted that in sub-Saharan countries the gross capital formation ratio to

GDP was less than 17 percent, when related to advanced countries that had more than 28 percent in the 1990s (Hernandez-Cata 2000).

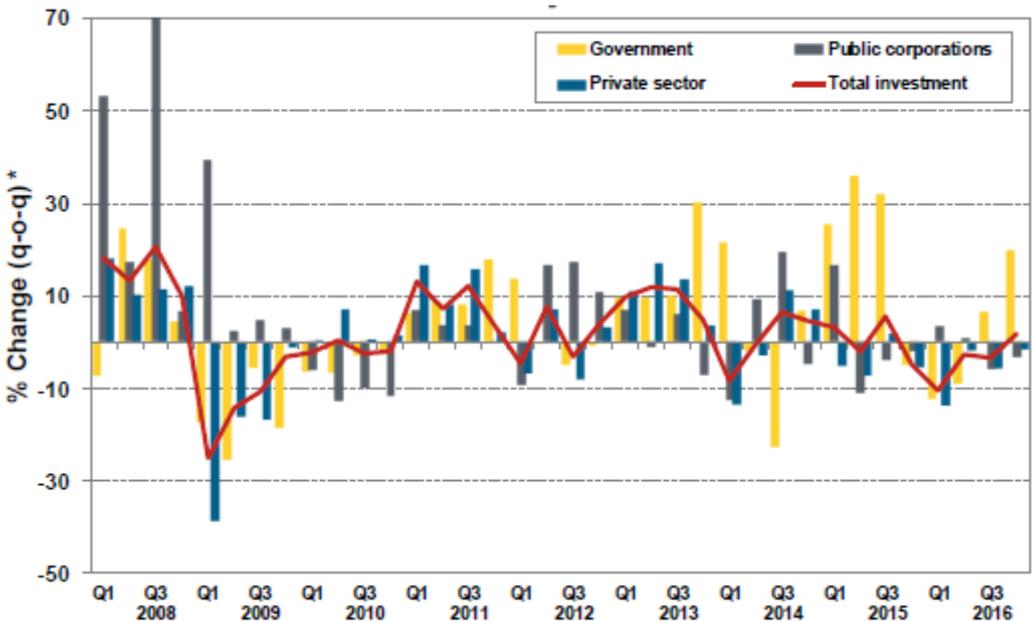
3.2.1 Investment spending in South Africa

Investments play a vital role in the development of countries. South Africa experienced slow investment and economic growth during the apartheid regime (Faulkner & Loewald, 2008:4). Investment activities within the country have undergone sequences of fluctuations and improved remarkably after 1994. The target for South Africa is a minimum investment ratio of 25 percent to 30 percent of GDP should be spent on investment activities and the level must be maintained at all times. There is much to be done to encourage the investment environment within the country, as investment spending activities have remained below the target of 25 percent (Bruggenman, 2009).

Investment levels in South Africa have been identified as the principal factor behind suboptimal growth rates. The level of investment spending starts to taper when projects are near completion, this has happened for decades and makes it difficult to carry out investments plans further (Lings, 2017). Institutional groups, namely public corporations, private sector and general government contribute differently to South African investment spending. Gross fixed capital formation increased between the years 2000 to 2007, but has declined since. Public corporations have contribute more since 2006, during the financial crisis in 2008 to 2009 it was stable until the current year 2017, while the general government kept having fluctuations, this can be due to the unstable growth in the country (IDC, 2016).

Despite the decline in investment spending activities, the government continued catering for economic infrastructure and sustainable sizeable investment spending in social infrastructure (schools, clinics, hospital, etc.). The spending on education has continued to grow in South Africa as about R92.1 billion was spent in 2006, giving South Africa the recognition of having the highest rate of investment in education in the world.

Figure 3.1: Gross fixed capital formation in South Africa



Source: IDC (2017)

Figure 3.1 indicates quarterly figures of South African investment spending. During the financial crisis, the only sector contributing to investment spending was public corporation; the private sector declined from the third quarter of 2008. In 2009, investment spending reached negative signs, indicating the low levels of investor confidence and while during 2016, it showed only negative growth. The public corporations improved in 2014 from the difficult negative growth indicated in 2013. Investment spending has been growing as depicted but at a slow rate. After 2015 there was no positive flow and 2016 indicates that sluggish growth in investment spending still exists. Private business enterprises reported a sharp drop in 2016 after the decline on year on year real terms of about 2.6 percent decline. The private sector contribution to investment spending is in recession as it fell by almost -5.8 percent in 2016 after a decline of -4.3 percent in 2015. Lings (2017) indicates that in the first three months of 2017 capital formation increased by 1.2 percent, but there was deterioration that resulted from the cabinet reshuffle and the credit rating downgrade.

Investment spending activities have played diverse roles (improving and replacing infrastructure, educational needs) within the South African economy, irrespective of the sluggish rate, but the rate can hinder investment opportunities in the near future. In this way, South Africa needs to reach and sustain the target of 25 percent of GDP from investments so that the low investor confidence can grow and the goals set out are catered for (The Presidency, 2014). Investment activities are affected by the challenging environment within the country, as investment decisions are affected

by various trends within the market and the economy as a whole. There is much that still needs to be done to encourage a vigorous environment for investment in South Africa. The ratio of investment spending took a trend of fluctuating further and short of the desirable 25 percent needed to deal with the spending activities, by the government, corporations, and individuals.

3.2.2 Investment spending in Nigeria

The phenomenal achievements in Nigeria have continued developing in recent years, regardless of structural weaknesses. Bakare (2011) indicates that investments are growing in Nigeria, but are influenced by unexpected and detrimental factors; even after it was introduced as the first country in Africa with the largest GDP in 2014, there are still some challenges within the sectors of the economy and the market. The investment rate contribution to GDP in Nigeria is 30 percent and Nigeria has been far below the minimum investment percentage to GDP (Needs, 2004). To keep up with the 30 percent of GDP, the investment rate should not be less than 27 percent, because this indicates that at least the contribution of spending investment is making an impact as it is close to the 30 percent mentioned by Gills *et al.* (1987). The average percentage of GDP was good from 1990 to 2000 (21.7%). The National Bureau of Statistics (2016) indicates that it declined to 21.3 percent at the beginning of 2015, dropping drastically to 12 percent in 2011. Even after overtaking South Africa to be the first economy in Africa, gross capital formation declined in 2014, reaching negative terms (-1.11%) at the start of January and -4.37 percent in 2015 for the first time since 2013.

Nigeria's growth in gross fixed capital formation has maintained a disorganised pattern since the early 1980s. Gross fixed capital formation decreased from (United States Dollar) USD 666 million (N103 billion) to USD 183 million in 1988 (N28 billion). It picked up during the 21st century, as even during the financial crisis in 2007 to 2008, the impact was not great. During 2010, about USD 918 million (142 billion naira) improvements were made; however, gross fixed capital formation declined in 2012 by 20 percent (N101 billion) (Igbokwe, 2015:2). It is evident that even though the country witnessed growth three years prior, there are still some major improvements to be done.

Buhari, (2015) mentioned that Nigeria is shifting its dependence on oil and wants to account for the 30 percent of the total spending by increasing its investment spending three times in 2016 (Davies, 2016). On the other hand, MTN revealed that it is willing to spend about 726.1 million dollars to upgrade its network and improve the quality of service in Nigeria and double investment

spending in 2016. This is part of social corporate responsibility investments as MTN has faith that the country will expand in the future (Akingbala, 2016). The plans made for investment spending in Nigeria during the year 2016 faded away because the country was exposed to recession. The precarious state of the finances of Nigeria prevented the country from attaining its investment spending budget in 2016. The plans set out will be outlined in the future and the government claims things will be different as the country is forecast to recover (Idem, 2017). The investment spending plans set out for coming years in Nigeria are not yet set out in the budget, as things are unclear after recovering from the fallout in 2016. The country does not construct its capital stock based on the current investment ratio of 12 percent of GDP (Hoskins, 2017; Sobowale, 2017).

3.3 DETERMINANTS OF INVESTMENT SPENDING

To set out the objective of the study in this chapter, this section will provide an overview of determinants that have a significant impact on investment spending in South Africa and Nigeria. The determinants that affect investment spending in both countries are discussed as follows.

3.3.1 Determinants of investment spending in South Africa

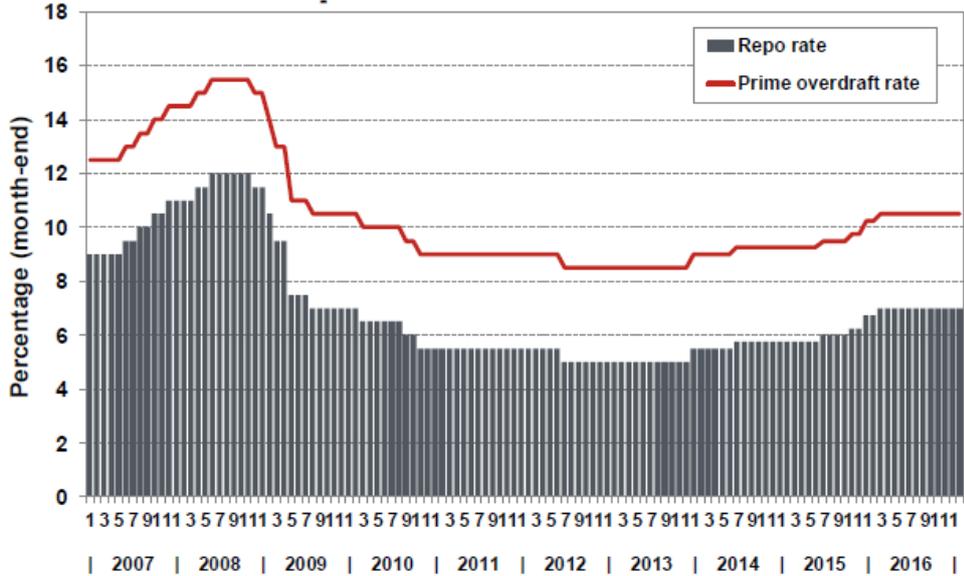
To understand the events that are upholding investment spending in South Africa, this section will explain the identified determinants that influence investment spending in South Africa.

3.3.1.1 Interest rates

The movements of interest rates have an effect on the lenders, borrowers and investors. The real interest rates take into account the inflation rate in South Africa, set out by the South African Reserve Bank (SARB) (National Treasury, 2015:170). Economic growth, price stability and investment activities are achieved by the repo rate set by SARB.

The interest rates in South Africa have been kept in a stable position to support the economic recovery. During the 1990s, it was at its highest; in the last months of 1998, it was 15 percent, but decreased until the 2008 financial crisis where it took a dive to 12 percent. During the 2010 world cup, it was at 6 percent as there was a lot happening within the country, which could be an indication that the country was trying to bring more investments by decreasing the lending rate at that time. From 2010 to 2014, the interest rate was at a positive and normal rate, until 2016 where it increased by 75 basis points leading to 7 percent, which was due to drought within the country. In real terms, interest rates and lending rates in South Africa have remained at stable levels since the financial crisis in 2008 (IDC, 2017).

Figure 3.2: Interest rate yields



Source: IDC (2017)

Figure 3.2 depicts the results of the repo rate and prime overdraft rates in South Africa on a monthly basis. Both the rates went up during the financial crisis, in the first month of 2009 rates started decreasing and becoming stable. From 2014 to 2016, the rates started increasing and remained at 7 percent during 2016, prime overdraft rates picked up in 2016 from 10 percent to 10.25 percent during 2016.

IDC (2017) mentions that investors must start saving to make the country an investment destination because of the hikes in the rates. Investor confidence can decrease from the way the rates have been moving and they can withdraw or stop investing because their investments will now grow at a lower rate and this will hinder business opportunities, investment and spending activities within the country. The best way is for South Africa to have a stable and most affordable interest rate; this can enhance and increase business, consumer and investor confidence.

3.3.1.2 Exchange rates

The exchange rate is one of the important factors that contribute to growth and an indication of the level of investment that will come into the country (Mpofu *et al.*, 2013:88). The South African currency is currently under the floating exchange rate system, which is an indication that the rand is exposed and influenced by the aspects of foreign demand, and supply in the international markets. South Africa has been characterised by numerous exchange rate regimes, from the fixed exchange rate, crawling peg Rand, dual exchange rate until the recent floating exchange rate,

which was invented in 2000. The recent exchange rate was introduced to deal with the inflationary targeting framework of monetary policy (Mtonga, 2011:2).

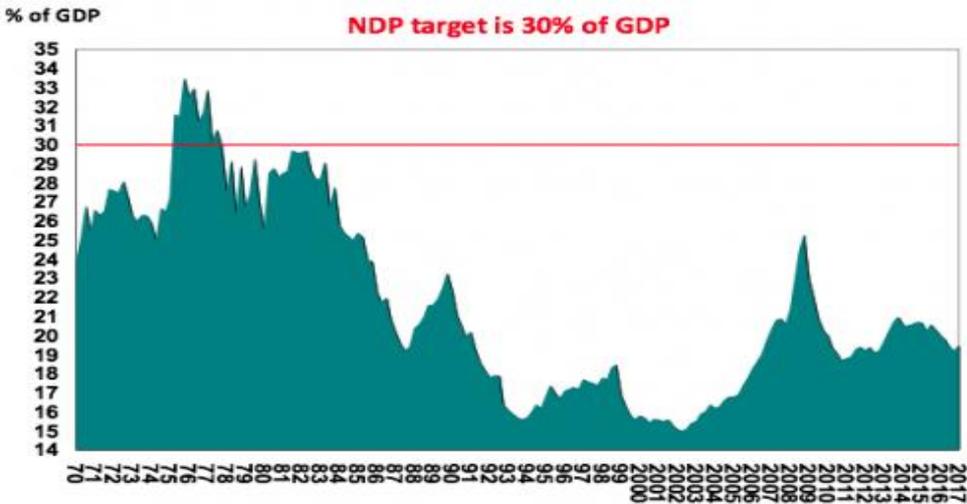
The previous regime has changed and affected the country's currency (the rand). The rand is used together with US dollar in most cases; as the rand is the most traded currency with other trading partners. From 1996 to 2001 it depreciated to about 15.8 percent of its value to the US dollar. The rand was in a well-established state until 2008, during the financial crisis, where it reached about 16 to 17 percent of the US dollar. The decline led to economic crises, investments declining and both consumer and business confidence to decline further. The rand declined sharply in 2015, but at the year-end of 2016, the rand indicated R13.73, which was stronger than in 2015. During 2017, the rand appreciated until the economic position changed and the effect of the junk status hit the country (IDC, 2017). The results of nominal and real effective rate show that the real effective exchange rate is stable in South Africa and appreciates most of the time and the nominal exchange rate has a largely continuous trend. In 2015, the rand was the worst performing currency, due to sluggish economic growth, low business and consumer confidence levels negatively affected the currency (SARB, 2016).

Mittner (2014) indicates that the rand would remain in this weak position for the next five years. The volatility of the rand will lead to uncertainties with import and export prices, which will affect the business areas of the country and the investments spheres of the economy. The currency has to be stable so that opportunities are open for business and investment purposes in the country. The exchange rate in South Africa is not stable enough as everything the media publishes affects it; this hampers opportunities for the country

3.3.1.3 Gross domestic product

GDP plays an important role in the economy of South Africa, as in most countries. It is part of growth and development activities of the country. As mentioned, investment spending is set to contribute about 25 percent of GDP in South Africa. The GDP growth rate in South Africa fell ever since the population increased in the early 1980s and that is when investment started to shrink every year (Goedhuys, 1999:148). From 2004 to 2005, the GDP was growing at about 5 percent per year, which is at a rate of 0.41 percent monthly. GDP in South Africa showed -7.4 percent growth in second quarter of 2008 and -0.7 percent in the fourth quarter due to the financial crisis. South Africa experienced a recession in 2008 – 17 years after the first recession of the 1980s (Statistics SA, 2011).

Figure 3.3: Investment as a percentage of GDP



Source: Stanlib (2017)

Capital formation as a percentage of GDP in the long term in South Africa has not reached the set rate in ages. During the financial crisis it decreased a little and in 2009 picked up. During the financial crisis, investment was still contributing to GDP, much higher than it is after 2010. It picked up in 2010 to about 24 percent, which could be due to the world cup that took place within the country. It declined since then to about 20 percent in 2014 and declined further to about 18 percent in the few last months of 2017. The fixed investment activity is posing a challenge for the country due to a decline in private business enterprises, as this trend has been affected by labour absorption. The economic prospects for growth have been unfavourable until currently due to the credit rating downgrades that still loom large in the country (Lings, 2017). The investment ratio to GDP has not yet reached the desired level of 25 percent in South Africa. The -0.7 percent in GDP that was introduced in the first few months of 2017 was the first since the financial crisis in 2009. The country’s financing needs and economic pace played a role in the slow growth pace or negative growth within the country.

3.3.1.4 Savings

A stable financial system and savings inflows provide funds for investment spending; savings was recognised as vital for the economic growth and development (Hess, 2010). Savings contributes funds for capital formation, which leads to economic development. The South African savings rate is relatively slow, compared to other economies. The World Economic Forum (WEF, 2008) indicates that South Africa, as rated by other international standards, has low national savings; this

raises a cause of concern. It was ranked 102 out of 134 countries on national savings rate percentage to GDP.

Savings by the government, households and corporates within the country have been slow especially the saving rate by the government to the contribution of GDP. The government savings have been negative in the country. Households have not contributed more than 5 percent during the years (about -1 percent in 2006 to 2008 and -0 percent in 2009 to 2011 to GDP). Corporates are the only significant contributors to the national savings, having saved more and contributed to GDP and capital formation. The savings rate in South Africa was kept in negative values for over five years 2006 to 2011; hence, the slow investment rate to reach a 5 percent or 10 percent increase (Prinsloo, 2010). Chiroro (2010) indicates that at least 72 percent of South African households do not save, hence the drastic downfall. The country is dominated by a spending culture rather than a saving culture. The contribution of government and household to the national savings of South Africa indicates negligible contributions.

Enhancing savings behaviours must be strengthened in the country, in order to have capital formation, which will enhance investment activities and development in the. For South Africa, the economic theory (classical theory) dictates that the only way investments can be funded is by saving, is a parable theory. The reason is that the country has more of a spending culture and no savings are taking place (Grobler, 2015).

3.3.1.5 Trade openness

Trade liberation in South Africa has a major influence on the growth of trade and development of the country; hence, the country is able to trade with other economies by exporting and importing goods and services (Lawrence & Edwards, 2006:2). According to the IDC (2017:18) the trade balance in South Africa has been welcoming, but for some underlying reason in 2008 it reached a -R26 billion due to the financial crisis, improved in 2009 to 2011. In 2012 after three months it declined by -R3 billion and from then the country trade balance produced negatives, it hit the worst in March 2013 with -R100 billion.

The 2008 global financial crisis caused a decline in exports and imports. A decline occurred at the end of 2011 in exports due to the falling of mineral prices, strikes in mining and the rising cost of electricity. Imports recovered after the 2008 crisis by contributing 37 percent to GDP, this is where the start of deficit in the trade balance occurred (The Presidency, 2014:89)

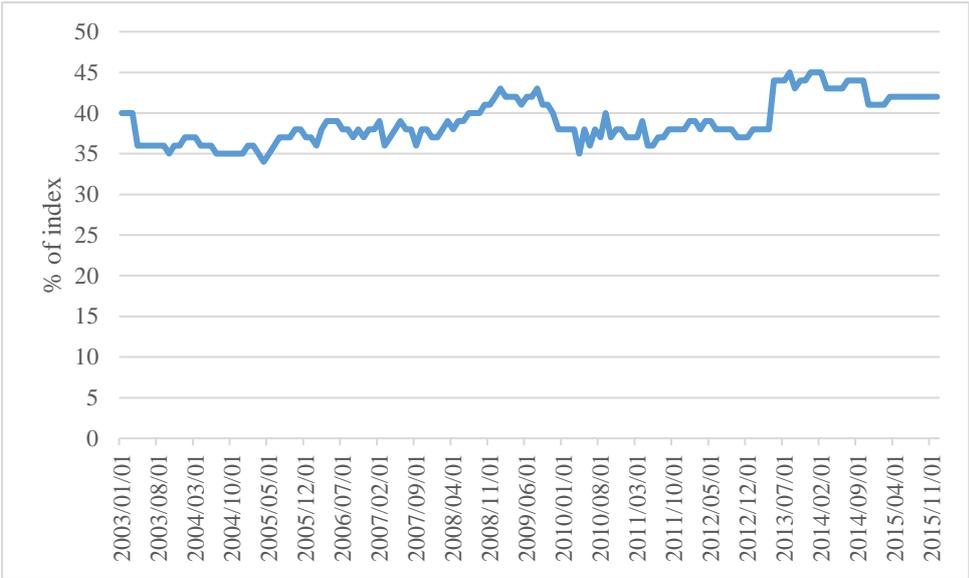
The weak economy suppressed the trade balance. Exchange rate dominates the export market more especially in the manufacturing market, this imparts business confidence and imports have been declining; hence, in 2016 they increased by only 0.5 percent from 0.5 percent in 2015 (IDC, 2017). As long as the economy of South Africa is still in recession and being downgraded, has a negative growth in GDP and slow or unstable growth in gross fixed capital formation, the country will be import-dominated instead of export-dominated.

