The Determinants of Unemployment: A Case of South Africa

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ABSTRACT

Unemployment is a serious challenge throughout the world and a pervasive problem for developing nations. Besides other countries, South Africa has not escaped from the scourge of high unemployment. The unemployment rate in South Africa is complicated by extremely serious socio-political issues confronted by the South African government. As a result, this research investigates the determining factors which cause unemployment in South Africa and proposes a policy recommendation to alleviate unemployment in South Africa.

The determinants of unemployment are analysed using Johansen cointegration analysis technique from an econometric perspective with annual time series data from 1986 to 2016. This study initially provides an overview of the South African unemployment and factors that cause high unemployment. Variables are chosen from empirical literature. The study identifies the potential factors such as population growth, government expenditure on education, foreign direct investment, and gross domestic product as the determinants of unemployment in South Africa. The data of this study is obtained from the South African Reserve Bank, International Monetary Fund, and the World Bank. The Johansen cointegration test established that there is a long-run relationship between unemployment and chosen variables. In addition, the outcome of vector error correction model revealed that the speed of adjustment coefficient is 112.52 percent showing the variation in unemployment rate from its equilibrium level are corrected within a year. The value of adjustment is a relatively higher compared to those from previous studies on South Africa and high-speed of adjustment to long-run equilibrium. This implies that short-run shocks or disturbances in the unemployment rate would quickly move the economy towards the long-run equilibrium.

Diagnostic and stability tests results show that the residuals behaved well. Impulse response outcomes were steady with the long-run dynamic model. The outcomes of the variance decomposition showed that most of the forecast error variance in unemployment rate is explained by government expenditure on education, whereas limited proportion of variation was explained by population growth and foreign direct investment in unemployment rate. The Granger causality test results shows that variables such government expenditure on education, and foreign direct investment provide unidirectional relationship and gross domestic product reinforce the inverse relationship suggested by economic theory. Therefore, in order to reduce and possibly eradicate the unemployment level, means to draw up and implement policies that will create an enabling environment for economic growth those are required. The results that have arisen from this study confirm the theoretical predictions and are also supported by previous researchers. Policy recommendations were made by utilizing these outcomes. One of the recommendation is that government should give education first priority.

ACKNOWLEDGEMENTS

DECLARATION

I, Priyanka Patel, student number 24420905, declare that in compiling this study I have cited all the published sources as well as internet sources used. This is my own work and all sources used have been duly acknowledged. I also declare that I have not previously submitted or presented this dissertation to any other university for obtaining any other degree or qualification.

Student's Signature

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Date

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DEDICATION

This dissertation is dedicated firstly to my late grandmother and grandfather; secondly to my family as well as lecturers who were helpful in completing this research. This would not have materialized without their full input.

LISTS OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ADL	Autoregressive Distributed Lag
AIC	Aikaike Information Criteria
ANC	African National Congress
ARDL	Autoregressive Distributed Lag Models
ASGISA	Accelerated and Shared Growth Initiative of South Africa
BEE	Black Economic Empowerment
BRICS	Brazil, Russia, India, China, and South Africa
CBN	Central Bank of Nigeria
CPI	Consumer Price Index
DBE	Department of Basic Education
DF	Dickey-Fuller
DoE	Department of Education
EPL	Employment Protection Legislation
FDI	Foreign Direct Investment
FEVD	Forecast Error Variance Decomposition
FMOLS	Fully Modified Ordinary Least Square
FPR	Final Prediction Error
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
GEEDU	Government Expenditure on Education
GIRF	Generalized Impulse Response Function
HQ	Hanann-Quin Criterion

IBGE   Brazilian Institute of Geography and Statistics

IDC   Industrial Development Corporation

ILO   International Labour Organization

IMF   International Monetary Fund

INEGI   Instituto Nacional de Estadistica and Geograffa an Informatica

INR   Inflation Rate

IPAP   Industrial Policy Action Plan

JB   Jarque - Bera

LM   Lagrange Multiplier

LR   Sequential Modified Likelihood Ratio

MLM   Multinomial Logistic Regression Model

MTEF   Medium Term Expenditure Framework

NDP   National Development Plan

NGP   National Government Plan

NSFAS   National Student Financial aid Scheme

OECD   Organisation for Economic Co-operation and Development

OLS   Ordinary Least Square

PG   Population Growth

PP   Phillips – Perron

QLFS   Quarterly Labour Force Survey

RDP   Reconstruction and Development Program

RLMS   Russian Longitudinal Monitoring Survey

SARB   South African Reserve Bank

SC   Schward Information Criterion

SELRM   Single Equation Linear Regression Model

SVECM   Structural Vector Error Correction Model

ULMS   Ukrainian Longitudinal Monitoring Survey

UR   Unemployment Rate

UNR   Unemployment Rate (Modified)

VAR   Vector Autoregressive

VECM   Vector Error Correction Model

ZAR   Zuid-Afrikaanse Rand (South African Rand)

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Unemployment is a worldwide problem that every nation relatively struggle with. Indeed, even the United States of America, which has the most robust prevailing economy worldwide is compelled to put significant resources into job creation and economic development programmes intended for reducing institutional unemployment. This unemployment challenge has become so enormous in the worldwide economy that the protector of the worldwide economic framework, the World Bank and the International Monetary Fund depend on the institutional unemployment figures as the catalogues of the socio-economic virtuous fortune of countries (Mafiri, 2002).

Additionally, it has been broadly accepted that countries are commonly disadvantaged from unemployment. The problem of unemployment is also a continually expanding phenomenon in Pakistan (Cheema and Atta, 2014). Similar to other numerous developing countries, unemployment has been one of the main challenges in South Asian countries because of the lack of capacity which make them different in relation to the developed countries. The extreme unemployment rate negatively effects unsteady economic conditions and this is problematic on the grounds that when labourers are unemployed, there is bound to be less-consumption of resources in a country. Accordingly, the aggregate production of a nation is not as much as their potential levels of output because these resources are not completely consumed in nations (Maqbool *et al*., 2013).

South Africa faced a tragedic phase of global financial crisis after a very long period of 17 years which made the economy to go through recession in the year of 2008 till 2009. Due to the recession, the labour market of South Africa started to experience a plunge in production which lead to reduce in demand for labour. The pressure of recession was felt by most of the companies and experienced major financial problems, as a result companies end up retrenching the individuals. The effect of retrenchment in labour distress subsequently unannounced strikes occurred along these lines further bringing down the volumes of production in South Africa (Steytler and Powell, 2010).

Marumoagae (2014), the pace of retrenchments was doubled in 2009. It is assessed that a aggregate number of 4899 companies retrenched employees from January 2008 to January 2009 in South Africa. The South African labour market was also severely affected as many employees lost their jobs. On the other hand, South

Africa's macroeconomic policies have contributed remarkably to the country's development. These policies have been supported by a consistent and straightforward policy framework, including a credible inflation targeting regime.

Furthermore, the labour market of South Africa is saturated by almost 75 percent of employees are low-skilled or semi-skilled (HuffPost South Africa, 2018). The South African rate of employment has been declining steadily in the course of recent decades. In 1994 the unemployment rate was 22 percent; in 2014 it was 25 percent and currently in 2018 the rate is 26.7 percent (HuffPost South Africa, 2018). As per Statistics South Africa (2018), growth in employment in nearly all sectors is well below the growth of real GDP. Growth in South Africa's economy has been mostly jobless, as there will be less production in all sectors, which will lead to an economic recession.

South Africa's recent unemployment figure was released by Statistics South Africa (StatSA) on May 15 2018, showing that the rate of unemployment has stayed unchanged in the first quarter of 2018, at 26.7 percent (HuffPost South Africa, 2018). Unemployment amongst the young between the ages of 24 and 35 is about 35.4 percent (HuffPost South Africa, 2018), and there are about 3 million young people in South Africa who are not presently in training, education or actively job-seeking.

In general, unemployment significantly generates poverty, homelessness and nurtures family disunity. According to Kingdon and Knight (2007), unemployment remains a genuine issue of concern because it brings about overwhelming impact on economic welfare, crime, the erosion of human capital, unhappiness and social insecurity. Unemployment also breeds some psychological problems such as hopelessness, frustration hostility and some obvious activities that unemployed youth go through the direction of criminal behaviour (Bakare, 2011).

Moreover, the unemployed also undergo psychological costs such as involuntary unemployment which bring about a loss of confidence and self-esteem. The psychological disorders such as, divorces, suicides and criminal activities tend to rise when the rate of unemployment increases (Mohr, Fourie and Associates, 2012).

Malakwane (2012) states that ever since 1994, poverty remains an epidemic for South Africa even though economic growth has been intermittently experienced. The impact of poverty and unemployment generates social and economic problems. Indeed, in spite of the fact that South Africa is a middle-income country, its society has stayed as one of the extremely unequal in the world. Moreover, the high rate of crime is attributed to unemployment and poverty to some degree. Unemployment influences the entire economy, not just the

jobless. Even though many unemployed individuals need skills and training, there are a significant number of individuals who have skills and experience, but are not being efficiently used in the economy.

1.2 Statement of the Research Problem

Unemployment has been a great concern for researchers, as well as policy makers of both developed and developing countries. Unemployment remains an essentially challenging socio-economic issue debated in macroeconomic analysis. The creation of employment is one of the best ways of getting out of this conundrum.

Ever since the end of apartheid in 1994, the problem of unemployment remains determinedly high in South Africa. The economy showed some improvement in 1995 and at some point it was anticipated that unemployment would decline constantly. In spite of the fact that the South African economy has been demonstrating adequate, positive improvement in the previous 20 years, development in employment remains generally slow. Growth in employment is not sufficiently quick to absorb the new entrants of labour, thereby heightening the impact of this challenge on the performance of the national economy generally (Hendriks, 2016).

Unemployment is a serious problem that needs to be consider in light of the fact that the unemployed need to accomplish something to sustain their living. The rise in unemployment will cause poverty which forces many individuals into unlawful ways of getting income. According to Mncayi (2016), in most cases, the individual will have gone to school or have experienced preparing to make themselves employable but then because of conditions in the economy the individual stays jobless. This is an issue, which is then connected to numerous other social issues, as the jobless need to rely upon the society for their welfare.

Ndhlovu (2010), the consequences of unemployment are numerous and varied which consist of a low self-esteem of oneself, alcohol and other drugs abuse. Many individuals make use of the illegal sale of alcohol in order to earn a living. Moreover, there has been a rapid rise in domestic violence because of extreme liquor misuse. A number of youngsters any how attempt to find some other ways of generating income for financing their families and especially for their studies. This is on the grounds that education is viewed as critical as it encourages job seeking in other areas.

Various policies were introduced by South African government to address the problem of unemployment and also issues like poverty. The Accelerated and Shared Growth Initiative of South Africa (AsgiSA) and the Broad Based Black Economic Empowerment initiative are the policies that focus on employment. The policies of employment are likewise to engage well with other policies that work with field of incentives to

create employment. The existence of all these policies does not mean that the problem of unemployment will be alleviated (Brynard, 2011).

Furthermore, according to Rossouw and Ferreira (2016) stated that since 1994, most of the policies were implemented by the ANC government, such as the Redistribution and Development Programme (RDP), the Growth, Employment and Redistribution (GEAR) strategy, the Accelerated and Shared Growth Initiative of South Africa (ASGISA), and the New Growth Path (NGP), along with the Industrial Policy Action Plan (IPAP), have combined the jobs-through-construction strategy. The above mentioned policies need to deal with the negative consequences of apartheid, like inequality, poverty and unemployment. Nevertheless, these policies basically been unsuccessful to deal with those issues, as the poverty and unemployment kept on rising whereas inequality keep to be widespread (Ocran, 2009).

By looking at all these facts, South Africa faces its highest unemployment rate. The several attempts that have been made by various scholars in different nations to alleviate the problem of unemployment seem to have failed because this has kept on increasing in every nation alongside South Africa. This raises questions for all the economists and policy makers on how to, alleviate the problem of unemployment in both developing and developed countries. Even government of South Africa have also attempted by implementing policies to alleviate the problem of unemployment but failed to do so.

1.3 Aims and Objectives of the Study
The study aims to:

- Investigate the determinants of unemployment in South Africa;
- Investigate the causal relationship between unemployment and its determining factors;

The objectives of the study are:

- To analyse the impact of the determinants of unemployment on the economy in South Africa;
- To utilise the granger causality test to determine the existence of a causal relationship among the variables;
- Empirically determine the factors that cause unemployment in South Africa using econometric tools.
- Make policy recommendations in respect of unemployment.

1.4 Research Questions
1. What are the factors that determine unemployment in South Africa?

2. Does causal relationship exists amongst the unemployment and population growth, unemployment and government expenditure on education, unemployment and foreign direct investment, unemployment and economic growth?
3. Econometric tools that would be employed to investigate the determinants of unemployment in South Africa will help to draw a meaningful policy conclusion?

1.5 Hypothesis of the Study

H_0: The following factors do not significantly determine unemployment in South Africa: *population growth, government expenditure on education, foreign direct investment and gross domestic product.*

H_1: The following factors significantly determine unemployment in South Africa: *population growth, government expenditure on education, foreign direct investment and gross domestic product.*

1.6 Significance of the Study

Although, unemployment is a problem faced by all developed and developing countries and numerous assessments also have researched the determinants of unemployment in South Africa. This research contributes towards the on-going debates on determinants of unemployment.

Results from this investigation inform policy makers in South Africa to decide on an appropriate policy that could assist in bringing down the unemployment rate, at the same time supporting other reasonable factors. The results will help us to understand the relationship between unemployment, economic growth, foreign direct investment, population growth and government expenditure on education.

Numerous studies done by Fabiani, Locarno, Oneto, and Sestito (2001), Brüggemann (2001), Tercek and Simmons (2014) and many more on developed countires; Foley (1997), Eita and Ashipala (2010), Cheema and Atta (2014) and many more studies were done on developing countries, and limited studies were done on South Africa by Mafiri (2002), Malakwane (2012) and Viljoen and Dunga (2014). There are many studies done on developing counties but here stated only few. Most of the studies have used different econometric tools as well as variables to determine the relationship or effect of independent variables on dependent variables, somewhat mixed results archived by earlier studies. The variables that this study has chosen are from on empirical studies done on developing countries. However, those variables were ingoned in South Africa. Therefore this study offers a deeper level of analysis and adds to the discussion of unemployment using the chosen variables, and it is hoped that this study provides insight into the problem.

1.7 Limitations of the Study

There are other variables which might also impact unemployment as which were not taken into account, one of the variable is inflation. Inflation was first included in the model and then had to remove from the model because study was not getting the meaningful results. Second limitation is that even after dropping out one variable from the model, the speed of adjustment value in the short run model is very high.

1.8 Organization of the Study

The study consists of six chapters:

Chapter one is the introductory chapter. It begins by outlining the general background and introduction of the study. It provides an outline of the aims, objectives, hypotheses, significance of the research, limitations of the study, and lastly sketches the structure of the dissertation. Chapter two scans the unemployment phenomenon in South Africa, in addition to unemployment policy and the determinants of unemployment that are applicable to South Africa. Chapter three is based on the literature review. It analyses the relevant theoretical and empirical literature based on the determinants of unemployment in South Africa. Chapter four outlines and discusses methodology. This chapter explains the regression model and various tests utilized to examine the data. Chapter five is penultimate one, the interpretation of the results. It gives out the estimation and interpretation of the outcomes that obtained from various tests that were conducted in the chapter four. The summary, conclusion and recommendations are made in light of the consequences of the examination and these are presented in final chapter six.

CHAPTER TWO

AN OVERVIEW OF UNEMPLOYMENT IN SOUTH AFRICA

2.1 Introduction

This chapter presents a general scan of the unemployment patterns and its determined variables over the period 1986 to 2016 in South Africa. The insight derived from the unemployment policies helps to shed light on the reason why the rate of unemployment keeps increasing. The ways in which unemployment trends change over time are examined and the chapter also presents a comparative analysis of South Africa's unemployment trends from the 1980. There are several causes that determine unemployment patterns in South Africa. This chapter is split into the following subdivisions: the initial section gives an historical overview of South African unemployment; the second provides the general background of determined factors; the third section explains the policies on unemployment in South Africa while the fourth section concludes the overview.

2.2 Historical Overview of South African Unemployment

Unemployment is a challenge throughout the world but it is most prevalent in developing nations. In history, different economists have posited diverse views on the unemployment phenomenon and there are many theories that have been formulated by various schools of thought regarding unemployment. For example, classical theory and Keynesian theory proffer different views on unemployment rates.

South Africa is one of the few nations in Africa which have prospects of development and growth in terms of Tourism and farming. Tourism which leads to nation building and South Africa is very good in farming that export goods to other countries which brings income for the economy. Tourism is also a source of income for the South African economy. It has a mixed population with different languages, cultures and religions. South Africa characterized by high rate of poverty, unemployment and income inequalities compared to other countries. The majority of black population is economically marginalized with very little leverage on the means of production (Singh, 2015).

Banda, Ngirande and Hogwe (2013) have observed that, one of the most squeezing issues that the South African economy faces is unemployment. Ironically, South Africa is endowed with a great deal of resources, with both human and minerals. At the same time, these resources have not been equitably used in South Africa due to corruption, gross mismanagement and hostile policies of the politically different governments that have run the economy.

According to Rodrik (2008), the proximate reason for high unemployment in South Africa is that nominal South African wages are excessively high in contrast to real wage levels that would clear labour markets at lower levels of unemployment. Trade unions and wage bartering have played a critical role in the wage determination in South Africa.

Ndhlovu (2010) argues that socio-economic determinants influence individuals mentally, physically, and emotionally. Such determinants extend from educational levels, income, standard of living and the development of skills. The level of education has expanded ever since the end of politically-sanctioned racial segregation in South Africa. However, there are still mismatch with regard to education and employment. Individuals deprived of formal education struggle to get job opportunities, and the individual who does not have tertiary education is certain to be excluded from the job market. Figures of unemployment continue to soar as a result of this uneven playing field. Post matric therefore appears to be the only assurance that one could get employed. Learnerships and Internship programmes are methods for getting the essential experience, yet their effectiveness is questionable and currently under investigation.

Even though poor education is critical factor that contributing to unemployment, graduate unemployment is likewise on the increase in our nation. Other characteristics of unemployment is that it is not homogenously spread amongst the different population groups as black and female youths have less access to employment. Education plays a recognized part in unemployment as those with a poor education fail to find employment. Unemployment in this way reflects other social challenges like racial and sexual inequalities and this could likewise be linked to poverty. Stereotyping of and prejudice towards poor people because poverty is associated with such problems as lack of hygiene, illness, disease and lack of education, and so on. These biases lead to separate between poor people and the rich and this separation keeps the biased relationship with their unequal distribution of resources and influence entire (Cloete, 2015).

According to Sebusi (2007), South Africa has a shortage of skills that has caused a chronic unemployment challenge in the nation. The job market could support individuals by providing good education and who have the right skills for the job. The individuals who were educated poorly, as well as the uneducated individuals are the ones mostly affected by the unemployment. The unequal education that was already accessed by other races in South Africa generated low quality of education for black individuals (Mallet, 2002). This has additionally led to an unequal distribution of income, unemployment and a high level of poverty amongst the black community.

According to Triegaardt (1992) in his article state that, the first report released by statistics South Africa (1991) in the 1991 census expresses that just about 2 million South Africans were unemployed. A growing

number of individuals were self-employed, the number being twice as high as that in 1980. These figures confirm that there was an extreme shortage of occupations in the formal sector with no assurance for growth in the informal sector, and the concurrent increment in the number of individuals not engaged in either the formal or informal sectors.

Malakwane (2012) states that, during the politically-sanctioned racial segregation period the majority of black individuals were uneducated because of the segregation framework and lack of opportunities. Consequently, there were no adequate essential skills in the labour market. That gave rise to the present situation where the majority of the individuals are unable to get jobs as a result of the structural anomalies in the economy. Those who were uneducated and poor in those days have remained extremely poor nowadays, making impossible to manage the cost of a good education, as well a healthy lifestyle for their kids who additionally struggle to find jobs. Seeking and Natrass (2006) argue that these are the long-term consequences factored into the high unemployment figures in South Africa. The fact remains that unemployment accumulated momentum in the post-apartheid period.

Earlier in 1994, unemployment remained serious and challenged the political circumstances in South Africa. The rate of unemployment displayed a long-term increase from 9.2 percent in 1980 to 22.9 percent in 1994. In the end it declined by 16.7 percent in 1995. An increase in unemployment indicates there is a drop in occupation. Whenever there is a decline in occupation this not only pushes the community into poverty but brings about a decrease in output. This is the dilemma for South Africa even though the economy accomplished development from 1985 to 1988. When GDP-growth of South Africa was essentially adverse for the initial three years of the 1990s, at that point the effect of the political instability could be allied to the performance of South African economy. Most remarkably, in 1992 South African economic growth rate was -2.14 percent and this still holds as the lowest record of this nation's economic growth rate in nearly 20 years (Madito and Khumalo, 2014).

Malakwane (2012) argues that in 1994, when the African National Congress (ANC) came into control, they inherited an economy that had steadily been adversely influenced by population growth which prompted far reaching unemployment levels. The challenge of unemployment keeps on plaguing South Africa. Although, ever since 1994, many circumstances have become promising and better for the black population with significant changes occurring, the rate of unemployment has multiplied and the marginalized under apartheid continue to tragically bear costs of the continuing rise in unemployment.

In spite of a strong recovery in economic growth and unemployment, particularly as far back as 2000, the rate of South African unemployment climbed considerably from its high levels in the mid-1990s. From 1995

to 2007, the narrow (broad) unemployment rate increased from 17(29) percent to 23(26) percent. The fundamental purpose behind the insistently high and rising unemployment rates in South Africa over this period was the huge growth in the labour force and not an inadequate growth of the nation (Hodge, 2009).

Figure 2.1 Trends of Unemployment in South Africa (1986-2016)
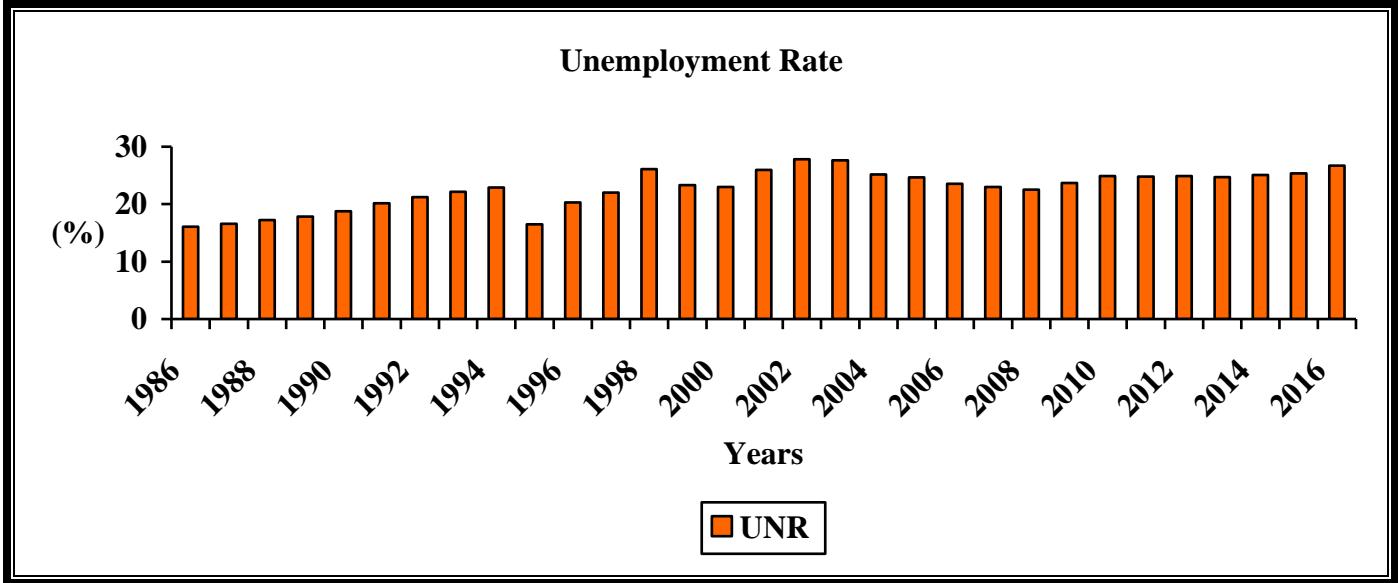
Source: Author compilation data from IMF Bank (2017)

Figure 2.1 illustrates the trends of South African unemployment from the period 1986 to 2016. In Figure 2.1, unemployment trends show that rate of unemployment is fluctuating. Schoeman and Blaauw (2005) observe that South Africa's unemployment rate has been increasing from the beginning of the 80's. In the 1980s, South Africa faced a global economic crisis, consequently, the currency lost its value, the prices of gold dropped, coupled with unemployment and inflation which were also high during that time.

Between 1980 and 1993 the fluctuation in South African unemployment radiate from great political unrests in the nation combined with economic instability because of sanctions. The South African unemployment rate has grown steadily ever since 1990 (Murwirapachena, 2011). As indicated by Trading Economics, the unemployment rate in South Africa averaged 25.60 percent from 2000 until 2018, achieving an all-time high of 31.20 percent in the first quarter of 2003 and a record low of 21.50 percent in the final quarter of 2008 (Khumalo, 2018).

Triegaardt (1992) suggests that structural unemployment is becoming an ever worrisome issue in South Africa. Every year, the number of economically active individuals entering the labour force increases but the quantities of available jobs are shrinking. The high rate of population growth has a direct impact on the level

of unemployment, yet the fundamental issue is that the economy is not generating more employment opportunities.

The South Africa's structural level of unemplyment or natural level of unemployment is gradually rising after some time. The addressing the problem of unemployment that South Africa is facing, wealth will be redistributes to the previously disadvantaged population groups. As a result, this lead to increased in protests, racism, hate and hostility among South African residents. Addressing the issue of South Africa's unemployment ought to be the government's top priority at this stage. The economy of South Africa has certain structural issues which are adding to the persistently high unemployment rate. Some portion of the issue is more noteworthy automation in labour intensive industries like mining, lack of experienced, prepared staff for specific positions because of lack of education and experience (South African Market Insights, 2017).

Schoeman, Blaauw and Pretorius (2008) show that the behaviour of South African unemployment changed drastically contrasted with the period 1970 till the end of 1983. Additionally, after the adverse shock in 1983, unemployment turned out to be absolutely reliant on its past trends. Unemployment rate averaged of 20.9 percent between 1984 and 1992. During pre-politically–sanctioned racial segregation period, this rate of unemployment averaged 17.9 percent contrasted with the normal average of 24.9 percent in the democratic period. Moreover, unemployment was 12.6 percent on average between 1980 and 1985, between 1986 and 1999 the average rate was 21.87 percent and 27.1 percent average between 2000 and 2007 (Chicheke, 2009).