3.3.1.6 Country risk

There are several reasons why South Africa's risks landscape grows at a gradual rate. The political, economic, sovereign and social risks dominate in the national top 10 risks worldwide. The risks make it difficult for the country to have stable growth (IRMSA, 2017). While looking at the overall country risk ratings, Carlens (2017) indicates that in South Africa the political uncertainty has led to an environment where business, investment and spending environment for investors, corporations, companies and government are reluctant. The cabinet reshuffle in the country added to the rise in political instability from 2015 to 2016, because two days after the reshuffle the rating agencies downgraded South Africa to junk status. The economy has been growing at 1.6 percent for the past five years affecting country risk and resulting in low commodity prices. South Africa's country risk rating is C, which indicates a high risk because of the troublesome weakness within the political and economic outlook.

Figure 3.4 portrays the risk in the country; it was at its highest during the financial crisis in 2008 throughout 2009. In 2010, it went down; this can be due to the exposure of the 2010 world cup held in the country. Country risk kept the same level as 2010 until, in 2013 it went up to about 45 percent until 2014 and remained until the year-end of 2015. It is evident that the graph has an index of about 35 percent to 46 percent, which is an indication that the country is at risk. This has to be one of the reasons the country (South Africa) rated C in the country risk rating. This shows that the country is in a high-risk level for one to invest in or involve in any activities.

Figure 3.4: Country risk movements



Source: Constructed by author, data from EIU (2016)

Masie (2016) mentioned, the government finances their debt by borrowing from international financial markets; this has put a lot of thinking for investors in a way that the country is refereed as a country with lot of potential but without hassles. The poor policy, collapsing of government projects in education, infrastructure etc., also put the country under pressure where investors lose confidence as well as the citizens of the country (Masie, 2016). Consumer and investor confidence and political outlook in South Africa needs to be looked at carefully so that international economies can trust and do business with the country. It is noticeable that the investment obligations have faded away in the country because the country is dominated by low savings rate, import dominated and unstable currency. In addition, its political risk rating is high, followed by financial risk and economic risk rating. Country risk in South Africa is in jeopardy because of the risk of being downgraded further (Carlens, 2017). Corruption remains the political corruption in the country; hence, the investment prospects diminish (Lloyd, 2015).

3.3.1.7 Inflation rate

Inflation is a proxy of consumer inflation rate (CPI). In South Africa, SARB has set an inflation target, which ranges from 3 to 6 percent. In 2004 it reached 1.4 percent from 5.8 percent in 2003, reached its highest during the financial crisis in 2008 to 11.5 percent and 7.5 percent in 2009 (SARB, 2012). The year 2016 was a difficult year for economists and farmers as the country was exposed to drought situations that led CPI out of the target range with 6.4 percent. (IDC, 2017). The inflation within the country is limiting exporting and importing activities, which limits

investment opportunities (KPMG, 2016). If investments are hampered, there will be no growth and no spending activities will take place, as the other challenges facing the country will not be addressed fully. The uncertainty of inflation rates, interest rates and country risks are factors hampering the process.

The basic principle is to spend less and save more. From the discussion of the determinants of investment spending in South Africa, it is evident the country still has a lot more to improve on them. For the country to establish economic growth and investment activities, the determinants must be given more detailed attention on how to control them.

3.3.2 Nigeria

Determinants of investment spending in Nigeria will also be outlined in this section. Much of Nigeria's market potential remains unrealised, because of a long list of impediments to investments.

3.3.2.1 Interest rates

The policy set for interest rates in Nigeria is a major instrument of the monetary policy because it plays a role in providing financial resources to promote growth and development in the future for the country (Ojima & Fabiam, 2015:2). In Nigeria, the interest rate was set to be fixed by the Central Bank Of Nigeria (CBN) with periodic adjustments since 1986 (Osofisan, 1993). The fixed interest rates kept increasing no matter the set adjustments on them (Obute, Asor & Idoko 2012). The interest rate policy was deregulated and became driven by the demand and supply forces (Soyibo & Adekanye, 1992). As a key variable, interest rates affect the decisions of consumers, businesses, institutions, policymakers and professional investors in the economic policy of Nigeria. The repo, lending and deposit rates of interest move in a similar direction in Nigeria. The rates are lowered or increased depending on the state of the trade balance.

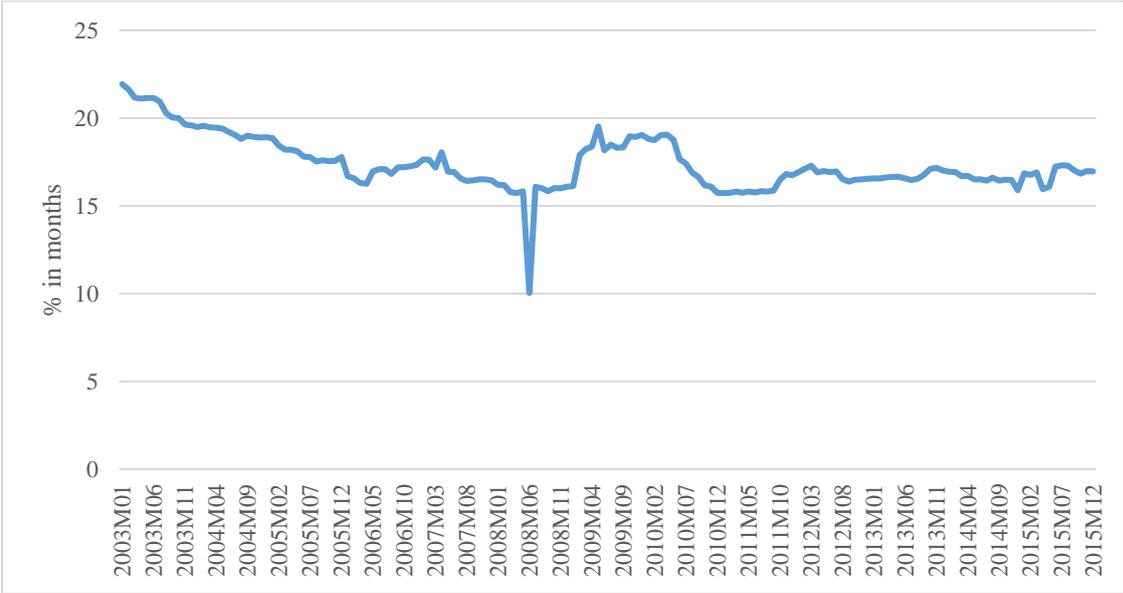
The interest rate in Nigeria has risen and fallen from 1996 to 2008, where it reached 10 percent, this was to encourage financing through the financial crisis and the lending rate took a pick up during July 2008. It increased from 2009 to 2010 where it was at 18 percent to 19 percent, which encouraged investments in the country (Osundina & Osundina, 2014). The interest rates in Nigeria are reported by the CBN.

The year 2003 showed the highest rate, but as years went by the rate kept decreasing, it was at its lowest during the 2008 financial crisis at 10 percent. 2008 was the year where the lending rate was

lowest according to the chosen period used for the study. In 2015, it reached 17 percent during January. In 2016 at December it was 17.09 percent and recently it has reached its highest level since the start of 2017 as in March it was 17.44 percent, 17.58 percent in June and 17.65 percent in July. This shows that the lending rate in Nigeria keeps going up even after plans to combat it at lower rate. All information interpreted was based on Figure 3.5.

From the analysis of interest rates in Nigeria compared to South Africa, South Africa’s lending rate has been kept low, maintained regardless of the situations of low investments rate, and economic growth. The lending rate has been at high levels to discourage borrowing on imported goods, this threatens the foreign reserves and investment inflows in the country (Luca & Spatafora, 2012). The adjustments set for the Nigerian interest rate are the way they are due to the market expectations in the country. Lending rates in both countries are both stable, even though South Africa has better one.

Figure 3.5: Lending rate yields



Source: Constructed by the author, data from INET BFA.

3.3.2.2 Exchange rates

The exchange rate is one of the key determinants of the level of economic strength in Nigeria, apart from the interest rate and inflation (Nwachukwu *et al.*, 2016). The exchange rate has gone through a substantial transformation in Nigeria just as it did in South Africa. The exchange rate in Nigeria transitioned from the fixed exchange rate, pegged exchange rate, managed to float and back to the fixed exchange rate; people have not been investing due to the exchange rate volatility.

The volatility and continued depreciation of the naira resulted in a decline in investment and living standards, which lead to a cost-push inflation (Adelowokan *et al*, 2015:22). In 2016, Nigeria decided to abandon the approach of the fixed exchange rate to floating exchange rate (Mondi, 2016).

The Nigerian currency is called the naira. The currency has been trading below 150 naira from 2007 to 2014. During 2009 it declined to reach a low of about 150-105 naira during the financial crisis. It increased after overtaking South Africa and being introduced as the largest economy in Africa in 2014, reaching 200 naira from January 2015 and it was stable until 2016. The weakness of the naira from 2015 was due to the response of oil prices in 2014 as the oil industry grew inward investments within the industry (Mondi, 2016) and this forced CBN to devalue the Naira to twice its previous value. If the decline in oil prices keeps going further, Nigeria must remove its dependence on oil prices. Already, investors are losing their nest eggs by investing within the country and most of them are removing their investments because the naira keeps increasing in the country. Since Nigeria's goods are mostly imported, their currency will make it harder for them to import/export products (Mondi, 2016).

3.3.2.3 Gross domestic product

The decisions of how to invest and how to spend investments have an effect on the growth of the country. In Nigeria, gross fixed capital formation has to contribute about 30 percent to GDP as mentioned in Section 3.2.2. Gross fixed capital formation averaged 21.7 percent from 1997 to 2000 and led to 22.3 percent of GDP to 26.2 percent in 2002 but radically declined to 21.3 percent in 2005 (Bakare, 2011:36; NEEDS, 2014). The economy in Nigeria still faces challenges notwithstanding being the largest economy in Africa. The Nigerian growth is driven by the oil sector and this has affected the slower GDP growth (PWC, 2014).

GDP in Nigeria had an average of 8.6 percent from 2000 to 2011, in 2003 it recorded 10.4 percent; in 2011 it grew to the rate of 7.4 percent. No matter the downturn where some economic contributors like agriculture hit bad climatic conditions, 6.4 percent was contributed to the growth respectively. Some of the factors that affected economic conditions were the Boko Haram incident in 2012, as it led to startling away both domestic and foreign investors. During 2014 Nigeria recorded 6.2 percent GDP – the highest in a long time; the country was announced the largest economy within Africa. Things took a turn when the oil prices dropped and affected the GDP by 2015 and 2016. The 2015 2.5 percent was the lowest growth of GDP in five years (Guièze, 2012;

PWC, 2014 Kale, 2016). The investment decisions within the country were delayed; from that time, the growth declined and oil prices declined. The year 2015 made changes to the economy of Nigeria as even the following year the exchange rate regime was changed to floating, but that was when the country was exposed to recession in 2016. After the painful recession in 2017, the country exited the recession, because the most important economic industries contributed and grew comprising oil prices, agriculture, manufacturing and trade. This can increase the levels of business, consumer and investor confidence (Shafal, 2017).

3.3.2.4 Savings

Investments are generated mostly from savings in developing countries; the rate of saving movements has an impact on the performance of the economy, both private and public investments, and leads to either low or high absorption on capacity (National Planning Commission, 2014). Nigeria is amongst the low-income earners and has retrograded the saving mobilisation and investment. The main source of savings is personal savings and it has been difficult to accumulate personal savings within the country due to low-income earners and unemployment in the country (Uma *et al*, 2014). (Olayeni & Micheal, 2013) savings can increase in the country if the banking sector target all the savers, not only target high savers to save and not low earners. The country has been accompanied by the low degree of savings, leading to a low capital formation.

CBN (2012) indicates that savings ratio to GDP moved from 16.95 percent in 2008 to 23.25 percent in 2009, but fell to 17.45 percent in 2011. In real and nominal terms, savings also decreased in Nigeria where they decreased to -47.49 from 31.83 in 2015 third quarter. The weak performance of savings in the country will affect the future of the economy, as the country is not saving enough, which is why after the oil prices decreased, the country did not have enough savings to survive on, leading to recession while investments grew at slower rates and spending activities remained static.

3.3.2.5 Trade openness

After different political regimes, the country widened its trading doors and traded within the international economies market. Nigerian economy has been relatively open since 1986, after becoming a member of WTO in 1995. Trade relations with other countries increased after the removal of restrictions in the country. However, its trade regimes remain highly protected (Department of state, 2014). Its trade barriers are criticised because the country is not following WTO obligations (Africa Economic Outlook, 2005).

The African Economic Outlook (2005 & 2006) mentions the favourable international oil market in 2004 led to an exceptional increase in the trade balance. Imports decreased and exports overwhelmingly increased. Thanks to the booming oil prices, the current account swung a deficit to a surplus in 2003 to 2004.

In 2013, its global exports declined by 35.6 percent, while imports rose by 22 percent. The decline in exports might be caused by the decline in the oil sector since the oil sector contracted from 2012 and 90 percent of its total exports earnings is contributed by the oil sector. Nigeria's overall trade is dominated by the oil sector (Department of State, 2014; Kale, 2016). More like the South African trade, Nigeria is import dependent and this should not be ignored, it surpassed export value for the first time since 2011. Since the country experienced different exchange regimes the trade-growth nexus might also be affected. Trade policies in Nigeria are unreliable and have low quality (Olufemi, 2004:301).

The oil sector both affected and benefited exports and imports of goods and services in Nigeria. During 2014 and 2015, there was a further decline in exports because they only grew by 0.14 percent in 2015 from 24.09 percent in 2014. While imports remained stable, though it recorded a decline (Kale, 2016), it is evident from the discussion of both the countries concerning exports and imports, they are import dependent.

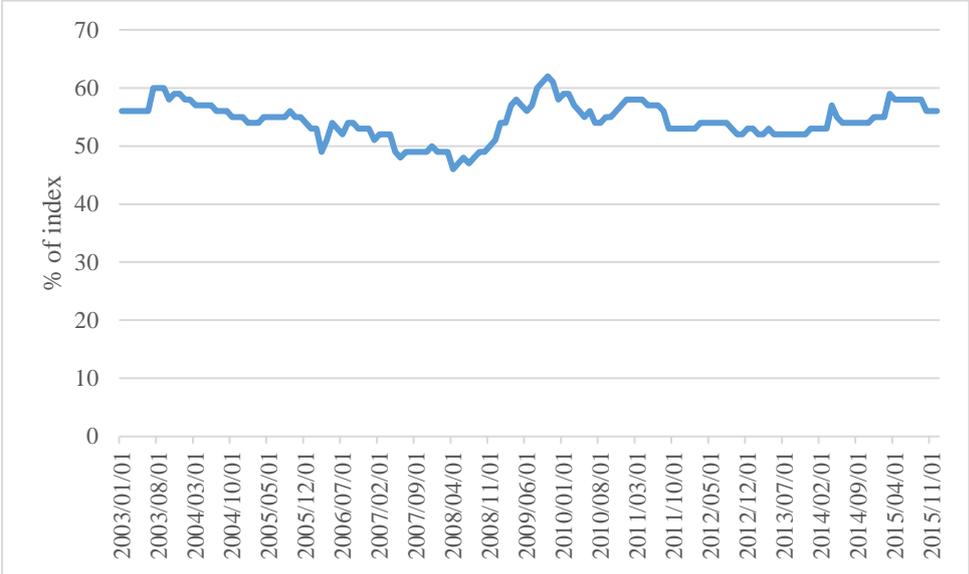
3.3.2.6 Country risk

The dependence on oil in Nigeria has caused many disruptions in economic risk, political risk and financial bank system, as the banking system's non-performing loans have increased from 6 percent in 2015 to about 15 percent recently. Both political and financial system risks have a very high level of country risk, which is tier 5 (A.M Best company, 2017). As the largest economy competing with South Africa and after growing in 2010, 2014 and 2015 to indicate a few years of growth, the country faced recession and on investment when the oil prices fell. The dependence on oil led to changes in the country, trade balances were negative after seven years and investments fell, as the oil prices hampered the diversification efforts in the country (Societe-Generale, 2017).

Figure 3.6 depicts the political, economic and financial risks that indicated the country risk index of the country. It is evident that the country is faced with high country risk. During the financial crisis, the country was low at 49 percent, which was the only period country risk has been low in Nigeria. During 2010, it reached a level of about 62 percent – the highest ever. It is evident Nigeria has high economic, financial and political risk as part of the country risk, which is affecting the

development of the country. Even in 2014, country risk was still high, after it was announced the largest economy in Africa. This is an indication that the country still faces problems within the economy.

Figure 3.6: Country risk movements



Source: Constructed by author, data from EIU (2016)

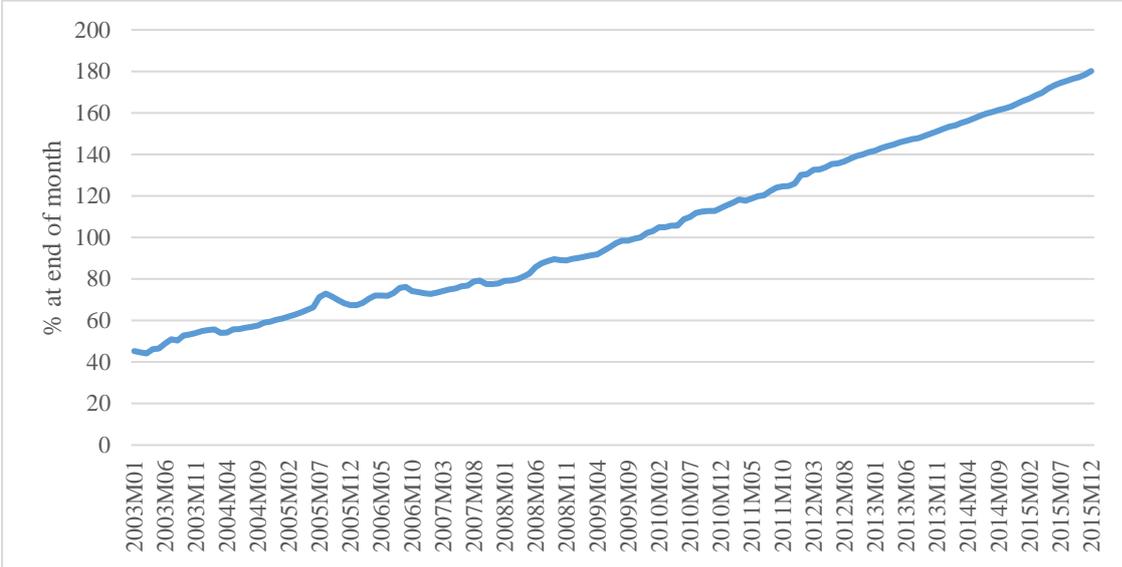
When comparing the overall situation of country risk in both South Africa and Nigeria, Nigeria far outweighs South Africa even after it overtook South Africa in terms of GDP. Both countries have undergone various struggles, namely apartheid, xenophobia attacks in South Africa and military regime in Nigeria (Tuman, 1994), therefore, it can be said that it looks as if the countries are still facing those problems since their country risk is not decreasing. As mentioned, corruption takes place in South Africa, but in Nigeria, it is more of an epidemic (Carlens, 2017).

3.3.2.7 Inflation rate

The inflation rate in Nigeria has been fluctuating and has been a problem for several years (Olayungbo, 2013:238). The CBN targets single digit inflation rates because it is regarded as a sensible limit of inflation but in 2003, it was 13.9 percent, followed by the highest of 17.9 percent in 2005, it fell in 2006 to a single digit of 6.5 percent and 6.6 percent in 2007, but rose during the financial crisis to 17.9 percent in 2008. Since then it has been at a single-digit rate as in 2013 it showed 8 percent, 2014 and increased in 2015 to 9.5 percent from 8.2 percent at the beginning of the year. The following figure displays the CPI inflation in Nigeria, which indicates the CPI has been increasing over the years. The CPI has increased over the years in Nigeria; in 2017, it took it

to up to 239.3 indexes in July. Figure 3.8 shows that CPI in Nigeria has been increasing from 2003 until 2015, in 2008 it declined by small percentage but rose again. CPI levels continue to creep upwards in Nigeria.

Figure 3.7: Consumer Price Index yields



Source: Constructed by the author, data from CIEC.

The reason for the increase in the rate during 2015 was because the exchange rate was weak, late rainfall and the fall in the oil price had an impinging effect on inflation (CBN, 2015). The country does not have a desirable rate like South Africa, which has set a target rate for inflation. Unstable inflation affects corporate investments and the rate of return on investments because investors lose confidence and start looking for better options. CPI is a guide for producers and investors in a way that they know the movement of their investments, a high CPI and inflation rate discourages price stability and foreign investment. Foreign investors will fade away if inflation prices are high. Both countries are faced with increasing price levels.

This section has scrutinised the determinants of investment spending from the standpoint of South Africa and Nigeria. The section that follows investigates the investment movements in both countries by looking at the perspective of domestic and foreign investments in South Africa and Nigeria.

3.4 TRENDS OF TYPES OF INVESTMENTS IN SOUTH AFRICA AND NIGERIA

Other than the determinants deliberated in the previous section, there are decisions necessary when determining when and where to invest. Those investment decisions include whether to invest within the country, domestic investments or foreign investments. To have the presence of viable domestic and foreign investments, a country must have strong economic, financial and attractive investment setting (Wentworth, 2012:3). This section of the study will focus on the domestic and foreign investment trends in both South Africa and Nigeria.

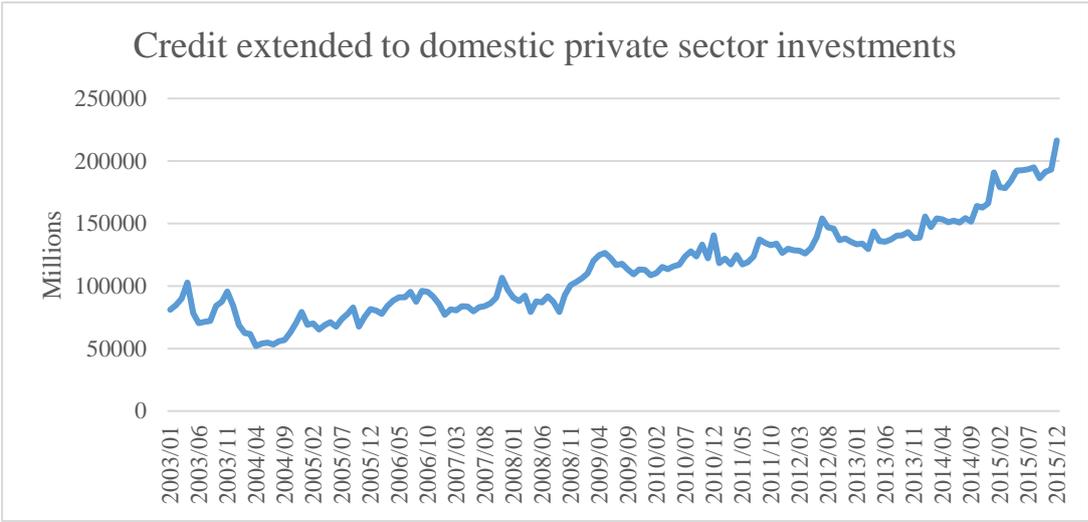
3.4.1 South Africa's investment trends

A country like South Africa, which is characterised by fluctuations in rand, low savings rate and an economy that has large financing needs, makes it hard to compete in the international markets. After years of being able to enter the trade after 1994, the country is still not attracting investments and they are growing at a slower growth rate. The fluctuations in investments and spending activities in the country are not showing growth (Arvanitis, 2006; Wentworth, 2012:6). Carim, (1994:7) indicates that both foreign and domestic investment are consequential for each country, moreover the developing countries, because they increase capital accumulation and have a way of becoming productive. An overview will be given to understand how both domestic and foreign investments in South Africa are trending and look at how robust they are.

The suboptimal growth rates in South Africa are affected by the low investment rate since the country is dominated by low savings rate. If savings are low within a country, there will be no investments made. Since economic theory declares that investments are financed through saving, South Africa ought to encourage domestic savings as an impetus for domestic investments (Grobler, 2015). The outcome would create wealth, job creation and reduce the dependency on foreign investors who come to the country to fund developments.

From Figure 3.9, it is evident that the credit to domestic private sector investments in South Africa has been accumulating. The only time the credit was low was during February 2004 at R50 million, increasing from January 2005 until today. The credit that is extended for investment opportunities has a delay on domestic investments in the country because profits are not made and investments are not generated.

Figure 3.8: Private sector credit



Source: Constructed by the author, data from SARB.

The domestic investments in South Africa are daunting, in a way that households are still the ones that are extending their credits while they have low savings. It has recently declined by 0.7 percent in 2017, still not enough to influence the growth of investments (IDC, 2017). Subsequently, low commodity prices, diminishing business, consumer and investor confidence are a challenge to the domestic economy. Investments in the country will diminish and be hampered further if the uncertainty on economic decisions continues.

3.4.1.1 Foreign investments trends

Foreign investments in South Africa have a complex and a lengthy history. South Africa is performing poorly in attracting foreign investments, as it fell out of favour with investors (Fin24, 2015). The country did not even make it to the top 25 destination African foreign investments. Foreign investment in the country can stimulate growth and investment activities since the country is faced with low saving rates and less domestic investments in the country. Foreign investment in South Africa is an impetus for investment purpose and economic growth and development (Arvanitis, 2006:64). South Africa is regarded as a frustrating economy in a way that it has a mixed outlook due to the risks facing the country and exchange rate volatility which impede the investor’s decisions and it a concern to foreign investors (Omarjee, 2017).

Foreign investment flows in South Africa tumbled after 10 years, which was the lowest level, in 2015 – it declined by 69 percent, which went to R1.8 billion. Ever since the downgrade, the investors are cautious about investing in the country. The most contributing sectors to the economy

that attract potential investors in South Africa are the mining sector and the financial sector. The levels of foreign investments in the country grow but are below the expectations of the country (CUTS Centre for Competition, Investment & Economic Regulation, 2003).

According to indicators, foreign investment flows into South Africa declined from R45 billion during the financial crisis to R2 billion. During 2009, they picked up but have not reached a level of R45 billion since; after the financial meltdown investments in the country remained threatening. However, from the US dollar, South Africa gained 9 009 million US dollars during the financial crisis. Even the 2010 world cup did not attract foreign inflows. In 2015 a decline of -R15 billion loss was detected on foreign investments. South Africa continues to attract foreign direct investment (FDI) flows, in 2016 after the decline in 2015, but the growth of FDI in the country has been growing at the slow rate (IDC, 2017:23).

The plans to attract FDI in the country experience bumps concerning the state of the country. Fuzile (2016) indicates that there is no easy road for South Africa and considers that the country cannot address the economic and development challenges alone; in which case, the country can continue this road only if they commit to getting out of the state it is in. The following section discusses both domestic and foreign investments in Nigeria.

3.4.2 Nigeria's investment trends

The decisions to make an investment in a particular country are influenced by the state of the country and how the economy is performing (UNCTAD, 2017). Nigeria, like most developing countries can benefit both from domestic and foreign investment inflows (World Bank, 2006). Nigeria has set various incentives that will help and encourage investments in the country (Lovells, 2013), after the military and political regimes. Even on the contribution of investments, Nigeria still depended on oil. A discussion on the condition of domestic and foreign investments in Nigeria is analysed. Due to lack of availability of data for Nigeria, the discussion on the investments trends is limited because of the range of data in the study and most information on the trends is focused more on the history. Tétényi (2014) mentions that the foreign policy in Nigeria is much more difficult to elaborate upon, unlike South Africa. The information is more difficult to access, if not published by the government.

3.4.2.1 Domestic investment movements

Domestic investment is essential for the development of the economy as it provides domestic resources to fund investment activities; hence, domestic investment is fundamental for capital formation. Capital formation in Nigeria shown by CBN statistic indicates that it has fallen in real terms. The certainty about the fall of domestic investments in Nigeria originates from low per capita income and prospects to save are low, while the spending is high hence there is no development in domestic investment (Noko, 2017). The stagnant growth on domestic investment resulting in low savings has influenced capital formation in Nigeria. Donwa & Agbontaen, (2010) reveal statistics from CBN having a closer look at the trends of domestic investment income flows. The country experienced a decline ever since 2004, in 2003 it recorded the highest income of domestic investment at N258 588.6 million, a more drastic fall during the 2008 financial meltdown fell to –N114484.4 million.

After the meltdown, the country's domestic investments did not improve, even after the announcement of being the largest economy in 2014. Later the oil prices decreased in the country and the economic activities took an overturn experiencing downfall. Like South Africa, savings and income in Nigeria have to be maintained and they need to find ways to grow incomes and encourage savings (Cairns, 2014). After the recession that hit the country, retrenchment and the absence of a cushion for savings within the country increased during the recession. To maintain and attract domestic investments, there are many developments that need to be addressed and challenges facing the country after the recession and its dependence on the oil industry. Lack of services on transport facilities like roads, water and electricity in Nigeria is unproductive and considered a serious problem to investment in Nigeria (PWC, 2016). This also requires consideration to increase and attract domestic investment within the country. A country with good and stable infrastructure and good services offered increases consumer and investor confidence.

3.4.2.2 Foreign investments movements

Asiedu, (2003) indicates that Nigeria qualifies to be a beneficiary of FDI as it is one of the countries that has constantly received a flow of goods FDI in the past decade. FDI attraction increases the level of domestic capital formation in Nigeria. The country has ranked amongst the top three countries in Africa, which has the best destination for FDI and has been growing tremendously, surpassing South Africa. The country recently was ranked nineteenth recently (Vanguard, 2017). NBS (2017) mentions that FDI plummeted in 2016, by an enormous 46 percent.

Nigeria was the favourite destination for FDI because oil was the most wanted commodity in the country, oil industry devoted the country as it has attracted about USD 20 billion during 2010 (this is discussed in dollars, as published by the United States to Naira currency) (Hansen, 2013). Currently, the crude oil is in a rapid decline to about 60 percent of oil price that led to no flow in FDI and the FDI exploration dropped, because oil is no longer as profitable as it used to be. Nigeria is unable to find an alternative investment option, which would attract FDI like oil industry, did (Vanguard, 2017). UNCTAD (2017) reported FDI fell from 58 billion dollars in 2014 to 39.6 billion dollars in 2015.

Nigeria hopes and believes (Vanguard, 2017) that the only way to attract FDI again is to overcome the infrastructure deficits in the country, as they dampen the FDI drive too. As long as the country is dependent on the oil industry, the FDI will continue to decrease as oil prices are depressed and will keep on decreasing due to the commodity prices and low savings facing the country. FDI estimates for the year indicate that another decline is facing the country because even inflation rate for the country is at the two-digit mark, savings keep decreasing and this is deterring foreign investor. Foreign investors closed their foreign brand shops and exited the automobile sector and retail, as they have noticed their businesses in Nigeria are a risk at large (Vanguard, 2017; Oguh, 2016). From the discussion about Nigeria, it is evident that the country was more dependent on the oil sector and now that the oil industry prices have collapsed, investors and consumers are losing confidence in the country. The country must enhance more ideas on how to move forward from all the tension of the oil sector and on how to attract FDI and deal with the movements of the determinants discussed above.

3.5 Summary

After an overview given by this chapter, discussions on the investment climate in South Africa and Nigeria were detailed. It is evident that both countries have undergone various changes over the years and the determinant trends were affected by the financial meltdown during the 2007 to 2008 and 2009. The countries seem to be affected most by the same determinants; the movement on the investment trends was discussed and savings and income are the dominant determinants of the domestic investment of both countries. The discussion of the chapter on the determinants of South Africa and Nigeria, together with the investment trends in both countries were discussed from an overview of 2003 to 2015. The next chapter is an outline of the methodology.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

In this chapter, a detailed methodology is described. The researcher uses the methodology when conducting research and data are collected to justify decisions made when collecting the data to be captured (Radebe, 2014:77). This chapter appraises the methodology employed to compare the determinants of investment spending in South Africa and Nigeria. Chapter 2 gave a detailed theoretical overview of investment spending and its determinants and explained how global studies have been conducted. Chapter 3 discussed the situation of investment spending in both countries. In this chapter, the theoretical assumptions discussed in the literature are tested. For this study, gross fixed capital formation is the dependent variable followed by the determinants of investment spending in both countries as independent variables.

The intention of this chapter is to explain the collection of data and the model used. Section 4.2 explains the sample period and data sources collection. Section 4.3 detailed explanations of variables used in the study, Section 4.4 is the model specification and Section 4.5 discusses the diagnostic tests for the model and, lastly, Section 4.7 concludes the chapter with the brief summary.

4.2 SAMPLE PERIOD AND DATA SOURCES

The research design adopted by this study collected data from different international data sources. The study makes use of sourced secondary time-series data from SARB, IMF, Economist Intelligence Unit (EUI), World Bank, CEIC data and INET BFA. The study employs and covers monthly data ranging from January 2003 to December 2015 for both South Africa and Nigeria, with a total number of 156 observations. The period was chosen because of the availability of data, especially in the case of Nigeria. While collecting data some variables were monthly basis and some quarterly and e-views was employed to convert the data to a monthly basis on some variables obtained. The use of data can give faulty results, as it was difficult to obtain data for Nigeria from different international data sources used.

4.2.1 Model conditions

To minimise the range between the variables, the study observes a logarithmic transformation model on all the variables for South Africa and Nigeria, because some of the variables are in real values and others in percentages. Gross fixed capital formation (real investment spending) is the dependent variable as it is the main determinant under the scrutiny of the determinants, namely

lending rate, real effective exchange rate, GDP, inflation rate(calculated as the change in the consumer price index, CPI), country risk, real savings rate and trade openness.

The real investment spending was modelled as follows:

$$GFCF_t = f(AE_t) \quad (4.1)$$

With AE having seven components this function is expressed as follows:

$$GFCF_t = f(LEN_t + PRICELEVEL_t + REER_t + GDP_t + SAV_t + COU_t + TO_t) \quad (4.2)$$

$GFCF_t$ = Gross fixed capital formation (real investment spending) at time t

LEN_t denotes lending rate at time t,

$PRICELEVEL_t$ denotes price level (CPI) at time t,

$REER_t$ denotes real effective exchange rate at time t,

GDP_t denotes real GDP at time t,

SAV_t denotes savings percentage of GDP at time t,

COU_t denotes country risk at time t,

TO_t denotes trade openness at time t,

4.3 EXPLANATIONS OF VARIABLES USED

There is philosophy that stipulates there are various determinants of real investment worldwide (Magableh & Ajlouni, 2016). As mentioned, the variables chosen for the study are as follows: the dependent variable is gross fixed capital formation (real investment spending) with its determinants lending rate, real effective exchange rate, GDP, real savings rate, inflation rate and country risk and trade openness. The chosen variables were based on available studies (Ali *et al*, 2012; Kosma, 2015) that consider interest rate, tax policies, savings, GDP at constant prices, CPI and exchange rate as determinants of investment spending. For the purpose of the study, the variables mentioned will be outlined by definitions, as they will be used for the purpose of the empirical findings.

4.3.1 Gross fixed capital formation

Gross fixed capital formation (GFCF) includes spending from general government, public corporations and private enterprises (SARB, 2015). The study uses gross fixed capital formation of both public and private investment. Gross fixed capital formation is a component of expenditure approach to calculate GDP (Lexicon, 2017). It is essentially net investment, which includes spending on land improvements, plant, machinery and equipment purchases, the construction of roads, railways, private residential dwellings and commercial and industrial buildings (Pettinger, 2012). Investment spending aims to certify a look able future for individuals, the production in firms and the general government as a whole (Mankiw & Taylor, 2008:540). Gross fixed capital formation at constant prices data in millions was collected for both countries, rands for South Africa from SARB and Naira for Nigeria from IMF. Seven determinants of investment spending were identified to evaluate the level of investment spending in South Africa and Nigeria.

4.3.2 The explanatory (independent) variables

4.3.2.1 Real interest rate (lending rate)

Interest rate affects investment spending depending on the movement of interest rates, considering how the fluctuations in interest rates are, high interest rates discourage investors from withdrawing their investments and low interest rates stimulate investment levels and investment costs decline (Suyuan & Khurshid, 2015:82). The International Monetary Fund (IMF, 2016) defines interest rate as a rate that has to be paid to the financial institution when borrowing money and the lending rate is usually differentiated according to the creditworthiness of borrowers. The relationship between interest rate and investment spending is expected to be negative (Ahmed & Islam, 2005; Kamal, 2011). The investor confidence is determined by interest rate; hence, lending rate is used as one of the determinants of real investment spending for both countries. Lending rate data for Nigeria was collected from INET-BFA and for South Africa from SARB.

4.3.2.2 Price level

CPI represents an increase in the price level (inflation) (Colander & Gamber 2002:198). Price level determines investment spending activities. The recent literature emphasises that if price level is high, investment activities are discouraged and when price level is low investment spending activities are encouraged (interest rate effect) (Kennedy, 2010, Lee & Wong, 2005; Mubarik, 2005; Hussain, 2005; Munir & Mansur, 2009). The expected relationship between price level and

investment for the purpose of the study is negative. CPI rate was collected from SARB for South Africa and from CIEC for Nigeria.

4.3.2.3 Real effective exchange rate

The real effective exchange rate refers to the measurement of the real value of country's currency against the basket of trading partners, several foreign countries (Darvas, 2012:1). Real exchange rate is vital because it is used for the indication of competitiveness for the international trade of any country (Goldberg, 1993; Darby, 1999; Serven, 1993; Central Bank of the Republic of Turkey, 1997:1). For the purpose of the study, it is expected that the real effective exchange rate fluctuations have a negative impact on investment. Real effective rate in monthly analysis for Nigeria CIEC and for South Africa was obtained from SARB from 2003-2015.

4.3.2.4 Real gross domestic product

GDP is equal to the sum of personal consumption expenditure, gross private domestic investment and gross investment (BEA, 2016). Kira (2013:149) describes GDP as one of the measures of the national income and the output for a given country's economy at a given period and represents the value of the total goods and services produced within a country. Investment plays a vital role on economic growth as it provides a source of output and a stable growth is a key attraction to capital formation (Mohsen, 2015:19). Economic growth has a positive influence on investment, as the various studies formulated positive relationships between economic growth and investment (Zon, 2006; Odendokun, 1997). The real GDP is measured in South African rand (millions) and Nigerian naira (millions) at constant prices seasonally adjusted for both countries from 2003-2015.

4.3.2.5 Real savings

Savings is an income put away and not consumed immediately for purchasing goods and services; it is the disposable income minus the personal consumption expenditure (Johnson, 2015:2). Economists believe savings and investment are the prerequisite for economic growth and economic development (Johnson, 2015:2). For the purpose of the study the expected relationship between savings and investment is positive (Ikhida, 2004; Wahid *et al* 2008). Savings rate as a percentage of GDP data was sourced from SARB for South Africa and IMF database for Nigeria (2003-2015).

4.3.2.6 Country risk

Country risk model is used by banks, asset managers and treasury departments to review country credit limits, financial institutions risks, cross border investments and to evaluate the risks of keeping cash and profits (investments) in a particular country. Country risk is a combination of risk scores on a scale of 0-100 and ratings of six groups of risks (sovereign debt, currency, banking sector, political, economic structure and overall country risk) (EIU, 1946; Khattab *et al*, 2015:26). The expected relationship between country risk and investment based on the studies of Gastanaga *et al*, (1998) and Wei (2000) indicate there is little impact on FDI flows and country risk, for the purpose of the study an ambiguous relationship is expected from country risk and investment. The data for country risk for both South Africa and Nigeria were collected from the EIU on monthly basis from 2003 month one to 2015 month 12.

4.3.2.7 Trade openness

Trade openness represents the degree at which unrestricted markets are used to coordinate with other markets by trading across the national borders; this encourages the transfer of ideas and opportunities where they were not available before (Skipton, 2007:3). Restricted trade regimes affect private investment negatively while trade liberation affects it positively. Domestic investments are affected negatively by trade openness as it creates more chances of the outflow of capital in the economy (importing more) (Asante, 2000; Bibi *et al.*, 2012). Levine and Renelt (1992) find that a positive relationship between investment and trade is occupied by how the trade flows are measured by exports, imports and the total of trade. The expected relationship between trade openness and investment for the purpose of the study is ambiguous. Trade openness is measured as a percentage share of the export and import on the GDPF for both countries. For South Africa, the following were collected to calculate trade openness, namely exports for goods and services at constant price plus imports for goods and services at constant prices divided by GDP constant prices seasonally adjusted (SARB 2003-2015). For Nigeria, total exports plus total imports divided by GDP at constant LS data (CIEC 2003-2015).

4.4 MODEL SPECIFICATIONS

The study considers testing for cointegration analysis with ARDL context. ARDL was selected as the variables chosen for the study contract a single equation, the model was introduced by Pesaran & Shin, (1999) and extended further in a new study (Perasan *et al.*, 2001). ARDL is utilised in this study to ascertain the comparative analysis of determinants of investment spending in South Africa

and Nigeria. Short- and long-run relationships are analysed using the ARDL. Henry and Richard (1983) adopted the model, as they believed the model helps with the consideration in the behaviour of the variables over time and that the effect of the exogenous variable is spread over the period. The model is employed to determine the relationship between the determinants and real investment spending. ARDL has been employed by other studies (Sunde, 2017; Dritsakis, 2011; Shittu *et al.*, 2012).

ARDL can be employed if the variables are stationary at I (0) or I (1), it can also be employed if there is a mixture of both at level I (0) and first difference I (1) variables (Pesaran & Shin, 1999). If it is found that, the variables are stationary at second difference I (2) then ARDL fails to accommodate those variables. The ARDL model has advantages and disadvantages, which are discussed in the following subsections.

4.4.1 Advantages of ARDL model

This approach does not require a preceding determination of the order of integration amongst the variables, unlike other approaches that require the variables pose the same order of integration models such as Engle Granger (1987) or Johansen (1991) (Ahmed *et al.*, 2013), meaning they must all either be I (0) or I (1) .

If there is an existence of single long-run relationship, the ARDL approach differentiates between dependent variables and the variables explained. The reason is that the ARDL assumes that only the single reduced form equation relationship exists between the variables explained and exogenous variables (Perasan *et al.*, 2001).

This makes it simple and easy to elaborate. Hamuda *et al.* (2013) mentions that the model is statistically much more significant approach to determine the co-integration relationship in small samples, because the variables are assigned different lags length when the model is introduced.

4.4.2 Disadvantages of ARDL model

The model only makes use of variables that are either stationary at I (1) or I (0) or a mixture of both; it cannot look at variables that are cointegrated at I (2). I (2) series contain two unit roots and this requires differencing twice to induce stationarity, hence it is not regarded (Brooks, 2014:360).

ARDL model overlooks the possibilities of having other cointegration equations, because the model uses a single equation (Muchapondwa & Pimhidzai 2011).