According to Industrial Development Corporation (2017), the South African economy is struggling to generate more new job opportunities at an adequate pace to reduce unemployment and poverty. Generally in 2016, only 51 000 new jobs opportunities were added (IDC, 2017). The trend of South African unemployment rate kept on rising to peak at 26.5 percent in fourth quarter of 2016 and this indicates that there was a small improvement from the 13 years high unemployment rate of 27.1 percent in the previous quarter (IDC, 2017). Nearly 5.8 million individuals are unemployed at present as indicated by the official description, expanding to 8.9 million (IDC, 2017). In 2016, more than 588 000 individuals were added up to the unemployed group. It is concerning that just about 70 percent of the people who are unemployed have been without a job for over 1 year, whereas a large number of these individuals are likewise poorly qualified. Therefore, the opportunity to be re-employed becomes gradually difficult in the formal sector of the economy.

Unemployment in South Africa has soared to its highest level ever since September 2003. In the fourth quarter of 2016, the rate of unemployment remained at 26.5 % and around 433 000 of individuals have joined

the ranks of the unemployed in the initial quarter of 2017. South Africa's unemployment rate in the initial quarter of 2017 has risen by 1.2 of a percentage point and stands at 27.7 percent.

2.2.1 Types of Unemployment

The cost of unemployment is divided into two, to be specific the economic and non-economic cost. The economic cost is the loss of yield of workers who are unproductive and the non-economic cost leads to socio-economic issues, like the high level of crime and labour unrest. In South Africa the economic cost of unemployment can be noticed in the low level of the nation's Gross Domestic Product (GDP) and the increments in government's transfer payments, for instance child grants and the Unemployment Insurance Funds (UIF), which raises government expenditure. Unemployment is classified into four types namely: seasonal unemployment, structural unemployment, frictional unemployment and cyclical unemployment (D'Souza, 2009).

- Frictional unemployment

Frictional unemployment occurs because of the amount of time it takes for one to find employment or to move from one job to another. There will always be workers who are changing jobs at any point in time. Persons who leave one job or are looking for a first job often do not find employment immediately although there are vacancies in the economy. Frictional unemployment is inevitable and it is not deliberated to be a serious problem in the economy (Mohr and Fourie, 2008). Frictional joblessness can exist in a circumstance where there is no skill or location mismatch. Frictional joblessness likewise alludes to a economically rational procedure of search for new employment where individuals intentionally remain unemployed while they seek out and weigh up appropriate job vacancies.

Graduates can likewise be alluded to as being frictionally unemployed because of lags in the labour market that happen while they are searching for jobs; chances are they will typically get employment within an extremely short space of time (AEO, 2012). Frictional unemployment is generally of short duration, which can be decreased significantly further by enhancing labour market information and placement services, with the goal that the employer and the work-searchers can locate each other sooner and more effectively (Barker,2007).

- Cyclical unemployment

Cyclical unemployment arises when yield is below its full-employment level. In other words, cyclical unemployment is related with an inadequate level of total demand, and consequently also called demand-deficiency unemployment. at the point when total demand rises, firms increment their procuring. At the point when total demand falls, firms dismiss workers.

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Lindbeck (2015:738) additionally clarifies cyclical unemployment arising because of the labour market disequilibrium where labour supply is said to be in excess at prevailing wage rates. This unevenness between the amount of occupations available in the market and number of individuals searching for employments will keep going as long as specific characteristics of the economy change. For example, as long as the business cycle is in recession, cyclical unemployment will continue to rise until the economy is said to recovering.

- Seasonal unemployment

Seasonal unemployment arises because of normal and anticipated changes in economic activities over the course of a single year (Mafiri, 2002). As per Gupta (2004), seasonal unemployment is caused by variations in seasons. Agriculture sector probably is the best example. Farmers and labourers have little work to do during off seasons. People working amid peak periods and joblessness in off-peak periods are described as seasonal laborers or seasonally employed. This joblessness happens on regular and predictable premise (Mafiri, 2002).

- Structural unemployment

According to Chadha (1194: 23), South Africa experienced unemployment is largely structural rather than cyclical. Even amid periods of high economic growth, job opportunities do not grow fast enough to absorb those officially unemployed and those recently entering the labour market. There are several reasons for this, for instance the rapid development of the labour force, the utilization of capital or skill intensive innovation, or an inflexible labour market (Mafiri, 2002).

Structural unemployment could likewise refer to a skill mismatch, for example between the skill that the employers require and those that employees offer, or a geographical mismatch. The significant proportion of unemployment in South Africa is structural. Structural unemployment is bring about by changes in the composition of labour supply and demand (Mafiri, 2002).

2.3 Determinants of Unemployment in South Africa

The general background of determined factors that caused unemployment in South Africa is discussed further from the period 1986 to 2016. However, some of the factor trends are discussed from 1980s, these factors are such as population growth, government expenditure on education, foreign direct investment and economic growth are brought into discussion to enlighten the factor trends in relation to unemployment and how does this factors affect unemployment. This would give a general idea about the relationship between this factors and unemployment.

2.3.1 Population Growth in South Africa (1986 - 2016)

The rate of unemployment can either increase or decrease respectively concerning the growth or decline in population of the country. The expansion rate in unemployment could be linked to population growth particularly in developing countries like South Africa. South Africa's unemployment rate comes about unbelievably growing in the midst of disturbing economic recession while population growth has also been increasing. If this not checked, then this problem can negatively affect the country's economy in the future.

In South Africa the majority of black people are still in the lower income groups because there is a significant difference in monthly family income between the various population groups in South Africa. The skew distribution of income is also noticeable in the higher income group, where most of the white respondents earn higher income than other population groups. There is likewise a higher level of unemployment amongst the black population contrast to the demographics of the other population groups. The high unemployment is especially serious amongst black women in South Africa. Discrimination in employment leads to imbalances in education. Blacks generally have lower educational qualifications than the other population groups and ironically their population has expanded dramatically. The lower levels of education and the high population growth amongst blacks in South Africa have cumulatively added to a high unemployment rate. A black are additionally the least urbanized population and in this manner work among them is low, as there are less employment opportunities in rural and provincial zones. High unemployment and low income amongst the black individuals can therefore for the most part be attributed to their lower levels of education (Lekganyane-Maleka, 2004).

South Africa has had a moderately high and unchanging population growth for a long time, expected at 29.1 million in 1980 and gradually rising to 50.6 million in 2011. The latest Stats -SA estimates show that South Africa has an aggregate population of around 52.9 million. As far as yearly growth rate, the population has expanded at a rate of 2.1 percent every year; however growth rates have slowed down to a great extent because of the impact of AIDS deaths and declining productiveness after 2000. The latest estimates by Stats-SA suggest a general growth increase from 1.30 percent (2002 to 2003) to 1.34 percent (2012 to 2013).

Figure 2.2 Trends of South African Population Growth (1986-2016)
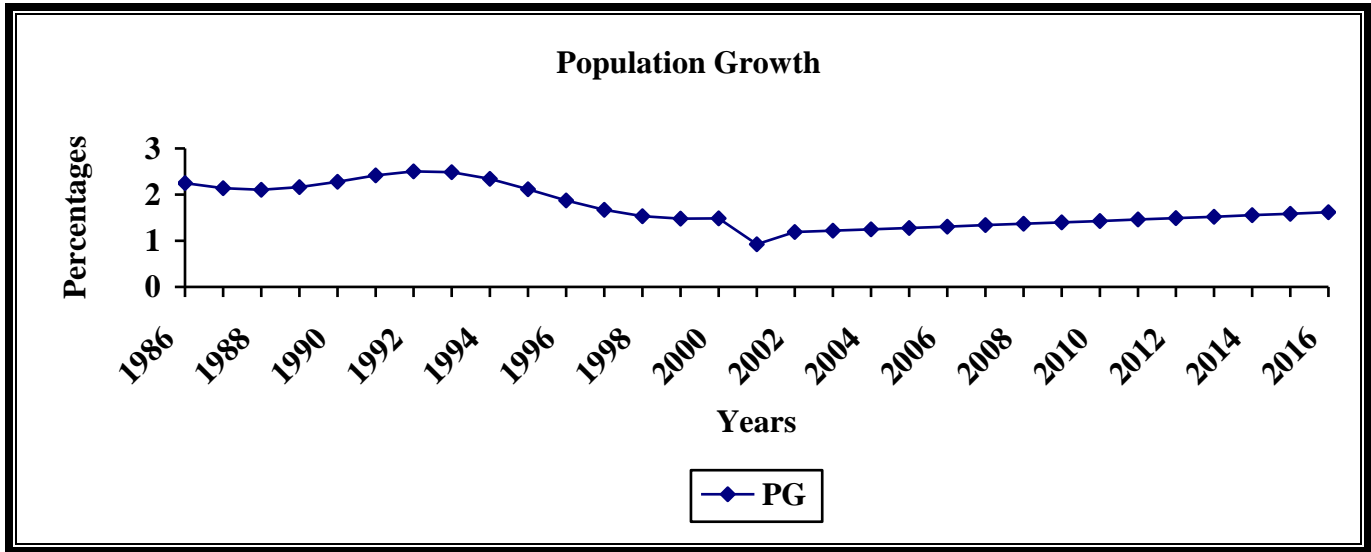
Source: Author compilation data from World Bank (2017)

Figure 2.2; illustrates the trends of population growth rate of South Africa from 1986 to 2016. One of the causes that lead to unemployment in the country is population growth. For instance, if the population rate is more than a country can cope with, will result in decline in quality of life because government have to promote equity in distribution of resources (Gov.za, 2019). It is noticeable that the growth rate of the South African population has declined from the year 1995 and even more so for the year 2001. At the 2001 Census, aggregate for resident citizens in South Africa was 44,819,778. The 2011 Census revealed that the population had moved to more than 50.5 million individuals.

The reason behind the population growth is the immigration, a subject which raises a differentiating set of perspectives. Lekganyane-Maleka (2004) stated that, unlawful migration is a complicated issue as it presents numerous economic, social and ethical issues Aside from those immigrants who enter South Africa legally; there are additionally expansive number who are entering unlawfully. The estimates number of illegal immigration in South Africa fluctuates between 2 to 5 million (Lekganyane-Maleka, 2004 cited by Alvarado and Creedy, 1998:44). These illegal immigrants have left their local nations wanting to find employment opportunities, political freedom, education and a for the most part desirable lifestyle in South Africa (Lekganyane-Maleka, 2004).

2.3.2 Government Expenditure on Education in South Africa (1986 – 2016)

Governments are focusing more on enhancing the nature of basic education and education is a priority too for the South African government. Government has additionally expended efforts to improve the state of education in the country. Through the provision of a conducive environment to learn and educate, and

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ensuring that the School Infrastructure Backlogs that has so far been a restrictive block allows for significant progress.

As indicated by DoE (2001), there are an enormous number of well-known challenges in the education framework in South Africa: under-qualified educators, poor performance by both the students and educators, poor student standards, as well as lacking resources, along with insufficient infrastructure. These present quite massive difficulties that government had to overcome from 1994.

Expenditure on education has expanded enormously in the democratic period. In 1994, the government spent R31.8 billion on education. This increased to R92.1 billion by 2006, and this accounts for 17.8 percent of aggregate government expenditure. At approximately 5 percent of national GDP, South Africa's investment in education is among the most noteworthy on the planet (Brand South Africa, 2002). The national Department of Basic Education and the nine provincial education budgets are projected to spend more than R230 billion on basic education in 2017/18 (Unicef.org, 2011). As per 2017/18 budget, an amount of R7.3 billion was transfred from nine provinces to the Department of Basic Education to complete projects under the school infrastructure backlogs grants. In 2018, government allocated R246.8 billion for basic education. Moreover, R31.7 million also allocated for the education infrastructure grant to build new schools, upgrade and maintain existing infrastructure and providing school furniture (Treasury.gov.za., 2018).

Instructors have enhanced their qualifications considerably in South Africa, with the level of under-qualified teachers declining from 36 % in 1994 to 26 % in 1998. Different approaches, inclusive of the redistribution of instructors, have been effectively utilized to redistribute educators to areas of more prominent need and build up more equitable student and teacher proportions. While the average of student and teacher proportion was 41:1 in 1994, this average had changed to 53:1 by 2000.

The state-supported National Student Financial Aid Scheme (NSFAS) has been fundamentally extended to subsidies advanced education for disadvantaged students. In 1996 the scheme funded 72 788 to students; the fund had come to 81 609 by 2000, with funds paid out rising from R333 million to R551 million. Before the end of 2001, the aggregate funds paid out, combined with contributor's money, was more than R2.8 million.

Education remains one of the priority areas for the government of South Africa. Throughout the recent years government has also endeavored toward upgrading the conditions of training within the country. In 2010, the Department of Basic Education (DBE) was driven by Action Plan 2014: Toward the Realization of Schooling by 2025, a report that outlines the areas that ought to be addressed in this period. The overall aim of this plan was to enhance student performance by overcoming the shortcomings in the education framework. This was mainly done by improving access towards education, providing safe buildings, offering learning and

instructing materials on time, also by increasing the number of educators and enhancing their skills (National Treasury, 2015).

According to National Treasury (2015), in 2013 and 2014, South Africa spent around R227 billion, which accounted for 19.7 percent of aggregate government expenditure on education, proportionate to 6.5 percent of GDP. Spending on education was anticipated to decrease to an average of 6.2 percent of GDP over the 2014 medium term expenditure framework (MTEF) period, and 19.1 percent of aggregate government spending over a similar period. Advanced education and training has been allocated more than 13 percent, and increments were anticipated at 15.6 percent in 2016 and 2017, with more funds accessible for student loans and bursaries. Spending on higher education was anticipated to develop by a normal yearly rate of 6.5 percent from the year of 2014 and 2015 to the financial year 2016 and 2017 as per the strategy obligation with respect to building access to advance education, particularly in science, engineering and technology (STEAM), which support more prominent economic competitiveness. The financial plan for provincial education was expected to grow by R26.2 billion from 2013 and 2014 to 2016 and 2017 at a normal yearly rate of 4.7 percent, because of government's responsibility in generating the correct workplace for quality education.

Government strives to improve the quality of basic education. One of the ways was to provide a conducive environment, which the school framework backlogs conditional grant attempts to address. Increased investment in the course of that time has contributed towards progress in the state of education. This investment helped to meet the aim of universal, access to improved quality education. Another factor in government's commitment of quality education was for access to Grade R programme for every one of the five-year olds by 2014 (National Treasury, 2015).

Figure 2.3 Trends of South Africa Government Expenditure on Education (1986-2016)
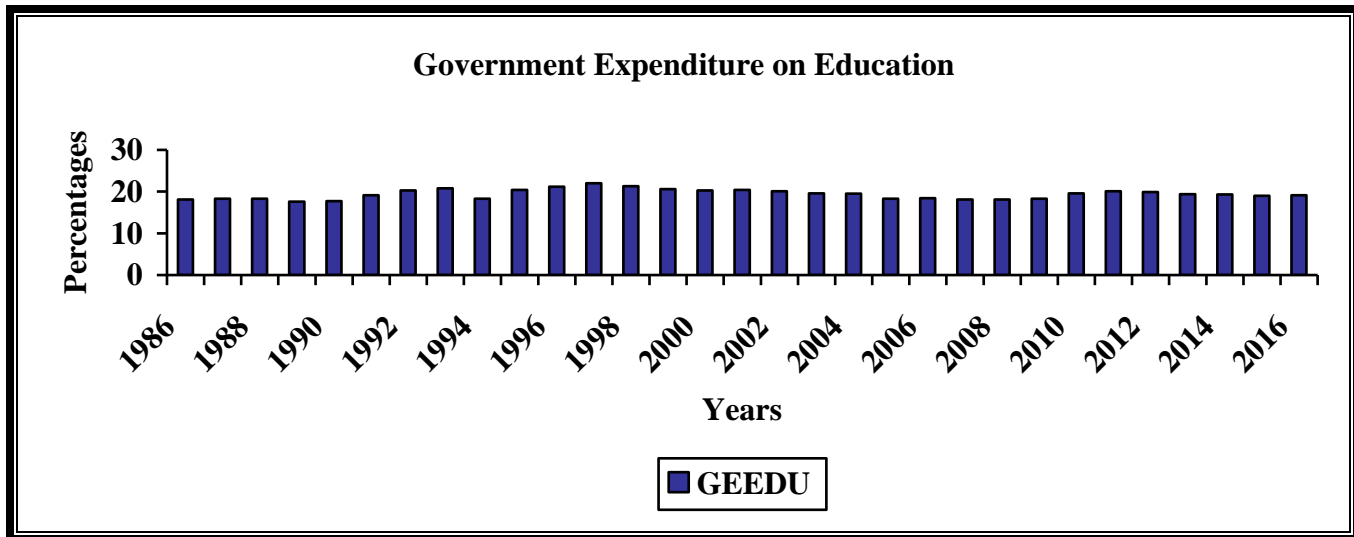
Source: Author compilation data from South African Reserve Bank (SARB) (2017)

Figure 2.3; illustrates the trends of South Africa government expenditure on education from the period of 1986 to 2016. An increase in levels of education will help to decrease the rate of unemployment in the country. Education is therefore perceived as a vital factor that helps to improve of numerous issues that nation faces.

Abdullah, Harun, and Jali (2017) also stated in their research that education broadly acknowledged that it can upgrade and enhance expectations for everyday comforts. As it were, government expenditure on education is an investment to increase the number of skilled labours in economic sectors, and raise the wealth of society through the growing number of individuals who has higher income. Through education, individuals appreciate with higher compensation, as well as have higher productivity of work by gaining more motivation as referenced in growth theory.

Government expenditure on education is vital to individuals particularly who have the lower income since education at tertiary level is excessively expensive and genuine fees is higher than capacity to paid by students. If government expenditure on education executed, it likewise will increase the individual's salary in the future (Abdullah, Harun, and Jali, 2017).

As per 2009/2010 budget review, education was allocated the greatest resources of government income. In 2010, it is allocated 17 percent of the government expenditure. The Treasury, in its 2010 budget review blames the discriminatory apartheid education system in defense to the massive expenditures towards education (for example, the school were strictly segregated by race). Their dispute was that Treasury spends more money on education since it seeks to fix the trouble caused by politically-sanctioned racial segregation

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regime. The belief was that South African blacks were separated before the job market entry. The quality of education provided to the South African blacks for the period was not as much in value and made them uncompetitive in the job market. By promoting education among the South Africans blacks, this helps to reduce rate of unemployment among the blacks whose unemployment rate average 30 percent ever since 1994, contrasted with the 10 percent average of white South Africans (Barker, 2007).

Over the long-run, resources might be distributed to educational expansion at the cost of making new employment. The counter-argument would be that, as the country turns out to be more educated, such a country would be more productive, prompting an expansion in national production. An increase in national production will prompt an expansion in the demand for goods and services and accordingly it will create more jobs opportunities (Todaro, 2000: pp.339). A higher quality of labour also leads to a higher increase in the yield of the economy. The higher quality of labour is an additional element of the quality of education one has. The poor performance at the primary and secondary level prompt negative implications for tertiary instruction enrolments as well as performance. The lack of skilled labour implies that the nation is not able to attain a higher level of production, which means the production capacity might be underutilized. The shortage of skills is limiting economic growth in light of the fact that the economy cannot operate to its full potential (Sebusi, 2007).

2.3.3 Foreign Direct Investment in South Africa (1986 - 2016)

Mazenda (2014) shows that South Africa is an emerging nation and mainly relies upon investment for projected growth. Over the years, the investment climate has changed significantly in South Africa. Foreign trade and investment in South Africa was severely impacted by sanctions and boycotts in the 1970s and 1980s. The campaigns brought about moderate investment to South Africa. In 1994, just after the first democratically elected government came into control, the South African investment climate started to change. The nation was politically steady with a more open and outwardly arranged economy. Between 1994 and 1999, gas and oil industries have additionally enticed a huge amount of foreign investment whereas ever since 2000, the investment in the mining sector has been substantially more grounded (Hanouch and Rumney, 2005).

Throughout the 1980s, the campaign for change strengthened significantly as political uncertainty in South Africa worsened, and economic conditions were declining. Foreign direct investors pulled out from South Africa, nearly 225 US corporations, and 20 percent of UK firms, between 1984 and 1988. Regardless, in the 1990s, there were still in excess of 450 foreign firms with direct investment in South Africa. The begin of the 1990s in South Africa, total foreign direct investment liabilities amounting to US$ 7.94 billion. From that about 85 percent was from Europe and 13 percent from North America. As of 1985, the portfolio of inflows

likewise stopped, as foreign bank creditors carried out a debt settlement schedule of the South African government and public sector borrowers. The resulting capital outflows and further economic reduction remained worth mentioning in moving toward white political sentiment, particularly in business, in contrast to politically-sanctioned racial segregation (Gelb and Black, 2004).

According to Gelb and Black (2004), over the 1990s the policy system turned out to be more significantly more liberal and outward-oriented, using the clear objective of attracting new foreign investment. Direct investment specifically has been recognized by numerous policymakers as the way to enhanced development, and outlined by the absolute most vital economic policy explanation from 1994 – the Growth, Employment and Redistribution (GEAR) policy was made known officially in June 1996.

As indicated by the GEAR approach (1996:27), foreign direct investment plays a significant role in empowering development (Bangane, 1999: pp.65) through modern technology which is transferred through new investment flows; transfer of basic abilities, management expertise and higher levels of training; access to universal wellsprings of finance and access to worldwide markets.

Faulkner and Loewald (2008: pp.4 and 7), indicate that the decade prior to 1994, South Africa experienced moderate investment and economic growth due to political instabilities and global sanctions forced as a measure of restricting segregation. Be that as it may, amid the 1970 - mid 1980s period the foreign direct investment in South Africa was at its highest point, with the support of investment noted at a rate over 25 percent. Amid the 1980s and mid-1990s, this rate started to decrease in light of political instability, combined with high inflation.

Figure 2.4 Trends of South African Foreign Direct Investment (1986 - 2016)
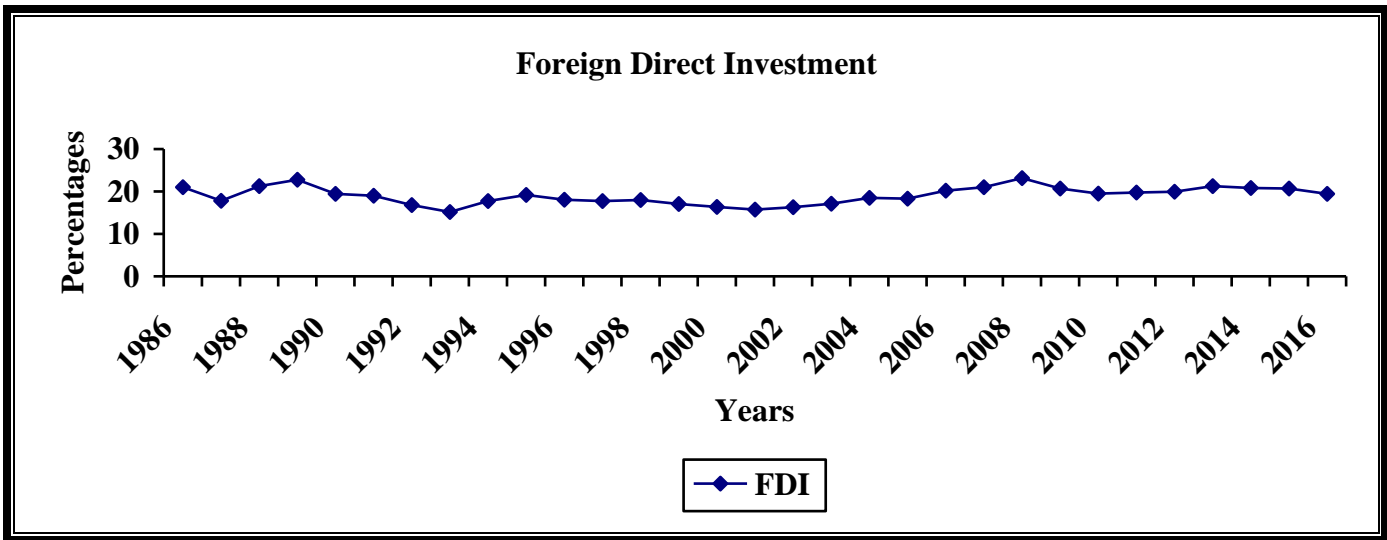
Source: Author compilation data from IMF Bank (2017)

Figure 2.4 illustrates the trends of South African foreign direct investment from the period of 1986 to 2016. During 1980s, as a result of politically-sanctioned racial segregation strategies, the pressure increased on foreign investors to disinvest from South Africa. Around 245 firms pulled back from the economy. As the economy kept on battling, the inflows of foreign direct investment kept on declining, and in the long run the portfolio investment likewise declined. This indicates that inflows of foreign direct investment to South Africa have fluctuated significantly over the years (Gelb and Black, 2004).

Sebusi (2007), states that the quality of labour plays an essential part in the attraction of foreign direct investment to a nation. The shortage of skills creating obstacles to production and along these lines foreign companies cannot amplify their production capacities. South Africa cannot adequately take its legitimate position in the worldwide group because of the current level of skills shortage. This skills shortage hinders the economic growth that this nation could accomplish without the obstacles in production.

According to Trading Economics (2017), foreign direct investment in South Africa is an average of 522.67 ZAR billion from 1956 until 2017, achieving an all-time high of 2089 ZAR billion in the first quarter of 2016 and a record low of 1 ZAR billion in the last quarter of 1957.

2.3.4 Economic Growth in South Africa (1986-2016)

Economic growth is viewed as the best noticeable instruments for reducing poverty and unemployment, as well as helping to enhance the standard of living of individuals (Banda, Ngirande, and Hogwe, 2013). Kreishan (2011) also observes that an expansion in the growth of the GDP of the economy is required to expand work levels and consequently reduce unemployment. This view is broadly acknowledged in economic theory, therefore the theoretical suggestion that growth yield and unemployment are recognized as Okun's Law.

According to Tatom (1978), the relationship between economic growth and unemployment suggests that the GDP growth rate should be equivalent to its potential growth in order to maintain the consistent levels of the unemployment rate. In order for unemployment rate to decrease, then the rate of GDP growth needs to be over the economic growth rate of potential yield. Evidently economic growth plays an essential part in the creation of jobs. As raised in economic theory growing jobs are allied to a rise in the standard of living of many individuals (Malakwane, 2012).

Both moderate growth as well as high unemployment has been constant for a relatively long period of time in South Africa. Former and the ANC have dedicated time and effort to both radical financial change and the National Development Plan (NDP). The NDP says that the nation needs 5 percent yearly GDP growth in

order to handle unemployment, inequality and poverty. Be that as it may, in spite of the state's guarantees, both unemployment and GDP growth are getting worse.

The previous South African Finance Minister Malusi Gigaba stated that the economy of the nation is growing too slowly to deal with high unemployment rate that the nation confronts currently. According to Malusi Gigaba economic growth of South Africa is too low, too slow in addressing the present rate of unemployment. Therefore, the country needs to encourage business for investment, transforming ownership and supply management to create more employment.

Figure 2.5 Trends of South African Economic Growth (1986-2016)

Source: Author compilation data from IMF Bank (2017)

Figure 2.5 illustrates the trend of South Africa's economic growth (real GDP) from the year of 1986 - 2016. The gross domestic product (GDP) is recognized as one of the primary indicators that measure the condition of a country's economy. It is particularly concerning that as the worldwide financial market experienced a crisis in 2009, the economic growth rate of South Africa has not been sufficiently strong to prompt creation of jobs.