The ARDL model equation to estimate the relation between investment and its determinants is as follows:

$$\begin{aligned} \Delta LGFCF_t = & \delta_0 + \sum_{i=1}^k \alpha_{1i} \Delta LGFCF_{t-i} + \sum_{i=0}^k \alpha_{2i} \Delta LLEN_{t-i} + \sum_{i=0}^k \alpha_{3i} \Delta LPRICELEVEL_{t-i} + \\ & \sum_{i=0}^k \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=0}^k \alpha_{5i} \Delta LGDP_{t-i} + \sum_{i=0}^k \alpha_{6i} \Delta LSAV_{t-i} + \sum_{i=0}^k \alpha_{7i} \Delta LCOU_{t-i} + \\ & \sum_{i=0}^k \alpha_{8i} \Delta LTO_{t-i} + \delta_1 LGFCF_{t-1} + \delta_2 LLEN_{t-1} + \delta_3 LPRICELEVEL_{t-1} + \delta_4 LREER_{t-1} + \\ & \delta_5 LGDP_{t-1} + \delta_6 LSAV_{t-1} + \delta_7 LCOU_{t-1} + \delta_8 LTO_{t-1} + e_t \end{aligned} \quad (4.3)$$

L denotes variables that are in natural logarithm. k is the ARDL maximum lag order chosen. $(\delta_1 - \delta_2 - \delta_3 - \delta_4 - \delta_5 - \delta_6 - \delta_7 - \delta_8)$ indicates long-run relationship, while $(\alpha_1 - \alpha_2 - \alpha_3 - \alpha_4 - \alpha_5 - \alpha_6 - \alpha_7 - \alpha_8)$ represents the short run dynamic. e_t represents error term.

4.4.3 Cointegration test

Cointegrating relationship is considered as the long run or equilibrium phenomenon of variables that might diverge from short-run relationships but can return to association in the long run (Patterson, 2000:15). The essence to conduct this test is to test the presence of long-run relationship among the variables (Khumalo, 2011:49). The cointegration test helps to understand and identify if the variables in the model are cointegrated or not. If the test fails to identify the cointegration between the variables, it becomes imperative to work with the model (Nkoro & Uko, 2016:75).

In the model, if there is presence of co-integration, it means there is a long-run relationship, which is when the error correction model (ECM) will be estimated to check the speed of adjustment of the determinants to the equilibrium and examine the short run dynamic.

In this study, the cointegration was tested using the following hypothesis:

Null hypothesis (H_0): there is no co-integration $(\delta_1 - \delta_2 - \delta_3 - \delta_4 - \delta_5 - \delta_6 - \delta_7 - \delta_8 = 0)$

Alternative hypothesis (H_1): there is co-integration $(\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq 0)$

The hypothesis status of cointegration between the variables is based on the bound test when deciding to reject or accept the null hypothesis following the procedures (Malawi, 2014):

$F\text{-value} > \text{upper bound}$, the null hypothesis is rejected meaning variables are cointegrated.

$F\text{-value} < \text{upper bound}$, the null hypothesis is not rejected meaning variables are not cointegrated.

It is inconclusive if the F-value is between the lower and upper bound, if this is the case the study needs to be examined for further steps of analysis. If there is a presence of cointegration in the model, it means there is a long-run relationship; that is when the error correction model (ECM) will be estimated to check the speed of adjustment of the determinants to the equilibrium and examine the short run dynamic.

4.4.4 Error correction model

If investment spending and its determinants are cointegrated, ECM is estimated. ECM is the model constructed using the stationary variables with an error term capturing the movements back towards those that have the stochastic trend in the long run and the speed of adjustment on equilibrium (Brooks, 2015). ECM allows the long-term components of variables to obey equilibrium constraints while the short run components have elastic dynamic specifications. The ECM will be used only if the test indicates that investment spending and the determinants are cointegrated. The following equation is the ECM equation for the ARDL model:

$$\begin{aligned} \Delta LGFCF_t = & \delta 0^i + \sum_{i=1}^k \alpha_1 \Delta LGFCF_{t-i} + \sum_{i=0}^k \alpha_{2i} \Delta LLEN_{t-i} + \sum_{i=0}^k \alpha_{3i} \Delta LPRICELEVEL_{t-i} + \\ & \sum_{i=0}^k \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=0}^k \alpha_{5i} \Delta LGDP_{t-i} + \sum_{i=0}^k \alpha_{6i} \Delta LSAV_{t-i} + \sum_{i=0}^k \alpha_{7i} \Delta LCOU_{t-i} + \\ & \sum_{i=0}^k \alpha_{8i} \Delta LTO_{t-i} + \delta ECT_{t-1} + u_t \end{aligned} \quad (4.4)$$

The *ECT* in the equation is referred to as the error correction term, which measures adjustment speed to the equilibrium. If a positive coefficient exists, there is divergence and negative coefficient indicates a convergence. If the *ECT*=1 the adjustment is prompt, *ECT*=0 there is no adjustment and no long-run relationship. A number of diagnostic tests will be conducted in the following section, to check if the model used in the study meets the required assumptions.

The lag length is estimated for the model to decide how many lags will be used in the employed model (ARDL). Using different conditions the optimum numbers of lags were selected, because the use of lags is critical in the ARDL model (Li & Liu, 2012), based on the criterion of the Schwartz information criterion (SIC) and the Akaike information criterion (AIC) (Ivanov & Kilian, 2005). When choosing the number of lags to use in the model, the lag that has the small AIC and SIC is the chosen lag to use for the study.

4.4.5 Testing for stationarity (unit root test)

To establish a meaningful relationship between investment spending and its determinants, the variables have to satisfy the stationary condition. Stationarity has to be checked on variables, because it is the first step to conduct when dealing with time series analysis and if there is non-stationarity the results will lead to a spurious regression analysis (Gujarati & Porter, 2010). A stationary series is a series that has a variable with a constant mean, variance and constant auto variance for each lag that has been given (Brooks, 2015). A series that does not contain the above conditions of stationarity is said to be non-stationary.

The ARDL model requires to run the unit root test results to check the order of integration on variables if they are I (1) or I (0) or a mixture of both, but not integrated at I (2). There are many econometric techniques for unit root tests to check for stationarity, namely the augmented Dickey-Fuller (ADF), Phillip-Peron (PP) (1988) and Kwiatkowski, Phillips, Schmidt and Shin (KPSS) (1992), each of these tests are discussed in the following subsections.

4.4.5.1 Augmented Dickey-Fuller

The ADF test was generalised from Dickey-Fuller (DF) in order to accommodate the general ARIMA and ARMA models. The test is performed using trend, intercept or a mixture of both intercept and trend. The regression of test is as follows:

$$\Delta y_{t-1} = \psi y_{t-1} + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \dots + \beta_n \Delta y_{t-n} + u_t \quad (4.5)$$

The hypothesis used to test for unit root using ADF is:

Null hypothesis (H_0): $\psi = 0$: series contains a unit root (not stationary)

Alternative hypothesis (H_1): $\psi < 0$: series is stationary

The rejection of the null hypothesis indicates that there is no unit root and variable is stationary.

4.4.5.2 Phillip-Peron

The tests are similar to ADF tests but they incorporate an automatic correction to the DF procedure to allow for residuals that are autocorrelated (Brooks, 2015:364). Both tests offer similar results in most cases. Phillips and Perron (1998) indicate the test can test for unit root in variables that reflect

structural changes in the economy, this is one of the reasons that makes it better than the ADF test. Furthermore, under PP test the user does not have to specify a lag length for the test regression. PP requires software to be programmed and the test is limited to that of ADF (Steward, 2005). The formula:

$$y_t = \alpha y_{t-1} + \delta x_t + u_t \quad (4.6)$$

$$\Delta y_t = \theta_0 + \delta y_{t-1} + u_t \text{(PP test equation)} \quad (4.7)$$

θ_0 and t respectively denotes the trend and constant.

Null hypothesis (H_0): $\delta = 0$: series contains unit root (not stationary)

Alternative hypothesis (H_1): $\delta \neq 0$: series is stationary

The rejection null hypothesis indicates that is no unit root and variable is stationary.

There are criticisms of ADF and PP; Brooks (2014:364) indicates the most important criticism is their power is low if the process is stationary but the unit root is close to the boundary of non-stationary. As a result, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationary test is introduced to compare if the ADF and PP test results have similar results.

4.4.5.3 Kwiatkowski, Phillips, Schmidt and Shin (KPSS)

KPSS is a test for stationarity; a test where the null hypothesis is that a series is stationary against the alternative hypothesis that is not (Brooks, 2015:687). This test is more about stationary unlike ADF and PP that focus on unit root tests of variables. An estimation in KPSS model formula is a follows:

$$y_t = \beta' D_t + \mu_t + u_t \quad (4.8)$$

$$u_t = u_{t-1} + \varepsilon_t, \varepsilon_t \sim WN(0, \sigma_\varepsilon^2) \quad (4.9)$$

D_t denotes a constant or a constant with a trend, t denotes trend. The symbol μ_t is a random walk with an innovation variance of σ_ε^2 , while u_t is integrated of order zero I (0) and may be heteroscedastic and $WN(0, \sigma_\varepsilon^2)$ denotes white noise with mean zero and variance σ_ε^2 . The observation can be used to design hypothesis test:

Null hypothesis (H_0): $\sigma_\varepsilon^2 = 0$

Alternative hypothesis (H_1): $\sigma_\varepsilon^2 \neq 0$

4.4.5.4 Parameter stability test

Parameter stability test is used to check structural breaks in the model, when testing for unit root and stationary testing (Peron, 1988:13). The parameter stability test includes the idea of splitting the data into sub-periods and then estimating up to three models, this is done for each sub-part and all the data, then comparing the residual sum of squares (RSS) of each model (Brooks, 2014:26). The reliability of the regression coefficient consists of two tests, namely the Chow (analysis of variance) test and predictive failure tests (Patterson, 2000:185). The study makes use of the Chow test.

When conducting the Chow test, the following steps are followed (Brooks, 2014:226-227):

- i. Split the data into two sub-periods. Evaluate the three regressions over the sample period and two sub-periods separately. Obtain the RSS for each regression.
- ii. Restriction in the model. Restricted regression is the regression for the whole period and the unrestricted regression comes in two parts: one for each of the sub-samples.

$$\text{Test statistic} = \frac{RSS - (RSS_1 + RSS_2)}{RSS_1 + RSS_2} \times \frac{T - 2k}{k} \quad (4.10)$$

Where RSS = residual sum of squares for whole sample

RSS_1 = residual sum of squares for sub-sample 1

RSS_2 = residual sum of squares for sub-sample 2

T = number of observations

2k = number of regressors in the unrestricted regression (in two parts)

k = number of regressors in each unrestricted regression

Unrestricted regression is where the restriction is not imposed across the model. Since the restriction is that the coefficients are equal across the samples, this will be the single regression for the whole sample. Therefore, the test is one of how much the RSS is bigger than the sum of residuals for the whole sample ($RSS_1 + RSS_2$). If the coefficients do not change much between the samples, the RSS will not rise that much upon imposing the restriction (Brooks, 2014:226).

iii. *Perform the test*, the hypothesis test is as follows:

Null hypothesis (H_0) = the parameters are stable over time

Alternative hypothesis (H_1) = the parameters are not stable over time

If the value of test statistic is greater than the critical value from F -distribution, which is an $F(k, T-2k)$, then null hypothesis is rejected, concluding that the parameters are stable over time.

A **Breakpoint unit root test** is employed when the data contains a structural break or there is presence of trend, cautions researchers about a bias towards a false rejection of null hypothesis that traditional unit root tests tend to lead to due to power issues Perron (1989). The presence of a structural break in the intercept or trend using traditional unit root tests may appear non-stationary when the series is stationary (Mposelwa, 2016). Hence, the study employs break-point unit root test by running an ordinary least squares (OLS) regression suggested by Perron (1989) as follows:

$$y_t = a_0 + a_1 y_{t-1} + a_2 t + \mu_2 D_L + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_t \quad (4.11)$$

Where y_t is the series under consideration, a and β denote changes in the parameter for the period break $t = T_B + 1$. D , denotes the dummy variable. The hypothesis is set as follows:

Null hypothesis (H_0) = there is unit root (no presence of structural break)

Alternative hypothesis (H_1) = stationarity (presence of structural breaks)

4.5 DIAGNOSTIC TESTS

After the ECM model, diagnostic testing is needed to inspect if the stochastic properties used for the ECM model were met to avoid any econometric model problems and harm the superiority of findings acquired from regression analysis (Takaendesa, 2006:100; Muzindutsi, 2011:123). Diagnostic tests validate the parameter estimation outcomes that are accompanied by the model used throughout the study and used to check the goodness-of-fit of the model (Sibanda, 2012:57). The ARDL diagnostic tests, namely heteroscedasticity, autocorrelation, normality and parameter stability tests, were conducted to check if the model is fit and if they diversify each other (Zeileis & Hothorn, 2002).

4.5.1 Autocorrelation

Autocorrelation refers to the correlation of the series with its own past and future value; it is called serial correlation or lagged correlation in some cases. This test complicates the identity of significant correlation or covariance between time series and could be exploited for predictions. It is used in the model to check if the error terms are correlated over the period (Sibanda, 2012:58-59). Autocorrelation can be detected using either Durbin Watson test, the Breusch-Godfrey test or the LM test, out of all the tests, Gujarati (2003:473) indicates that the most used general test for autocorrelation is Breusch-Godfrey test, which is more likely the same as the LM test. The hypothesis test for autocorrelation is:

Null hypothesis (H_0): there is no autocorrelation

Alternative hypothesis (H_1): there is autocorrelation

4.5.2 Heteroscedasticity

Heteroscedasticity is an econometric model based on the assumption that denotes the homoscedasticity in error terms (Sibanda, 2012:58). Heteroscedasticity affects the distribution of the estimated coefficients increasing the variance of distribution and underestimating the variance of estimators leading to higher values of t and F statistics (Asteriou & Hall, 2014). The formal tests for heteroscedasticity are the Breusch-Pagan LM test, the Glesjer LM test, the Harvey-Godfrey LM test, the Park LM test, the Goldfeld-Quandt test and White's test. White's test is the most common heteroscedasticity test as it is simple and very easy to implement (Gujarati, 2003:415). The study will employ the White test to test for the presence of heteroscedasticity. Heteroscedasticity cannot be ignored, if this happens, estimated covariances and variances may be biased and render hypothesis tests invalid (Ramanathan, 1995). Hypothesis tests for heteroscedasticity are as follows:

Null hypothesis (H_0): Homoscedastic

Alternative hypothesis (H_1): Heteroscedasticity

4.5.3 Normality test

The normality test is used to check how error terms are distributed; the error terms can either be normally distributed or not distributed. The normality test is determined by checking the

probability of Jarque-Bera. The error terms are normally distributed in the model if the Jarque-Bera is more than the significant level of 5 percent (Gujarati & Porter, 2010:536).

4.5.4 Stability test

The stability is tested using the cumulative sum of residuals (CUSUM) and cumulative sum of residuals of squares (CUSUMQ) test. The tests are compared within the 5 percent significance level. Stability tests are used to examine the stability of short and long run coefficient in the model (Davisdescu, 2015).

4.6 TODA-YAMAMOTO CAUSALITY TEST

The study makes use of the Toda-Yamamoto procedure of Granger causality (Toda & Yomamoto, 1995). The Granger causality test minimises risks associated with invalid results when identifying the order of cointegration series (Mavrotas & Kelly, 2001). The Toda-Yamamoto procedure overcomes the problem of invalid results, which result when causality tests are performed in the presence of non-stationary series or even cointegrated (Ahmed, 2015:41). To avoid the mentioned issues, a modified Wald (MWALD) test has been employed for the study. Using the Toda-Yamamoto (1995) approach to test for Granger non-causality, the following VAR equations were estimated:

$$\begin{aligned} \Delta LGFCF_t = & \delta 0^i + \sum_{i=1}^{\kappa} \alpha_{1i} \Delta LGFCF_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{1i} \Delta LGFCF_{t-i} + \sum_{i=0}^{\kappa} \alpha_{2i} \Delta LLEN_{t-i} + \\ & \sum_{i=k+0}^{k+dmax} \alpha_{2i} \Delta LLEN_{t-i} + \sum_{i=0}^{\kappa} \alpha_{3i} \Delta LPRICELEVEL_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{3i} \Delta LPRICELEVEL_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=0}^{\kappa} \alpha_{5i} \Delta LGDP_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{5i} \Delta LGDP_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{6i} \Delta LSAV_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{6i} \Delta LSAV_{t-i} + \sum_{i=0}^{\kappa} \alpha_{7i} \Delta LCOU_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{7i} \Delta LCOU_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{8i} \Delta LTO_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{8i} \Delta LTO_{t-i} + \varepsilon_{1t} \end{aligned} \quad (4.12)$$

$$\begin{aligned} \Delta LLEN_t = & \delta 0^i + \sum_{i=1}^{\kappa} \alpha_{1i} \Delta LLEN_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{1i} \Delta LLEN_{t-i} + \sum_{i=0}^{\kappa} \alpha_{2i} \Delta LGFCF_{t-i} + \\ & \sum_{i=k+0}^{k+dmax} \alpha_{2i} \Delta LGFCF_{t-i} + \sum_{i=0}^{\kappa} \alpha_{3i} \Delta LPRICELEVEL_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{3i} \Delta LPRICELEVEL_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=0}^{\kappa} \alpha_{5i} \Delta LGDP_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{5i} \Delta LGDP_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{6i} \Delta LSAV_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{6i} \Delta LSAV_{t-i} + \sum_{i=0}^{\kappa} \alpha_{7i} \Delta LCOU_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{7i} \Delta LCOU_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{8i} \Delta LTO_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{8i} \Delta LTO_{t-i} + \varepsilon_{1t} \end{aligned} \quad (4.13)$$

$$\begin{aligned} \Delta LPRICELEVEL_t = & \delta 0^i + \sum_{i=1}^{\kappa} \alpha_{1i} \Delta LPRICELEVEL_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{1i} \Delta LPRICELEVEL_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{2i} \Delta LGFCF_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{2i} \Delta LGFCF_{t-i} + \sum_{i=0}^{\kappa} \alpha_{3i} \Delta LLEN_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{3i} \Delta LLEN_{t-i} + \\ & \sum_{i=0}^{\kappa} \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{4i} \Delta LREER_{t-i} + \sum_{i=0}^{\kappa} \alpha_{5i} \Delta LGDP_{t-i} + \sum_{i=k+0}^{k+dmax} \alpha_{5i} \Delta LGDP_{t-i} + \end{aligned}$$

4.7 SUMMARY

The chapter specified the chosen model to be used for the study and the model identified was the autoregressive distributed lag (ARDL). The model will be used to analyse the determinants of investment spending in South Africa and Nigeria.

The chapter discussed the selection of variables to be used in the study, using monthly observations of data from January 2003 to December 2015. The data were converted to natural logarithm and were collected from different international data sources: SARB, IMF, Economist Intelligence Unit (EUI), World Bank, CEIC Company Data Ltd and INET BFA.

The justification of the model was presented, a review of the unit root tests, namely ADF, PPS, KPSS and Chow's structural break test to check the stability of parameters were explained. The study continued to give a justification of other econometric tests to be used, namely cointegration test, ECM, diagnostic tests and Toda-Yamamoto causality test. The diagnostic tests reviewed in the chapter are heteroscedasticity, autocorrelation, normality and parameter stability tests to check if the model is fit.. The tests in the study were performed using EViews 9 software.

CHAPTER 5: EMPIRICAL ANALYSIS AND RESEARCH RESULTS

5.1 INTRODUCTION

Chapter 4 (research methodology) gave a detailed discussion about the econometric model chosen for the study and research techniques employed, as well as the selection of the ARDL model. The model can affect the results, as no econometric model is 100 percent error free. This chapter fulfils the empirical objectives set out for the study. This chapter aims to coordinate the economic analysis and establish interpretation on the analysis of determinants of investment spending in South Africa and Nigeria over the period January 2003 until December 2015. The chapter includes a discussion on the finding of whether the determinants (lending rate (LEN), price level, real effective exchange rate (REER), gross domestic product (GDP), savings (SAV), and country risk (COU) and trade openness (TO)) influence investment spending in South Africa and Nigeria. The display of data and results is one of the most useful method for researchers to analyse information, as it gives a quick understanding on analysing information.

The analysis in this study was conducted using the E-Views 9 for the statistical purposes and uses the 5 percent level of significance. The chapter consists of four sections. The first section, introduces the trends of investment spending and its determinants through graphical analysis, discusses descriptive statistics and also the correlation analysis of the variables. The second section discusses the unit root results, cointegration analyses and the ECM as well for short-run relationship. The third section consists of the diagnostic tests to assess the goodness-of-fit of the model. Finally, the fourth section, which is the final section of this chapter, elaborates on the summary findings of this chapter.

5.2 PRESENTATION OF THE RESULTS

This section displays the graphical analysis, followed by the descriptive and correlation analysis of determinants of investment spending in South Africa and Nigeria. The presentation of results section used raw data to inform the results for Section 5.2.