The trend of economic growth shows there is a rise in growth of South African economy since 1985. According to the government's central statistical service, in the early 1990s national economic stagnation continued, started declining in 1991, 1992 and 1993, but started recovery in 1994. Moreover, recovery continued in 1995 and in 1996, GDP growth would go above 4 percent. According to the Stats-South Africa (2014), gross domestic product declined in 2012 from 2.5 percent to 1.8 percent in 2013, but was expected to increase in 2014 by 2.7 percent and 3.5 percent in 2016.

GDP growth rate dropped suddenly from 4.3 percent in 1996 to 2.6 percent in 1997. This happened because of the global financial crisis. In 1999, growth rate improved to 2.4 percent from 0.5 percent recorded in 1998. After 2000, GDP growth rate continued to rise; however there was a slight decrease in growth rate to 2.7 percent in 2001. From 2002 to 2006 South Africa enjoyed positive and sustained economic growth rate of 5.6 percent, the highest ever since 1981. The GDP growth rate dropped to 3.6 percent in 2007. In 2008, the growth rate declined negatively in 2009 because of the global financial crisis. South Africa faced negative growth rate of -1.5 percent for the initial from the time since independence (Kin, 2012).

2.3.5 Inflation and Unemployment in South Africa (1986 – 2016)

The relationship between inflation and unemployment is clarified by the Phillips curve, which is the first curve developed by William Phillips in 1958. When rate of unemployment is low this tends to increase inflation rate and when rate of unemployment is high this would tend to decrease inflation rate, even to reach a negative. The government of South Africa is battling with two main financial issues which are unemployment and inflation. In South Africa, unemployment has been continually increasing which is a notable concern. The South Africa policy makers have subsequently been attempting to bring a balance between the unemployment and inflation.

The connection between inflation and unemployment has been about a contentious issue in economics. In general, there is a trade-off between these two and it is nigh impossible to achieve low unemployment if inflation continues to increase. The South African data demonstrates that there was an inverse relationship between inflation and unemployment. From the 1990s, inflation rate was 14 percent. However, inflation has shown a downward movement between the period 1994 and 2002 when it averaged 7 percent. In 1980, unemployment increased by 9.8 percent to reach a staggering 25.5 percent during 2007 and found the average of 21 percent over the period. Therefore, despite the fact that expansion now increases significantly less; unemployment is extremely high (Chicheke, 2009).

Figure 2.6 Trends of Inflation and Unemployment in South Africa (1986-2016)
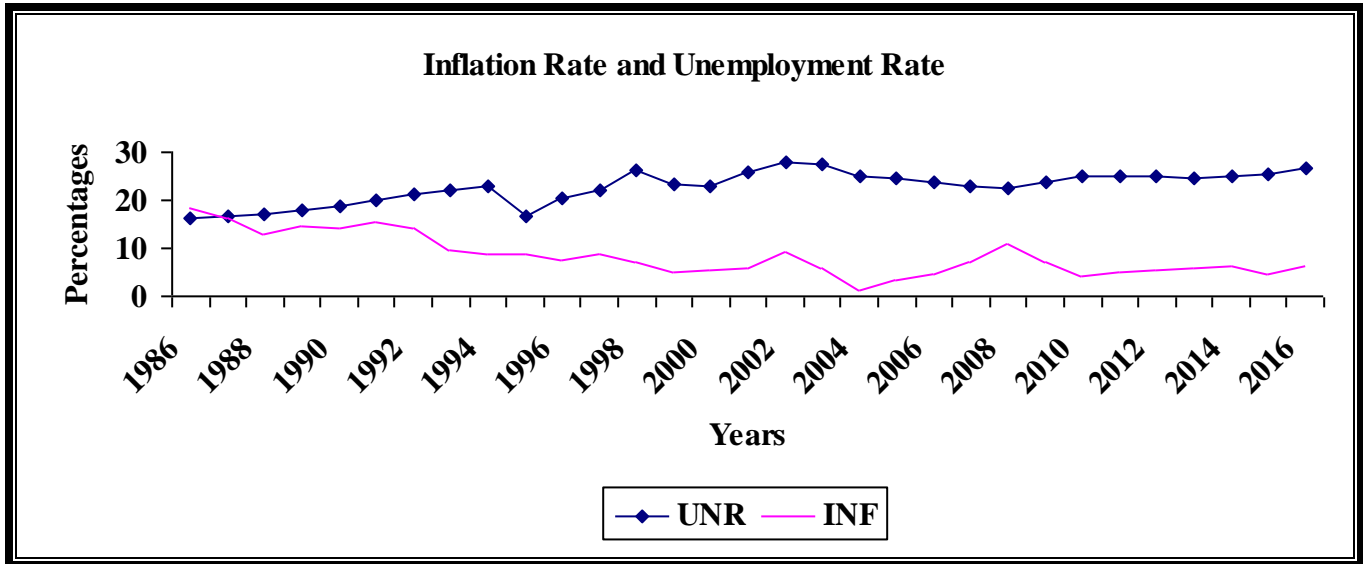
Source: Author compilation both data from IMF Bank (2017)

Figure 2.6 illustrates the trend of inflation and unemployment in South Africa for the time period 1986 to 2016. The trend in Figure 2.6 suggests that from 1986 to mid-1987 inflation was on an increase whereas unemployment was on the decrease. This shows that there is a negative relationship between inflation and unemployment. However, from 1987 to 2016, inflation decreased by showing a downward trend and unemployment showed an upward trend. According to Trading Economics (2017), inflation rate in South Africa reached 9.15 percent from 1968 up to 2017, achieving an all-time high of 20.70 percent in 1986 January and a low record of 0.20 percent in 2004 January.

High inflation would increase the costs of goods in the country. This would bring about a drop in the demand for goods and services and precipitate a high demand for labour. In this case, if prices increase for goods and services then employees would demand for higher wages and this would decline in hiring more employees. As a result, this would lead to rise in rate of unemployment in the country. Amid times of high unemployment, people demand fewer goods, which puts a burden on prices to reduce inflation.

2.4 Macroeconomic policies and strategies post-1994 in South Africa

After 1994, a large portion of South Africa's national development strategies have been executed, for instance, the Reconstruction and Development Program (RDP); Growth, Employment and Reduction (GEAR); Accelerated and Shared Growth Initiative of South Africa (ASGISA), and New Growth Path (NGP) (together with the Industrial Policy Action Plan (IPAP)), as an essential part of the African National Congress (ANC's) programme (Steenkamp, 2015).

The sustained economic growth experienced from 1994 would not have been acknowledged without the assistance of suitable government policies, plans and programmes concentrating on growth, generating employment, and wealth (Hanival and Maia, 2008).

According to Symes (2013), South Africa's unemployment policies are not comprised of one document but of various policies that address various aspects of unemployment. This segment gives a reviews of the South African macro-economic policies specifically linked to unemployment. The segment interrogates the RDP, GEAR, ASGISA, NDP and NGP policies, because these are macro – economic strategy that was chosen and intended to alleviate unemployment.

2.4.1 Reconstruction and Development Program (RDP)

As per Hanival and Maia (2008) the reconstruction and development program (RDP) was introduced in 1994, and had the essential goal in regard to eliminating racial inclinations from the monetary as well as South Africa's social structure, for to address the issues of poverty and socio-economic inequalities. The acts of injustices incurred through politically-sanctioned racial segregation had left many South African nearby the poverty line and by restricted access to sufficient education, bringing about their compelling rejection from higher experienced work opportunities, and confronting poor health care as well as housing circumstances. The RDP was intended to reverse these inequalities.

There has likewise been consistent development in individual's access towards schooling, health care, electrification, roads, media communications and public transport, even though there are much work still needed to be done in the remaking and change within society of South Africa. The RDP was a socio-economic program rather than a coordinated macroeconomic policy framework (Hanival and Maia, 2008).

Contrasted and the quantity of unskilled individuals in South Africa, the opportunities was made by this program are practically little. However, these public work programs remain significant in aiding with job creation, particularly in achieving unqualified women, youth and individuals that are disabled. These programs plays a vital part in giving a temporary way out for unemployment, as well aiding government toward encouraging the procedure of job creation and development of skill later on, as it is one of the only a handful combination of example of overcoming difficulty in the endeavors at employment creation in South Africa (Steenkamp, 2015).

2.4.2 Growth, Employment and Reduction (GEAR) Program

As indicated by Hanival and Maia (2008), the government of South Africa accordingly declared the Growth Employment and Redistribution (GEAR) macroeconomic and social development policy structure, key objectives of that strategy consist of: accelerating the economic growth to generate for work-seekers; income

will be redistributed in addition to creating opportunities that intended for poor individuals; create a society wherein sound wellbeing, schooling and additional services that are accessible for everyone; and empowering where an home environment are safe, also job environments are beneficial.

As per Visser (2004), the new equitable government made it a need toward raising economic growth, for to growth in employment and also to alleviate poverty in South Africa. Economic growth was confirmed by introducing macroeconomic policies in the long run, which was aimed to lower the barriers to trade, keep up stability of exchange rate, low rate of inflation along with moderate fiscal deficits by boosting economic growth, employment and redistribution. In 1996, this macroeconomic approach was executed, which is recognized as the Growth Employment and Redistribution Strategy (GEAR).

The objectives of this strategy are followed as: first objective be present to accomplish a macroeconomic balance within the economy through decreasing budget deficit of government and the deteriorating inflation rate. The second objective is to accomplish 6 percent growth by the year 2000, through enhancing the performance of nations in exports and fixed investments to raise growth. Lastly, the GEAR strategy designed for generating occupations through redistribution from economic growth and labour market reform (Mathe, 2002).

Moreover, this strategy was considered to be in coordinate conflict with the goals of the RDP strategy, as the reduction of poverty, income equality as well economic growth are basically insufficient toward reducing the high levels of unemployment. To accomplish the objectives that were laid out through these two strategies, South Africa required having a well formulated technique which would bring about economic growth and generation of employment (Steenkamp, 2015).

2.4.3 Accelerated and Shared Growth Initiative of South Africa (ASGISA) Program

The fundamental objective of this strategy was to reduce poverty by 2010 and cut up in unemployment by 2014. Government set a two-stage target for accomplishing the above mentioned objectives. In the initial stage, government looked for a normal yearly growth rate of 4.5 percent between 2005 and 2009. In the second stage, the average yearly growth rate was to increment of 6 percent of GDP, between 2010 and 2014 (Boshoff, 2008).

Afterwards, ASGISA managed to expand the investment rate through 5 percent of GDP, along with an expansion in government investment more than 10 percent yearly as well as an progress in the expenditure levels of both government and consumers in 2006 and 2007 (The Presidency, 2006). Be that as it may, while ASGISA had accomplished a specific level of achievement, unemployment kept on developing at the same

time as GDP growth declined. At last, upcoming of the program be present uncertain while government made no official declaration with respect to the fate of the ASGISA strategy (Steenkamp, 2015).

2.4.4 National Development Plan (NDP)

In mid-2013, the government has introduced the National Development Plan (NDP) – 2030 as South Africa's long-term socio economic development guide. This policy was adopted as the foundation and plan for a future economic and socio-economic development strategy for the country starting at 2012/13. NDP is seen as an policy diagram for eliminating poverty and reducing inequality in South Africa by 2030. So as to address the nation's socio-economic imbalance, NDP identifies the key requirements to faster growth in addition to other things and presents a guide to a more inclusive economy (South African History Online, 2017).

According to South African history online (2017), long-term strategic plan of NDP serves four broad objectives are as follows: providing overall goals for what they need to accomplish by 2030. Building consensus on the key obstacles to accomplishing these objectives and what should be done to overcome those obstacles. Providing a shared long-term strategic framework within which more detailed planning can take place in order to advance the long-term goals set out in the NDP. Creating a basis for making decisions about how best to utilize limited resources.

2.5 Conclusion

This chapter have noticed a rapidly increasing number of unemployed individuals along with moderately high levels of education; indeed a lack of skills in South Africa, along with increasing the number of well-educated individuals without employment. This additionally describes a standout amongst the most vital disputes that government is confronting: ensuring that the education system delivers the mix of aptitudes that are needed by the labour market. Despite the fact that jobs might have been generated previously and it is likewise essential to observe that a larger part of these occupations were invented in the informal sector, whereas jobs that are generally of low quality, are found to be less steady and paying low salary than formal sector jobs.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

This chapter gives a review of literature on unemployment and is split into two broad sections: theoretical and empirical literature. The chapter initially explores theoretical literature, which is based on theories of unemployment. The second part of this chapter examines the empirical literature that gives insights from studies that are relevant to the research question outlined in Chapter 1 of this study. Empirical literature may be classified by country (developed and developing), by number of years and by types of analysis used (surveys and econometric studies). Literature review is split into three sub-sections. Section 3.1 is introduction, followed by section 3.2 that covers theoretical literature. Section 3.3 examines the empirical literature on determinants of unemployment. The review of empirical literature is categorized into developed, developing countries and South Africa. Lastly, the chapter concludes this assessment in section 3.4.

3.2 Theoretical Literature

This section discusses the theoretical framework on unemployment. The theories reviewed are the classical theory, the Keynesian theory, and the monetarist theory of unemployment. Economists like Pigou (1929) and John Maynard Keynes (1936) developed a variety of models to explain and account for unemployment. There are five economic theories easily recognized in the literature for determining employment but only three theories are discussed in this study. Todaro (1985) recognised the first two classical and Keynesian models. A third one has been developed from the more recent neo-classical theory (Oniore, Bernard and Gyang, 2015).

3.2.1 The Classical Theory of Unemployment

Classical economics principles derived from Adam Smith were developed in the 19th century. The principal cause in the classical theory is that the economy is self-regulating. Classical economists uphold that the economy is often accomplished in regard to attaining the natural level of real gross domestic product; this can be obtained when the resources of the economy are fully employed. According to this theory, the solution to unemployment is to reduce wages.

The essential feature of this theory is that the labour market forces of supply and demand react to changes in real wages (Smith, 1994). Full unemployment within the capitalist economy is known as normal existence and it states that in a capitalist economy there cannot be a general unemployment. When there is unemployment, it will lead to decrease in wages and make the occupation of labour more profitable. As a

result, this will raise the need for labour and will reduce unemployment. Nevertheless, the present voluntary and frictional unemployment was identified by classical economists as a challenge for full employment (Dwivedi, 2005).

The demand for labour will be negatively sloped in all types of production for two reasons. First, a rise in the wage rate increases the costs of firms producing the commodity, forcing them to raise their selling prices. As the price of the product rises consumers will buy less of it and less output will be produced and sold. This means that less labour will be used. Second, a rise in wages makes labour more expensive relative to capital; firms will substitute capital for labour. This means that less labour will be used to produce whatever output the firms in the industry sell (Micro economic notes, 2019).

This theory relies upon law of marketplaces developed by Say (1832) who submits that the flexibility in remunerations, along with the interest rate and prices, generates some anxious moments for economists. According to Say's law of markets, supply generates its own demand. It implies that, at any time quantity is made and is sold as an entire whole, the manufacturer does not have to worry about the sale of their goods (Rohlf, 2008).

All laws are based on certain assumptions. If the assumptions are not satisfied in certain situations, at that point the law does not hold as accurate. For that reason, there are certain assumptions in the Say's law that needs to be satisfied for its appropriate application. The essential assumptions of the law are as follows: first, the application of this law requires a perfectly competitive market and free exchange economy. Second, the law assumes that all the saving is invested and income is spent immediately. Third, the law assumes that the government intervention does nothing in the market, which indicates that there is no government expenditure and revenue, taxation, and subsidies. Fourth, the law decides and limits the market size on the basis of production volume of an organization that makes total demand equal. Fifth assumption is that the needs of a closed economy allow for the application of the law.

Flexibility of the earnings rate always tries to keep the labour market in equivalence all the time. If the supply of labours goes beyond the requirement of firms for labour, then wages paid to labourers will decrease, assuring therefore that the work force is entirely employed.

Philbert (2016) argues that the classical point of view expresses that unemployment comes about because of limitations within the labour market and that happens once the real wages for a job are set over the market clearing level causing the quantity of jobs to go beyond the quantity of vacancies. Supplies resolve the demand for labour in a perfect labour market. At the point, when the market does not clear where demand is not corresponding to supply of work, there might be a possibility of unemployment occurring.

Unemployment is not an outcome of aggregate demand, but consequences of upper real wages that go beyond the market equilibrium earnings. Classical economics discussed that productivity and full employment are achieved without government intervention. As a consequence unemployment rises as the more the government intervenes in the economy.

The level of employment is determined by the interaction demand and supply. The equilibrium level of employment occurs at the point where demand and supply intersect. Classical unemployment occurs when the wages a worker is willing to accept (real wages) is in excess of those an employer is willing to pay (market clearing wage) (Khumalo, 2014).This is illustrated in Figure (3.1):

Figure 3.1 Classical unemployment and equilibrium in the market for labour
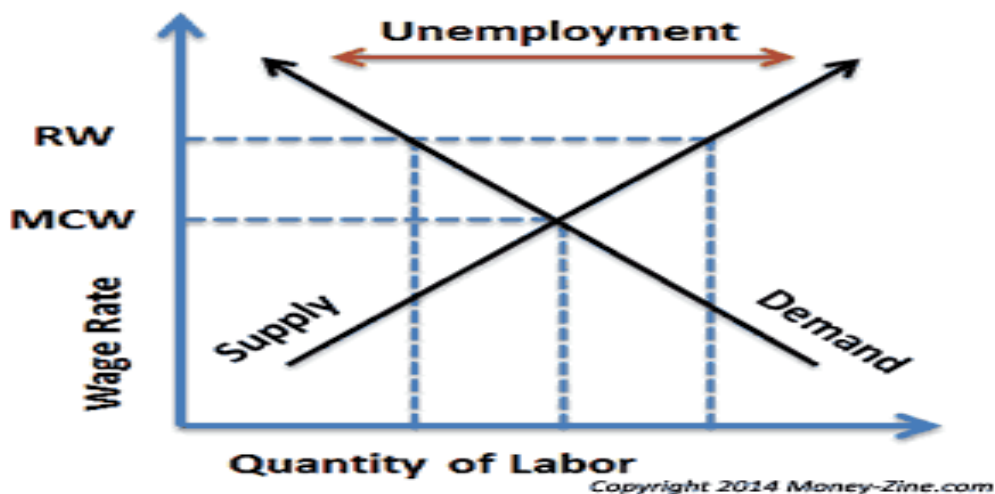
Figure (3.1) illustrates the interaction of demand and supply and the point of intersection of the two graphs that represents the equilibrium point. The equilibrium point represents the number of labourers QL who are employed at the prevailing wage rate market clearing wage (MCW). The graph represents a full employment situation. Those who are unemployed are those who are not prepared to work at the existing wage rate. When real wages (RW) are in excess of the market clearing wage (MCW), classical unemployment is greater than zero. The classical theory of employment is based on the assumption of flexibility of wages, interest and prices. This means that wage rate, interest rate and price level change in their respective markets according to the forces of demand and supply.

According to Bondi and Scott (2010), the classical theory of unemployment was not saved from criticisms. Keynes specifically criticized the classical theorists so much that he dedicated quite a bit of his book to invalidate the classical theory as a reason for his own theory. Keynes criticized the conclusion by classical

macroeconomic, that the state of full employment equilibrium could be kept up in the economy as a result of the use of Say's law of markets and the adaptability of wages, rate of interest and prices without any intervention by government (Jain, 2006).

3.2.2 Keynesian Theory of Unemployment

Keynesian theory was introduced by British economist Keynes in his book *The General Theory of Employment, Interest, and Money* issued in 1936 amid the great despair. This theory was based on a criticism of the classical theory. In this criticism, Keynes disputed that savers and investors have mismatched the procedures which might not guarantee that equilibrium happens in the money market. The costs and remunerations have a tendency to be severe, which might not contribute to equilibrium in the product and labour market. Due to this period of severe unemployment, Keynes argued to prove the deficiencies in classical theory.

Keynes started by criticising the classical economics for managing a "special case", the quantities of that "happens not to be those of the monetary society in which we in reality live." Keynes takes a full-length section titled "The Postulates of Classical Economics" (Knight, 1937) to argue his case. The standard Keynesian theory about unemployment is an expansion on unemployment that would reduce income, consumption, and also reduce aggregate output. In this theory, unemployment could be reduced if money wages were to decline.

According to Mafiri (2002), traditionally the concentration of Keynesian theory has been on cyclical joblessness. The simple Keynesian clarification of unemployment points to inadequate spending, for example a demand insufficiency. This makes the macroeconomic equilibrium to be underneath the level of full unemployment. In more present times of Keynesian theory, the framework of total demand and supply - a comparative story are advised for an equilibrium point to one side diagrammatically of the long-run supply curve aggregate supply. This equilibrium occurs because of a drop in aggregate demand.

Figure 3.2: Labour Market and Keynensian theory of unemployment
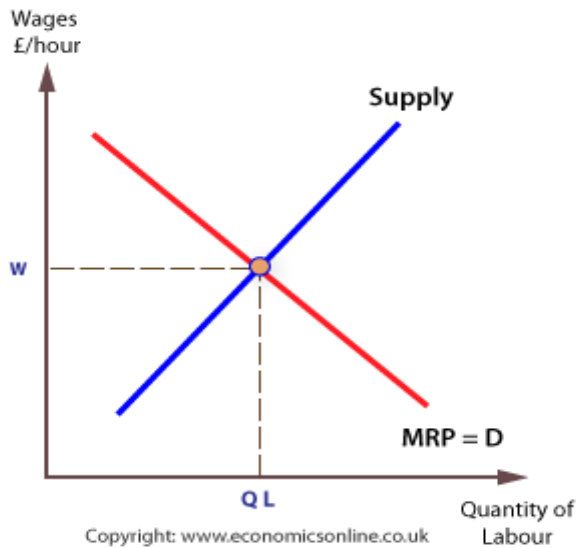
Source: Economicsonline.co.uk, (2019)
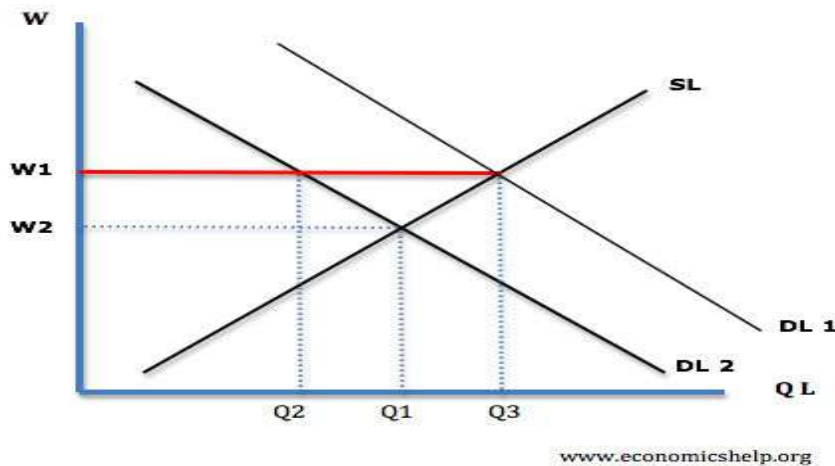
Source: Economicsonline.co.uk, (2019)

First graph in Figure 3.1 represent for the Unemployment and Equilibrium in the Labor Market. At the equilibrium wage (W), the equilibrium quantity (Q) of labor supplied by workers should be equal to the quantity of labor demanded by employers. In a labor market with flexible wages, the equilibrium will occur at wage (W) and quantity (Q), where the number of people looking for jobs (shown by S) equals the number of jobs available (shown by D) (Murwirapachena, 2011).

The Keynesian assumption that wages are sticky downwards, in other words meant that workers would not be happy about taking wage cuts and would resist them. This means that wages would not necessarily fall enough to clear the market and hence unemployment would remain. Figure 3.1 explains the behaviour of wages in a Keynesian view. As shown by second graph in Figure 3.1, when the demand for labour falls from DL1 to DL2 (maybe due to the start of a recession), the wage rate should fall from W1 to W2, so that the market clears. However, Keynesians argue that because wages are sticky downwards, this would not happen, the wage rate would remain at W1 and unemployment between Q2 and Q3 would persist. The Keynesians term this unemployment the demand deficient unemployment (Murwirapachena, 2011).

Keynes' theory of employment depended on the short run. In the short run, he expected that the components of job creation, for example capital products, supply of manual labour, technology, and productivity of manual labour, stay unaltered while deciding the level of employment. Consequently, according to Keynes, level of employment is dependent on national income and yield.

According to Smith (1194), two theories emerged from Keynes's 1936 work. First, the labour market fails to clear because of money wage rigidity. Yet because of the comparative flexibility of prices, the product market clears. As in the classical analysis, unemployment is associated with excessive real wages. Second, both the labour market and the product market are characterized by excess supply. This is more obviously keynesian unemployment in that it is associated with deficient product demand and not with excessive real wages. The first facts means that because of the money wage rigidity, that is, downward inflexibility of money wages, results in involuntary unemployment of labour. Fact two means exhibiting excess supply in both the product and labour market.

Keynesianism is the most disagreeable schools of thought during that time. It originated around 1929 from the neoclassical schools of thought. Keynes utilized numerous neoclassical hypothesizes and strategies, despite the fact that he analyzed them pointedly. Keynes's framework depended on a subjective psychological approach, however like a few different other economists before him; he had a macroeconomic approach to the issue of unemployment (Smit, 1996).

According to Smit (1996) the characteristics of the Keynesian school as follows: Keynes and his followers had a macroeconomic way to deal with the determinants of the aggregate or total of consumption, savings, income, output and employment. They focused on the significance of total demand as the direct determinants of national income, output and employment. Instability in the economy arises from changes in investment plans that make national income and output vary by a greater amount. Wages and prices have a tendency to

be unbending. This school encouraged government intervention through proper fiscal and monetary policies in order to support full employment, price stability, and economic growth.

In the middle of the 1930s, Keynesian economics addressed pressing issues arising from the great depression and unemployment. Not every one of the ideas of Keynes and his supporters are acknowledged. For example, the Chicago school dismissed the Keynesianism and requested that fiscal policy is commonly ineffective and that severe recessions are directly outcomes from inappropriate monetary policy (Smit, 1996).

According to Jain and Khanna (2010), the investigation of joblessness occurrence is that Keynes reasoned that the focal cause was the inadequacy of aggregate demand. Therefore, Keynes recommended that unemployment possibly brings to an end the trends by expanding the total demand. There are three components of total demand which are: first, the need for consumption products, second is need for investment foods, third is government expenditure. Keynes believed that battle with unemployment can be done through the intervention of government and achieve the objective of full employment.

The Keynesian theory of unemployment deals mostly with conditions satisfying the following description: there are abundant supplies within the labour market. All in theory profitable production possibilities are used. The supply of the goods is equivalent to the quantity produced, and the equivalent to the demand for goods. The nominal wage rate is unyielding downwards, and in this way the economy is in harmony despite the way that there is over abundance supply in the labour market (Holte, 1988).

According to Ferrari Filho (1996), the first economist was Patinkin (1956) and he formalised a Keynesian theory that regards unemployment as disequilibrium in economic circumstances. The Keynesian disequilibrium models were likewise investigated in the works of Barro and Grossman (1971), Benassy (1975), and Malinvaud (1977). Dissimilar to Patinkin, who breaks down the Keynesian disequilibrium because of inability to acquire short-run flexible wages in the labour market, Barro and Grossman create a general disequilibrium model, both for booms and depressions, to indicate proportioning rules in the products and labour markets when the vector of costs and wages is exogenous.

According to Morake (1997), the new Keynesian economic theorists proposed another contiguous source of unemployment. this contingency is that unemployment can be brought about not only, as it does in the neo-classical combination, by wages that are too high, but because of lacking specific levels of final demand in connection to the general level of prices and money ages. At the point when unemployment is achieved by this "nominal" source, it is now deliberated as "Keynesian" unemployment while on the other hand the real wage variation is referred to as "classical" by Shaun and Hargreaves (1992, pp.31). Unemployment as a phenomenon still causes displeasure and anxiety amongst economists.

Moreover, there are numerous criticisms against Keynesian theory of unemployment namely, (1) the theory does not give complete way out of unemployment: Keynesian theory does provide way out of one of the types of unemployment. It only manages cyclical unemployment. However, Keynes did not endeavor to resolve frictional, technological and chronic unemployment of underdeveloped nations. Additionally, he did not elaborate how to protect fair unemployment, as well as an entire theory ought to disclose how to get both full and reasonable employment. (2) Unrealistic hypothesis of the perfect rivalry. (3) There is no determinate purposeful relationship among actual demand and occupation: Keynes did not give any confirmation of this practical association. There is no immediate connection amongst effective demand and employment level. Actually everything relies on the complex interrelationship of wage rates, prices and money supply. (4) Is completely aggregated in nature: it is exceedingly aggregative on the grounds that it manages total concepts, for example, aggregate consumption, aggregate investment, and aggregate yield. (5) The unnecessary significance to actuation to invest: Keynes hypotheses specially depend upon investment to raise occupation. Studies bring up that different determining factors of occupation were overlooked by Keynes.

Additionally, (6) Keynes' theory of consumption disapproved Keynes utilization work on the premise that it is absolutely quantitative, yet utilization work has qualitative side too. Likewise this brings up the fact that genuine experience and empirical evidence does not help Keynes' utilization work. (7) Keynes overlooks the long-run issue: Keynes expects that ASF is given. Therefore, it is a short-run hypothesis and gives resolution for short-run employment issues. (8) Keynes theory is not generic: Keynes hypothesis is not valid in any place and all over. Its application, as best, is restricted to modern forward-looking nations and it has insufficient significance on immature nations like India. (9) Keynes overlooked accelerator influence: accelerator and multiplier all work together. Multiplier refers to the influence of investment on consumption and the accelerator demonstrates the influence of consumption on investment. In any case, Keynes overlooked the accelerator influence entirely. (10) There is no clarification of partial equilibrium: Keynes' theory offers no way out to despair in an individual or specific industry.

3.2.3 Monetarist Theory of Unemployment

According to Garrison (1984), Milton Friedman is known as the well-known monetarist and has disagreed with the economics of John Maynard Keynes. This theory direct criticism of keynesian economics theory, not because of its implications for the way taken by macroeconomic theory however as well because of its implications for economic policy. This prompted the advancement of a counter unemployment theory known as the Monetarist theory of unemployment.

Monetarism is an economic theory and stated the supply of money is the most vital driver of economic growth. As the supply of money rises, individuals will demand more, factories will produce more and

generating new jobs. This theory cautions that expanding the supply of money only gives a temporary enhancement to economic growth and creation of employment. As time goes on, it will raise inflation and when demand exceeds supply, prices will increase. Monetarists believe monetary policy is more well founded than fiscal policy.

In contrast to the Keynesian theory, the monetarist policy would better help the function of encouraging subsequent profitable accumulation. Monetarist reasons for capitalist emergencies greatly depend on the application of Milton Friedman for a full-employment model which is the natural rate of unemployment. The natural rate of unemployment is defined as the equilibrium within the labour market, and there no additional supply or demand within labour. At the point when unemployment goes beneath the natural rate by additional demand, the additional occupations would have an upward burden on remunerations, and this would eliminate the greater rate of unemployment as well as some long-term changes in the yield.

Like with the Keynesian theory, the monetarist theory is concerned simply with cyclical unemployment or short-run. However, its worry is not different from the Keynesian view in that the monetarist theory retains that involuntary unemployment is not a long-run issue, the economy is naturally steady and self-stabilizing, as well as it would unexpectedly come back to a full employment equilibrium after any unsettling influences. Consequently, fluctuations in occupation would be insignificant and impermanent. The common activity of the market forces of demand and supply would rapidly reduce unemployment. In the framework of total demand and supply this implies that the supply changes happen rapidly. In genuine fact, the long run drive back to full employment equilibrium is guaranteed and crucial (Mafiri, 2002).

Monetarist policies put excessive importance on controlling the money supply to regulate inflation. It likewise runs together with strict budgetary administration and for the most part a faith in laissez-faire is a free market supply side policy. The limitations of the monetarism hypothesis are as follows: growth in money supply is inconsistent because of structural change in economy and regulatory money supply is worthless. By regulating the money supply the act could possibly lead to recession.

3.3 Empirical Literature

This section will explores the research of national and international studies on determinants of unemployment. A wide range of evidence derives from developing countries, whereas literature from developed counties and South Africa is limited. Empirical literature is categorized by nation (developed and developing), by number of years and by types of analysis used by studies (surveys and econometric studies). Moreover, the empirical review in this study follows similar concepts where literature review is categorized in developed and developing countries. Empirical literature is divided into three parts: 3.3.1 evidence from

developed countries studies, followed by 3.3.2 evidence from developing countries studies and lastly, 3.3.3 empirical evidence from South African studies.

3.3.1 Empirical Evidence from Developed Countries

Fabiani, Locarno, Oneto, and Sestito (2001) studied the causes of unemployment fluctuation is an Italian case. The variables used in this model are unemployment rate, wages, GDP at constant prices, prices and labour share. Data used from the period of 1954 to 1969 having different time frames like unemployment rate used annual data obtained from ISTAT, wages data used annual time series, GDP at constant prices data used quarterly time series, prices data with different base year obtained from ISTAT as well as seasonally adjusted, and labour share used yearly data series. The researchers developed a Layard-Nickell type model; it was estimated and recognized by utilizing a VAR approach. The advantage of using this approach was embraced for determining the structural and cyclical unemployment. However, the results obtained from this approach show that the rise in Italian unemployment was non-demand factors such as output and labour supply shocks as well as the fully permanent shocks to the wage bargaining plan. The researchers recommend that the results of the study are still preliminary and further research needed to be done by using a better model with other sources of innovation.

Brüggemann (2001) analyzed the causes of German unemployment by using a structural vector error correction model (SVECM) framework. The study utilized quarterly, seasonally unadjusted information for the period 1970 to 1998. The aim was to estimate an exactly identified subset SVECM, which has short run parameter restrictions. The results obtained from a cointegration analysis reveal that there is a long-run relationship among real wages, productivity and unemployment that are interpreted as a wage setting relation. The study identified meaningful structural shocks by using of subset VECM and evaluates their significance for unemployment through impulse response analysis and also forecast error variance decompositions. By comparing all these results the study found that using the subset VECM it would reduce estimation uncertainty. Moreover, by comparing previous studies for West Germany, this study found that unemployment is equally determined in the long-run by technology, labour supply and demand shocks.

Linzert (2004) addressed the causes of German unemployment and also the dynamic impact of different macroeconomic shocks on German unemployment. The study used theoretical framework presented by Dolado and Jimeno (1997). A structural error correction model was employed for Germany data for the period 1969 to 1998, together with unified Germany from 1991. The data of this study found the factors to be cointegrated, in contrast to Donald and Jimeno (1997). The goal of the model was to decide the shocks that may influence the labour market equilibrium. The results reveal that shocks of technology and wage have only short-run effects on unemployment. A demand shock shows the expected impact as unemployment

considerably dropped in the short or medium run whereas the impact disappeared in the long-run. A labour supply shock significantly rises over a horizon up to three years. Price shocks have a most determined impact on unemployment with unemployment coming back to its pre-shock level following six years. In addition, the forecast error variance was generally clarified by labour supply, price and demand shocks. The researcher understands that the study fails to observe deterioration in unemployment to levels; therefore further research should have been done to determine the combination of shocks as well as the time series framework.

Baccaro and Rei (2007) explored the institutional determinants of unemployment in 18 OECD countries. The countries in this study are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States. The time series and cross-sectional dataset contains a series of macroeconomic and institutional measures for 18 OECD countries between 1960 and 1998. The study shows an increase in interest rates would raise unemployment and those nations that enhance the independence level of their central bank will end up improving the unemployment rate as well. Additionally, fluctuations in employment protection would benefit the replacement rates, and tax wedge appear negatively allied with fluctuations in unemployment, even though the coefficients are insignificant. One of the institutional variables found to be positively allied with changes in unemployment and the union is the density change variable. On other hand, the study also found interesting outcomes from the analysis of the bargaining coordination variable that turns out to be an insignificant predictor when fixed effect method used. However, this result is differs with most literature which ascribes a negative effect of this variable on unemployment.

Bassanini and Duval (2007) examined the effect of structural policies and institutions on total unemployment crosswise over OECD countries. The 20 OECD countries that study used are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States. The study employed pooled cross-country or time-series econometric analysis to investigate the immediate impact of policies and institutions on unemployment as well as the model which was evaluated for a sample of 20 OECD nations from the period 1982 to 2003. By contrast, and in accordance with various past investigations, no significant effect of employment protection legislation (EPL) on total unemployment was found. Broad sensitivity in this study determines that these outcomes are strong through specification, datasets and econometric techniques. The result found for Spain is consistent with earlier studies done by Bentolila and Dolado (1994).

Bakas and Papapetrou (2012) investigated the nature of Greek unemployment taking into account cross-sectional dependence amongst Greek areas as well as the existence of structural breaks. The quarterly data was used for unemployment for the 13 NUTS-II areas for the period of 1998:Q1 to 2011:Q2 and all the data

were obtained from the Hellenic Statistical Authority (ELSTAT). The study employed recently developed as well as more powerful panel unit root tests, for instance the Lagrange Multiplier (LM) used for to evaluate if regional unemployment rates are subject to hysteresis behaviour. The outcomes of the study present some evidence in favour of the hysteresis hypothesis for unemployment rate of Greece, even though this evidence becomes weaker, if they change analysis in the panel of the 13 Greek areas. The outcomes obtained from the empirical research specifically based on the panel root tests which account for the way that unemployment in Greece is subject to a structural break for both mean and the slope of the series, therefore the null hypothesis of the unit root was not rejected and indicated that the Greek regional unemployment series are non-stationary with the existence of a structural break.

Tercek and Simmons (2014) studied the determinants of European and United States unemployment by using annual data of every variable for France, Germany, Spain, and the United States for the period 1990 to 2012. The aim of the study was to establish the relationship between unemployment and a set of economic factors along with social indicators. The results show that every one of the seven regression models was statistically significant, with a few of the individual variables in each model. However, after running the seven regression models in this study and realising that there was a high level of correlation between a numbers of the variables, this would likewise be beneficial to take out a portion of the variables from the models and run a new regression model to limit the impact of these variables.

3.3.2 Empirical Evidence from Developing Countries

Foley (1997) investigated the determinants of unemployment in Russia, amid the beginning of economic transition. The existing data obtained from the Russian Longitudinal Monitoring Survey (RLMS), are a household-based survey intended to steadily measure the extent of the impact of economic reforms on the welfare of household and individuals in Russia. The data was divided into two phases: in one phase collected four waves of data and in phase two collected two waves of data. Each phase has a separate panel dataset. In phase one data used includes Round 1 (June to August, 1992), Round 2 (December 1992 to March 1993), Round 3 (July to September, 1993), and Round 4 (December 1993 to February 1994). It employed competing-risks, discrete-time waiting model augmented toward unobserved heterogeneity for evaluating the period of unemployment. The results obtained from competing-risks, discrete-time duration model reveals that married women go through expressively longer periods than married men before finding occupations. Local labour market demand conditions significantly impact on period. However, the results obtained in this study are powerful to the unobserved heterogeneity.

Rocha and Divino (2002) examined the determinants of unemployment in Brazil and Mexico. All the data used quarterly was from the period of 1990: I to 1999: III for both countries. Moreover, all the Brazil data

was obtained from the Central Bank, and the Brazilian Institute of Geography and statistics (IBGE), whereas, all the data of Mexico was obtained from the Central Bank of Mexico, and the Instituto Nacional de Estadistica, and Geograffa a informatica (INEGI). The study adopted a dynamic analysis derived from Autoregressive Distributed Lag Models (ADL) to estimate relationship among the variables. Theoretical modeling established on models of corporate funds and the firm profit-maximizing decision recommended that unemployment is positively related to real interest rate, real taxes on consumption and real exchange rates. The finding indicates that unemployment is positively correlated with interest rates and negatively related to taxes on consumption for both countries. In addition, an exchange rate has a negative correlation with Mexico unemployment and has an positive correlation with Brazilian unemployment. Maybe this throws light on the fact that the Brazilian and Mexican governments have sought to reduce unemployment targets by means of monetary approach, thereby ironically increasing the public spending.

Valadkhani (2003) researched empirically the sources of unemployment in Iran. The study employed general-to-specific econometric approach and a simultaneous equation model along with annual time series data for the period of 1968-2000. The outcomes from the empirical research clearly show the following five elements determine significant variations in the unemployment rate that are: inflation rate, output gap, economic uncertainty allied with an unstable currency, the real growth of investment, and a dummy variable capturing the devastating impact of the Iraqi war. The study likewise found that for the post-1979 era there was an existence of trade-off between inflation and unemployment that indicates Philips curve holds for this period. However, having a high along with the steady inflation rate deteriorated the domestic currency and will raise economic instability. Furthermore, the study recommends that the government of Iran ought to invigorate private investment and rescuscitate the lethargic economy before it turns out to be past the point of no return.

Kupets (2006) examined the duration about determinants of unemployment in Ukraine and the impacts of numerous individual qualities. The study used the various unemployment spell data obtained from the Ukrainian Longitudinal Monitoring Survey (ULMS) from the years 1998 to 2002, by estimating the cox proportional hazards model with two competing risks. The outcomes of the focal estimation are commonly similar to those obtained in developed and other transition nations. The outcomes of this study are steady with the finding acquired by Foley for Russia (Foley, 1997).

A study was examined by Türkyılmaz and Özer (2008) on the effects of several macroeconomic shocks on unemployment in Turkey by utilizing a structural vector error correction model (VECM). A monthly time series data were used for employment, real wage, productivity, consumer price indexes, and unemployment rate variables from the period of 1988:10 to 2004:03. All the data were obtained from Economic Research

and Consulting except consumer price indexes that was acquired from Central Bank of the Turkish Republic. The results obtained from Phillips Perron and the Augmented Dickey Fuller unit root tests shows that all the variables were stationary at I(1). Therefore, the Johansen cointegration analysis was applied and the results reveal that all the variables were cointegrated. Moreover, the results of the cointegration vectors disclose that there are two long-run relationships which are interpreted as the wage setting and the labour demand. A structural VECM model was obtained from by limitations in the long-run impact conditions by using of the model from theoretical side and the results obtained from the cointegration analysis. Furthermore, the outcomes of the Impulse-Response analysis of the structural VECM model presents that technology and labour supply shocks have a positive effect on Turkish unemployment in the long run. While, wage and labour demand shocks have a negative effect, which significantly declines since there is a limitation in the long-run. Additionally, a wage and labour shock does not have permanent effect on unemployment and also argued that wage and the labour demand shocks are the main factors of unemployment which produce negative impact on Turkish unemployment in the short-run. Alternatively, other variables for instance the technology, price and labour supply shocks are also vital factors of unemployment but in the long-run not in the short-run. The study recommends that suitable new job areas should be provided; high technology consumer goods must be manufactured and exported. Supply side deflationary policies should be undertaken in terms of unemployment and also new policies should be followed to create an effective labour market in order to combat with unemployment.

Eita and Ashipala (2010) inspected the determining factors of unemployment in Namibia for the period of 1971 to 2007. All the data were found from the Cornwall et al. (1991), the national planning commission (1999; 2006; 2008), Hartmann (1988), Bank of Namibia (1991; 2004; 2006; 2007), and ministry of labour and social welfare (1997; 2000; 2004). The unemployment model used macroeconomic factors and evaluated by employing the Engle – Granger two-step economic procedure. The outcomes of this study discovered the presence of a reverse correlation among unemployment and inflation in Namibia. Moreover, the outcomes also discovered that unemployment responded positively in case where real yield would below than possible yield and if wages rise. In addition, a rise in investment would lead to decrease unemployment significantly. The study recommends that it was essential to raise the yield up for the country's potential and they have likewise recognized a requirement about wage flexibility in Namibia. Furthermore, the study also emphasized there is a necessity to raise investment for to reduce unemployment.

Subramaniam and Baharumshah (2011) studied the determining factor of unemployment in the Philippines using yearly data form the year of 1974 to 2003 by employing the Autoregressive Distributed Lag Method (ARDL). The main objectives of the study are to decide whether a long-run relationship does exist among

unemployment, job vacancy, foreign direct investment, economic growth, government spending and inflation. Second one is to recognize the main macroeconomic variables which define unemployment in the Philippines. Last and third one is to examine the effect of political changes on unemployment. The result of the study discloses that the labour market in Philippines might be influenced by an issue of structural unemployment. As well as, political stability might likewise slow down economic growth also exacerbate the issue of unemployment in the Philippines. Therefore, this is very crucial for stakeholders of the Philippines should engage in active labour market policies and maintain stable government to the Philippines economy.

Kyei and Gyekye (2011) investigated the study based on the determining factor of unemployment in Limpopo province in South Africa. A secondary annual census data was used, that was obtained from Global Insight and used three different methods of analysis, which are regression, principal components and cluster analyses. Unemployment rate was used as dependent variable, whereas, race, age, education, gender and GDP was utilized as explanatory variables in the study. The outcomes of the study reveal that unemployment was determined at qualification below the degree. There is no meaningful relationship between GDP, matriculation and youth, male and unemployment. Furthermore, there are factors that known as the specialists of unemployment in Limpopo province in South Africa. The study recommends that provincial government should make sure that all school children have free access to schooling up to post-secondary level. Encourage private sectors in order to support learners and old age people to study. Discrimination should stop against women in job provision. Women should be treated same as men and should be given equally jobs.

Bakare (2011) examined the determinants of unemployment in Nigeria. As per Bakare (2011) the issue of urban unemployment known as one of the extreme economic dispute that Nigerian policy makers was confronting it. This research was done for recognizing the fundamental impacts of the urban unemployment crisis in Nigeria. The study utilized time series secondary data from the period of 1978 to 2008 with 30 observations and all the data obtained from the World Bank Digest of Statistics, Central Bank of Nigeria Statistical bulletin and International Financial Statistics. Additionally, data were also obtained from website, journals and newspapers. A parsimonious error correction mechanism and Engle Granger's two-step procedure was utilized so as to test the significant relationship amongst the variables. The results obtained from the empirical investigation revealed that the rising of nominal wages along with the faster growth population that influenced the supply side by a high as well as rapid progress within labour force relative to the absorptive capacity of the economy and it look as if to be the fundamental determining factor of high unemployment in Nigeria. On other hand the econometric outcomes reveals that there was a requirement for the government to initiate the direct measures that capable of creating jobs through industrialization and

mechanization of agriculture. The study recommends that programs of integrated rural development, re-introduction of economic activity and social investment towards the rural areas that should be set out upon to make an appropriate rural-urban economic balance.

Dogan (2012) studied the macroeconomics variables and unemployment in Turkey by responding of unemployment for to select macroeconomics shocks from the period of 2000:Q1 to 2010:Q1. The study used quarterly data set and all the variables are containing seasonality. The vector autoregressive (VAR) model was utilized for to look at the dynamic linkages amongst the variables considered. The outcomes of the study reveal that every one of the variables that are utilized as a part of this investigation have a statistically significant effect on unemployment and they do not extract statistically significant effect in excess of five periods. Furthermore, GDP growth, export growth and inflation have a negative effects on unemployment whereas, exchange rate, interbank interest rate and money growth removes negative effects on unemployment. Furthermore, the results of this study are steady with earlier literature. In conclusion, the results are likewise steady with Phillips Curve and Okun's law suggestion.

Peker and Bolukbas (2012) empirically studied the investigation of the causes that determined the unemployment in Turkey. The study employed Johansen co-integration technique by used of data from the period of 2000:Q1 to 2011:Q1. The findings of the results from a cointegration reveals that relations has been founded among the variables, an increase in confidence index of real sector would lead to reduce in unemployment rate as expected however an increase in the number of collective bargaining agreements for private segment would have an increasingly affect unemployment. Additionally, the results obtained from error correction model showed that coefficient is negative and statistically significant as it was anticipated. Furthermore, as indicated by the outcomes of this study, unemployment is caused by the upcoming opportunities of the real sector and the outlook of the union about workers remuneration in Turkey.

Maqbool *et al*., (2013) analyzed the study on determining factor of unemployment in Pakistan from the period of 1976 to 2012, by employing Autoregressive Distributed Lag (ARDL) method to test the determining factor of unemployment. The aims of the study are to examine the empirical relationship amid the dependent variables and independent variables. The empirical result of the study shows that the population growth, inflation, gross domestic product, and foreign direct investment are the noteworthy determining factor of unemployment in Pakistan for both in short and long-run. Moreover, the result of the CUSUM and CUSUMSQ test shows that the model is structurally steady within the critical restrictions of 5 percent. The study also shows the presence of Phillips curve in short-run also in long-run within Pakistan. It's recommends that the policy should attract local investment to increase foreign direct investment and

government should control population growth. In addition, government should improve law and order to regulate the corruption in order to raise the foreign direct investment and reduce the unemployment.

The study investigated by Bashier and Wahban (2013) on the determinants of employment in Jordan using a time series analysis from the period of 1980 to 2012. The study employed fully modified ordinary least square (FMOLS) method and was suggested by Philip and Hansen (1990) for providing optimal estimations of co-integration regression. The outcomes of the Johansen co-integration discovered that every one of the factors is integrated of order one I (1) and presence of long-run equilibrium amongst the factors. In addition, the empirical result states that every one of the variables has a significant positive effect on the level of employment in the labour market of Jordan. The study recommends that the results obtained by this study possibly the government of Jordan can make use of it for future follow-up and reexamination of the economic development programs. Additionally, the outcomes revealed that real gross domestic product had a significantly affected work and an increased in real gross domestic product by 10 percent would give rise to level of employment by 6.78 percent. Moreover, one of the significant strategies that were recommended was to attract the foreign direct investment into Jordan through setting out a few of economic strategies which would make Jordan more attractive to foreign investors.

The study investigated whether by ensuring that do all the variables have a comparable impact for all the three nations or not by analyzing a cross-country study on the macroeconomic determinants of the unemployment for India, China and Pakistan (Asif, 2013). Annual time series data was utilized from the period of 1980 to 2009. All the data were collected from the four different sources by employing cointegration, granger causality and regression analysis. The outcomes found from the regression analysis revealed that there was a significant impact of the considerable number of variables for each of the three nations. There are a positive relationship between gross domestic product and unemployment in Pakistan, this happened because of the poverty level and fail to utilize fully of foreign investment. The results obtained from granger causality disclosed that bidirectional causality does not occur among some of the factors for every one of the three nations. Moreover, the results obtained from cointegration states that long-run relationship does exist amongst the variables for every one of the models.

Additionally, the study done by Asif (2013) recommends few facts followed by: policy makers should be enhanced distribution of income for Pakistan for to have positive outcome of growth on the unemployment rate. Government needs to have appropriate utilization of foreign investment for to enhance the growth of the country and will help to diminish unemployment rate. Training opportunities needed to be established for to develop expertise of old and new employees of organizations to embrace the ups and downs of the environment. Government should generate more jobs opportunities for both educated and uneducated

individuals. Furthermore, the study also recommends that further research can be done by use of other variables such as age, gender, qualifications, sectors, wages and many more for to have a broader view toward unemployment. Lastly, because of the restricted period and resources, the study utilized exceptionally restricted data and a detailed research should be possible by having data of more nations and utilizing of big time frame.

Baah-Boateng (2013) analyzed the study on the determining factor of unemployment in Ghana by employing a binary regression estimation technique for three different cross-sectional datasets in 1991/92, 1998/99 and 2005/06 for examining determinates of unemployment from the outlooks of both request and supply of labour. The variables of the investigation are sorted into three different factors. Supply-side factors are age and education. Demand-side factors are employment-type dummies and full-time job dummy. Other factors are female dummy, married dummy, location variables, ecological variable, poverty dummy, and reservation wage. The results of a cross-sectional estimation of a probit regression model states that there was a robust impact of demand factors on unemployment in Ghana, and indicate a low generating in employment would effect of economic growth. Whereas, the result obtained from empirical analysis also found similar results as a cross-sectional estimation. Reservation wage also have an expanding impact of unemployment. The study recommends strategies that government should encourage investment in agriculture and manufacturing segments that would increase output of employment elasticity. Lastly, a downward review of expectancy on the part of jobseekers as far as their reservation wages possibly will diminish unemployment in Ghana.

Msigwa and Kipesha (2013) inspected the elements that define the youth unemployment in Tanzania, also recommended advancing methods to reduce the issue of unemployment. Secondary data was used which obtained from the National Bureau of Statistics integrated labour force survey of 2006 that is most existing survey so far. The Multinomial Logistic Regression model (MLM) was employed in this study for to analyses the determining factor of unemployment in Tanzania. Based on the outcomes obtained in course of the research, numerous recommendations were prepared followed by: the government of Tanzania as well as the policy makers has to analysis the laws and regulations of job market for to advance smooth changeover of youth from education toward job market. The government ought to generate more formal occupations and enhancing job market regulations relating to youth individuals by ensuring that each and every youth with education or expertise understand their investment in education also add toward the nation improvement. Additionally, the government and policy makers ought to encourage the laws and regulation relating to gender balance in the job market so as to give equal opportunity to the youth with the similar level of expertise or education.

An examination was conducted by Cheema and Atta (2014) reviewed the economic determining factor of unemployment within Pakistan by utilizing ARDL bound approach. It employed time series data for the period of 1973 to 2010. The aim of this examination was to discover the relationship amongst unemployment and other factors for instance output gap, uncertainty, productivity, trade openness, and gross fixed investment in Pakistan. The finding of the results states that amongst unemployment and output gap, productivity and economic uncertainty has a positive and statistical relationship; whereas gross fixed investment and trade openness had a negative and statistical relationship with unemployment. According to the policy level it is recommended that productivity gap ought to be diminish and government should also adopted a depreciation policy along with reduction in trade restriction would results in an rise in trade openness, as well as also encourages private investment and private sectors. Which would help to decrease in imports and increase in exports of the country, this would eventually decrease the level of unemployment.