5.2.1 Graphical analysis

Graphical analysis allows the researcher to look at data individually rather than merely summaries and it is the introductory examination of data before other formal analysis of data is made (Lavine, 2011). Graphs give an indication of how the variables performed during the period chosen for the

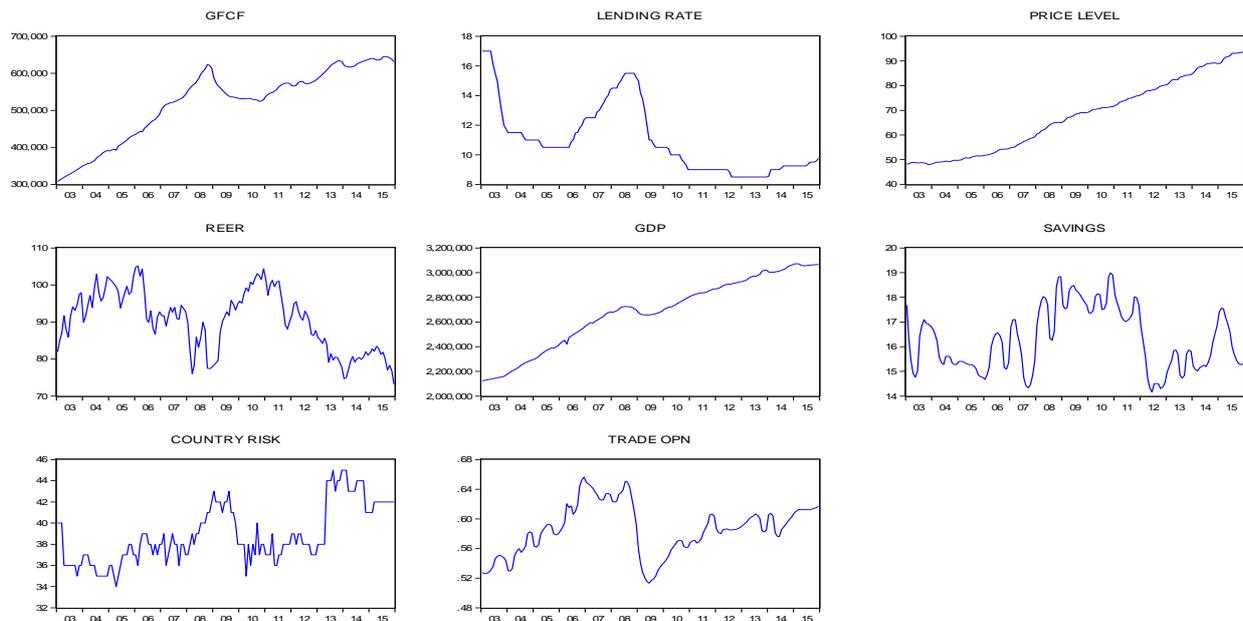
study. The graphical analysis of the behaviour of the variables for South Africa and Nigeria are shown in figures 5.1 and 5.2.

Figure 5.1 illustrates the graphical results of the monthly investment spending and its determinants in South Africa from January 2003 to December 2015. There are fluctuations on real effective exchange rate (REER), savings, and country risk and trade openness. Gross domestic product (GDP) and gross fixed capital formation (GFCF) indicated an increase from 2003 to 2007, after that the country was hit by sluggish growth. It can be seen on the GDP graph that after the 2010 World Cup GDP picked up, but moved at a sluggish rate. Lending rate decreased over time and price levels retained an increase. It evident that the financial crisis had an impact on the variables, even though on some variables the impact does not show that much, there is an indication of sluggish growth after the financial crisis. Figure 5.2 analyses the investment spending and its determinants in Nigeria from 2003 to 2015. Price level retained an increase for the chosen period and the lending rate was at its lowest during the financial crisis. This was to encourage more borrowing and investments since most banks were facing a financial crisis (Osundina & Osundina, 2014). There are fluctuations on savings, lending rate, country risk and REER, showing trends moving upwards and downward during the chosen period for the study.

From the graphical presentation in figures 5.1 and 5.2, it can be seen that the movements of the determinants in both countries seems likely. The country risk was high, price level kept an increasing rate and the financial crisis affected them, but its impact was not that bad as there was still some sluggish growth after the crisis on other variables. In conclusion, between the two countries, South African determinants are performing better than the Nigerian determinants, the lending rate, country risk, price level and the real effective exchange and even though they affect the investment spending, they are much better than in Nigeria from the trends depicted in figure 5.1 and 5.2 below.

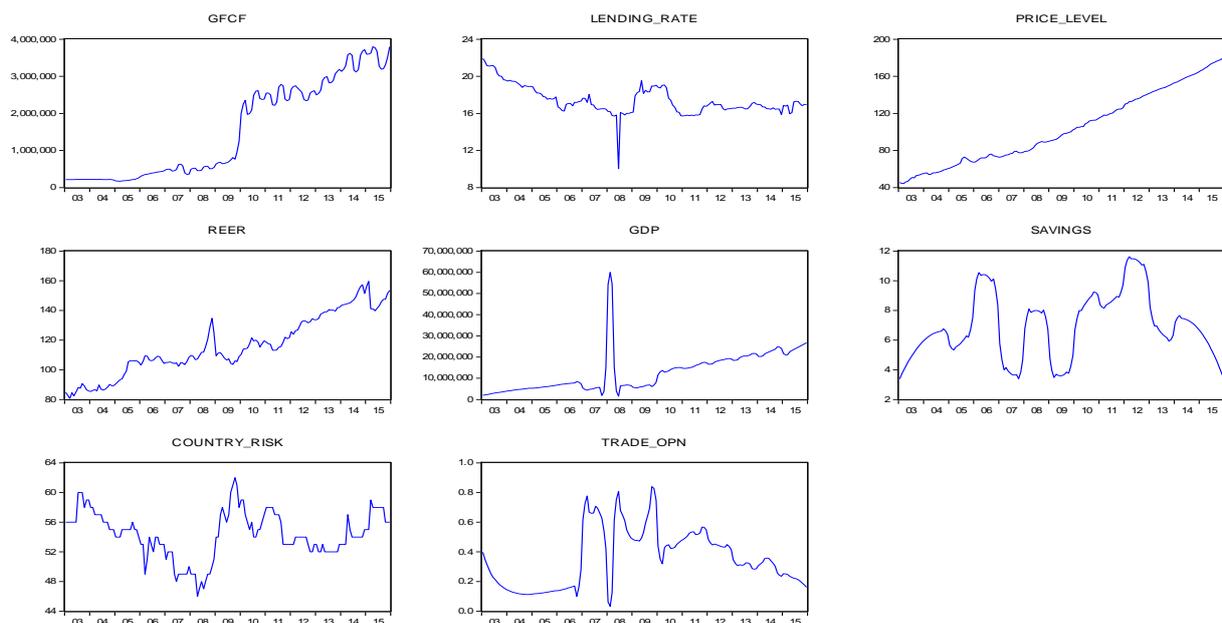
The following outcome to be analysed in this chapter, after the graphical analysis, is the descriptive and correlation analysis of the countries.

Figure 5.1: Trends of the investment spending and its determinants in South Africa



Source: Constructed by author

Figure 5.2 Trends of the investment spending and its determinants in Nigeria



Source: Constructed by author

5.2.2 Descriptive and correlation analysis

Descriptive analysis refers to numbers used to summarise and describe the data used. Any number that is computed or collected counts as descriptive analysis. Correlation analysis measures the strength of the relationship between two variables. The values are expressed and should be between +1 (positive relationship) and -1 (perfect negative relationship), this shows the linear dependence

of the set of data or variables used (Lane *et al.*, 2013:15). South Africa and Nigeria had a total of 156 monthly observations from January 2003 to December 2015. Tables 5.1 and 5.2 display the descriptive analysis of investment spending and its determinants for South Africa and Nigeria. The descriptive analysis displayed in this section represents the chosen variables employed from the previous chapter.

Table 5.1 analysis shows that the GFCF minimum and maximum are far apart from each other, this indicates GFCF grew by half of the minimum from 2003 to 2015, while the GDP has a small difference between minimum and maximum. Savings behaviour in South Africa is weak, as indicated from the minimum and maximum results, while the country risk is reaching the level of 50 percent this gives investors and foreign customers dissatisfaction of investments in the country. GFCF, real effective exchange rate, GDP and trade openness are negatively skewed, which indicates a deceleration to investment spending access. Other variables (savings, price level, country risk and lending rate) indicate positive skewness, but the impact of positivity is not that great, except for lending rate, which is perfectly skewed.

Table 5.1: South Africa – descriptive analysis

Variable	Count	Max	Min	Mean	Std. Dev	Skewness
GFCF	156	645370.3	307746.0	520848	97346.63	-0.686
LEN	156	17.000	8.500	11.000	2.333	0.992
PRICE LEVEL	156	93.700	48.000	67.404	14.592	0.199
REER	156	105.110	73.150	90.359	8.131	-0.170
GDP	156	3072252	2123310	2675219	286911.5	-0.426
SAV	156	18.988	14.151	16.288	1.269	0.278
COU	156	45.000	34.000	38.897	2.736	0.562
TO	156	0.656	0.513	0.585	0.034	-0.120

Source: Estimated by author

Figure 5.2 shows in the descriptive analysis of Nigeria that the country risk in the country is at its highest as its maximum is 62 percent and minimum 42 percent. Buhari (2015) mentions that corruption is one of the pressing issues in Nigeria. The impact of corruption impacts the country in a way that investments, especially FDI, becomes harder to predict and do business. Lending rate and price level indication of maximum and minimum have significant difference, which indicates a highest rate in both the rates over the period used for the study.. The standard deviations of the variables show low volatility as they are below the mean, more especially savings and REER. The

volatility is mostly distributed on GFCF and GDP is at its average as the standard deviations are mostly likely close to mean. Price level shows the highest wide spread (39.22%) of all the variables and more volatility. The variables in Nigeria are positively skewed, except for country risk, which is negatively skewed.

From the analysis of both countries, in Table 5.1 and Table 5.2, price level and lending rate in both countries fluctuated and had the same movement, as they play the same role in both countries. Savings behaviour from both countries in the analysis is low, as indicated by the descriptive analysis.

Table 5.2: Nigeria – descriptive analysis

Variable	Count	Max	Min	Mean	Std. Dev	Skewness
GFCF	156	3798471	171456.6	1532148	1286251	0.331
LEN	156	21.930	10.040	17.387	1.521	0.225
PRICE LEVEL	156	180.150	44.150	103.573	39.224	0.331
REER	156	159.610	80.68	115.979	20.207	0.256
GDP	156	59987936	1524768	12808174	9539931	1.852
SAV	156	11.630	3.387	6.6943	2.213	0.266
COU	156	62.000	46.000	54.358	3.178	-0.247
TO	156	0.840	0.032	0.355	0.196	0.450

Source: Estimated by author

Figure 5.3 assesses the correlation among the variables in South Africa: GFCF, LEN, price level, REER, GDP, SAV, and COU and TO. Negative correlation exists between LEN and REER to GFCF. There is positive correlation relationship between GDP, SAV, COU, TO and PRICE LEVEL to GFCF, a strong association exists between GDP and GFCF. Prior knowledge suggests investments are empowered by growth. Savings have a low positive relationship with GFCF; this is an indication that adds to the theory that South Africa is a low saving dominant country. The PRICE LEVEL to GFCF positive relationship contradicts the theory, price level contributes positively to investment spending (Naude & Krugell, 2003), and this can be seen as accidental correlation, because high spending behaviour on consumer goods decelerate the chances of investing. The results further show the positive relationship between PRICE LEVEL, GDP, COU and TO at 5 percent significance level; they are statistically significant to GFCF. Even though there is a negative relationship between LEN and REER, the results show that the negative

relationship between LEN and REER is statistically significant. The SAV positive relationship to GFCF was found to be insignificant.

Figure 5.4 depicts the presentation of correlation analysis between GFCF in Nigeria, using GFCF as the measure of the determinants. There is a negative correlation between GFCF and LEN, the rest of the determinants (GDP, PRICE LEVEL, REER, GDP, SAV and COU and TO) are positively correlated to GFCF in Nigeria. Both REER and PRICE LEVEL have a strong association with GFCF as they are above 0.8 percent. SAV is positively correlated to GFCF but there is no strong association as Uma *et al.* (2014) mentions that the country saving performance movements are low, hence there is weak positive correlation. On the Nigerian note, the results of indicate that PRICE LEVEL, REER, GDP and SAV positive relationship are significant to GFCF. LEN and TO has positive correlation but is insignificant to GFCF. Lastly, the country risk is insignificant to GFCF in Nigeria.

Table 5.3: South Africa – correlation between dependent and independent variables

Variable	Correlation coefficient	Probability
GFCF	1.000	-
LEN	-0.445	0.000
PRICE LEVEL	0.887	0.000
REER	-0.576	0.000
GDP	0.967	0.000
SAV	0.136	0.088
COU	0.693	0.000
TO	0.443	0.000

Source: Estimated by author

In conclusion, both descriptive and correlation analysis has been analysed and some of the variables differ in both countries except for saving, lending rate, country risk and price level, which indicates mostly the same results. The next step includes the unit root test to test for the stationarity and introduces the model chosen for the study after testing for the stationarity.

Table 5.4: Nigeria – correlation between dependent and independent variables

Variable	Correlation coefficient	Probability
GFCF	1.000	-
LEN	-0.423	0.000
PRICE LEVEL	0.960	0.000
REER	0.890	0.000
GDP	0.661	0.000
SAV	0.266	0.000
COU	0.120	0.135
TO	0.077	0.337

Source: Estimated by author

5.3 UNIT ROOT TESTS RESULTS

To avoid nonsensical or spurious results, unit root test or stationary tests are conducted as a testing strategy to examine the data series that none of the variables used are I (2), since the study employed the ARDL approach. The inclusion of I (2) variables in the ARDL model, would condense the computed F-statistics necessary for cointegration testing invalid (Pesaran *et al.*, 2001; Narayan & Smyth, 2005). The study employed Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski, Phillips, Schmidt and Shin (KPSS) tests to determine the order of cointegration on the variables. Both the other tests overcome the low power problems experienced by the ADF test. In this section, the results of the ADF and PP unit root tests results are discussed.

5.3.1 Augmented Dickey-Fuller (ADF) results

The ADF unit root test results for both countries (South Africa and Nigeria) are discussed in tables 5.5 and 5.6. Table 5.5 presents the results of ADF unit root test for investment spending and its determinants in South Africa. From the table, none of the variables were stationary at level. It can be seen from the results that the variables in the South African context are integrated of order, I (1), with either intercept or trend and intercept. The study uses the 5 percent significance level for hypothesis testing of unit root.

Table 5.5: South Africa – results ADF unit root test

	Level				1 st Difference				Decision inference
	Intercept		Trend & intercept		Intercept		Trend & intercept		
	T-stat	P-value	T-stat	P-value	T-stat	P-value	T-stat	P-value	
LGFCF	-2.752	0.067	-1.748	0.724	-4.494	0.000	-5.034	0.000	I (1)
LLEN	-2.279	0.073	-2.674	0.248	-4.015	0.001	-4.161	0.006	I (1)
LPRICE LEVEL	0.789	0.993	-2.582	0.288	-11.59	0.000	-11.62	0.000	I (1)
LREER	-1.499	0.531	-2.418	0.418	-6.788	0.000	-6.918	0.000	I (1)
LGDP	-2.678	0.080	-1.287	0.887	-5.414	0.000	-6.006	0.000	I (1)
LSAV	-1.985	0.293	-1.969	0.621	-3.487	0.009	-3.464	0.047	I (1)
LCOU	-1.902	0.330	-3.355	0.061	-16.76	0.000	16.74	0.000	I (1)
LTO	-2.707	0.075	-2.708	0.075	-5.042	0.000	-5.013	0.000	I (1)

Notes: H_0 : series has a unit root and H_a : series has no unit root, stationary

Source: Estimated by author

Table 5.6: Nigeria – results ADF unit root test

	Level				1 st Difference				Decision inference
	Intercept		Trend & intercept		Intercept		Trend & intercept		
	T-stat	P-value	T-stat	P-value	T-stat	P-value	T-stat	P-value	
LGFCF	-0.843	0.803	-2.636	0.264	2.933	0.044	-2.929	0.156	I (1)
LLEN	-2.987	0.038	-2.918	0.159	--	--	--	--	I (0)
LPRICE LEVEL	-0.637	0.857	-2.176	0.498	-6.922	0.000	-7.023	0.000	I (1)
LREER	.1.251	0.651	-3.569	0.035	--	--	--	--	I (0)
LGDP	-1.480	0.540	-3.822	0.018	--	--	--	--	I (0)
LSAV	-1.296	0.630	-0.695	0.971	-4.204	0.000	-4.517	0.002	I (1)
LCOU	-2.366	0.152	-2.350	0.404	-6.779	0.000	-6.770	0.000	I (1)
LTO	-1.873	0.344	-0.716	0.969	-5.643	0.000	-5.756	0.000	I (1)

Notes: H_0 : series has a unit root and H_a : series has no unit root, stationary

Source: Estimated by author

Table 5.6 depicts the ADF unit root test results for Nigeria. There is a mixture of both I (0) and I (1). LLEN, LGDP and LREER are stationary at level (I(0)). While LGFCF, LPRICE LEVEL, LSAV, LCOU, and LTO are integrated of order one (I (1)), with both the intercept and trend and

intercept. In conclusion, the ADF results for both countries show that none of the variables are integrated of order two or I (2).

5.3.2 Phillip-Peron (PP) results

The employment of the PP unit root test is to reach the same conclusion of that of ADF unit root test. The results for PP test are presented in Table 5.7 for South Africa and Table 5.8 for Nigeria. The test is conducted using the 5 percent significance level for hypothesis testing. The PP unit root test in Table 5.7 reveals the same results as that of ADF in Table 5.5, except the variables LGFCF and LCOU are stationary at level. Both LCOU and LGFCF for South Africa became stationary at level when the PP test was used.

Table 5.7: South Africa – PP unit root test results

	Level				1 st Difference				Decision inference
	Intercept		Trend & intercept		Intercept		Trend & intercept		
	T-stat	P-value	T-stat	P-value	T-stat	P-value	T-stat	P-value	
LGFCF	-3.138	0.025	1.802	0.699	--	--	--	--	I (0)
LLEN	-0.078	0.180	2.002	0.594	5.721	0.000	5.888	0.000	I (1)
LPRICE LEVEL	0.736	0.992	2.591	0.285	11.587	0.000	11.612	0.000	I (1)
LREER	-1.817	0.370	2.961	0.146	10.815	0.000	10.578	0.000	I (1)
LGDP	2.717	0.073	1.019	0.937	10.438	0.000	10.889	0.000	I (1)
LSAV	2.857	0.052	2.86	0.178	6.816	0.000	6.791	0.000	I (1)
LCOU	2.366	0.152	4.102	0.007	--	--	--	--	I (0)
LTO	2.260	0.186	2.212	0.479	6.55	0.000	6.539	0.000	I (1)

Notes: H₀: series has a unit root and H_a: series has no unit root, stationary

Source: Estimated by author

Table 5.8: Nigeria – PP unit root test results

	Intercept		Trend & intercept		Intercept		Trend & intercept		Decision inference
	T-stat	P-value	T-stat	P-value	T-stat	P-value	T-stat	P-value	
LGFCF	-0.609	0.863	-2.119	0.530	-8.865	0.000	-8.865	0.000	I (1)
LLEN	-4.352	0.000	-5.216	0.000	--	--	--	--	I (0)

LPRICE LEVEL	-1.794	0.382	-2.816	0.193	-9.497	0.000	-9.670	0.000	I (1)
LREER	-0.909	0.783	-3.011	0.132	-10.82	0.000	-10.78	0.000	I (1)
LGDP	-2.710	0.074	-3.541	0.038	--	--	--	--	I (0)
LSAV	-2.868	0.051	-2.603	0.274	-5.289	0.000	-5.378	0.000	I (1)
LCOU	-2.505	0.116	-2.483	0.335	-12.70	0.000	-12.67	0.000	I (1)
LTO	-2.406	0.141	-2.538	0.309	-8.471	0.000	-8.904	0.000	I (1)

Notes: H_0 : series has a unit root and H_a : series has no unit root, stationary

Source: Estimated by author

Table 5.8 depicts PP unit root test results for Nigeria. The outcomes are similar to that of ADF in Table 5.6, but the LREER is stationary at I (1) when using the PP unit root test, while in ADF test is stationary at level. The conclusion is that the ADF tests and PP test outcomes for both countries are mostly similar for each country. KPSS is discussed in the following section to confirm the results from the ADF and PP unit root tests.

5.3.3 Kwiatkowski, Phillips, Schmidt and Shin (KPSS) results

The KPSS stationarity test is used as a confirmatory test, from the ADF and PP unit root tests performed. KPSS is considered more by econometricians in relation to ADF and PP unit root test (Ongbor, 2015). Table 5.9 shows the KPSS stationarity test results for South Africa. The outcomes match those of the ADF test and PP, variables are stationary at level with intercept. At level with trend, variables (such as LLEN, LPRICE LEVEL, LREER, LCOU and LTO) are stationary; this is inconsistent with the results of ADF and PP. From the ADF and PP unit root results, the variables showed no stationarity at level but only at 1st difference, except for (LGFCF and LCOU) in PP. The KPSS stationarity test results shows a mix of results on the tests, but even after the inconsistency, the variables were stationary at 1st difference like ADF and PP at the end.

Table 5.9: South Africa – KPSS stationarity test results

	Level						1 ST Difference					
	Intercept			Intercept & trend			Intercept			Intercept and trend		
	LM -stat	Crit. value	Res	LM- stat	Crit. value	Res	LM- stat	Crit. value	Res	LM- stat	Crit. value	Res
LGFCF	1,26	0,463	UR	0,294	0,146	UR	0,569	0,463	UR	0,097	0,146	STAT
LLEN	0,88	0,463	UR	0,112	0,146	STAT	--	--	--	--	--	--

LPRICE LEVEL	1,51	0,463	UR	0,133	0,146	STAT	--	--	--	--	--	--
LREER	0,57	0,463	UR	0,136	0,146	STAT	--	--	--	--	--	--
LGDP	1,43	0,463	UR	0,294	0,146	UR	0,533	0,463	UR	0,073	0,146	STAT
LSAV	0,20	0,463	ST	0,199	0,146	UR	--	--	--	--	--	--
LCOU	0,82	0,463	UR	0,083	0,146	STAT	--	--	--	--	--	--
LTO	0,19	0,463	ST	0,127	0,146	STAT	--	--	--	--	--	--

* (RES=Result, UR=Unit root and STAT= Stationary)

Source: Estimated by author, using E-views 9

Table 5.10 depicts the KPSS stationarity test results for Nigeria, the outcomes shows that the LGDP and LREER are stationary at level, as they were in ADF and PP results. Most results followed some of the results in the previous tests, as there is a mixture of at level and first difference. In conclusion, the KPSS unit root results outcomes are consistent with that of ADF at level only with LGDP and LREER, and at first difference LGFCF, LPRICE LEVEL and LTO.

Table 5.10: Nigeria – KPSS unit root test results

	Level						1 ST Difference					
	Intercept			Intercept & trend			Intercept			Intercept and trend		
	LM-stat	Crit. value	Res	LM-stat	Crit. value	Res	LM-stat	Crit. value	Res	LM-stat	Crit. value	Res
LGFCF	1.44	0.463	UR	0.148	0.146	UR	0.094	0.463	STAT	0.093	0.146	STAT
LLEN	0.68	0.463	UR	0.178	0.146	UR	0.216	0.463	STAT	0.102	0.146	STAT
LPRICE LEVEL	1.52	0.463	UR	0.130	0.146	STAT	--	--	--	--	--	--
LREER	1.41	0.463	UR	0.105	0.146	STAT	--	--	--	--	--	--
LGDP	1.52	0.463	UR	0.060	0.146	STAT	--	--	--	--	--	--
LSAV	0.20	0.463	ST	0.090	0.146	STAT	--	--	--	--	--	--
LCOU	0.12	0.463	ST	0.125	0.146	STAT	--	--	--	--	--	--
LTO	0.55	0.463	UR	0.127	0.278	UR	0.134	0.463	STAT	0.123	0.146	STAT

* (RES=Result, UR=Unit root and STAT= Stationary)

Source: Estimated by author

5.3.4 Chow structural break test

After performing the unit root tests, structural break point is introduced. A structural test is employed to confirm or reject the unit root test results performed for the study. The results for the Chow test are presented in Table 5.11 for South Africa and Table 5.12 for Nigeria.

The sample break chosen for each country was determined by the multiple breakpoint test, Bar-Perron of $L + 1$ vs. L , sequentially for break sample. For South Africa, the sample was from 2003 January to 2008 July. The second sample was from August 2008 to December 2015. The test statistic were calculated using formula 4.10; the test result of 71.59 was obtained and it was discovered that this is more than the F-statistic (8,140), which is 1.94 from the F-distribution table. Table 5.11 shows the Chow breakpoint test for South Africa. Figure 5.12 depicts the Chow breakpoint test for Nigeria. The sample break was from January 2003 to January 2009 . The second break test was from 2009 February to 2015 December. A test statistic of 55.90 was obtained and this is more than the F-statistic of 1.94 from the F-distribution table. The Chow breakpoint tests for both South Africa and Nigeria, indicate that the parameters are not stable over time, explaining that there are breaks in the model.

Table 5.11: Chow structural break test for South Africa

Chow breakpoint test: 2008M07

Null hypothesis: No breaks at specified breakpoints

Varying regressors: All equation variables

Equation sample: 2003M01 2015M12

F-statistic	70.80300	Prob. F(8,140)	0.0000
Log likelihood ratio	252.4974	Prob. chi-square(8)	0.0000
Wald statistic	566.4240	Prob. chi-square(8)	0.0000

Source: Constructed by author

Table 5.12: Chow structural break test for Nigeria

Chow breakpoint test: 2009M01

Null hypothesis: No breaks at specified breakpoints

Varying regressors: All equation variables

Equation sample: 2003M01 2015M12

F-statistic	30.26817	Prob. F(8,140)	0.0000
Log likelihood ratio	156.6487	Prob. chi-square(8)	0.0000
Wald statistic	242.1453	Prob. chi-square(8)	0.0000

Source: Constructed by author

5.3.4.1 Break-point unit root test

After careful observation on the variables it was noticed that the parameters are unstable. This indicates that the variables for both Nigeria and South Africa are faced with structural breaks. When conducting a time series in macroeconomics and there is an existence of structural breaks, the variables can be determined by Perron (1989), which allows for a complete sample instead of using two-subsamples (Pahlavani & Wilson, 2005:135).

The breakpoint unit root test employed for the study is conducted with intercept and using breakpoint selection on Dickey-Fuller min-t, at level and first difference to identify the breaks in the unit root. Null hypothesis indicates the presence of unit root, although the alternative indicates that there is presence of stationarity (Mposelwa, 2016:63).

Table 5.13, 5.14, 5.15 and 5.16 represents the breakpoint unit root results for both South Africa and Nigeria. Table 5.13 depicts the breakpoint unit root test for South Africa with intercept; the results indicate that the determinants became stationary at first difference just like in the ADF unit root test in Table 5.5. The break dates for the variables or determinants in South Africa occurred mostly during 2007-2009; LLEN (2009m04), LREER (2008m2), LGDP (2007m10), LSAV (2008m10) and LTO (2009m01). The other break dates occurred after the financial crisis for LCOU (2013m05), taking into account that this break date also happened after the World Cup that occurred in South Africa.

Table 5.14 depicts the similar results to those in Table 5.13. The LTO became stationary at level as indicated in Table 5.14. The break dates are also the same as in Table 5.13; most break dates occurred in 2008-2009; LREER (2008m03), LSAV (2008m10). On the other hand, determinants that had break dates after the financial crisis in Table 5.14 LCOU (2013m05) had same results. In conclusion, the break dates in South Africa occurred mostly during the financial crisis and before the financial crisis.

Table 5.15 and Table 5.16 depict the breakpoint unit root tests for Nigeria. The results in Table 5.15 indicate a mixture of at level and first difference, such as the ADF unit root test in Table 5.5. The LREER in Table 5.15 is stationary at first difference, while in Table 5.5 became stationary at level. Most breaks occurred in 2008-2009; in Nigeria LLEN (2008m06) LREER (2009m10) and LGDP (2009m11). The financial crisis had an after impact on some variables as there are breaks in LSAV (2015m01), and LGFCF (2010m1). In Table 5.16, the breakpoint unit root test for Nigeria with intercept and trend, LGFCF is stationary at level. Results in Table 5.16 seem to be different

from those in Table 5.15. Break date can be identified for LREER (2008m11), LGDP (2008m03) during the financial crisis.

In conclusion, the breakpoint unit root test variables for both South Africa and Nigeria show that break dates occurred mostly during the financial crisis 2008-2009. This indicates that the financial crisis had an explosive impact on the determinants of investment spending and gross fixed capital formation in South Africa and Nigeria. The breakpoint unit root assists in estimating the appropriate model, when the parameters are not stable. After the breakpoint indicated that there is the presence of breaks in the data series, a dummy variable was added when estimating the ARDL model.

Table 5.13: Breakpoint unit root test for South Africa with intercept

At level with intercept						At 1 st difference with intercept				
	Time of break	lags	T-stat	P-value	Result	Time of break	lags	T-stat	P-value	Result
LGFCF	2005m04	3	-3.51	0.37	UR	2009m01	0	-7.77	<0.01	STAT
LLEN	2009m01	2	-4.34	0.06	UR	2009m04	0	-5.79	<0.01	STAT
LPRICE LEVEL	2007m03	0	-2.26	0.95	UR	2004m09	0	-14.5	<0.01	STAT
LREER	2012m09	2	-2.29	0.71	UR	2008m02	1	-10.9	<0.01	STAT
LGDP	2009m10	0	-3.71	0.27	UR	2007m10	1	-6.57	<0.01	STAT
LSAV	2011m10	10	-2.70	0.83	UR	2008m10	11	-4.80	0.01	STAT
LCOU	2013m04	1	-3.86	0.20	UR	2013m05	0	-18.2	<0.01	STAT
LTO	2008m07	4	-3.17	0.58	UR	2009m01	3	-5.93	<0.01	STAT

* (UR=Unit root and STAT= Stationary)

Source: Estimated by author

Table 5.14: Breakpoint unit root test for South Africa with intercept and trend

At level with trend and intercept						At 1 st difference with trend and intercept				
	Time of break	lags	T-stat	P-value	Result	Time of break	lags	T-stat	P-value	Result
LGFCF	2008m10	3	-3.23	0.83	UR	2009m01	0	-7.51	<0.01	STAT
LLEN	2009m3	1	-3.97	0.38	UR	2008m11	0	-7.16	<0.01	STAT
LPRICE LEVEL	2007m1	0	-4.70	0.07	UR	2004m09	0	-14.6	<0.01	STAT

LREER	2009m3	2	-4.43	0.15	UR	2008m03	1	-11.4	<0.01	STAT
LGDP	2006m05	2	-2.26	0.97	UR	2008m05	1	-6.58	<0.01	STAT
LSAV	2011m10	10	-4.40	0.14	UR	2008m10	11	-4.96	0.03	STAT
LCOU	2009m08	1	-4.84	0.05	UR	2013m05	0	-18.1	<0.01	STAT
LTO	2008m07	4	-5.73	<0.01	STAT	2006m10	5	-5.84	<0.01	STAT

* (UR=Unit root and STAT= Stationary)

Source: Estimated by author

Table 5.15: Breakpoint unit root test for Nigeria with intercept

At level with intercept						At 1 st difference with intercept				
	Time of break	lags	T-stat	P-value	Result	Time of break	lags	T-stat	P-value	Result
LGFCF	2009m10	4	-3.12	0.61	UR	2010m01	3	-5.25	<0.01	STAT
LLEN	2008m06	2	-5.39	<0.01	STAT	2008m08	0	-21.1	<0.01	STAT
LPRICE LEVEL	2008m03	1	-2.64	0.85	UR	2005m10	0	-10.5	<0.01	STAT
LREER	2011m06	0	-2.36	0.93	UR	2009m10	0	-13.3	<0.01	STAT
LGDP	2009m11	1	-6.71	<0.01	STAT	2008m08	4	-12.8	<0.01	STAT
LSAV	2015m06	13	-1.78	>0.99	UR	2015m01	12	-4.94	<0.01	STAT
LCOU	2008m04	0	-2.98	0.69	UR	2006m05	0	-13.2	<0.01	STAT
LTO	2006m01	2	-5.05	<0.01	STAT	2008m01	4	-11.9	<0.01	STAT

* (UR=Unit root and STAT= Stationary)

Source: Estimated by author

Table 5.16: Breakpoint unit root test for Nigeria with intercept and trend

At level with trend and intercept						At 1 st difference with trend and intercept				
	Time of break	lags	T-stat	P-value	Result	Time of break	lags	T-stat	P-value	Result
LGFCF	2009m10	7	-5.64	<0.01	STAT	2010m01	3	-5.13	0.02	STAT
LLEN	2006m06	2	-7.53	<0.01	STAT	2008m08	0	-21.1	<0.01	STAT
LPRICE LEVEL	2005m07	1	-4.53	0.12	UR	2005m10	0	-10.4	<0.01	STAT
LREER	2008m11	0	-5.34	<0.01	STAT	2009m01	0	-13.0	<0.01	STAT
LGDP	2008m03	1	-8.85	<0.01	STAT	2008m08	4	-12.8	<0.01	STAT
LSAV	2010m08	13	-2.35	>0.99	UR	2009m05	12	-5.44	<0.01	STAT
LCOU	2008m10	0	-3.66	0.58	UR	2008m04	0	-13.1	<0.01	STAT
LTO	2006m10	2	-6.36	<0.01	STAT	2008m01	4	11.8	<0.01	STAT

* (UR=Unit root and STAT= Stationary)

Source: Estimated by author

After an overview and the discussion of the breakpoint unit root test results, and found out there are breaks in the data series and none of the results indicated the presence of I (2). The ARDL was employed and dummy variables for breaks were constructed, because there were breaks during the financial crisis. The dummy was constructed by using 1- financial crisis (2007,2008,2009) and 0- for where there are no breaks in the model. The next section introduces the results of ARDL model estimated for both countries.

5.4 ARDL RESULTS

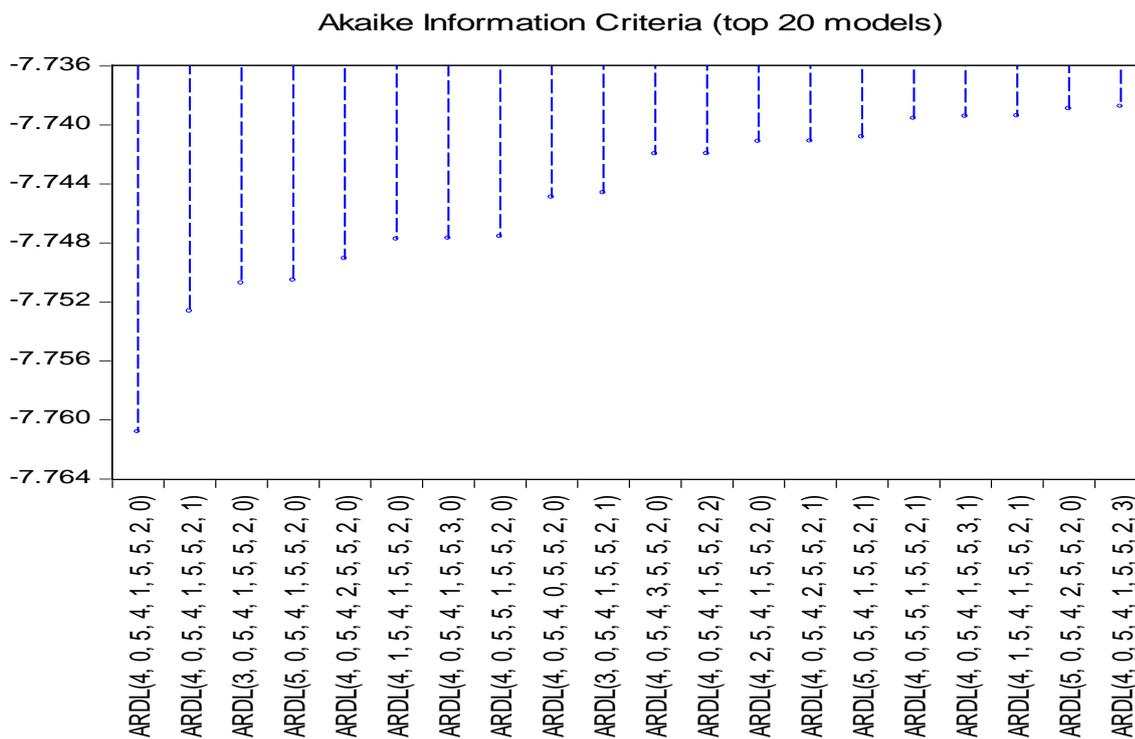
ARDL bounds tests for cointegration, the estimated long-run coefficients of the ARDL model, the error correction representation of the ARDL model and the ARDL ECM model diagnostic tests are presented in this section.

After the performance of the unit root tests, it is evident that the variables are integrated at either I (1) or I (0), and that none of the variables were integrated at I (2). Hence, the ARDL model with a dummy variable is employed for the study. Dummy dates for South Africa were created in 2007m03, 2007m03.2008m07 and 2009m10. For Nigeria, dummy dates were created in 2007m12, 2008m04 and 2009m10. The first stage is to identify the lag length to be used based on either AIC or SIC. The second stage is the application of bound test for cointegration, to test for long-run relationship.

5.4.1 ARDL lag model selection

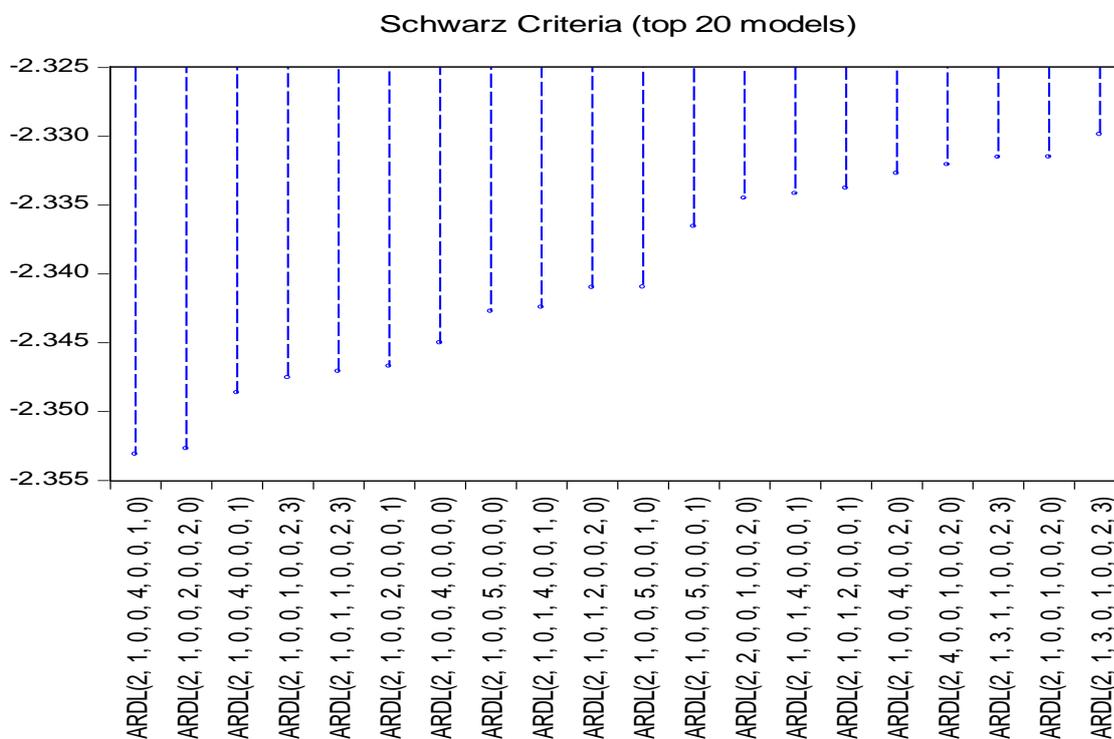
The lag selection for both countries differ, as different lag selection was chosen to find the perfect lag selection, that leads to perfect diagnostic tests. The order of lags was selected using any of the two information criteria, namely Schwartz information criterion (SIC) and the Akaike information criterion (AIC). Figure 5.3 represents lag selection for South Africa, the ARDL (4, 0, 5, 4, 1, 5, 5, 2, 0) model was selected for South Africa and AIC selected a better model than SIC. The selected model for Nigeria was ARDL (2, 1, 0, 0, 4, 0, 0, 1, 0) and it was identified using SIC. The results of the model selection for Nigeria is presented in Figure 5.4.

Figure 5.3: ARDL lag selection for South Africa



Source: Constructed by author

Figure 5.4: ARDL lag selection for Nigeria



Source: Estimated by author

5.4.2 ARDL bound test results

The cointegration test was conducted in the study to determine the long-run relationship that exists between the variables chosen for the study and the investment spending model. The study employed the ARDL bound test to check if there is an existence of long-run relationship amongst the variables chosen for the study. The results of ARDL bound test are presented in Table 5.17. If the estimated F-value is above the upper bound, the null hypothesis of cointegration is rejected notwithstanding the orders of integration of the respective variables. If the estimated F-statistic is below upper bound, the null hypothesis of no integration cannot be rejected. However, if the calculated F-value falls between the lower and upper critical values, the results are inconclusive (Dube, 2008). The results tabulated in Table 5.17 for South Africa shows that, the F-value (4.63) exceeds the upper bound at 10 percent and 5 percent significance levels. Thus, the null hypothesis of no cointegration is rejected. The results for South Africa indicate that there is a long-run relationship between the key determinants and investment spending for the period January 2003 to December 2015. The bound test for Nigeria indicates that the F-value of (6.85) exceeds the lower bound and upper bound at 5 percent and 10 percent, meaning there is evidence of long-run relationship between gross fixed capital formation and the determinants in Nigeria.

Table 5.17: Bound test for South Africa and Nigeria

Country	Model	Estimated F-value	Critical value			Inference
	Bound test		Significance level	Lower bound	Upper bound	
South Africa	-	4.635292	5%	2.22	3.39	Cointegrated
			10%	1.95	3.06	
Nigeria	-	6.854821	5%	2.55	3.68	Cointegrated
			10%	2.26	3.34	

The critical values are obtained from Persaran *et al.* (2001) table CI(ii) Case III: Unrestricted intercept and no trend and Persaran *et al.* (2001) table CI(v) Case V: Unrestricted intercept and unrestricted trend.