Kamran, Shujaat, Syed and Ali (2014) explored the study on the determining factor of unemployment in Pakistan. The study employed secondary data from the period of 1981 to 2010 utilizing regression model, as well as descriptive stats and graphs. The unemployment rate is dependent variable whereas; population growth rate, real gross domestic product, political regime, foreign direct investment, and literacy rate are independent variables. The objectives of the investigation are to examine the relationship among unemployment and its determining factor in Pakistan, fundamental factors of unemployment, trends of independent factors associated with the examination, and suggested recommendation for lessening the unemployment in Pakistan. The limitation of this research was the primary research that give more information than secondary information on the people who are unemployed and carried out limited factors where as more determining factor can be included such as inflation, poverty and many more to analysis depth in future. The results show that interest rate, gross domestic product, and literacy rate significantly affect unemployment rate, whereas foreign direct investment and literacy rate have a positive relationship with unemployment rate. Moreover, foreign direct investment and population growth has a statistically insignificant relationship. The study recommends that government should take strong action for further development in law and order circumstance in Pakistan. Government ought to enhance industries for to generate better occupation opportunities. Government should improve budget for education sector for better employment openings. The study suggests that there is need for further study in order to get better outcomes of the results.

Aqil, Qureshi, Ahmad, and Qadeer (2014) analyzed the study on the determining factor of unemployment in Pakistan. According to the study unemployment creates lots of economic and social problems in the economy. The goal of this examination was to discover the elements that influence the unemployment in

Pakistan. This investigation likewise endeavors to decide the elements that affect the work level in Pakistan. A time series data was utilized for the period of 1983 to 2010 and every one of the variables data was collected from IMF, World Bank and Mundi. The study employed correlation and multiple regression analysis. The results obtained from the correlation and multiple regression analysis reveals that there are no meaningful relationship of GDP Growth rate and inflation with the unemployment rate. On the other hand, foreign direct investment and population growth rate found to have a significant and negative relation with Pakistan unemployment rate. This implies that greater the foreign direct investment and population growth would prompt lessening the rate of unemployment in the nation.

Khumalo (2014) investigate the determinants of unemployment in Swaziland by using cointegration analysis from an econometric perception with annual data from 1991 to 2012. The aims of this research is to examined the possible causes for the high unemployment rate in Swaziland and to recommended possible policy that could be applied toward alleviating the problem of unemployment rate within the country. The study has identified the potential variables that determined unemployment in Swaziland are gross domestic product, inflation and government spending. The results present the existence of a long-run relationship between unemployment and its determining factors. The granger causality and model stimulation experiment areas well conducted to look at the relationship between unemployment and its determinants. The result of the simulation experiment reveals that the linear model is a best appropriate model since the forecasted unemployment tracks the genuine values of unemployment.

Arslan and Zaman (2014) explored the study on unemployment and its determinants in economy of Pakistan from the period of 1999 to 2010. The study employed Ordinary Least Square Regression Model (OLS) for determining the results of the factors of unemployment. All the data was acquired from economic survey of Pakistan and IFS. The results obtained by the study reveals that foreign direct investment, gross domestic product and inflation rate (CPI based) negatively impacted the unemployment. Where population growth rate have a positive impact on unemployment and it also add to unemployment in Pakistan. However, as per finding of this investigation, population growth is the major influential factor of unemployment. Arslan and Zaman (2014) also saw that there is a tradeoff between the inflation and unemployment in Pakistan economy anyway there is a need of further research for to look at whether this tradeoff is short-run or long-run. The study recommends that government should focus on foreign direct investment, embrace policies for attracting foreign investors to invest, and ought to control inflation rate. Policy makers must know at which rate gross domestic product of the economy can be beneficial in order to reduce unemployment. Government ought to apply policies in order to control population growth rate in Pakistan economy. Moreover, there is need for further research by adding more variables such as exports, labour market policies, capital stock and many

others. Data of the study can be greater than before intended for getting further valid research and possibly done in other nations based on same topic.

Trimurti and Komalasari (2014) studied empirically on the evidence from seven provinces in Indonesia the determinants of unemployment. The seven provinces investigated are DKI Jakarta province, West Java province, Banten province, Central java province, Yogyakarta province, East Java province, and Bali province. The study used panel data that were employed from the period of 2004 to 2012, obtained from BPS Indonesia and Bappenas Indonesia data bases. The empirical relationship among the economic growth, inflation, minimum wages, and unemployment rate was examined by using regression analysis with SPSS 18. The results show that economic growth and joblessness factors insignificantly impact on unemployment, whereas, inflation and joblessness factors each have a positive and significant impact on unemployment, the minimum wages and joblessness factors insignificantly impact on unemployment.

Chowdhury and Hossain (2014) studied the macroeconomic determining factors of unemployment rate in Bangladesh economy. All the data were used for the period of 2000 to 2011, by employing Simple Single Equation Linear Regression Model (SELRM). The outcomes obtained from the regression analysis identified that there was a significant effect of all the variables on unemployment. Moreover, the main finding of the examination states that inflation rate stimulates unemployment rate in Bangladesh positively, whereas, GDP growth rate and exchange rate have a negative effect on unemployment. The study recognized that there was a trade-off among unemployment and inflation in Bangladesh economy however; further research required to be done to check whether there was a short-run or long-run trade-off. The study recommends that policy makers need to enhance distribution of income, needed to have proper utilization of foreign investment, government need to create more jobs opportunities and labour intensive strategies in order to reduce unemployment in Bangladesh. Furthermore, because of limited time and resources data was used limited in this study therefore further research could be extended by using of other variables such as age, gender, qualification, sector, and wages for a broader outlook towards unemployment and also the causes of unemployment.

Khumalo and Eita (2015) analyzed the macroeconomic causes of unemployment in Swaziland by employing Engle-Granger two steps econometric procedure. It employed annual data for the period 1991 to 2012, with total of 22 observations. The researchers found evidence of long-run relationship between unemployment and its macroeconomic determinants. The outcomes of the investigation reveal that a rise in the ratio of actual to potential GDP increases will lead to decrease unemployment. There is a negative effect of inflation on unemployment but statistically insignificant relationship and this recommend that there is a weak evidence of Phillips curve in Swaziland. This finding is consistent with the results of Maqbool *et al.* (2013) on the

determinants of unemployment in Pakistan and Eita and Ashipala (2010) on the determinants of unemployment in Namibia. A rise in government spending brings about the consequences of a rise in unemployment. Moreover, there was a global economic crisis of 2007 to 2009 which impacted negatively on the Swaziland economy and would cause a rise in unemployment. Furthermore, the results of the simulation model displays that the model is good as the estimated forecasted unemployment trails the real unemployment.

Oniore *et al.*, (2015) surveyed the study on macroeconomic determining factor of unemployment in Nigeria. The study utilized time series information from the period of 1981 to 2014 by employing Augmented Dickey Fuller Unit Root test for stationarity and to verify long run relationship amongst the variables Johansen cointegration test was utilized. The outcome shows that GDP growth rate, inflation rate, degree of openness and private domestic investment has statistically significant influence on unemployment in the short run. Moreover, the Johansen cointegration test outcome does support the presence of a long-run relationship amongst the factors and negatively signed. The findings of the ECM are significant, it also show the high speed of adjustment from short run fluctuation toward long run equilibrium. Therefore, the study recommends that policies that concentrating on expanding of GDP growth ought to be carry out. Government ought to encourage investment at all levels and should also decrease trade restriction and would lead to increase in openness of trade.

A study was conducted by Gur (2015) through an analysis of the unemployment determinants in BRIC countries. The objective of the investigation was to look at the variables that influence unemployment in BRIC nations. The BRIC countries comprises of Brazil, Russia, India and China. The examination employed panel data analyses for the period of 2001 to 2012, in addition data collected from OECD, the World Bank and Bloomberg. The unemployment causes by economic growth, population growth, inflation rate, interest rates, fluctuation in exchange rate, and other numerous variables. The results of the study reveal that problem of unemployment in BRIC countries is mainly caused by inflation followed by population growth. Moreover, other factors such as GDP, trade volume, aggregate investment and industrial product growth are the foremost economic components that prompt the lessening in regards to unemployment.

Akanbi (2015) investigated the study on the effect of macroeconomic factors on Nigerian unemployment by employing the vector autoregressive approach. This approach was used to compute the forecast error variance decomposition (FEVD) and as well to plot the generalized impulse response function (GIRF). Additionally, the granger causality test was additionally done for to check if the factors are informative in forecasting the rate of unemployment. The macroeconomic variables that study used are unemployment rate, money supply, gross domestic product, inflation rate, foreign direct investment, and lending rate. All the data

are annual for the period of 1985 to 2010. The outcomes show that the positive shocks to gross domestic product increased unemployment rate is not consistent with economic theory. Shocks to foreign direct investment, inflation rate, and money supply reduce unemployment in Nigeria as it expected, whereas shocks to lending rate reduce unemployment and it conflicting to economic theory. Moreover, the result obtained from FEVD demonstrated that shocks to unemployment rate stay the main wellspring of variation in the forecast of unemployment rate. The results of the granger causality test reveal that inflation rate is linearly informative in forecasting unemployment rate. The examination recommends that government should search for methods for expanding the economy together with processing its unrefined oil locally and exporting refined oil based goods.

The study was examined by O'Nwachukwu (2016) on the determinants of the unemployment rate in Nigeria. The secondary time series data were utilized from the period of 1980 to 2016; all the data was acquired from the International Monetary Fund (IMF), World Outlook Database and the Central Bank of Nigeria (CBN) Statistical Bulletin. The examination used the Ordinary Least Squares (OLS) technique for assessing the model and the ADF unit root test was likewise used. The results reveal that government expenditure, inflation rate and population growth are statistically important variables in enlightening the ups and downs in unemployment of Nigeria. On the other hand, first lag of unemployment and actual GDP are not statistically important variables in explaining the unemployment rate in Nigeria. This research recommends that government needed to allocate greater quantity of money to capital expenditure in the budget, and awarded plans should be monitored to see that they are accomplished. Lastly, the examination likewise recommends that corrupt official that commits fraud money should be punished as needs to and technologies that are required human labour to function ought to be introduced.

Sahin (2016) explored the study by empirically analyzing the determinants of unemployment in China. A time series data was utilized for the time period of 1982 to 2014 and every one of the data were collected from the International Monetary Fund (IMF) and the World Bank. Autoregressive Distributed Lag (ARDL) approach by Pesaran et al (2001) was employed to test the determinants of unemployment in China. The result of the long-run estimation found a negative and significant correlation among gross domestic product and an unemployment rate in China. A positive and insignificant relationship was found among inflation rate and foreign direct investment with unemployment rate. The outcome of the short-run shows that gross domestic product; inflation and foreign direct investment have a negative and insignificant relationship with unemployment rate. Furthermore, the result of the error correction model was negative and statistically significant. The result of CUSUM and CUSUMSQ also shows that the model was structurally steady within 5 percent critical bounds.

Bhebhe[1], Bhebhe[2] and Bhebhe[3] (2016) investigated the effects of high unemployment amongst youths in the capital city of Zimbabwe, Harare. It followed recognition that there might be no way out of the issue of high youth unemployment if the reasons for such unemployment are not recognized first. The investigation surveyed 180 unemployed youth. The findings showed that the main influential factor was the economic slump leading to the unemployment of youths in Zimbabwe. The current impact of economic downturn directly crippled industries and led to a severe lack of foreign direct investment which were both held responsible for the circumstances. The following are recommendations arising from the study: that government should take all measures to create opportunities for employment for the youths of the country. Second recommendation is that all the youths should play a role in re-industrializing the country. Third one is that government should have a skills assessment and catalogue of all the youths' unemployment, calibrating their qualifications as well as all the other details.

3.3.3 Empirical Evidence from South Africa

Mafiri (2002) investigated the socio-economic impact of unemployment in South Africa. The study employed both qualitative and quantitative data to analyses as well as both descriptive and analytical survey methods. The outcomes of the investigation disclose that there are a clear relationship among an individual's self-dignity, the quality of life and employment status. Additionally, the finding indicated that there are many things that government needs to do on job creation to avert unemployment. The study recommends that new occupation opportunities can be generated without decreasing the current ones. Government should promote more equal employment opportunities for those who are unemployed. The most importance is emphasizing the creation of more skilled, moderately well-paid jobs and that government should promote essential education along with specialized training for these occupations.

Kingdon and Knight (2007) examined on the unemployment in South Africa by elaborating on causes, problems and policies of unemployment. The study explains the components behind the sharp growth in unemployment amid post-politically-sanctioned racial segregation period, role of labour legislation, the system of labour market governance, evaluating the polices of labour market, identifying the knowledge gaps about the functioning the labour market, and draws some policy recommendations. By employing household survey spanning from the period of 1995 to 2003.The inheritance of South African history keeps on having long-term impacts on the labour market. There are multiple conclusions were made on main policy followed by: firstly, insufficiency and issues should be addressed by StatsSA, policy maker, and researchers on labour market statistics need to be utilized efficiently. Secondly, needed for investigation on how active labour policies have been performing. Thirdly, labour market regulations entail reconsiderations, by giving more concern of employers and investors. Lastly but in particular, it is very vital for pursuing a set of policies

which support the economic growth rate. Furthermore, the growth of the country more than other factors, will decide the future of unemployment in South Africa.

Schoeman, Blaauw and Pretorius (2008) explored the study on the determinants of the South African unemployment rate from the period of 1970 to 2002. Unemployment rate was used as dependent variable, whereas total fixed capital stock, banker's acceptance rate, unionization as the percentage of formal employment, unrefined oil price and real effective exchange rate used as independent factors. The results from the empirical ratify that the total fixed capital stock, interest rate and degree of unionisation are significant elements in explaining the unemployment rate in South Africa. This suggests that unemployment in long-run equilibrium within South Africa were endogenously resolute by economic as well as institutional elements. Therefore, the study recommends that there are needed of further research in order to make any significant policy recommendation for to decrease unemployment and to determine why various stuns keep on having a long-term impact on unemployment after economic reality has improved.

Burger and Fintel (2009) conducted a study on the deciding the reasons for the rising South African unemployment rate based on the analysis of an age, period and generational. A cross-sectional household surveys was managed after South Africa's political growth, for to increase awareness into the sources of the acceleration in the high unemployment rate. The study employed a synthetic panel dataset in order to decompose unemployment along with other labour market consequences into cyclical, generational and life-cycle impacts. The study endorses numerous of the explanations for increasing unemployment presented in the literature review. The results discloses that age was not really the important factor for South African unemployment, however that the risks of being part of a specific generation of entries could be more crucial. This study has discovered that structural problems are of great significance.

Malakwane (2012) examined the study in view of the social and economic impact of unemployment in South Africa. The study utilized both quantitative data that was gathered information by the scholar through numerous sources and used existing data through different sources for instance libraries, the internet, and observations. According to the information received in this study suggest that there be existent relationships among unemployment, and different factors, for example, crime, health, education as well as skills. Policies have been introduced to alleviate the problem of unemployment and poverty such as Growth, Employment and Redistribution (GEAR), Reconstruction and Development Programme (RDP) and Black Economic Empowerment (BEE). The study recommends that more radical approach and policy intervention is vital in order to address these challenges more efficiently. Features such as clear rural development approach, education system should be reform, providing a beneficial business environment for the private as well as for

small, medium, and micro-sized enterprises, and lastly government should make an enhancement in employment creation in order to alleviate the problem of crucial skills shortages.

Mosikari (2013) examined the issue of unemployment in the South African perspective. The examination especially contemplated the consequence of unemployment on the gross domestic product of South Africa. The yearly time series information was utilized from period of 1980 to 2011 by employing the Johansen cointegration technique as well as Granger causality test. The outcomes discovered that among unemployment rate and gross domestic product in South Africa had no causality. Based on the results obtained, the investigation all supported strategies on economic growth with the possibility that improved development and also, it would convert into work in South African economy.

An examination was researched by Viljoen and Dunga (2014) on the determining factors which influenced the female unemployment in a South African township, a case of Bophelong Township. It employed a logistic regression model to examine the potential determining factor of female unemployment. The study was based on a household survey by making use of questionnaires and a sample of 300 households was surveyed but 295 questionnaires were completed in July 2013. The outcomes acquired from the logistic regression model indicates that household size, age, marital status, access to social grants and poverty status were found to be important factors of either of one are utilized or not. Even though there are occupations in that area, the quality is such that household can still be beneath the normal poverty line. Therefore, further investigations are needed to be done and this would have policy allegations through improving the amount of works as well as nature of occupation in the Bophelong Township.

3.4 Limitations of Empirical Studies

The reviewed studies have made valuable contribution to the analysis and understanding the unemployment phenomenon and coming up with various policy solutions to fight the problem in South Africa. However, the studies done by developed countries and South Africa have neglected the impact of government expenditure, foreign direct investment, economic growth, and population growth on the unemployment rate yet these factors have a significant impact on the resulting unemployment rate in a country especially in developing countries such as South Africa. Government expenditure as an effect on the unemployment rate is supported by the Keynesian Theory which suggested the increase of government spending in order to reduce unemployment.

According to Younkins (2008), Keynes proposed a solution to increase consumption through government spending, his solution was to stimulate consumption and beat down production. He also stated that aggregate

demand can be too low at times as compared to aggregate supply and that· government spending was needed to fill the gap left by private sector demand to ensure full employment.

Moreover, most of the reviewed studies done by South Africa only focusing on factors such crime, age, marital status and many more. Yet the studies fail to add the other factors that cause unemployment in developed countries and South Africa. This study therefore incorporates these aspects that have been neglected by other scholars in order to gain insight into the phenomenon of unemployment on a broader spectrum and more specifically in South Africa.

3.5 Conclusion

The primary objective of this chapter was to outline theoretical as well as empirical literature on the determinants of unemployment. Over the years, several theoretical models were developed based on the movements and performance of unemployment. Theories of unemployment have been introduced from the proposition given by various schools of thought, which is, the Keynesians theory developed by John Maynard Keynes, the classical theory developed by Adam Smith, and the monetarists' theory developed by Milton Friedman. All these schools of thought concur that unemployment was an issue that discouraged the economy and there was a need to find solution to this current challenge.

The second part of this chapter explored the empirical studies led by prior scholars on the determining factors of unemployment in developed and developing nations and additionally in cross-countries. Studies reviewed numerous quantitative models employed to test the relationships amongst variables and empirically estimated these fundamental models; however they have only selected those variables that suit their various circumstances. Following this vast literature, the study covered the main determinants of unemployment in developing countries as well as in developed countries and these includes population growth, foreign direct investment, government expenditure on education, and gross domestic product. Moreover, there are many other variables that are significant determinants of unemployment stated by different studies but this study only chose some of them.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

Chapter two and Chapter three both have given some light on the relations among unemployment and its potential determinants in South Africa. In this chapter unemployment model will be modified and estimation techniques will be employed such as unit root test. The motivation of this chapter is to specifying the determining factors (population growth, government expenditure on education, foreign direct investment and economic growth) and identify data used in the model. Section 4.1 gives introduction, Section 4.2 outlines a model that links unemployment to its potential determinants that is model specification, followed by section 4.3 that gives definitions of the variables along with expected signs. Data sources of the study are shown in section 4.4. Section 4.5 presents an analysis of the estimation techniques and a Vector Error Correction Model in section 4.6. This is followed by diagnostic and stability tests for the study of determinants of unemployment that are presented in section 4.7. Section 4.8 is based on the impulse responses and variance decomposition analysis. Section 4.9 testing the Granger causality between variables. Lastly, the chapter concludes in section 4.10.

4.2 Empirical Background and Model Specification

It is well established from empirical literature that unemployment has significant impact on foreign direct investment, population growth, gross domestic product and government expenditure on education. In this study will examine whether variation in unemployment is associated with foreign direct investment, population growth, gross domestic product and government expenditure on education.

This section presents the model specification used in the study. The model is adopted from Arslan and Zaman (2014). The model is expressed as follows:

$$UR_t = \beta_0 + \beta_1 PG_t + \beta_2 FDI_t + \beta_3 INR_t + \beta_4 GDP_t + \mu_t ....(4.1)$$

Where, UR denotes as unemployment rate and is the dependent variable. β_0 is constant and (t) represents time. PG is denotes population growth; FDI denotes foreign direct investment; INR denotes inflation rate; and GDP equates to gross domestic product which are explanatory variables.

The intention of this research is to investigate factors that cause employment rate in South Africa. In this examination, the dependent variable is unemployment rate as influenced by the factors by other independent factors that are population growth, government expenditure on education, foreign direct investment, and

gross domestic product. The study has modified this model by adding another variable which is government expenditure on education. The study added this variable because government spends a higher portion of its budget on education, but still the rate of unemployment in the country keeps increasing with each passing year.

Abdullah, Harun, and Jali (2017), Government expenditure on education is also a way out to tackle the economic issues, for example, unemployment, poverty, and economic recession. It is on the grounds that the government expenditure on education could increase the number of skilled laboures in economic sectors. The expanding number of skilled labours will also affect the expansion of income in society as a whole and expansion in aggregate expenditure on final demand. At the same time, the growth in number of skilled labour in economic sector will influence the expansion in labour productivity and it additionally give positive effect on overall economic growth. In this manner, government spending on education becoming as one of the main expenses in a few nations to increase the number of workers.

Therefore, the modified model of the study is:

$$UNR_t = \beta_0 + \beta_1 PG_t + \beta_2 GEEDU_t + \beta_3 FDI_t + \beta_4 GDP_t + \mu_t \ ....(4.2)$$

where,

UNR_t = Unemployment Rate

$\beta_1 PG_t$ = Population Growth

$\beta_2 GEEDU_t$ = Government Expenditure on Education

$\beta_3 FDI_t$ = Foreign Direct Investment

$\beta_4 GDP_t$ = Real Gross Domestic Product

μ_t = Error Term

To get rid of the impact of outliners, every one of the variables is changed into the logarithm form because logarithmic values reduce the tendency of fluctuation over time. Therefore, the regression is calculated from the formula:

$$LUNR = \beta_0 + \beta_1 LPG + \beta_2 LGEEDU + \beta_3 LFDI + \beta_4 LGDP + \mu \ ....(4.3)$$

4.3 Definition of Variables and Expected Signs

Unemployment Rate (LUNR) - Oniore, Bernard and Gyang (2015) define unemployment as the state of having no work or being out of work or a proportion of individuals who can work but are currently seeking occupation yet they are not capable to find it. The consequences of long term unemployment in creating financial hardship are contemplated as poverty, homelessness, crime, frustration, breakdown and family tension, social seclusion, lack of self-confidence and pride. According to the IMF Bank, unemployment rate can also be characterized by the national definition, the ILO or the OECD harmonized definition. The OECD harmonized defined unemployment rate as it provides the number of unemployed people as a proportion of the labour force (is the aggregate number of individuals employed add with unemployed). As characterized by the International Labour Organization, unemployed persons are individuals that are as of now not working yet as well as moderately ready and willing to work for pay, presently accessible to work, and have effectively search for jobs.

Population Growth (LPG) – This is defined as the rise in the quantity of those that reside within a state or nation. According to World Bank, population growth defines as that totals every one of the citizens irrespective of legal status or citizenship. Whenever, an increase in population growth would lead to rapid rise in unemployment. If population growth rate increases then the unemployment also increases. In previous studies done by many researches showed that high level of population growth erode the economy (Kalim, 2003; M.Rafiq, et al., 2010). Therefore, the study assumed that there may be a positive relationship between population growth and unemployment rate.

Government Expenditure on Education (LGEEDU) – Government expenditure denotes the purchase of goods and services, which consist of public consumption and public investment, and transfer payments, made up of income transfer and capital transfer. According to the World Bank, general government expenditure on education (current, capital and transfer) is stated as a proportion of GDP. This consists of expenses that are supported by transfers from general sources to government. General government commonly alludes to local, regional and central governments. Abdullah, Harun, and Jali (2017), education likewise considered as human capital investment to increase the productivity of labour and reduce economic problems such as unemployment and poverty. The study assumed that there might be a positive relationship between government expenditure and unemployment rate.

Foreign Direct Investment (LFDI) – FDI is defined as an investment in a business by an investor from another nation for which the foreign investor has control over the organization acquired. The study assumed that there may be positive relationship between foreign direct investment and unemployment rate. As the FDI

inflows increases in a country then unemployment reduces because FDI provides new opportunities and thus helping in reducing the unemployment (Arslan and Zaman, 2014).

Real Gross Domestic Product (LGDP) – This is defined as the aggregate market value of entirely finished goods and services created yearly inside the borders of a nation. According to IMF Bank, GDP is defined as the annual proportion of the constant amount that are year-on-year changes; the base year is the nation particular. Evidently economic growth plays an essential role in jobs development. Unemployment rate should be reduced to avoid shortage of national production and waste of human resources. Okun's Law stated that there is a negative relationship between unemployment and output (GDP). It's also depends on the country's development and how resources are wisely used. Theoretically, a high rate of economic growth may reduce unemployment. The relationship between unemployment rate and economic growth is governed by Okun's Law (ŞAHİN, 2016) . Therefore, the examination assumes or expects that there could be negative or positive relationship between economic growth (GDP) and unemployment rate.

4.4 Data Sources

The research used yearly time series information from the period of 1986 – 2016, with sample of 30 observations intended for estimating a regression model. The study will not have any problem with degree of freedom lost because there is enough observation. The study uses secondary data for analysis and all the empirical estimations in this study are carried out using the time series econometric package Eviews 9. All the data for the variables are available and acquired from shown below in table:

Variables	Sources
Unemployment rate	IMF Bank
Population growth	World Bank
Government spending on education	South African Reserve Bank (SARB)
Foreign direct investment	IMF Bank
Economic growth (GDP)	IMF Bank

4.5 Estimation Techniques

Brooks (2008) suggests that there are various estimation techniques that can used for research. The regression estimation techniques depend on the assumption that every one of the factors need to be factored into a regression model that is stationary. The utilization of the data that are non-stationary could bring about spurious regression (Brooks, 2014). It is essential to make certain that every one of the variables is stationary so as to avoid having a spurious regression. The examination employs the Johansen cointegrations approach. Johansen cointegration technique is a framework equation test which gives evaluations of every one of the

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cointegrating relationships that could exist inside a vector of non-stationary variables or a mixture of stationary and no-stationary variables by capturing the fundamental time series data properties (Harris, 1995).

A layout of the stages was given by Harris (1995), associated with implementing the Johansen cointegration approach. The initial step in applying Johansen approach is to determine the stationarity which is also called order of integration of all the variables in the model, subsequently carrying out cointegration test in order to discover any relationships in the long-run among the variables. Then it is essential to estimate a short-run equation of vector error correction model for discovering cointegration in the prior stage. Lastly, residuals diagnostic and stability test are carried out.

A time series econometric technique called Vector Error Correction Model (VECM) is used in this study for to examine the relationship between unemployment in South Africa and its independent variables. The study uses VECM technique rather than Vector Autoregression (VAR) model since VAR models are misspecified when series are cointegrated (Mah, 2012). Additionally, the VECM is a preferred method over the Ordinary Least Square (OLS) technique in light of the fact that VECM model uses multivariate time series data compared to the OLS approach. OLS method uses time series data where variables are stationary at that level. In the event that series are differenced, the OLS probably does not give great economic interpretation, consequently giving misleading outcomes (Gujarati and Porter, 2009).

4.5.1 Stationarity Test

Gujarati and Porter (1999) suggest that a series is stationarity when the value of mean and variance are constant in excess of the period. The intention for testing the stationarity within time series analysis is that non-stationary data could prompt invalid regression except if no less than one cointegrating relationship exists. As a result, the unit root tests are done to keep away from invalid regression outcomes that get hold of partial outcomes. At the point where data are stationary that would be integrated of order zero, signified as I (0). Whenever a data are not found to be stationary then that one will be difference n-times for stationary; signified as I (n). The stationary test consists of graphical inspection and unit root test. Graphical examination is a method that uses testing stationary, in addition this is possible in type of visual analysis of either correlogram test. Augmented Dickey-Fuller (ADF) test was developed through Dickey and Fuller in 1981 whereas Phillips-Perron (PP) was developed by Phillips and Perron in 1988, both of which are employed as formal tests where the null hypothesis states that unit root is present in time series.

Moreover, this is the initial stage of the methodology to decide the order of integration of the series because while estimating a regression, the calculation involves time series data and Checking whether variables are stationary or not. According to Brooks (2014, pg. 354), a series that is not stationary is referred to as non-

stationary and use of non-stationary data would lead to spurious regression. A non-stationarity time series will have a period fluctuating mean or a period changing difference or both. In the event that two stationary variables are generated by means of independent random series, when one of those variables will be regressed on the other, then the t-ratio on the slope coefficient would be expected not to be significantly different from zero, and the R^2 value would be low. Whenever non-stationary variables are utilized within a regression model, at that point it could be shown that the standard assumption meant for asymptotic analysis is not legitimate. Accordingly, the usual t-ratios will not pursue a t-distribution and the F-statistic, also will not pursue an F-distribution.

On reason of spurious regression, unit root or otherwise stationarity test need to agree on one of the factors before estimating the parameters and testing for cointegration. There are several tests of stationarity, amongst others, the graphical analysis and the correlogram tests. In this study we discuss two unit root tests which are Augmented Dickey-Fuller (ADF) and Phillips Perron (PP).

4.5.2 Informal Unit Root Test

The graphical analysis is highly utilized informal techniques for testing stationarity of the time series. The investigation includes a visual plot of the time series and takes into consideration that the capturing a number of data errors or structural breaks. In any case, these are essential to take note; and it became tough to inform about the data of the time series whether it is stationary or not, by inspecting the graphical plots. Therefore, two formal tests are additionally utilized, that is to say, the Augmented Dickey Fuller and Phillips – Perron tests (Sibanda, 2012).

4.5.3 Formal Unit Root Test

4.5.3.1 Augmented Dickey-Fuller Test

Augmented Dickey-Fuller (ADF) test was developed from adaptation of the Dickey-Fuller test for bigger arrangements of time series models. If the number is found to be negative in the test, then the Augmented Dickey-Fuller (ADF) statistic is utilized. The more negative the numbers are, the stronger the grounded rejection of the hypothesis become and that states there is a unit root at any level of confidence. The advantages of the ADF test have above the DF test are that it takes into consideration the existence of the deterministic movement and drifts needs to be tested, which implies that using additional lagged difference terms, the serial correlation is rectified within the residuals. Augmented Dickey-Fuller (ADF) unit root test is based on following equation (Chemma and Atta, 2014).

$$\Delta X_t = yX_{t-1} + \sum_{i=1}^{p} \beta_i \Delta X_{t-i} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.4)$$

Where, Δ denotes the first difference operator, ρ denote the lag operator, t denote the time subscript and ε is the error term. Augmented Dickey-Fuller (ADF) test is based on the following three possible forms.

(1) Without intercept and trend

$$\Delta X_t = yX_{t-1} + \sum_{i=1}^{p} \beta_i \Delta X + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.5)$$

(2) With intercept

$$\Delta X_t = \alpha_0 + yX_{t-1} + \sum_{i=1}^{p} \beta_i \Delta X + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.6)$$

(3) With intercept and trend

$$\Delta X_t = \alpha_0 + yX + \beta_t + \sum_{i=1}^{p} \beta_i \Delta X_{t-i} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.7)$$

This test was performed on level and first difference form. The null hypothesis states that the variable has unit root and alternative hypothesis stats that there is no unit root. If t-statistic value is more than ADF critical value, then null hypothesis was not rejected. It shows that series is nonstationary. If t-statistics value is less than the ADF critical value, then the null hypothesis was rejected. It shows that series is stationary.

4.5.3.2 Phillips Perron Test

The Phillips-Perron test is used as a non-parametric correction for managing each relationship within the error terms and t-statistics. The PP test has an advantage over the ADF test in that the PP test tends to be strong toward common types of heteroscedasticity within the error term. This test adjusts each serial correlation as well as heteroscedasticity in the errors of the regression, through modifying the test statistics directly.

According to Donner and Barbosa (2008, pp.160), the Phillips Perron (PP) unit root test contrasts with the Augmented Dickey-Fuller (ADF) test for the most part in how they deal with serial correlation and heteroscedasticity in the errors. The Phillip - Perron (PP) unit root test is based on the model:

$$X_t = \eta + \beta_t + \pi X_{t-1} + \psi_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.8)$$

The null hypothesis of the unit root is expressed by, H_0: $\pi = 1$; the stationary procedure (ψ_t) is not assumed to be white noise and serial correlation, as well as heteroscedasticity in the (ψ_t) term are taken care of in the test statistic.

4.5.4 Cointegration

Cointegration test is the econometric method that makes use of testing the correlation among time series variables that are not stationary. At least two series are cointegrated once variables are moving all together at similar wavelength (Gujarati and Porter, 2010). To test for cointegration the two methods are the Johansen

cointegration test which was introduced by SØren Johansen and Engel-Granger test which was developed by R.F. Engel and C.W.J. Granger. This study utilizes the Johansen cointegration approach to recognize whether there is a long-run or short-run relationship between the determined variables.

There are numerous approaches of testing for cointegration that exist; these consist of the Engle – Granger approach that relies upon residuals and the Johansen and Juselius (1991, 1995) strategy which relies upon maximum likelihood estimation on a VAR framework. In any case it is essential to observe that the greater parts of these strategies have a number of issues when applied to multivariate models. Johansen approach has in excess of one cointegration vector which considered with two tests to help establishing the numeral cointegrating vectors (Murwirapachena, 2011).

4.5.5 Johansen Cointegration Test

There are numerous methods of testing for cointegration, however two methods regularly override the rest in particular the Engle-Granger approach that is residual based and the Johansen and Julius (1990) approach that depends on maximum likelihood estimation on a vector autoregressive (VAR) system. The dynamic interrelationship between stationary variables is described by using of a general structure of the vector autoregressive (VAR) model (Kin, 2012). Brooks (2008) argues that the Engle-Granger method does not have power in unit root tests, where simultaneous equation bias and the unattainability for carrying out the hypothesis tests the genuine cointegration relationships. By highlighting the shortcoming of the Engle-Granger method, therefore this examination employs the Johansen cointegration technique. According to Greene (2000), this approach gives the coefficient of the speed of adjustment where Gross Domestic Product returns to its equilibrium after a shock occurred in short term.

The Johansen cointegration approach is applied in this study for testing cointegration. This approach has been shown to be superior to Engle and Granger's (1987) residual-based approach. Among other things, the Johansen approach is capable of detecting multiple cointegrating relationships. Greene (2000), the benefit of using this technique is that it agrees to the identification of each cointegrating vector inside a specified arrangement of variables. Moreover, the procedure has preferable asymptotic properties which yield stronger outcomes. The Johansen approach could be summarized in five steps that are used when implementing, as shown below:

Step 1: Testing for the order of integration of the variables under examination. Each variable ought to be integrated of the similar order before continuing with the cointegration test.

Step 2: This step consists of choosing the appropriate lag length of the model. Estimate the model and determine the rank of II.

Step 3: With respect to the deterministic components in the multivariate framework the decision of the most reasonable model is made. An analysis of the normalized cointegrating vectors and the speed of adjustment coefficient are made.

Step 4: This step incorporates the determination of the number of cointegrating vectors. Causality tests on the error correction model distinguish a structural model and a decision is made if the estimated model is sensible are done in this last step.

We have to choose an appropriate lag for our variables in order to get credible outcomes. This can be done by using an unrestricted VAR. As indicated by Asterious and Hall (2007), selection of lag length provides a lag through which the error terms display normality, no autocorrelation, and no heteroscedasticity. Lag lengths are influenced through factors that are excluded. That influenced the conduct of our model within the short-run. Accordingly we want great lag. Different information criteria are available for choosing the suitable lag length shown further in Chapter 5.

According to Tetteh (2015), the Johansen approach to cointegration test involves two test statistics: first test is the maximum eigenvalue test (λmax) and the null hypothesis states that there is (r + 1) cointegrating vectors, where the alternative hypothesis states there is (r) cointegrating vectors. The second test is trace test, utilized to test the hypotheses that there are at most (r) cointegrating vectors.

4.5.5.1 Trace Test

This test statistic depends on a likelihood ratio test for the matrix. The trace statistics consider whether the trace will rise through including additional eigenvalue further than the rth eigenvalue. The null hypothesis of the trace test will be the quantity of cointegrating vectors that is less than or equivalent to r. The same applies to maximum eigenvalue test, if $\bar{\lambda}_t = 0$, the trace statistic will be equivalent to zero also. Conversely, the closer the root of characteristics is to concord and more negative is known as the $In(1-\bar{\lambda}_t)$ term and thus, the greater the trace statistics. The trace statistics is determined by:

$$\lambda_{trace} = -T \sum_{i=r+1}^{n} In(1-\bar{\lambda}_{r+1}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.9)$$

where, T denotes the size of the sample and $\bar{\lambda}$ denotes the ith largest eigenvalue of matrix Π (Majavu, 2015).

4.5.5.2 Maximum Eigenvalue Test

The maximum eigenvalue test statistics depend upon the characteristic roots (eigenvalue) acquired in the estimation process. This test comprises of arranging the biggest eigenvalue in descending order, also by seeing they are essentially not quite the same as zero. In the case that the factors are most certainly not

cointegrated, the rank of Π is zero and every one of the characteristics roots measure up to zero. In order to test how many of the number characteristics roots are altogether unique in relation to zero, the maximum eigenvalue test uses the following statistic (Majavu, 2015):

$$\lambda_{max}(r, r+1) = -TIn(1 - \bar{\lambda}_{r+1}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.10)$$

where, T denotes the size of the sample and $\bar{\lambda}$ denotes the ith largest eigenvalue of matrix Π.

4.6 Vector Error Correction Model (VECM)

The vector autoregressive (VAR) model is a common structure that is utilized to depict the dynamic interrelationship between stationary variables. Dolado et al. (1999) conclude that whenever the time series are not stationary at that point the VAR structure ought to be adjusted to permit predictable estimation of the corrections amid the arrangement. The vector error correction model (VEC) shows just an extraordinary instance of the VAR for variables that are stationary in their variation (for instance, I (1)). The VEC could similarly consider any cointegration associations between the variables (Kin, 2012).

Engle and Granger (1988) built up a technique for reconciliation of the short run performance of an economics series using its long run performance. The VECM model integrates the information of long-run with an adjustment mechanism of short-run. The specifications of VECM model are to estimate the correlation among unemployment rate and explanatory variables. The VECM model defeats spurious regression using suitable differenced components to decide the short-term changes within the model.

This model presents restricted VAR designed model aimed at utilizing non-stationary variables at level form, particularly recognized as cointegrated. This one might be tested for cointegration by utilizing an expected VAR equation. The vector error correction mechanism permits the series of long-term elements for complying with equilibrium limitations, whereas a short-run element has flexible dynamic specification. This essentially implies that an extent of disequilibrium as of one period will be rectified within the following time frame (Mah, 2012).

4.7 Diagnostic and Stability Test

The diagnostic and stability test should be performed with the goal that, the model as a final point can be selected as a best fit in the sense that every one of the estimated coefficients have the right signs, they are statistically significant based on the t-stats and f-tests, and furthermore the value of R-square is rationally high (Gujarati, 2004: pp. 516). In this regard the study uses normality test, heteroscedasticity test, Autocorrelation test, and AR roots graph. The stability test decides whether the model of the study is steady, so as to be utilized for economic decisions and also forecasts. Under the stability test the two main tests are

the Ramsey Reset test and Cusum test. Diagnostic and stability tests should be done on the short run equation.

4.7.1 Normality Test

The normality test is utilized to decide whether a data set or residuals are normally distributed. In order to test normality, Jarque-Bera (JB) tests is used. However, the most commonly used method is Jarque-Bera (JB) test. The null hypothesis for Jarque-Bera test states that residuals are normally distributed and rejects the null hypothesis if the p-value is less than 5% level of significance. This test is known as a goodness-of-fit to look over sample information if the measures such as skewness and kurtosis of the OLS residuals are significant or not. This can be tested by formula as follows:

$$JB = \frac{n}{6}\left[s^2 + \frac{(k-3)^2}{4} \right] \dots\dots\dots\dots\dots\dots\dots\dots\dots(4.11)$$

where S represents sample skewness, K represents kurtosis and n is the number of observation or the sample size. When there is a large sample, JB follows a chi-square distribution (x^2).

4.7.2 Heteroscedasticity Test

Stock and Watson (2012) perceive heteroscedasticity as a circumstance where the variance of the regression error term depending on the regression is not consistent. Heteroscedasticity errors have a non-constant variance and this is more commonly a problem for cross-sectional data sets, although a time series model can also have non-constant variances. There are various multiple econometric tests that detect the problem of heteroscedasticity in this manner: Breusch-Pagan-Godfrey Test, Goldfeld-Quandt Test, Langrage Multiplier (LM) Test and White's General Heteroscedasticity Test. This study uses White General Heteroscedasticity test to test for heteroscedasticity within the residuals wherein estimates of the least squares are steady in the occurrence of heteroscedasticity. A null hypothesis of this test states that there is no heteroscedasticity if an error is homoscedastic. In the case where the probability value is not as much as the significance level (p<0.05), then the null hypothesis is rejected and the conclusion is that there is significant proof of heteroscedasticity. The heteroscedasticity test is tested using following regression model:

$$\varepsilon_t^2 = \beta_0 + \beta_1 X_t + \beta_2 Z_t + \beta_3 X_t^2 + \beta_4 Z_t^2 + \beta_5 X_t^2 + Y_t \dots\dots\dots\dots\dots\dots\dots\dots(4.12)$$

4.7.3 Autocorrelation Test

Autocorrelation can be explained as a relationship among individuals of series of observations well-arranged in time or space. According to Gujarati and Porter (2010), autocorrelation is generally related with time series data and there should be no correlation between the error terms. There are several methods that can be

used to detecting Autocorrelation as follows: Graphic Method, Durbin-Watson (d) Test, Breusch-Godfrey Test of higher-order autocorrelation, and Runs Test. The Breusch-Godfrey Lagrange Multiplier Test of autocorrelation is utilized in this study to test the existence or the nonexistence of serial correlation within the residuals. A null hypothesis of this test states no presence of serial correlation. In the cases where the p-value is not as much as the significance level (p<0.05), then the null hypothesis is rejected and it can be concluded that there is proof of serial correlation. The formula shown below is utilized to test autocorrelation:

$$LM(H) = \frac{(TSS - RSS)}{\dfrac{TSS}{n}} = nR^2 \dotfill (4.13)$$

where TSS stands for the aggregate quantity of squares, RSS stands for the residual quantity of squares and n stands for the size of the sample.

4.7.4 AR Roots Graph

After the VECM model is estimated, the steadiness of the VAR model is subsequently tested by plotting an AR roots graph. A VAR model is deemed to be steady in case that all modulus of the roots are not as much as the one and as well as within the circle. The outcomes arising from this stability testing strategy decide whether an impulse response analysis could possibly utilize or not for examining the effects of shocks on the factors within the indicated models (Sibanda, 2012).

4.8 Impulse Response and Variance Decomposition Analysis

Additionally to the VECM model, the impulse response analysis and variance decomposition are further analysed in the short-run dynamics of the models. The utilization of these econometrics methods allows the scholars to look at the impact of shocks on explained variables and the relative importance of each shock within the whole framework (Sibanda, 2012).

Lutkepohl (1990) considers that estimation through VAR model will show factors that have statistically significant impact upon other factors within a system. After the responses of the structure toward shocks in the variables, along with the decomposing forecast error variances in the VAR model are standard means for economic exploration.

4.8.1 Impulse Response Analysis

Brooks (2008) observes that impulse responses plot the reactivity of the independent variables within the VAR model to influence alternate factors. This is done with the end goal that every factor from every equation (independently), a stock will affect the random error and reveal effects upon the VAR that are

recorded after some time. In this way, whenever there is the existence of a specific number of factors within a framework, the quantity of impulses responses produced is an aggregate of the square of the factors.

The impulse response analyses pursue the responsiveness of the explained factor toward shocks on the explanatory factors. This one demonstrates the extent as well as steadiness of such shocks in excess of a given timeframe. The dynamic structure of the VAR model allows the transmission of the impact of a shock toward an explanatory factor to every one of the explained factors. The impulse response analysis is utilized in this study by using of VECM model. In a steady framework, a shock to any of the factors is estimated to ultimately pass away. The Cholesky orthogonalisation approach deals with impulse response analysis that is utilized. Around 36 quarters of time periods were selected with a specific end goal to make sure the effect of a shock in the short, medium, and long-term periods is established (Sibanda, 2012).

4.8.2 Variance Decomposition Analysis

Brooks (2002) observes that the variance decomposition analysis gives minutely differed methods for testing the VAR framework processes. This analysis gives the division of the dynamics in the explained factor caused by internal shocks that could be attributed to various factors. A shock towards a variable directly influences the variable itself. That shock is additionally passed on to other factors by the VAR framework elements. Variance decomposition decides the amount of the error variance represented by advancements to each of the explanatory variables. As a matter of fact, it has been observed that advancements of the own-series accounted the most for the error variance of the series within the autoregressive procedure.

The responsiveness of the explained factor toward shocks on the explanatory factors is traced by the impulse response analysis, whereas the facts are given by the variance decomposition analysis on the relative significance of each shock toward the framework. As in the impulse response analysis, the relative significance of each shock makes use of over a time period of 36 quarters (Sibanda, 2012).

4.9 Granger Causality test

This test is done to determine if one variable is causally related to another as a result allowing determining the capacity of one variable to cause the other variable. In the bivariate case, the standard Granger causality test amounts to testing whether past values of (Y) together with past values of (X) explains the current change in (X) better than the past values of (X) alone will do. Failure to reject this null hypothesis leads to the conclusion that (Y) Granger causes (X). This process is repeated interchanging the two variables(Y and X). Granger causality measures precedence and information content but does not indicate the causality in the common use of the term. If a cointegration vector exists there is causality amongst the variables at least in one direction (Sarbapriya, 2012).

4.10 Conclusion

The chapter dealt with the methodology, examination of variables and use of the estimation techniques in determining factors of unemployment in South Africa. The Johansen cointegration approach and VECM model were employed as the estimation techniques in this study. The Johansen cointegration technique was selected as the preferable estimation method because it has several advantages over alternative techniques. The chapter also discussed the diagnostic and stability tests which involve normality test, heteroscedasticity test, and autocorrelation test, as well as AR Root test for stability. The chapter ended by exploring impulse response and the variance decomposition analysis along with Granger causality test. Having outlined the methodology utilized in this research, Chapter 5 shows the estimation, presentation as well as the analysis of the estimation techniques applied in this study.

CHAPTER FIVE

ESTIMATION AND ANALYSIS OF RESULTS

5.1 Introduction

This chapter provides estimated results through interpretation of findings and analyzing the data. The chapter comprises of ten sections. The second chapter analyse the result of descriptive statistics. The third section introduces the outcomes of the stationary/unit roots tests. The fourth section reviews the cointegration test outcomes. The fifth section reports on the long and short run terms of the vector error correction model. Diagnostic tests outcomes are presented in the sixth section to check if model is stable. Analyses of the Impulse response and variance decomposition are discussed in the seventh and eighth sections correspondingly. Section ninth presents the Granger causality test. All the results in this chapter are rounded off to the nearest 3 decimal places. The last section concludes the chapter.

5.2 Descriptive statistics of variables used in this study

The nature of data for respective variables used in the study is summarized in Table 5.1 below. The residuals from all of the variables in levels form do satisfy the normality test. It is observed that the null hypothesis of residuals for LOGUNR, LOGPG, LOGEEDU, LOGFDI and LOGGDP cannot be rejected at 5 percent of significance as indicated by the high p-value of the Jaque-Bera statistics; therefore, we accept the null hypothesis that the residuals from these variables are normally distributed. This indicate that in testing for stationary of such variables, structural break and outliers will not had to be accounted for using conventional unit root test.

Table 5.1Descriptive statistics of variables used in the study at level form

	LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
Mean	3.112	0.499	2.964	2.940	7.652
Median	3.148	0.426	2.965	2.953	7.605
Maximum	3.325	0.917	3.091	3.142	8.030
Minimum	2.776	-0.081	2.868	2.719	7.315
Std. Dev.	0.157	0.259	0.060	0.107	0.248
Skewness	-0.831	0.078	0.196	-0.151	0.216
Kurtosis	2.619	2.178	2.058	2.303	1.516
Jarque-Bera	3.758	0.904	1.344	0.746	3.086
Probability	0.153	0.636	0.511	0.689	0.214
Sum	96.477	15.485	91.878	91.136	237.223
Sum Sq. Dev.	0.739	2.010	0.106	0.341	1.848
Observations	31	31	31	31	31

5.3 Stationary Tests

Before analyzing the determinants of unemployment, the Augmented Dickey-Fuller and the Phillips-Perron unit root tests are utilized for examining the stationarity properties in regard to the variables. The null hypothesis of both tests indicates the variable have a unit root, while on the other hand the series will not have a unit root stated by alternative hypothesis. The methodology section underlines the specified estimation equation utilized when carrying out the unit root tests. In order to reduce the variability of the series, all the series were transformed into logarithms (Khumalo, 2014). Stationarity can be tested by using two methods which is informal visual inspection and formal the ADF and PP unit root test. Both tests are essential because they provide an understanding of the structural breaks, movements and stationarity using the data set (Brooks, 2008). Each variable was tested for visual impact and more or less similar trends were observed for both levels form and first difference form.

5.3.1 Informal Unit Root Results

Figure 5.1 Graphical Presentation of Variables at Level Form (1986-2016)
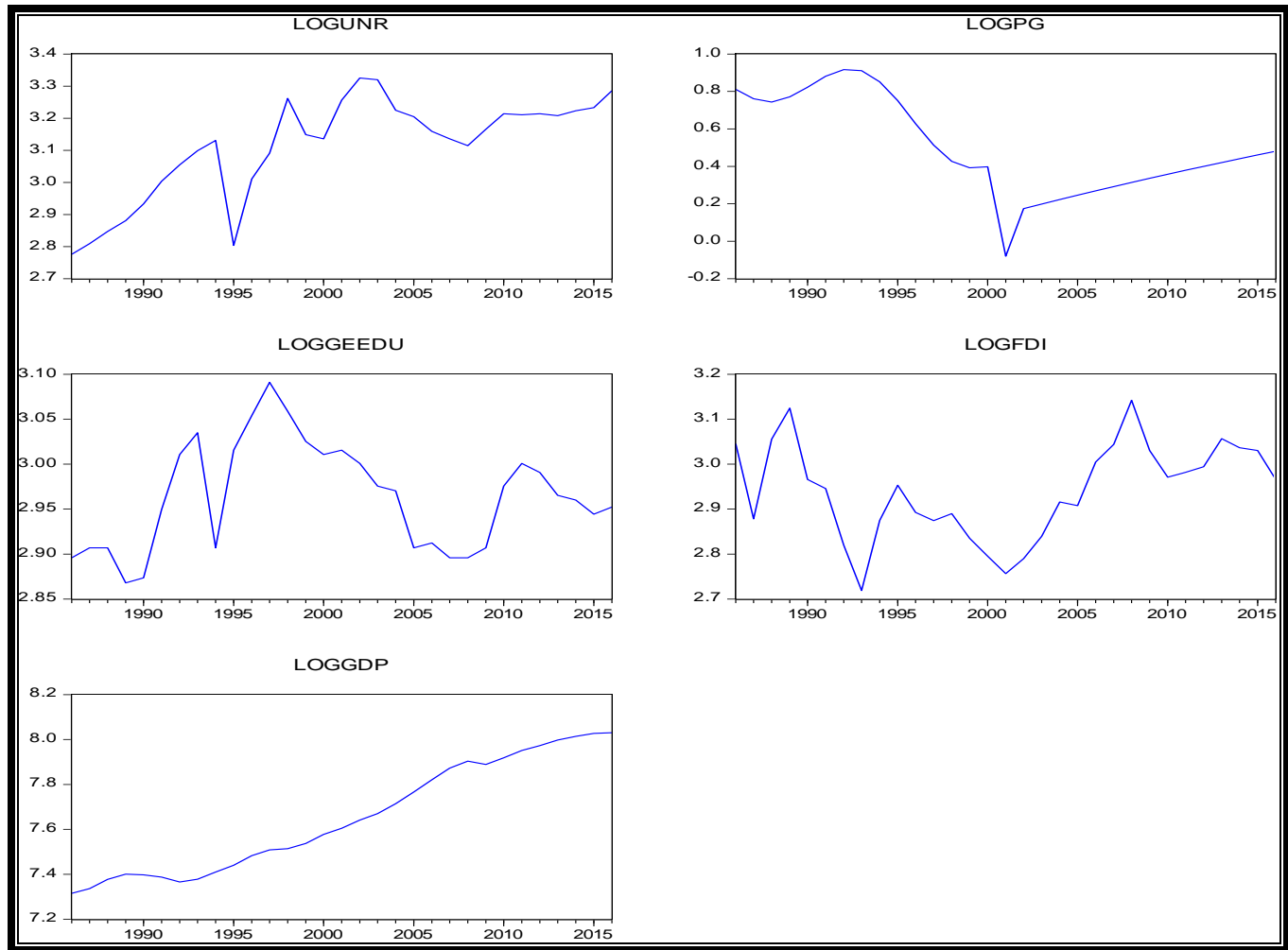
The results of visual inspection shows those variables are increasing and decreasing, suggesting some evidence of non-stationary as they trend. Specifically, the first impression from figure 5.1 is that, LOGUNR increases until 1994, then decreases and then again increases till 2016. Similarly, LOGPG decreases until 2000 and then increases till 2016. LOGGEEDU and LOGFDI have a similar trend, increases and decreases over the years. Whereas, LOGGDP time series seems to be trending upwards with fluctuation. This is clear indicates that all the variables are non-stationary at level form, implying that the mean and variance are not steady after some time. As a result all the series are tested at first difference in order to establish if all the variables are stationary.