Source: compiled by author

Therefore, it has been concluded that there is cointegration between investment spending and its determinants in South Africa and Nigeria, suggesting that the error correction model (ECM) should be estimated. Before proceeding to the ECM, the long-run relationship and coefficients for the variables chosen for South Africa is presented in equations 5.1 and 5.2 for Nigeria.

$$LGFCF= 0.0150*LLEN - 0.5736*LPRICE_LEVEL - 0.5642*LREER + 2.6424*LGDP + 0.2209*LSAV - 0.4708*LCOU -0.0361*LTO -0.0565*DUMMY \quad (5.1)$$

$$LGFCF= 2.2612*LLEN - 0.0016*LPRICE_LEVEL + 0.4362*LREER + 1.2273*LGDP + 0.1255*LSAV + 2.0547*LCOU + 0.6107*LTO- 0.8234*DUMMY + 0.0053*@TREND \quad (5.2)$$

Equation 5.1 represents the long-run equation for gross fixed capital formation and the determinants (lending rate, price level, REER, GDP, savings, country risk and trade openness) in South Africa. Based on the long-run relationship for South Africa, there is positive relationship between lending and gross fixed capital formation, implying that an increase in lending rate leads to an increase of 0.01 on gross fixed capital formation. This contradicts the set up hypothesis for the study as the study expected a negative relationship, but Ferdousi (2009) mentioned that lending rates have little impact on gross fixed capital formation if the interest rate is not high and has been stable for a time period. One of the reasons could be that lending has decreased/ kept a stable position in South Africa (IDC, 2017). The equation also indicates that PRICE LEVEL and REER have a long run negative effect on gross fixed capital formation. A 1 percent increase in price level and REER would cause gross fixed capital formation to decline by 57.3 percent and 56.4 percent, respectively. The fluctuations of the rand, considering the downgrades from the rating agencies, led to a higher real effective exchange rate from the equation. GDP and savings have a long-run effect on gross fixed capital formation in South Africa. An increase of 1 percent in GDP and SAV leads to an increase of 2.64 and 22.0 percent to gross fixed capital formation. Both COU and TO would cause gross fixed capital formation to decline by 47.0 percent and 3.61 percent, respectively. The gross fixed capital formation results relate to the expected impact, either negative or positive, set for the study, except the LEN which gave a different expected impact. Studies (Ali *et al.*, 2012; Kosma, 2015) confirm the same results as South Africa on most variables. The dummy variable shows that an increase in dummy variable decreases gross fixed capital formation by 5.65 percent in the long run. This implies that the period of the financial crisis, compared to non-finical crisis period, led to a significant decrease in the South African real investment, because during the financial crisis lending rates were high and inflation rates as depicted in the graphs.

Equation 5.2 represents the long-run relationship equation for Nigeria. There is a positive relationship between lending rate and gross fixed capital formation; an increase in lending rates leads to an increase of 2.26 percent on gross fixed capital formation. Price level has a long-run negative impact on gross fixed capital formation; 1 percent increase in price level would cause

gross fixed capital formation to decline by 0.016 percent. Savings and GDP positively impact gross fixed capital formation; an increase in savings and GDP increases gross fixed capital formation by 1.22 percent and 12.5 percent. The other determinants country risk and trade openness impact the gross fixed capital formation positively. More especially, the trade openness – an increase in trade openness increases gross fixed capital formation by 61.1 percent and it can be noticeable that the oil industry is the most exported product in the country, which has impacted the country trade openness. The dummy variable shows that an increase in dummy variable decrease gross fixed capital formation by 82.34 percent in the long run.

5.4.3 ARDL error correction model (ECM) results

Since the long-run relationship has been established between investment spending and the determinants in both countries, South Africa and Nigeria, the study further estimated and analysed the error correction model (ECM). The fact that the variables are cointegrated in the model, short-run ARDL ECM is estimated in this study to capture the speed of adjustment for long-run equilibrium. After noticing the presence of long-run cointegration, the ECM was established to capture the determinants of investment spending in South Africa and Nigeria. Table 5.18 and 5.19 display the ECM results for both South Africa and Nigeria.

Table 5.18: ECM results on AIC based for South Africa

Cointegrating form				
Variable	Coefficient	Std. error	t-Statistic	Prob.
D(LGFCF(-1))	0.350518	0.068416	5.123367	0.0000
D(LGFCF(-2))	0.206978	0.071174	2.908035	0.0044
D(LGFCF(-3))	-0.115551	0.069820	-1.654994	0.1006
D(LLENDING_RATE)	0.001148	0.006379	0.179969	0.8575
D(LPRICE_LEVEL)	0.168961	0.078628	2.148883	0.0337
D(LPRICE_LEVEL(-1))	-0.010226	0.100044	-0.102210	0.9188
D(LPRICE_LEVEL(-2))	0.071864	0.098696	0.728141	0.4680
D(LPRICE_LEVEL(-3))	-0.229326	0.099193	-2.311922	0.0225
D(LPRICE_LEVEL(-4))	0.259937	0.075584	3.439030	0.0008
D(LREER)	-0.036510	0.015308	-2.384968	0.0187
D(LREER(-1))	0.009883	0.020924	0.472337	0.6376

D(LREER(-2))	-0.025086	0.021028	-1.192980	0.2353
D(LREER(-3))	0.074966	0.015225	4.923860	0.0000
D(LGDP)	0.523187	0.154062	3.395956	0.0009
D(LSAVINGS)	0.040304	0.022378	1.801022	0.0743
D(LSAVINGS(-1))	0.029899	0.036644	0.815925	0.4162
D(LSAVINGS(-2))	0.065742	0.035416	1.856296	0.0659
D(LSAVINGS(-3))	-0.138273	0.039063	-3.539702	0.0006
D(LSAVINGS(-4))	0.067726	0.022190	3.052084	0.0028
D(LCOUNTRY_RISK)	-0.023318	0.016059	-1.452023	0.1492
D(LCOUNTRY_RISK(-1))	-0.013485	0.017320	-0.778568	0.4378
D(LCOUNTRY_RISK(-2))	-0.010037	0.017370	-0.577851	0.5645
D(LCOUNTRY_RISK(-3))	-0.003982	0.017466	-0.227971	0.8201
D(LCOUNTRY_RISK(-4))	0.046829	0.014869	3.149344	0.0021
D(LTRADE_OPN)	0.011260	0.041242	0.273019	0.7853
D(LTRADE_OPN(-1))	0.092538	0.041363	2.237208	0.0272
DUMMY	-0.004313	0.001745	-2.472088	0.0149
CointEq(-1)	-0.076387	0.020123	-3.796045	0.0002

Source: Estimated by author

Table 5.19: ECM results on AIC based for Nigeria

Cointegrating form				
Variable	Coefficient	Std. error	t-Statistic	Prob.
D(LGFCF(-1))	0.503059	0.063223	7.956915	0.0000
D(LLENDING_RATE)	-0.137970	0.113987	-1.210402	0.2283
D(LPRICE_LEVEL)	-0.000284	0.001667	-0.170518	0.8649
D(LREER)	0.076288	0.135929	0.561233	0.5756
D(LGDP)	0.243522	0.030575	7.964660	0.0000
D(LGDP(-1))	-0.097596	0.037446	-2.606354	0.0102
D(LGDP(-2))	0.023775	0.038102	0.623995	0.5337
D(LGDP(-3))	-0.076847	0.026061	-2.948729	0.0038
D(LSAVINGS)	0.021943	0.027059	0.810925	0.4188
D(LCOUNTRY_RISK)	0.359336	0.134538	2.670889	0.0085

D(LTRADE_OPN)	0.037688	0.028722	1.312154	0.1917
DUMMY	-0.144003	0.043507	-3.309873	0.0012
D(@TREND	0.000934	0.001806	0.517087	0.6059
CointEq(-1)	-0.174885	0.026992	-6.479243	0.0000

Source: Estimated by author

5.4.3.1 Short – run relationship for South Africa

The error correction term (ECM) of -0.076 is negative, statistically significant and indicates a good sign and as the rule of thumb indicated that the error term must be negative and significant (Brooks, 2015). The ECM term is significant at 5 percent significance level. This implies that 7.63 percent of the previous month's disequilibrium is corrected in the current month. This means that in South Africa, it therefore takes approximately 13.15 months ($1/0.0763$) for a change in independent variables to have full effect on dependent variable. This is moderate adjustment. LPRICE LEVEL is significant at 5 percent indicating that there is a short-run relationship between price level and gross fixed capital formation. LGDP is also significant at 5 percent, a short-run relationship exists between gross domestic product and gross fixed capital formation. LLENDING RATE is insignificant at 5 percent in the short-run relationship indicating there is no evidence of short-run relationship between LLENDING RATE and gross fixed capital formation. LCOU, LTO and LSAV also indicates that they are no significance at 5 percent, indicating that there is no short-run relationship between country risk and gross fixed capital formation, trade openness and gross fixed capital formation and between savings and gross fixed capital formation. The dummy variable is negatively correlated and is significant at 5 percent significance level.

5.4.3.2 Short – run relationship for Nigeria

The error correction coefficient for Nigeria is negative and significant as desired, this indicates the existence of long-run association between the observed variables employed for the study. Table 5.19 represents the EM of Nigeria, implying that 17.4 percent of disequilibrium between gross fixed capital formation and its determinants is correlated every month. It therefore takes approximately 5.72 months ($1/0.1748$) for a change in independent variables to have full effect on dependent variable. This is a quick adjustment in real investment. In South Africa, it takes 13.15 months to adjust to equilibrium, while in Nigeria it takes 5.72 months. LLENDING RATE is insignificant at 5 percent indicating that there is no short-run relationship between lending rate and gross fixed capital formation. LPRICE LEVEL is insignificant at 5 percent indicating that there is

no short-run relationship between price level and gross fixed capital formation. LREER is also insignificant at 5 percent indicating that there is no short-run relationship between real effective exchange rate and gross fixed capital formation. The dummy variable is negatively correlated and is significant at 5 percent significance level.

The short-run relationship between South Africa and Nigeria with gross fixed capital formation and its determinants adjusts more rapidly in Nigeria than in South Africa.

5.5 DIAGNOSTIC TEST RESULTS ARDL MODEL

After examining the cointegration results generated by the ARDL, the models of both countries (South Africa and Nigeria) were exposed to a series of diagnostic tests to ensure validity and that the model does not provide spurious results and robustness of the cointegration results. The requirements of testing for robustness on the model involve that the model must be free from correlation and heteroscedasticity (Pesaran *et al.*, 1999:2001). To confirm that the ECM meets all the econometric assumptions, the following diagnostic tests are analysed.

Table 5.20: South Africa’s diagnostic test

Diagnostic test	F-statistic	Prob. chi-square
Breusch-Godfrey serial- correlation test	0.18888	0.7794
Heteroscedasticity test: White	1.334	0.1513
Normality		0.000

Source: Constructed by author

Table 5.21: Nigeria’s diagnostic test

Diagnostic test	F-statistic	Prob. chi-square
Breusch-Godfrey serial- correlation test	0.113	0.7187
Heteroscedasticity test: White	1.601	0.0808
Normality	-	0.000

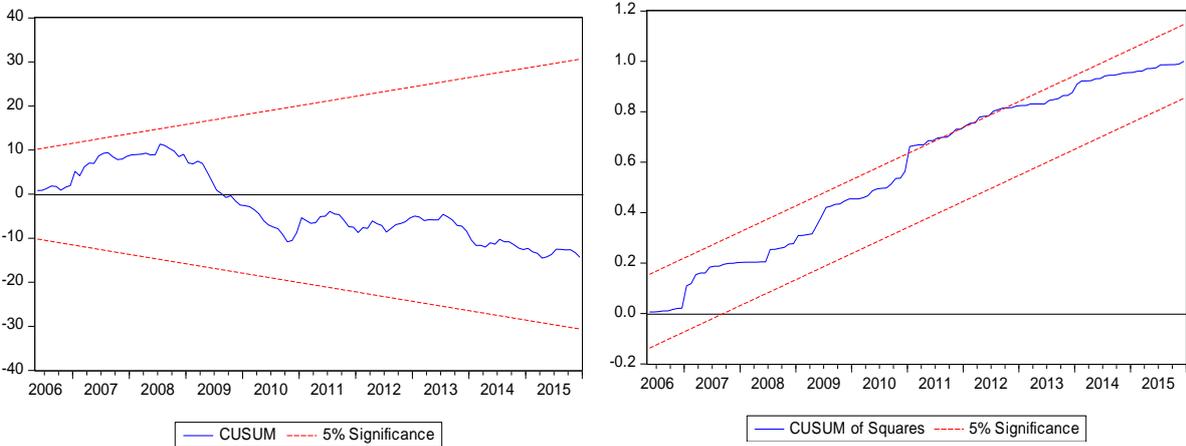
Source: Constructed by author

The results for the diagnostic test on South Africa, presented in Table 5.20, imply that p-values are greater than the 5 percent significance level. This indicates that in South Africa the ARDL model does not suffer from serial correlation and it is not subject to heteroscedasticity. Thus, the ARDL results are reliable as residuals are homoscedasticity and no serial correlation. The Jarque-Bera and the probability results imply that there is no presence of normality, meaning the results

are not normally distributed. It can be concluded that there is no autocorrelation and heteroscedasticity in the model as depicted in Table 5.20. Table 5.21 also implies that the model does not suffer from autocorrelation and heteroscedasticity.

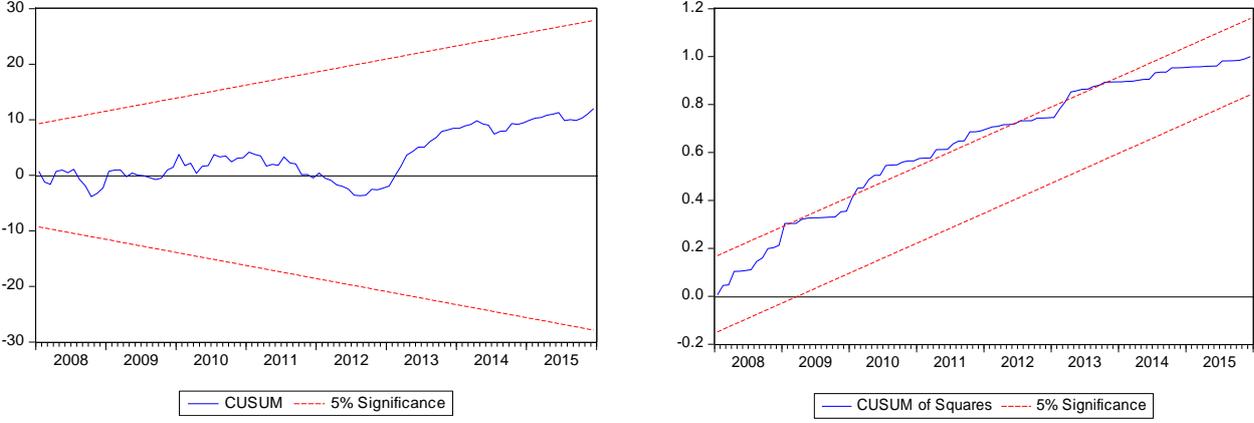
The results for structural stability to check for the parameter stability given by the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) are all within the critical bounds at 5% level of significance (see Figures in 5.5) for South Africa. Even though there is a slight break in the graph between 2011 and 2012. Figure 5.6 stability test for Nigeria are well within the critical bounds of 5%, but the CUSUMSQ has a slight breaks during 2010 and 2011. This is not a problem as it went outside of the boundaries and came back to the boundary of 5 percent at the end of the period chosen for the study.

Figure 5.5: CUSUM for stability test South Africa



Source: Constructed by author

Figure 5.6: CUSUM for stability test Nigeria



Source: Constructed by author

The statistic line is well within the two sets of bands indicating that the null hypothesis is not rejected in both countries, even though there is an indication of breaks in the model on the CUSUMSQ graphs.

5.6 TODA-YAMAMOTO GRANGER CAUSALITY TEST

The Toda-Yamamoto granger causality test was used to determine the short-run causal relationship between gross fixed capital formation and its determinants in South Africa and Nigeria. Table 5.22 and Table 5.23 depict the results for both South Africa and Nigeria. There is bidirectional causality between LREER to LGFCF in South Africa. However, there is no causal relationship between LLEN to LGFCF, LCOU to LGFCF and LTO to LGFCF. There is an indication of unidirectional causality between LPRICELEVEL to LGFCF, LGDP to LGFCF and LSAV to LGFCF. Similar to the short-run results for Nigeria. The results in table 5.23 indicate that there is a directional causality between LLEN to LGFCF, a one-way causal relationship in LLEN to LGFCF, LREER to LGFCF, LGDP to LGFCF, LCOU to LGFCF and LTO to LGFCF. This means that changes in LLEN, LREER, LGDP, LCOU and LTO causes changes in GFCF. There is no causality between LSAV to LGFCF

The outcomes for the causal relationship among the independent variable are presented in appendix A, at the end of the study.

Table 5.22: Toda-Yamamoto causality (MWALD) test results-South Africa

Null hypothesis	Chi-sq	Prob	Granger causality
LLEN does not Granger Cause LGFCF	4.899	0.672	No causality
LGFCF does not Granger Cause LLEN	8.760	0.270	
LPRICE LEVEL does not Granger Cause LGFCF	21.24	0.003	Unidirectional causality from CPI to LGFCF
LGFCF does not Granger Cause LPRICE LEVEL	3.680	0.815	
LREER does not Granger Cause LGFCF	14.61	0.041	Bidirectional causality
LGFCF does not Granger Cause LREER	19.03	0.008	
LGDP does not Granger Cause LGFCF	21.02	0.003	

LGFCF does not Granger Cause LGDP	8.71	0.273	Unidirectional causality from LGDP to LGFCF
LSAV does not Granger Cause LGFCF	18.34	0.010	Unidirectional causality from LSAV to LGFCF
LGFCF does not Granger Cause LSAV	3.723	0.811	
LCOU does not Granger Cause LGFCF	4.191	0.757	No causality
LGFCF does not Granger Cause LCOU	6.139	0.523	
LTO does not Granger Cause LGFCF	10.83	0.146	No causality
LGFCF does not Granger Cause LTO	3.44	0.841	

Source: Estimated by author

Table 5.23: Toda-Yamamoto causality (MWALD) test results- Nigeria

Null hypothesis	Chi-sq	Prob	Granger causality
LLEN does not Granger Cause LGFCF	13.82	0.016	Bidirectional causality
LGFCF does not Granger Cause LLEN	10.59	0.059	
LPRICE LEVEL does not Granger Cause LGFCF	7.120	0.211	No causality
LGFCF does not Granger Cause LPRICE LEVEL	7.006	0.220	
LREER does not Granger Cause LGFCF	14.55	0.012	Unidirectional causality from LREER to LGFCF
LGFCF does not Granger Cause LREER	2.087	0.836	
LGDP does not Granger Cause LGFCF	25.04	0.000	Unidirectional causality from LGDP to LGFCF
LGFCF does not Granger Cause LGDP	7.351	0.195	
LSAV does not Granger Cause LGFCF	9.203	0.101	No causality
LGFCF does not Granger Cause LSAV	0.231	0.998	
LCOU does not Granger Cause LGFCF	20.325	0.001	Unidirectional causality from LCOU to LGFCF
LGFCF does not Granger Cause LCOU	3.889	0.565	
LTO does not Granger Cause LGFCF	36.37	0.000	Unidirectional causality from LTO to LGFCF
LGFCF does not Granger Cause LTO	4.078	0.538	

Source: Estimated by author

5.7 DISCUSSION OF RESULTS

This section of the study focuses on the discussion of the economic results that were obtained through using E-views 9 to conduct the tests. The determinants of investment spending in South Africa and Nigeria for the period January 2003 to December 2015 are set out in this chapter. This chapter has achieved one of the objectives of the study, which was to analyse the relationship between investment spending and the determinants (lending rate, price level, real effective exchange rate, gross domestic product, savings, and country risk and trade openness) in South Africa and Nigeria. The chapter was employed to establish whether the finding of the study corresponds to the set hypothesis for each determinant to investment spending, based on the literature. The prepositions are for South Africa and Nigeria:

- there is a negative relationship between lending rate and investment spending;
- there is a negative relationship between price level and investment spending;
- there is a negative relationship between real exchange rate and investment spending;
- there is a positive relationship between GDP and investment spending;
- there is a positive relationship between savings and investment spending;
- there is either a positive or negative relationship between country risk and investment spending; and
- there is either a positive or negative relationship between trade openness and investment spending.

The findings of the study presented and tested the unit root test and the variables showed a mixture of both $I(0)$ and $I(1)$ as per the employed econometric model (ARDL) and there was no presence of $I(2)$ variables. The ARDL results showed there was a long-run relationship in all the analysis for both South Africa and Nigeria. The ECT results presented in both tables 5.18 and 5.19 were negative and significant, with different speed adjustment according to the analysis of their equation. The diagnostic tests presented that there was no sign of autocorrelation and heteroscedasticity, the results were not normally distributed for both South Africa and Nigeria. There was stability among the variables, even though there was an existence of some breaks in the CUSUMSQ.

The findings from the long-run relationship analysis conducted for both countries are presented in formulas 5.1 and 5.2. The long-run relationship based on the gross fixed capital formation and its determinants as independent variables (lending rate, price level, real effective exchange rate, gross domestic product, savings, country risk, and trade openness) for the period January 2003 to

December 2015. The results are contrary to the researcher's expectation for South Africa and for Nigeria; the results do not portray the researcher's expectations. Lending rate is positive in both countries, which contradicts the expectations. The positive effect can be because of the stable lending rate in both countries from early 2010 to 2015 and investors may see this as an opportunity, hence the positive effect. For Nigeria, a study by Donwa and Odia (2009) found a positive relationship between lending rate and gross fixed capital formation. The positive relationship is rare, as most studies show a negative relationship, but Nisha and Nisha (2011) believe that investors, indicating that even if the country economy is not stable, usually create the economic activities. Investors will usually choose to invest in certain selected countries that are doing well. Lending rates in Nigeria encourage investment spending more than in South Africa. The movement in both countries seems to show similarity, as they are stable.