Figure 5.2 Graphical Presentation of Variables at First Differenced Form (1986-2016)
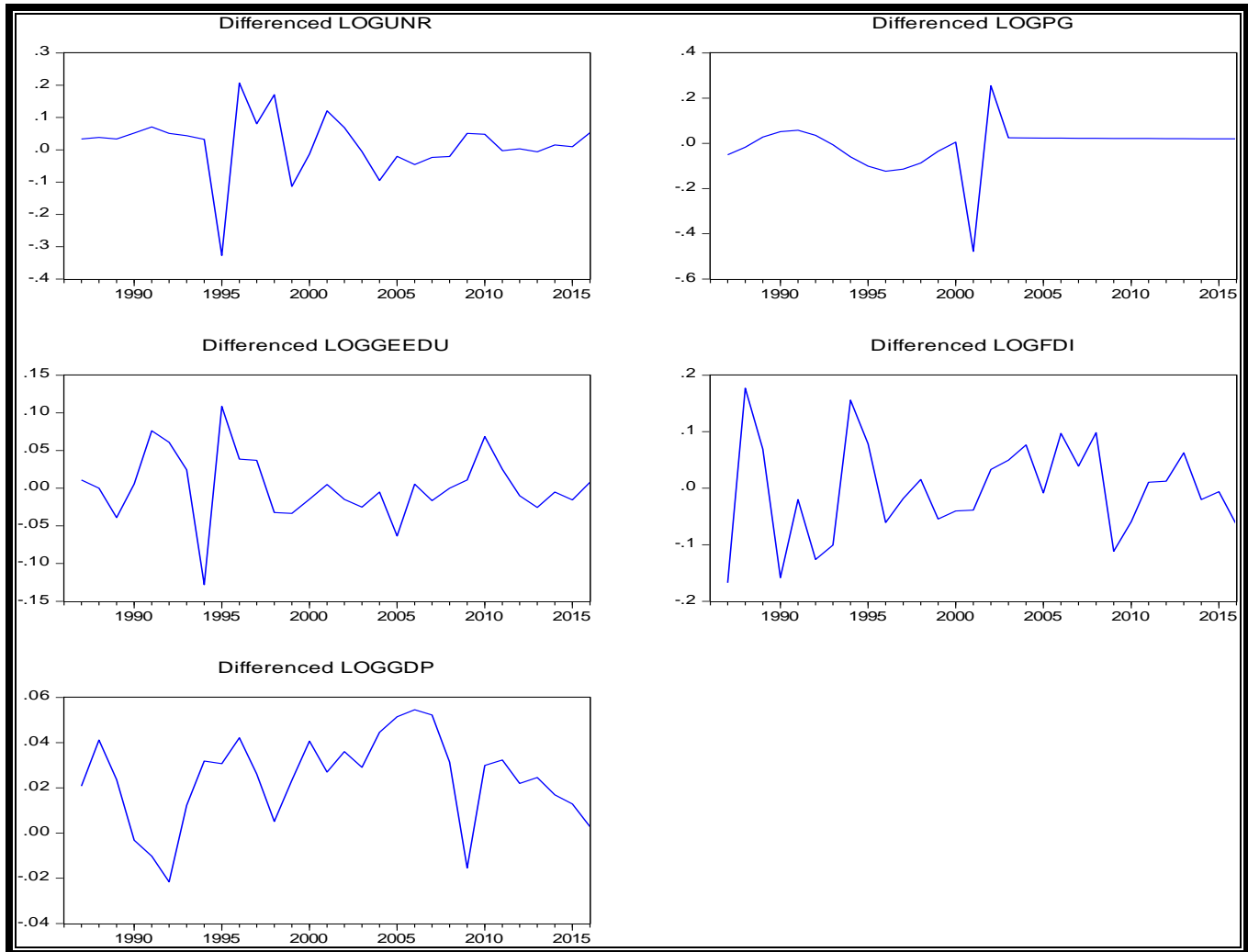
Figure 5.2 indicates that all differenced factors fluctuate around the mean; therefore the variables are integrated at first difference. All the series are stationary after first differenced form. Therefore, we can say that the series integrated to the order 1 if integrated of order I (1). As a result all the variables have to be differenced to avoid spurious results.

5.3.2 Formal Unit Root Test

After the informal test, which is graphical or visual inspection, second method was followed by a formal test conducted to support the results established from the graphical analysis. ADF and PP tests were used to test for stationary. At the point where the series was found non-stationary then it would lead to unreasonable and meaningless results whereby it cannot be tested for cointegration and further tests, along these lines it is exceptionally essential to test for stationarity. Moreover, if the variables are observed to be non-stationary at level form I (0) then it will be tested by first differenced form, which is known as order of integration 1 or I (1).

Table 5.2 ADF and PP Test Results at Level Form

Variables	Model specification	ADF TEST		PP TEST	
		ADF T-Statistic Value	ADF Probability Value	PP T-Statistic Value	PP Probability Value
LUNR	Intercept	-2.295	0.180	-2.286	0.183
	Trend and Intercept	-2.919	0.171	-2.673	0.254
	None	0.898	0.897	2.036	0.988
LPG	Intercept	-1.483	0.528	-1.494	0.523
	Trend and Intercept	-1.194	0.894	-1.255	0.880
	None	-1.171	0.215	-1.183	0.211
LGEEDU	Intercept	-2.279	0.185	-2.259	0.191
	Trend and Intercept	-2.203	0.471	-2.007	0.574
	None	0.190	0.734	0.516	0.821
LFDI	Intercept	-2.406	0.149	-2.406	0.149
	Trend and Intercept	-2.662	0.258	-2.654	0.261
	None	-0.252	0.587	-0.304	0.568
LGDP	Intercept	-0.312	0.911	0.158	0.965
	Trend and Intercept	-2.347	0.397	-1.593	0.772
	None	2.060	0.989	5.104	1.000

***statistically significant at 1%

**statistically significant at 5%

*statistically significant at 10%

The ADF and PP tests every one of the variables in (1) intercepts, (2) trends and intercept, and (3) no trend and no intercept. The results in Table 5.2 show that LUNR, LPG, LGEEDU, LFDI and LGDP are non-stationary because all the variables values are more than 10%, 5% and 1% level of significance at level form. Therefore the study fails to reject the null hypothesis at 10%, 5%, and 1% level of significance. Consequently, the variables should be tested for stationarity at 1st difference which is integrated of order 1 or I (1), in order to get strong results for every one of the variables are stationary at all levels.

Table 5.3 ADF and PP Test Results at First Difference

Variables	Model specification	ADF TEST		PP TEST	
		ADF T-Statistics Value	ADF Probability Value	PP T-Statistics Value	PP Probability Value
D(LUNR)	Intercept	-4.803	0.001***	-9.350	0.000***
	Trend and Intercept	-4.964	0.002***	-10.835	0.000***
	None	-6.125	0.000***	-6.215	0.000***
D(LPG)	Intercept	-6.220	0.000***	-6.157	0.000***
	Trend and Intercept	-6.272	0.000***	-6.209	0.000***
	None	-6.274	0.000***	-6.204	0.000***
D(LGEEDU)	Intercept	-5.382	0.000***	-6.689	0.000***
	Trend and Intercept	-5.339	0.001***	-8.611	0.000***
	None	-5.474	0.000***	-6.835	0.000***
D(LFDI)	Intercept	-5.766	0.000***	-6.341	0.000***
	Trend and Intercept	-5.588	0.001***	-6.045	0.000***
	None	-5.869	0.000***	-6.473	0.000***
D(LGDP)	Intercept	-2.783	0.073*	-2.795	0.071*
	Trend and Intercept	-2.694	0.246	-2.705	0.242
	None	-1.756	0.075*	-1.660	0.091*

***statistically significant at 1%

**statistically significant at 5%

*statistically significant at 10%

The variables turn out to be stationary as shown by results obtained in Table 5.3; this indicates its mean and variance are steady after some time. It seems that the results received from both the ADF and PP test are equally the same with those from the graphical examination and most of the variables are strongly significant at first difference at 1% level of significance for both tests. All the series are stationary after first differenced form. As a result all the variables have to be differenced to avoid spurious results. Therefore, we can say that the series is integrated to the order 1 or I (1). Subsequently, we can proceed to cointegration test after the stationary test.

5.4 Cointegration Test Results

The cointegration approach confirms an integration of the long and short run relationship among variables inside a combined structure. The most vital step is to make certain that each variable is integrated of the same order. This possibly accomplished by differencing once every one of the variables. This study used the Johansen's (Johansen and Juselius, 1990) maximum likelihood technique for cointegration test.

In this test, it is an essential to decide best lag length that eradicates serial-correlation within the residuals, also deciding the deterministic pattern of assumptions for the VAR model. The selection of the lag order for the VAR, the information criteria approach uses a direction in deciding on lag order. The choice is made of lag 1 in this study, because it allows the adjustment within the model and brings about well-behaved residuals.

5.4.1 Lag Length Selection Criteria

The lag length selection criteria are a significant stage in the examination of the VAR model. This allows the analysis to choose the lag length of the VAR model (Kifa, 2014). Table 5.3 presents the confirmation of the lag lengths that are carefully chosen by various information criteria.

Table 5.4: Lag Length Selection Criteria Results

Lag	LogL	LR	FPE	AIC	SC	HQ14	Conclusion
0	127.817	NA	1.44e-10	-8.470	-8.234	-8.396	Not good
1	264.438	216.709*	6.75e-14	-16.168	-14.754*	-15.725*	Good
2	292.001	34.216	6.69e-14*	-16.3449*	-13.752	-15.533	Not Good

*indicates lag order selected by the criteria

LR: Sequential modified LR test statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan-Quinn Information Criterion

Table 5.4 indicates lag 1 is selected. The information criteria approach produced agreeable results as well as a decision to adopt lag 1. As a result, the Johansen cointegration test was conducted by using lag 1 for the VAR.

The Johansen cointegration approach depends on the trace test presented in Table 5.4 (a) and maximum eigenvalue test is shown in Table 5.4 (b). The null hypothesis of trace test states that the number of cointegrating equation is more prominent than the number of variables included. Supposing that the test statistic value is smaller than the critical values of the trace test and then the study fails to reject the null hypothesis. The null hypothesis of the maximum eigenvalue test states that the number of cointegrating equation is (r) in contrast to the number of alternative hypothesis of cointegrating equations in addition to one which is (r + 1). In the event that the test statistic is smaller than the maximum eigenvalue test critical value then we cannot reject the null hypothesis (Adrino, 2012).

Table 5.5 (a) Cointegration Rank Test (Trace) Results

Hypothesized No. Of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob.**	Conclusion
None*	0.640	82.230	69.819	0.004	Reject Ho
At most 1*	0.597	52.637	47.856	0.017	Reject Ho
At most 2	0.443	26.279	29.797	0.121	Accept Ho
At most 3	0.264	9.317	15.494	0.337	Accept Ho
At most 4	0.015	0.438	3.841	0.508	Accept Ho

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

Table 5.5 (b) Cointegration Rank Test (Maximum Eigenvalue) Results

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**	Conclusion
None	0.640	29.593	33.877	0.149	Accept Ho
At most 1	0.597	26.358	27.584	0.071	Accept Ho
At most 2	0.443	16.962	21.132	0.174	Accept Ho
At most 3	0.264	8.879	14.265	0.296	Accept Ho
At most 4	0.015	0.438	3.841	0.508	Accept Ho

Max-eigenvalue test indicates 0 cointegrating eqn(s) at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

The trace test appears in at least two cointegrating equations existing at 5 percent significance level. The null hypothesis of no cointegrating vectors is rejected as the trace test statistic of 82.230 is more noteworthy than the 5% critical value of approximately 69.819; this suggesting cointergration exist at none. Proceeding onward to test the null hypothesis is at most 1 cointegrating vector, the trace statistics is present at 52.637 and this is more noteworthy than the critical value of 47.856. Consequently, there is a cointegration of variables for at most one. At most 2, there is no cointegration vector and null hypothesis cannot be rejected.

Additionally, at most 2 the null hypothesis of no cointegrating vector is rejected, because the trace statistics of 26.279 are not more than the 5 percent critical value of 29.797. The null hypothesis of no cointegrating vector is also rejected for at most 3. Here the trace statistics of at most 3 is 9.317 is less than the 5 percent critical value 15.495. This indicates the variables factored into this research under the trace statistics are

cointegrated at none as well as at most 1. Therefore, 2 cointegrating equations were identified by the trace statistics at 5 percent level of significance. A unique long-run relationship is expected to exist between unemployment and its determined variables.

The maximum eigenvalue test in Table 5.5 (b) shows no cointegrating equation is existent at 5% significant level. The null hypothesis of no cointegrating vectors cannot be rejected as the eigenvalue of 29.593 is not more than 5% critical value of 33.877. By utilizing the similar analysis, the null hypothesis expressed that there are cointegrating vectors that cannot be rejected at most one, as the test statistics value of 20.592 are not more than 5% percent critical value of 21.132. At most 2, the null hypothesis cannot be rejected as the statistics value of approximately 16.962 are not more than the critical value of 21.132 at 5 percent level of significant. At most 3, the null hypothesis cannot be rejected since the statistic value of 8.879 is not as much as the critical value of 14.265 at 5 percent level of significant. At most 4, the null hypothesis cannot be rejected as the statistic value of 0.438 is not as much as the critical value of 3.841 at 5 percent level of significant.

By looking at the outcomes obtained from cointegration test, using the trace and Max-Eigen tests, the trace test specifies two cointegrating vectors whereas the value of Max-Eigen test does not specify one cointegrating equation at the 5 percent significant level as depicted above in Table 5.5(a) and Table 5.5(b). Lütkepohl *et al*. (2001) argues that the trace test is stronger than the maximum eigenvalue test; therefore this research endorses the outcome of the trace test and concludes there are two cointegrating equations. It implies that a long-run relationship does exist among the factors. As variables may also have short or long run impacts, in order to disaggregate these impacts, a Vector Error Correction Model (VECM) is utilized. Therefore, it is required that cointegration vectors are stationary and cointegration relations are plotted in Figure 5.3, below. Both cointegrating relation appear to be stationary.

Figure 5.3 Cointegration Vectors
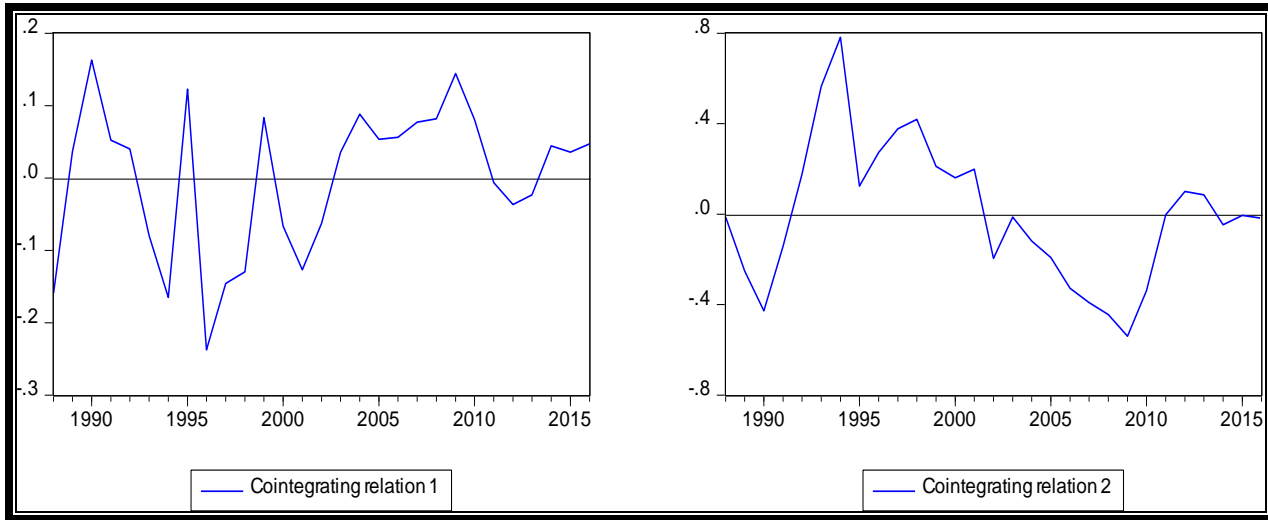
Source: Eviews 9 computation: Data obtained from SARB, IMF Bank and World Bank, (2017)

5.5 Vector Error Correction Model (VECM)

Partly one cointegration equation was discovered at section 5.4 which points that a VECM model can be utilized. This model will helps us to decide the impacts of variables among the short and long run accordingly as well as establishing the effect of other variables on unemployment. The VECM outcomes in excess of the Long and Short-run time period are presented in Section 5.5.1 and 5.5.2. A summary of the Long-run and Short-run parameters is presented separately in Table 5.6 and Table 5.7. All the outcomes are reported in detail in the Appendixes.

If trace and Max-Eigen found more than one cointegrating equation, it is not sensible to take the unrestricted estimated equation in β specifically as significant long-run estimating parameters. It is vital to impose restrictions on the components of β in an endeavor to acquire the essential relationship among the variables (Eita, 2007). Subsequently there are two cointegrating vectors the VECM is visualized along these lines in the form of matrixes in equation 5.1:

$$\Pi\chi_{t-1} = \alpha\beta'\chi_{t-1} = \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & \alpha_{32} \\ \alpha_{41} & \alpha_{42} \\ \alpha_{51} & \alpha_{52} \\ \alpha_{61} & \alpha_{62} \end{bmatrix} \begin{bmatrix} \beta_{11} & \beta_{21} & \beta_{31} & \beta_{41} & \beta_{51} & \beta_{61} \\ \beta_{12} & \beta_{22} & \beta_{32} & \beta_{42} & \beta_{52} & \beta_{62} \end{bmatrix} \begin{bmatrix} LUNR_{t-1} \\ LPG_{t-1} \\ LGEEDU_{t-1} \\ LFDI_{t-1} \\ LGDP_{t-1} \\ C_t \end{bmatrix} \quad\text{.......................................(5.1)}$$

5.5.1 Long-Run Restrictions Model

The long-run restriction is done within this investigation. Testing for the long-run factor helps to find which variables ought to be included into the model and which ones should not be included in the model (Eita, 2007). Four long-run restrictions were imposed on two cointegrating vectors as appeared in Equation 5.2:

$$\Pi \chi_{t-1} = \alpha\beta'\chi_{t-1} = \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & \alpha_{32} \\ 0 & 0 \\ \alpha_{51} & \alpha_{52} \\ \alpha_{61} & \alpha_{62} \end{bmatrix} \begin{bmatrix} 1 & 0 & \beta_{31} & \beta_{41} & \beta_{51} & \beta_{61} \\ 0 & 1 & \beta_{32} & \beta_{42} & \beta_{52} & \beta_{62} \end{bmatrix} \begin{bmatrix} LUNR_{t-1} \\ LPG_{t-1} \\ LGEEDU_{t-1} \\ LFDI_{t-1} \\ LGDP_{t-1} \\ C_t \end{bmatrix} \quad ....(5.2)$$

where β_1 and α_1 signify the parameters for long-run and short-run of the VECM respectively. The study imposed restrictions in both the short and the long-run model accordingly, the unemployment rate equation and population growth model specified. Summary of the restricted long-run parameters outcomes are presented in Table 5.5 beneath (see the outcomes in Appendix).

Table 5.6 (a) Results of Long-Run Cointegration Equation 1

Variable	Coefficient	Standard Error	T-Statistic
Constant	0.299	-	-
LUNR(-1)	1.000	-	-
LPG(-1)	0.000	-	-
LGEEDU(-1)	-0.890	0.322	-2.762
LFDI(-1)	1.006	0.207	4.868
LGDP(-1)	-0.487	0.065	-7.467

Source: Computed using data from Eviews 9: VECM Assumption 3

Table 5.6 (b) Results of Long-Run Cointegration Equation 2

Variable	Coefficient	Standard Error	T-Statistic
Constant	-10.015	-	-
LUNR(-1)	0.000	-	-
LPG(-1)	1.000	-	-
LGEEDU(-1)	3.132	1.400	2.237
LFDI(-1)	-1.380	0.898	-1.537
LGDP(-1)	0.560	0.284	1.975

Source: Computed using data from Eviews 9: VECM Assumption 3

The standard system is applied in interpreting the result of VECM long-run model. A negative coefficient is interpreted as a positive coefficient and the other way around. Therefore, the entire coefficients in the model were multiplied by -1, (Lawana, 2016). For that reason, this study also applied the same procedure. The effect of long run effect from the independent variables on unemployment (UNR) as presented by Table 5.6 (a) and (b) is shown by utilizing equation 5.3 and 5.4:

$$UNR = -0.299122 + 0.890017GEEDU - 1.00553FDI + 0.487284GDP ....(5.3)$$

$$PG = 10.01540 - 3.132391GEEDU + 1.38001FDI - 0.559982GDP ....(5.4)$$

Eita (2007) deduces that the results of the first cointegrating vector is the most important than the second cointegrating vector is not important. Therefore, this study focuses on first equation or cointegrating vector which is the unemployment rate equation. That is because the focal point of the study is on the unemployment rate.

Equation 5.3 shows that a constant and foreign direct investment (FDI) has a negative long-run relationship with unemployment rate (UNR). Furthermore, the outcomes likewise show that government expenditure on education (GEEDU) and gross domestic product (GDP) have a positive long-run relationship with unemployment rate (UNR). Each one of the independent variables is statistically significant in enlightening the dependent variable (unemployment) as the value of absolute t-value is above 2.

Based on the equation 5.3, in the first cointegrating long-run equation, zero restriction is imposed on population growth (PG) as it has now turned out to be the explained variable of the second equation. Unemployment remains a consequence of an extremely high number of people having an extremely small number of jobs. Conclusively, overpopulation brings about the unemployment and consequently overpopulation which is described as a circumstance wherein a nation's human population goes beyond the conveying boundary of particular conditions signifying that the people are over and above the measure of available occupations. O'Nwachukwu (2016) and Asif (2013) found similar results in their studies but for different countries. Moreover, Asif (2013) also clarifies that when there is a rise in population growth, unemployment rates expanded too. Logically and theoretically it underpins the outcomes of this study, because as the population rises in spite of the fact that the factors of production continue expanding that expansion is not in the same extent as the production and use of the resources.

A one percent increase in government expenditure on education (GEEDU) would result in a rise in unemployment (UNR) by 89 percent. As per economic theory, this finding suggests that government expenditure would reduce unemployment in an economy and the outcomes of the model do not appear to be

in line with this economic theory. Khumalo (2014) and O'Nwachukwu (2016) also found similar results in their studies, thereby contradicting the theory. An increase in government expenditure might create a multiplier effect. If the government expenditure causes the unemployed to acquire occupations then they will have more wages/ salaries to spend, prompting a further rise in total demand. In these circumstances of additional limits in the economy, government expenditure might cause a greater final increase in GDP than the underlying injection.

Foreign direct investment (FDI) has a negative long run relationship with unemployment (UNR). A one percent rise in FDI would results in a drop in unemployment (UNR) by 100.6 percent. Similarly, as per Hisarciklilar *et al.* (2014), stated that the widespread uses of new technology in producing goods that are originating from foreign direct investment, and is assumed to negatively affect employment. FDI is not the fundamental factor in resolving the problem of unemployment, according to the Aktar and Ozturk (2009) indicates that foreign direct investment does not contribute in reducing the problem of unemployment. On other side there are few studies that states that foreign direct investment is considered as a vital key, because it will make employments for the individuals who are unemployed in the nation. Joshi and Ghosal (2009), Lin and Wang (2004), Driffield and Taylor (2000), as well as Schmerer (2012) enlightened foreign direct investment can create other new job. A rise in FDI will boost the economy. Isaac (2012) also identified that foreign direct investment can increase unemployment.

A one percent increase in GDP would lead to decrease unemployment by 48.73 percent. The results correspond to economic theory, which implies that an increase in GDP would reduce unemployment and a decrease in GDP would increase unemployment. Economic growth and unemployment are therefore related and connected trends. Asif (2013) also found similar results for two countries, India and China, where as they found positive impact for Pakistan. There was a positive and significant relationship between Gross Domestic Product (GDP) and unemployment in Pakistan because of the poverty levels and non-use of foreign investment of that nation. It implies that when an economy develops, occupation opportunities are enhanced and in the long-run the unemployment rate falls. This concurs with the theory of inverse relationships, and it likewise implies that by and large the use of the resources in these nations is superior to that of Pakistan. On the other hand, Mayekiso (2015) found negative impact of gross domestic product on unemployment and suggested that a decrease in real gross domestic product would bring about an expansion in unemployment. The results are consistent with the theoretical expectation that amid the economic downswing, unemployment indicates upward slope or turns out to be emphatically inclined. At the point when there is a decrease in genuine GDP, the joblessness rate turns out to be potentially higher (Barker, 2007).

Equation 5.4 shows restrictions imposed on unemployment rate (UNR) in the second equation since it is an endogenous variable in the first equation. The imposed restrictions indicate the actual variable does not play a role in the determination of the explained variable. The government expenditure on education (GEEDU) and gross domestic product (GDP) have a negative long-run relationship with population growth (PG), while a positive long-run correlation was found to have an impact on foreign direct investment (FDI) and population growth (PG). The value of foreign direct investment (FDI) and gross domestic product (GDP) are statistically insignificant in explaining population growth as the absolute t-value is not more than 2. In the same equation, the value of government expenditure on education (GEEDU) is statistically significant as the absolute t-value is above 2.

Government expenditure on education (GEEDU) was established as having a negative and long run correlation with population growth (PG). A one percent increase in GEEDU would lead to decrease in population growth (PG) by 313.24 percent. Where, a study done by Kimakova (2009) found a negative impact of population growth on government expenditure. Foreign direct investment (FDI) has a positive long run relationship with population growth (PG). A one percent increase in FDI would lead to increase in population growth (PG) by 138 percent. Gross domestic product (GDP) was found to have a negative long run relationship with population growth (PG). A one percent increase in GDP would cause population growth (PG) decrease by -56 percent.

5.5.2 Short Run Results

Table 5.7 Results of Short-Run Cointegration Equation 1 and 2 (VECM)

	COINTEGRATING EQUATION (1)			COINTEGRATING EQUATION (2)		
Variables	**Coefficient**	**Standard Error**	**T-Statistics**	**Coefficient**	**Standard Error**	**T-Statistics**
D(LOGUNR)	-1.125	0.288	-3.908	-0.240	0.067	-3.599
D(LOGPG)	1.092	0.520	2.102	0.039	0.120	-0.322
D(LOGGEEDU)	-0.074	0.275	-0.269	-0.049	0.064	-0.776
D(LOGFDI)	0.000	0.000	[NA]	0.000	0.000	[NA]
D(LOGGDP)	0.046	0.089	0.520	0.013	0.021	0.643
LR test for binding restrictions (rank = 2):						
Chi – Square (2)			5.779104			
Probability			0.055601			

Source: Own estimates based on the data obtained from SARB, IMF and World Bank, (2017)

According to the results obtained for cointegrating equation 1 in Table 5.7, the estimation of equation is theoretically correct as the sign of the vector error correction model of D (LOGUNR) is negative and reported as -1.125. This indicates the speed of adjustment is about 112.52 percent. The result proves the existence of a problem in the long-run equilibrium correlation among the explanatory variables within South Africa therefore the VECM is well determined. This implies that there is a deviation from equilibrium; just 112.52 percent are rectified in one year while the variable moves to reestablishing equilibrium. This speed of adjustment is slightly higher compared to those from previous studies on South Africa. The value of adjustment is a relatively high-speed of adjustment to long-run equilibrium. This implies that short-run shocks or disturbances in the unemployment rate would quickly move the economy towards the long-run equilibrium. The speed of adjustment value is statistically meaningful and a value of t-stats is negative at -3.908.

A positive effect of LPG was found to have on LUNR in the short-run because there will be limited job opportunities to accommodate everyone. Even so, the t-stats value of LPG 2.102 is statistically significant. The coefficient indicates that one percent increase in LPG will cause LUNR to rise by 109 percent. This shows that LPG has a positive impact on unemployment. The outcome is similar to the findings of Bakare (2011), who states that most economists generally reason that high growth rate of population would result in rapid growth of the labour force that could exceed the supply of occupations.