The negative impact of price level on both countries was expected and concurring with the study's expectation, the price level indicated a negative relationship on both countries. The drought situations in South Africa led to higher consumer prices (IDC, 2017). From the results of long-run relationship, the impact of the price level in both countries differs. The impact of price level to gross fixed capital formation is weak, even though price level has been creeping upward in Nigeria. The impact of price level in South Africa high due to the drought conditions that largely affected the agricultural output. Leading to high inflation. The price level in Nigeria has less impact on GFCF than in South Africa.

The real effective exchange rate negative impact on gross fixed capital formation in the long run in South Africa is due to the weaker rand, while the naira positively affects the gross fixed capital formation. This is because most investors prefer to put their investment in more stable and efficient economies. Even though the prediction for Nigeria is not according to the researcher's expectation, the naira is more stable than the rand. The gross domestic product and savings have a positive impact on gross fixed capital formation in both countries, based on the economic theory. Results confirmed by Adofu (2010) and Ramakrishna and Rao (2012) confirm the positive impact of GDP and savings on the gross fixed capital formation. The countries are both dominant by spending culture rather than saving the culture, hence the weak positive impact study by Dooley *et al.* (1987) indicated that countries with low saving rates have low investments. South Africa has better savings plans than Nigeria. Investment is regarded as a determinant of GDP, the engine of growth and prosperity of nations (Sisaq, 2010). According to the long-run relationship, South Africa GDP is contributing better than Nigeria to gross fixed capital formation, supported by BBC (2014),

Nigeria may have surpassed South Africa as the largest economy, but it does not provide those services, which are needed for being a regional hegemon.

The ambiguous prepositions set for country risk and trade openness as expected for the study depicted the following for both countries. South Africa being downgraded by credit agencies to junk status (Lings, 2017), the preposition of negative impact was expected and with Nigeria the country risk positive impact on gross fixed capital formation as the researcher of the study contradicts to what has been discussed during the study. Regarding the increasing country risk in Nigeria, more research can be done on this relationship between country risk and gross fixed capital formation. Nigeria suffers from outbreaks of political violence, corruption, Islamic military insurgence by Boko Haram (Aon, 2013; Control Risks, 2013) and corruption dampens the level of trade openness and the investment to GDP ratio average over the period. Investment is threatened by country risk in Nigeria, the analysis of country risk and gross fixed capital formation in Formula 5.2 contradict the theory. A study by Anfofun (2005) demonstrated political risk as one of the reasons why investors have no confidence in the investment climate of Nigeria.

Both countries could influence investment through a number of channels; international trade is regarded as one of the channels for the study. The countries are more important as a source of imports than a destination for exports. The results of the long-run analysis suggest trade openness has a negative impact on the gross fixed capital formation. Compared to Nigeria, trade openness positively affects gross fixed capital formation. Exports in Nigeria are 90 percent dependent on the oil industry, the positive effect of trade openness was expected even though the country is considered import dependent, the oil industry is maintaining the balance between imports and exports. South Africa has kept a low negative impact on the gross fixed capital formation. Due to high country risk, currency getting weaker can also be the contributing factors to the negative trade openness to the gross fixed capital formation.

The long-run equation for both countries is driven by shocks and trends. The dummy variable employed for both South Africa and Nigeria presents a negative impact and is insignificant. This indicates that the structural break that occurred does not have much effect on the determinants of South Africa and Nigeria.

The outcome of ECM is negative and significant as desired in both countries. It is much faster for the dependent variable (gross fixed capital formation) to restore the system back to equilibrium in Nigeria. It takes 5.72 months only, while in South Africa it takes more than a year (13.15 months).

The only determinant that responds in the short run in both countries is the gross domestic product in different periods, as in Nigeria it responds quickly and in South Africa it is slow to adjust. Other determinants like price level and real effective exchange rate are significant in the short run in South Africa. In Nigeria in the short run, country risk only affects the gross fixed capital formation. The presence of a dummy variable in the short run adjusts to gross fixed capital formation for both countries and the trend employed for Nigeria does not have any impact in the short run.

5.8 SUMMARY

This chapter presented the empirical findings conducted for comparative analysis on key determinants of investment spending in South Africa and Nigeria for the period January 2003 to December 2015. The chapter began by reporting on the trend analysis of the determinants and lending rate, which has been stable for the past few years, while real effective exchange rate and country risk kept an upward movement in both countries. The next section focused on the descriptive and correlation analysis. Followed by the unit root test results, which revealed that none of the variables were cointegrated at I (2).

The results revealed there is a long-run relationship between investment spending and the employed determinants for South Africa and Nigeria. The stable lending rate is a dominant determinant in both countries, by positively affecting gross fixed capital formation. The behaviour of savings and gross domestic product positively affect gross fixed capital formation in both countries, savings in Nigeria perform better than in South Africa. The gross domestic product affects the gross fixed capital formation in both countries in the short run and Nigeria responds to the adjustment quickly in the short run. The casual tests to accompany the results of short run were tested and they are in accordance with the results.

The next chapter discusses the summary and conclusions of the study.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The study focused on the comparative analysis of investment spending and key determinants in South Africa and Nigeria for the period January 2003 to December 2015. The emphasis has been on the identification of key determinants that are affecting investment spending (gross fixed capital formation) in South Africa and Nigeria since investment spending in both countries has been low. The study employed the following determinants: lending rate, price level, real effective exchange rate, gross domestic product, savings and country risk and trade openness.

Based on the literature, there is a lack of studies pertaining to investment spending in Nigeria and South Africa. The available studies indicate discussion about investment, FDI and private investment, and some determinants (GDP, inflation and interest rates) in other countries. After noticing there is a sluggish growth of investment spending on the largest economies in Africa (South Africa and Nigeria), a research was created to analyse the determinants of the sluggish growth. The aim is also to contribute to the literature about investment spending and the key determinants with the attention to South Africa and Nigeria.

This chapter presents the summary of the findings of the research, followed by theoretical objectives, empirical objectives, conclusions and recommendations, which are based on the empirical findings.

6.2 SUMMARY

Chapter 1 provided an introduction to the study and a foundation on how the study was formulated. The problem statement was highlighted and primary, theoretical and empirical objectives were acknowledged. The end of the chapter presented a brief overview of each chapter. **Chapter 2** provided a detailed theoretical feature of investment and investment spending, by discussing the global and local aspects of investment and investment spending definitions, importance, types of investment. The theories that are essential for investment spending (Harold-Domar growth model, the accelerator theory, neoclassical theory and Q theory) were discussed and an overview of the financial crisis was reviewed. The determinants of investment spending worldwide were analysed and discussed. **Chapter 3** provided an overview of South Africa and Nigeria's investment climate, by discussing the state of investment spending in both countries, the identified determinants and the investment trends. **Chapter 4** elaborated on the research

methodology. The chapter highlighted the methodological findings to fulfil the empirical objectives of the study and the provided insight into the employment of an econometric model and ARDL approach (Perasan *et al.*, 2001). The sample was chosen based on the availability of data using international sources to collect data. Definitions of determinants employed for the study were discussed and the author elaborated on the model specification, unit root tests, cointegration and diagnostic tests. Lastly, the causality analysis was highlighted. **Chapter 5** discussed the empirical analysis and research findings, by identifying the effect of determinants of investment spending in South Africa and Nigeria. Presentation of results, with an overview of graphical analysis and correlation analysis, were observed. The financial crisis had an impact on the determinants from the view on the graphical analysis. The unit root test was conducted and the results found a mixture of $I(0)$ and $I(1)$. The findings validated the use of the ARDL model, which employs variables that are stationary at either $I(1)$ or $I(0)$ or the mixture of both. The cointegration findings revealed there exists a long-run relationship between gross fixed capital formation and determinants (lending rate, price level, real effective exchange rate, gross domestic product, savings, and country risk and trade openness) in both countries. The ECT found the short-run relationship and diagnostic test were conducted to check if the results of ECM are a perfect fit. The diagnostic test presented the absence of autocorrelation and heteroscedasticity.

6.2.1 THEORETICAL OBJECTIVES

In accordance, with the primary objectives of the study, incorporating theoretical objectives formulated for the study were achieved in Chapter 2, which provided theoretical international explanations on investment by providing definitions, the importance of investment and investment spending, as well as theories of investment spending. Financial crisis effect was discussed upon the explanation of investment, explaining how it impacted investments. The theoretical explanations on the determinants of investment spending were identified. Followed by the link (relationship) between investment spending and the determinants. The empirical studies that have been reviewed show that there is a mixture of assumptions regarding investment spending. There is lack of empirical studies on investment spending in accordance with the chosen determinants for both South Africa and Nigeria. The discussion has been provided on the empirical studies found internationally. Chapter 3 presented a discussion on the investment climate for South Africa and Nigeria, together with the identified determinants employed for the study.

6.2.2 EMPIRICAL OBJECTIVES

In chapter 1, four empirical objectives were set out and listed as follows:

- Review investment spending and its determinants in both countries
- Estimate and compare the long-run relationship between investment spending and its determinants in both countries
- Determine and compare the short-run relationship between investment spending and its determinants in both countries
- Determine and compare the direction of the causal link between investment spending and its determinants in both countries.

The empirical objectives were achieved through an econometric model built in Chapter 4 of the study and discussed in Chapter 5.

The determinants for South Africa and Nigeria were identified in Chapter 4 of the study, which are the lending rate, price level, real effective exchange rate, gross domestic product, savings, and country risk and trade openness. The ARDL model was employed to test for cointegration. The analysis of the results identified a long-run relationship between investment spending and the determinants in South Africa and Nigeria. In the short run, the determinants predicted the direction of gross fixed capital formation in South Africa and Nigeria. Comparison of the determinants in both countries shows that lending rate has remained stable and affected gross fixed capital formation positively in South Africa and Nigeria. The savings behaviour of both countries shown by the results indicated a weak positive relationship because the countries are dominant in spending rather than saving. The financial crisis affected the determinants, as break dates were found. A dummy variable was significant to the gross fixed capital formation.

In the case of the long-run relationship, the study set a hypothesis for each determinant to gross fixed capital formation based on the literature discussed in chapters 2 and 4. The results portray the researcher's expectations for South Africa, while for Nigeria it was opposite. The study achieved the objectives set for the study, both empirical and theoretical.

6.3 CONCLUSION

Gross fixed capital formation in South Africa and Nigeria suggested that it is positively responsive to lending rate, savings and gross domestic product in the long run, similar to the results achieved study by Ali *et al.* (2015). Nigeria is adjusting quickly for a change in independent variables to

have the full effect on the dependent variable in five months, better than South Africa in the short run. It is evident that investment activities growth in both countries is affected by the determinants. Real effective exchange rate and price level are unstable and the increasing rates, affected gross fixed capital formation in both countries in the long run for the chosen period.

From the discussion on the literature, the determinants affect the gross fixed capital formation in both countries, regarding the investment climate discussed for both countries. The sluggish growth on investment activities is affected by the employed determinants for the study in South Africa and Nigeria. For healthy and stable growing investment activities in both countries, the determinants must be analysed better in future.

6.4 RECOMMENDATIONS

Based on the findings, the study recommends that efforts should be made to encourage gross fixed capital formation into South Africa and Nigeria. Good and stable gross fixed capital formation will improve the infrastructure facilities and this is a great deal for improving (schools, hospitals, and clinics) as both South Africa and Nigeria still have unstable facilities. This will lead to an attraction of investors within the countries. The inflationary trends should be decreased and introduce policies to encourage and enable gross fixed capital formation by policymakers should be strengthened.

The main limitation faced during the study was employing and collecting the Nigerian data. For further research, other researchers should test the determinants of Nigeria and analyse whether the results lead to same or different conclusions.

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APPENDIX A

SOUTH AFRICA

VAR Granger Causality/Block Exogeneity Wald Tests

Date: 11/20/17 Time: 22:34

Sample: 2003M01 2015M12

Included observations: 148

Dependent variable: LGFCF

Excluded	Chi-sq	df	Prob.
LLENDING_RA TE	4.899076	7	0.6723
LPRICE_LEVE L	21.24617	7	0.0034
LREER	14.61362	7	0.0413
LGDP	21.10240	7	0.0036
LSAVINGS	18.34772	7	0.0105
LCOUNTRY_RI SK	4.191029	7	0.7575
LTRADE_OPN DUMMY	10.83251	7	0.1461
	6.153007	7	0.5220
All	137.3344	56	0.0000

Dependent variable: LLENDING_RATE

Excluded	Chi-sq	df	Prob.
LGFCF	8.760070	7	0.2703
LPRICE_LEVE L	5.053226	7	0.6535
LREER	4.610899	7	0.7073
LGDP	3.754402	7	0.8076
LSAVINGS	7.675482	7	0.3621
LCOUNTRY_RI SK	3.525448	7	0.8325
LTRADE_OPN DUMMY	19.24006	7	0.0075
	20.23811	7	0.0051
All	126.7733	56	0.0000

Dependent variable: LPRICE_LEVEL

Excluded	Chi-sq	df	Prob.
LGFCF	3.680962	7	0.8157
LLENDING_RA TE	5.516191	7	0.5972
LREER	6.685383	7	0.4624
LGDP	3.215283	7	0.8644
LSAVINGS	6.065250	7	0.5322

LCOUNTRY_RI			
SK	7.458343	7	0.3828
LTRADE_OPN	3.697766	7	0.8139
DUMMY	4.203112	7	0.7561
All	31.55974	56	0.9966

Dependent variable: LREER

Excluded	Chi-sq	df	Prob.
LGFCF	19.03193	7	0.0081
LLENDING_RA			
TE	15.33317	7	0.0320
LPRICE_LEVE			
L	22.20162	7	0.0023
LGDP	12.41142	7	0.0878
LSAVINGS	21.92198	7	0.0026
LCOUNTRY_RI			
SK	7.925177	7	0.3392
LTRADE_OPN	33.31908	7	0.0000
DUMMY	5.939444	7	0.5468
All	97.15534	56	0.0005

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
LGFCF	8.719837	7	0.2734
LLENDING_RA			
TE	0.982395	7	0.9951
LPRICE_LEVE			
L	1.204478	7	0.9908
LREER	2.424105	7	0.9327
LSAVINGS	7.736549	7	0.3564
LCOUNTRY_RI			
SK	3.981505	7	0.7819
LTRADE_OPN	9.534592	7	0.2165
DUMMY	5.292452	7	0.6243
All	43.61134	56	0.8861

Dependent variable: LSAVINGS

Excluded	Chi-sq	df	Prob.
LGFCF	3.723605	7	0.8110
LLENDING_RA			
TE	21.68047	7	0.0029
LPRICE_LEVE			
L	10.45851	7	0.1640
LREER	14.61694	7	0.0412
LGDP	7.443140	7	0.3842
LCOUNTRY_RI			
SK	18.99328	7	0.0082
LTRADE_OPN	18.94289	7	0.0084
DUMMY	18.60175	7	0.0095
All	107.3187	56	0.0000

Dependent variable: LCOUNTRY_RISK

Excluded	Chi-sq	df	Prob.
LGFCF	6.139689	7	0.5235
LLENDING_RA			
TE	10.25184	7	0.1747
LPRICE_LEVE			
L	7.629061	7	0.3664
LREER	9.261878	7	0.2344
LGDP	10.42626	7	0.1657
LSAVINGS	13.27262	7	0.0657
LTRADE_OPN	10.34571	7	0.1698
DUMMY	12.82207	7	0.0766
All	50.18936	56	0.6935

Dependent variable: LTRADE_OPN

Excluded	Chi-sq	df	Prob.
LGFCF	3.443762	7	0.8411
LLENDING_RA			
TE	7.442140	7	0.3843
LPRICE_LEVE			
L	4.805640	7	0.6837
LREER	9.342550	7	0.2290
LGDP	35.53022	7	0.0000
LSAVINGS	2.240297	7	0.9454
LCOUNTRY_RI			
SK	2.786220	7	0.9040
DUMMY	14.15184	7	0.0485
All	113.5092	56	0.0000

Dependent variable: DUMMY

Excluded	Chi-sq	df	Prob.
LGFCF	10.53446	7	0.1603
LLENDING_RA			
TE	25.19862	7	0.0007
LPRICE_LEVE			
L	32.23437	7	0.0000
LREER	17.70593	7	0.0134
LGDP	7.164177	7	0.4120
LSAVINGS	23.48922	7	0.0014
LCOUNTRY_RI			
SK	12.32516	7	0.0904
LTRADE_OPN	13.84870	7	0.0539
All	135.9170	56	0.0000

NIGERIA

VAR Granger Causality/Block Exogeneity Wald Tests

Date: 11/20/17 Time: 22:53

Sample: 2003M01 2015M12

Included observations: 150

Dependent variable: LGFCF

Excluded	Chi-sq	df	Prob.
LLENDING_RA			
TE	13.82920	5	0.0167
LPRICE_LEVE			
L	7.120567	5	0.2118
LREER	14.55941	5	0.0124
LGDP	25.04149	5	0.0001
LSAVINGS	9.203738	5	0.1012
LCOUNTRY_RI			
SK	20.32566	5	0.0011
LTRADE_OPN	36.37374	5	0.0000
DUMMY	46.79278	5	0.0000
All	150.5188	40	0.0000

Dependent variable: LLENDING_RATE

Excluded	Chi-sq	df	Prob.
LGFCF	10.59863	5	0.0599
LPRICE_LEVE			
L	1.623510	5	0.8984
LREER	3.913085	5	0.5620
LGDP	8.293830	5	0.1408
LSAVINGS	23.85587	5	0.0002
LCOUNTRY_RI			
SK	3.640070	5	0.6023
LTRADE_OPN	19.46230	5	0.0016
DUMMY	10.21913	5	0.0693
All	181.4037	40	0.0000

Dependent variable: LPRICE_LEVEL

Excluded	Chi-sq	df	Prob.
LGFCF	7.006974	5	0.2201
LLENDING_RA			
TE	2.073607	5	0.8389
LREER	4.689799	5	0.4549
LGDP	2.183251	5	0.8233
LSAVINGS	0.779399	5	0.9783
LCOUNTRY_RI			
SK	5.657565	5	0.3410
LTRADE_OPN	0.799779	5	0.9770
DUMMY	2.990894	5	0.7014
All	28.81005	40	0.9057

Dependent variable: LREER

Excluded	Chi-sq	df	Prob.
LGFCF	2.087303	5	0.8369
LLENDING_RA TE	3.010836	5	0.6983
LPRICE_LEVE L	2.650669	5	0.7537
LGDP	4.438013	5	0.4882
LSAVINGS	3.485147	5	0.6256
LCOUNTRY_RI SK	4.649966	5	0.4601
LTRADE_OPN DUMMY	3.375051	5	0.6424
	1.965812	5	0.8539
All	34.57114	40	0.7127

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
LGFCF	7.351308	5	0.1958
LLENDING_RA TE	21.89305	5	0.0005
LPRICE_LEVE L	5.083820	5	0.4057
LREER	2.303607	5	0.8057
LSAVINGS	0.647766	5	0.9857
LCOUNTRY_RI SK	9.376219	5	0.0950
LTRADE_OPN DUMMY	27.87785	5	0.0000
	15.78917	5	0.0075
All	197.2880	40	0.0000

Dependent variable: LSAVINGS

Excluded	Chi-sq	df	Prob.
LGFCF	0.231597	5	0.9987
LLENDING_RA TE	7.551564	5	0.1827
LPRICE_LEVE L	0.982237	5	0.9640
LREER	4.067800	5	0.5397
LGDP	4.636009	5	0.4619
LCOUNTRY_RI SK	2.243639	5	0.8145
LTRADE_OPN DUMMY	4.773548	5	0.4441
	6.428238	5	0.2667
All	31.26245	40	0.8371

Dependent variable: LCOUNTRY_RISK

Excluded	Chi-sq	df	Prob.
LGFCF	3.889914	5	0.5654
LLENDING_RA TE	6.555029	5	0.2559
LPRICE_LEVE L	7.518004	5	0.1849
LREER	2.899356	5	0.7155
LGDP	2.438945	5	0.7857
LSAVINGS	9.083110	5	0.1058
LTRADE_OPN DUMMY	11.66575	5	0.0397
	8.260893	5	0.1424
All	66.91462	40	0.0048

Dependent variable: LTRADE_OPN

Excluded	Chi-sq	df	Prob.
LGFCF	4.078142	5	0.5382
LLENDING_RA TE	29.12547	5	0.0000
LPRICE_LEVE L	8.175766	5	0.1468
LREER	2.564256	5	0.7668
LGDP	70.18360	5	0.0000
LSAVINGS	4.892702	5	0.4291
LCOUNTRY_RI SK	5.163220	5	0.3963
DUMMY	6.129929	5	0.2938
All	269.7965	40	0.0000

Dependent variable: DUMMY

Excluded	Chi-sq	df	Prob.
LGFCF	12.35740	5	0.0302
LLENDING_RA TE	27.98633	5	0.0000
LPRICE_LEVE L	3.367117	5	0.6436
LREER	4.229558	5	0.5169
LGDP	51.21357	5	0.0000
LSAVINGS	1.326037	5	0.9322
LCOUNTRY_RI SK	11.29578	5	0.0458
LTRADE_OPN	13.09441	5	0.0225
All	139.1280	40	0.0000