Government expenditure on education have a negative affects on unemployment in short run. A rise in LGEEDU by 1 percent will reduce unemployment by approximately 7.4 percent. This complies with general economic theory. A rise in government expenditure on education in the short run will increase employment and job opportunities, ultimately reducing unemployment in the country. The LGEEDU is statistically insignificant because t-statistics value is less than 2, which is - 0.269. A similar finding to these results was found in studies by Khumalo (2014) and Murwirapachena, (2011).

Gross Domestic Product has a positive relationship with LUNR in the short-run depending on the government priority and also their behaviour. A 1 percent increase in LGDP would lead to increase LUNR by 4.6 percent. This does not correspond with economic theory. It is not statistically significant because the value of t-statistics is 0.520, and this is less than 2. Okun's law states that a 1 percent decrease in unemployment will happen when the economy grows about 2 percent faster than expected. However, the t-value of LGDP 0.520 is insignificant. Banda, Ngirande, and Hogwe (2013) also found similar results in their study.

According to the results obtained for cointegrating equation 2 in Table 5.6, the coefficient of D (LOGUNR) is negative and stated as -0.240. This indicates the speed of adjustment is around 23.99 percent. This also suggests that if there is a deviation from equilibrium, just 23.99 percent will be rectified in one year as the variable moves to reestablishing equilibrium. The value of the speed of adjustment was found as statistically meaningful with a negative value of t-stats about -3.599.

A positive effect of LPG was found to have in the short-run on LUNR, but the t-value of LPG -0.322 is insignificant. The coefficient indicates current UNR may rise by 90.1 percent if LPG is increased by 1 percent. This shows that LPG has a positive effect on unemployment. Government expenditure on education (GEEDU) has a negative effect on unemployment. An increase in LGEEDU by 1 percent will reduce unemployment by approximately 4.9 percent. This complies with economic theory. Gross Domestic Product has a positive relationship with LUNR. If there is 1 percent rise in LGDP, this would lead to growth in LUNR by 4.6 percent. This does not correspond with economic theory as it is not statistically significant because the value of t-statistics is not more than 2, that is 0.520.

For both cointegrating equation 1 and 2, zero restrictions were imposed on foreign direct investment. This indicates the study of unemployment can work without help of foreign direct investment in order to get back to equilibrium over the long-run. The result for likelihood ratio for binding restrictions of LR is 5.779 and probability value is 0.056.

5.6 Diagnostic Checks Results

The unemployment model was used for diagnostic tests. The diagnostic and stability tests are responsible for checking whether a model is correctly specified along with the goodness off fitness. The tests results depend on statistical values. The model was tested for normality test, heteroscedasticity test, autocorrelation test; AR roots graphs, as well as impulse response and variance decomposition analysis. The interpretation of the tests is considered on the following criteria when probability value is less than ($p<0.05$), we reject the null hypothesis and when the probability value is more than ($p>0.05$), we accept the null hypothesis. The good conditions of the model were tested in four different main techniques. To start with, Jarque-Bera's normality test was tested. This was followed by heteroscedasticity tested utilizing White's test with no cross terms and autocorrelation tested using Breusch-Godfrey test. Finally, AR Roots graph was tested to check if the model is stable or not. In Table 5.8 below, a summary of the diagnostic and stability tests outcomes of regression model is presented followed by providing more information on each test.

Table 5.8 Summary Diagnostic Results

Test	Null Hypothesis	T-Statistic	P-Value	Conclusion
Jarque-Bera	There is normal distribution.	13.764	0.184	The residuals are normally distributed.
White (Chi-Sq.)	No conditional heteroscedasticity	244.608	0.051	There is no heteroscedasticity.
Breusch-Godfrey	No serial correlation	26.249	0.394	There is no serial correlation.
AR Roots Graphs	Stable model	$\sum_{r=1}^{n} a_1 < 1$		The model is stable.

Source: Own estimates based on the data obtained from SARB, IMF, and World Bank, (2017)

Normality tests were accomplished by employing the Jarque-Bera (JB) test. This test is utilized to decide whether a data set or residuals are normally distributed or not. As per economic theory, it is expected that the hypothesis states the residuals are normally distributed. Based on the outcomes from Table 5.8 above the residuals are normally distributed as probability value of Jarque-Bera is more than 5 percent and highly significant. Gujarati (2004; pp.149) argues that if the probability value of the Jarque-Bera statistics is very low in an application, at that point the study may reject the null hypothesis and declare the residuals are normally distributed. In this regard, we therefore conclude by accepting the null hypothesis which indicates the residuals are normally distributed and rejecting the alternative hypothesis which predicts that the residuals are not normally distributed.

At the point where the residuals are heteroskedastic, the indication is that the variances of the error terms are not continuous as of one perception toward another. A null hypothesis of the heteroscedasticity test signifies that there is no heteroscedasticity within the residuals. Whenever the value of the probability is not more than the 5 % significant level then reject the Ho. The outcomes obtained from Table 5.8 point out that the test for heteroscedasticity employing White test with no cross-terms produced, a Chi-square of 244.608 at a probability value of 0.051. This shows that there is no heteroscedasticity among the variables as the Chi Square probability value is above 5 percent and less than 10 percent level of significant. Therefore, we accept the null hypothesis that predicts there is no heteroscedasticity and rejecting the alternative hypothesis. This allows us to conclude that residuals are homoscedastic.

The autocorrelation test was used to tests for serial correlation amongst the variables. The null hypothesis of the autocorrelation test states that there is no serial correlation. If the p-value is not more than 5 percent level of significance, then we reject the null hypothesis and conclude that the residuals are serially correlated. The outcomes obtained in Table 5.8 show that LM tests probability value (0.394) is above 5 percent at lag one up

to two, therefore the null hypothesis is accepted and it is concluded that there are no serial correlation amid the residuals. Since the selected lag length was one, therefore we determine that the residuals are not serially correlated.

5.6.1 Stability Test Results

The AR roots graph used for testing the stability of a model is presented in Figure 5.4 beneath. A VAR model is held to be steady in case all the modulus of the roots is not as much as the one and also within the circle. All the modulus of the roots lies in the unit circle, therefore we can determine that this model for South Africa is steady and the results obtained would be reasonable.

Figure 5.4 Stability Test Results
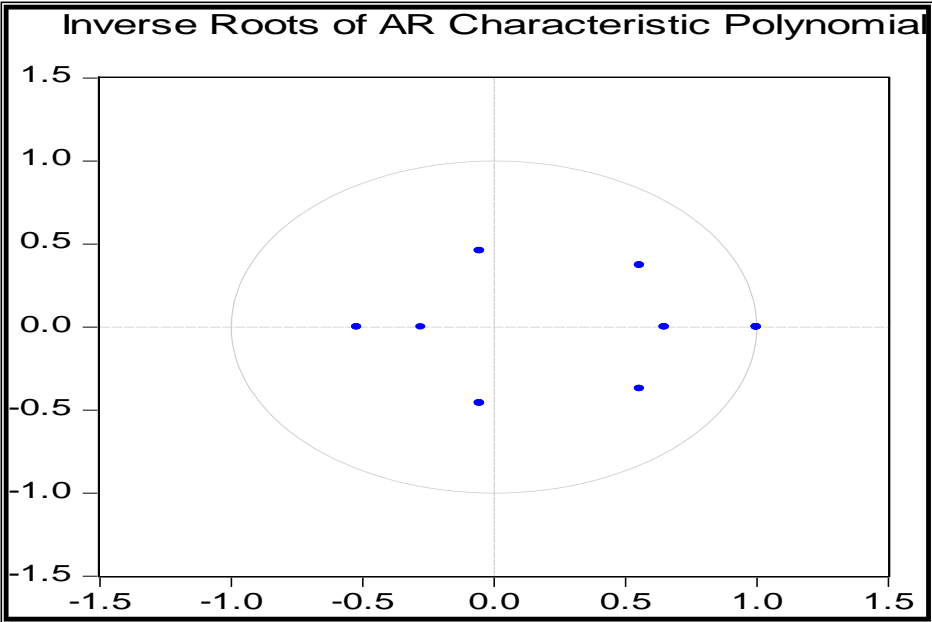
Source: Computed using data obtained from SARB, IMF, and World Bank, (2017)

Since the residuals are steady, there is no serial correlation, no heteroscedasticity. The residuals also are normally distributed, therefore it is logical to conclude that estimated model of this study for South Africa is feasible and it may be utilized for further investigation.

5.7 Results of Impulse Response

The impulse response analysis was advanced by Sims (1980) and this shows the response of unemployment to other deciding factors. Sims (1980), established that a shock to the variable does not just impact the variable itself; the shock leads to all other independent variables through the lag or dynamic structure of the Vector Autoregression (VAR). The impulse response results are from VECM.

As indicated in Figure 5.5 underneath, the response of LUNR to LUNR has a decreasing positive impact on itself up to the 10 periods. This implies that a shock to LUNR in the economy of South Africa brings about a decrease in LUNR.

The response of LUNR towards LPG and LUNR toward LFDI has a negatively increasing impact over similar time periods. This implies shocks to LPG and LFDI would bring about LUNR to decrease. The outcomes of impulse response shows a negative relationship amongst LUNR and LFDI, linking with the Johansen cointegration results of long-run equation 1 that is discussed above. The response of LUNR to LGDP was equally increasingly negative between second and third period then negatively increased up to the 10th period. This implies shock to LGDP results in a decrease in LUNR, an outcome that tallies with the Johansen cointegrating results of long-run cointegrating equation 2 that show above. Therefore, we conclude that LGDP and LFDI will have an impact on LUNR in the long-run.   .

The response of LUNR to LGEEDU has an increasing positive effect during the first two periods. After these periods, decrease until fourth period and again it turns out to be gradually positive until 10th period. This indicates that a shock to LGEEDU would make LUNR to rise. The results of impulse response of a positive relationship among LUNR and LGEEDU links with the outcomes of Johansen cointegration long-run equation 1, that is discussed above. Therefore, we could conclude that LGEEDU will have an impact on LUNR in the long-run.

A shock from LPG positively impacted on LPG and the response of LPG to LFDI has a positive impact. This implies that a shock on LPG and LFDI will result in LPG to increase throughout the years. However, the LPG response to LGEEDU is initially negative up to 10th period. The response of LPG to LGDP is negative until 5th period and after this it increased positively over the period. This indicates, a shock to LGDP will bring about an increase in LPG because shock is generally positive.

The response of LGEEDU to LUNR is at first negative over the period meaning that LUNR will cause LGEEDU to decrease. Response of LGEEDU toward LPG is negative accordingly a shock in LPG would bring about LGEEDU to decrease. The response of LGEEDU toward LGEEDU is positive and decreases over the period. LGEEDU to LFDI initially positive up 10th period, however it does not have much effect of shock. This means that, LFDI makes an increase in LGEEDU mainly. Response of LGEEDU to LGDP is at first negative and then decreases after 4th period. It started to increase up to 10th period. This means that a shock to LGDP will result in a decrease in.

The response of LFDI to LUNR is initially negative and decreases across the 10th period. This means a shock to LUNR would bring about a decline to LFDI. Response of LFDI to LPG is initially positive but decreases

after 2nd period and increases after 3rd period up to the 10th period. This means that LPG would cause LFDI to increase over the period. The response of LFDI toward LGEEDU is negative. Subsequently when LGEEDU experiences a shock; this one will cause LFDI to decline. Response of LFDI toward LFDI is positive and decreased up to 10th implying therefore that a shock of LFDI will make LFDI to rise over the period. Additionally, the response of LFDI to LGDP is increasingly positive over the period. Therefore we could conclude that when LGDP experiences a shock, this causes LFDI to rise.

Furthermore, the response of LGDP to LUNR is also gradually negative over the period. This implies that when LUNR experiences a shock, it will bring about a decrease in LGDP mostly. Response of LGDP to LPG is positive and increasing over the period. This demonstrates that a shock of LPG will make LGDP to rise. LGDP to LGEEDU is negative, decreases up to 4th period and after that it increases up to 10th period. We conclude that the response is mostly negative and a shock in LGEEDU is likely to cause a decline in LGDP. Response of LGDP to LFDI is negative, decreases after first period, and after that increases up to 10th period. Therefore, we can say that a shock of LFDI will bring about a decrease to LGDP mostly. Response of LGDP to LGDP is positively increased up to 6th period after that decreased up to 10th period. This implies, when LGDP experiences a shock, this is likely to raise LGDP.

Figure 5.5 Impulse Response Function Results
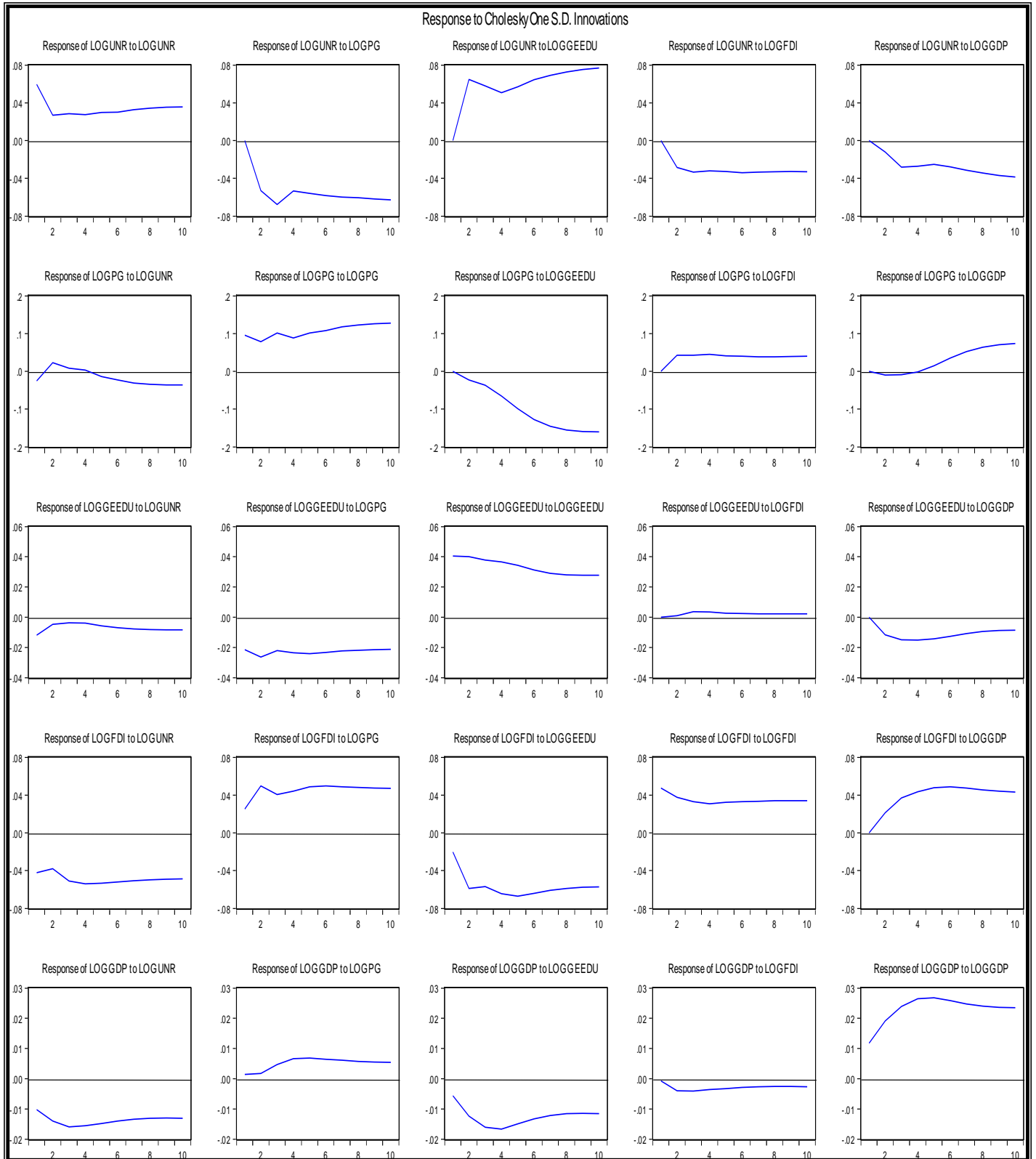
Source: Own estimates based on the data obtained from SARB, IMF, and World Bank, (2017)

5.8 Results of Variance Decomposition

The analysis of the Variance decomposition pointed out the portion of the activities in sequences because of its own shocks set against the shocks attributed to additional factors (Mazenda, 2014). It also displays how much of the forecast error variance may be explained by the shocks from other independent factors. The summary of variance decomposition analysis outcomes is shown in Table 5.9, pointing to the net effect of LUNR on the explanatory variables in excess of a time period of ten years. An excessive proportion of the forecast error variance in LUNR is clarified through its own independent variables.

Table 5.9 Variance Decomposition of LUNR Results

Period	S.E.	LUNR	LPG	LGEEDU	LFDI	LGDP
1	0.060	100.000	0.000	0.000	0.000	0.000
2	0.111	34.919	22.952	34.367	6.562	1.110
3	0.151	22.204	32.342	33.003	8.367	4.084
4	0.176	18.935	33.195	32.887	9.576	5.407
5	0.199	16.886	33.576	33.644	10.100	5.794
6	0.224	15.205	33.401	34.962	10.298	6.134
7	0.248	14.103	32.412	36.146	10.174	6.593
8	0.272	13.332	32.412	37.225	9.938	7.093
9	0.296	12.748	31.905	38.099	9.670	7.578
10	0.318	12.288	31.484	38.773	9.433	8.023

Source: Results computed make use of data from SARB, IMF, and World Bank, (2017)

Table 5.9, spans a time period of 10 years with the intention of finding out the impacts of the variables and their influence on the LUNR for a comparatively longer period of time. The forecast error variance of LUNR is clarified through its own innovations at 12.29% but mostly explained by 38.77 percent of LGEEDU, towards the end of 10 years. According to Brooks (2002:342), all the variation in the dependent variable in the first year is clarified by its own innovations or shocks. From Table 5.8 above, the results show that from the second period up to the tenth period, LGEEDU is the variable that brings about the maximum variation in LUNR.

Appendix F further down displays the effect of the variance decomposition between the independent variables. The variance decomposition of LUNR on LPG reveals the high extent of shocks as clarified by the LGEEDU with 45.06 percent, followed by 40.80 percent variations on its own innovation LPG, and 2.32 percent of LUNR. The variance decomposition of LUNR on LGEEDU is generally clarified through their own innovation with 61.33 percent followed by 2.94 percent of LUNR. The variance decomposition of

LUNR on FDI is mainly clarified through LGEEDU with 31.31 percent followed by 22.47 percent of LUNR and 19.26 percent variation on its own innovation (LFDI). The variance decomposition of LUNR on LGDP is 57.98 percent explained by its own innovation followed by 20.25 percent of LUNR. We can conclude that apart from LUNR, LPG and LFDI, most of the variations of LUNR on the LGEEDU and LGDP are explained by their own innovations.

5.9 Granger Causality Test

According to Gujarati and Porter, (2009), Granger causality test is a statistical hypothesis test for determining whether one series is useful in forecasting another. For instance, a time series (X) is said to Granger-cause (Y). Using T-tests and F-tests, the values of (X) can provide information about the future values of (Y).

Testing for causality upholds the standard procedure outlined by Gujarati and Porter (2009). The hypotheses will first be tested and then compared with the F statistics values. If the F-statistic values are greater than the probability values, we then conclude by rejecting the null hypotheses and accept the alternative hypotheses.

As such, we accept the null hypothesis that says LOGPG does not Granger cause LOGUNR. Also, the null hypothesis which states that LOGUNR does not Granger cause LOGPG is insignificant at 10 percent, we therefore accept the null hypothesis that says LOGUNR does not Granger cause LOGPG and reject the alternative hypothesis which states that LOGUNR does Granger cause LOGPG. The results indicate that causality does not occur between LOGUNR and LOGPG in both directions.

The null hypothesis which states that LOGGEEDU does not Granger cause LOGUNR and is highly significant at 1 percent, as such we reject the null hypothesis that LOGGEEDU does not Granger cause LOGUNR and we accept the alternative hypothesis which states that LOGGEEDU does Granger cause LOGUNR. Also, the null hypothesis which states that LOGUNR does not Granger causes LOGGEEDU. In this case, we accept the null hypothesis and reject the alternative hypothesis. The results indicate that causality does occur between LOGGEEDU and LOGUNR in one direction. This implies that changes in LOGGEEDU affect LOGUNR but changes in LOGUNR will not affect LOGGEEDU in South Africa. The causality is unidirectional, from LOGGEEDU to LOGUNR. The implication of these results for the South African government and policy makers is that since government expenditure on education affect unemployment but unemployment does not affect government expenditure on education, the results does allied with economic theory.

The null hypothesis which states that LOGFDI does not Granger cause LOGUNR and is highly significant at 10 percent, as such we reject the null hypothesis that LOGFDI does not Granger cause LOGUNR and we

accept the alternative hypothesis which states that LOGFDI does Granger cause LOGUNR. Also, the null hypothesis which states that LOGUNR does not Granger causes LOGFDI. In this case, we accept the null hypothesis and reject the alternative hypothesis. The results indicate that causality does occur between LOGFDI and LOGUNR in one direction. This implies that changes in LOGFDI affect LOGUNR but changes in LOGUNR will not affect LOGFDI in South Africa. The causality is unidirectional, from LOGFDI to LOGUNR. The result does allied with economic theory.

The null hypothesis which states that LOGGDP does not Granger causes LOGUNR is highly insignificant at 10 percent, as such we accept the null hypothesis that LOGGDP does not Granger cause LOGUNR and we reject the alternative hypothesis which states that LOGGDP does Granger cause LOGUNR. Also, the null hypothesis which states that LOGUNR does not Granger causes LOGGDP at 5 percent significant. In this case, we reject the null hypothesis and accept the alternative hypothesis. The results indicate that causality does occur between LOGUNR and LOGGDP in one direction. This implies that changes in LOGUNR affect LOGGDP but changes in LOGGDP will not affect LOGUNR in South Africa. The causality is unidirectional, from LOGUNR to LOGGDP.

Table 5.10: Pairwise Granger Causality Test with Lags:2

Hypothesis	Obs	F-Statistic	Probability
LOGPG does not Granger cause LOGUNR	29	1.77981	0.1902
LOGUNR does not Granger cause LOGPG		0.31463	0.7330
LOGGEEDU does not Granger cause LOGUNR	29	11.0800	0.0004
LOGUNR does not Granger cause LOGGEEDU		0.27224	0.7640
LOGFDI does not Granger cause LOGUNR	29	2.64046	0.0919
LOGUNR does not Granger cause LOGFDI		0.00160	0.9984
LOGGDP does not Granger cause LOGUNR	29	1.09788	0.3498
LOGUNR does not Granger cause LOGGDP		3.60370	0.0428

$\alpha = 0.10$ Decision rule == reject Ho if p-value<O .1 0

5.10 Conclusion

The chapter explored the effect of determined variables on unemployment within South Africa. This chapter was split into eight subdivisions together with the introduction. The results obtained from graphical analysis as well as the unit root tests show that each of the variables were non- stationary at level form, then stationary once tested first difference. As a result, the variables were integrated about the same order I (1).

Cointegration tests be presented in the third section and employed the Johansen cointegration approach. The information criteria approach was utilized in selecting the lag order. A choice was made to accept lag 1 for VAR. This choice was made, when all the information criteria methods utilized and lag 1 chosen.

The trace and maximum eigenvalue tests were utilized to test the cointegration. The trace test revealed the presence of two cointegrating vectors and the maximum eigenvalue test revealed zero cointegrating vectors. Therefore, there existed two significant long-run relationships and two cointegrating vector relationships after normalization. Since the study found more than one cointegrating vector, an imposed restriction was applied on components upon long and short-run model. Variables could also have short or long run effects. In the fourth section, a vector error correction model (VECM) was introduced to disaggregate these impacts. The independent components are likewise significant or insignificant relying upon the time period.

Diagnostic and stability tests were outlined and performed in section five, and the outcomes showed that the residuals performed well. The analysis of impulse response and variance decomposition was reviewed in section six and seven respectively. Nearly all results of the impulse response analysis had an accurate sign also confirmed in the outcomes of the cointegration results. Most shocks were not steady. The outcomes of the variance decomposition showed that LUNR is explained by LGEEDU as the most significant of the forecaste error variances. LPG and LFDI did not explain much of the proportions of variation in LUNR.

The results indicate that causality does not occur between LOGUNR and LOGPG in both directions. Variables such LOGGEEDU, and LFDI provide unidirectional relationship and LOGGDP reinforce the inverse relationship suggested by economic theory. Therefore, in order to reduce and possibly eradicate the unemployment level, means to draw up and implement policies that will create an enabling environment for economic growth those are required.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 Introduction

This chapter deals with conclusions and recommendations towards policy as derived from the study. The initial section provides a brief summary of each chapter of the dissertation. The second section outlines a discussion on policy implications as well as recommendations based on the outcomes of this study. In the last section, limitations of the study along with areas for the further research are presented.

6.2 Summary and Conclusion

Unemployment is a global problem that almost every nation struggle to avert and resolve. The rate of unemployment in South Africa is significantly high compared to other economies in the world. The intention of this research was to investigate the determining factors of unemployment in South Africa, from the period of 1986 to 2016 utilizing time series annual data. The variables utilized within this study were unemployment rate, population growth, government expenditure on education, foreign direct investment and gross domestic product. The overall aims of the study as stated in chapter 1 were achieved in the course of this study.

Chapter two was based on the overview of unemployment in South Africa. The chapter gave a historical background of South African unemployment rate, provided the general background of determined factors that are population growth, government expenditure on education, foreign direct investment, and gross domestic product. Unemployment policy in South Africa was explained as a worrisome trend that called for rigorous resolution in the chapter.

Chapter three anchored the study within the theoretical framework, wherein theories of unemployment were introduced in order to engage fully with various schools of thought, which is, the Keynesian theory developed by John Maynard Keynes, the classical theory developed by Adam Smith, and the monetarists theory developed by Milton Friedman. All these schools of thought confirm that unemployment caused disinvestment in the economy and ought to be resolved.

Empirical literature explored national and international studies done in past on determinants of unemployment. Evidence derived from developing nations and from developed counties and South Africa was limited. All the studies are arranged in order of significance, specifically where cross-sectional and individual studies coalesce to inform the research paradigms related to the research question.

Chapter Four presented the model specification and how the model was estimated. The model was adopted from Arslan and Zaman (2014) where UR is denoted as unemployment rate and is a dependent variable; β_0 is constant and (t) represent time. PG is denotes as population growth; FDI means foreign direct investment; INR implies inflation rate; and GDP is denoted as gross domestic product which are all independent variables. The study modified this model by adding another variable which is government expenditure on education (GEEDU). The variables used are unemployment rate, foreign direct investment, population growth, government expenditure on education, and gross domestic product. The Augmented Dickey Fuller and Phillips Perron tests were employed to test the unit root of this research model. Johansen Cointegration technique was also employed. Diagnostic and stability tests were done, including the residuals normality test, heteroscedasticity test, and serial correlation test. The AR Root test was also done for stability. The impulse response and variance decomposition tests were also used up for examining the responsiveness of this model and the importance of shocks towards the variable of interest, which is unemployment.

Chapter Five analysed the impact of explanatory variables on unemployment. The chapter also analysed the time series properties of the information by making use of the formal (unit root test) and informal tests (visual inspection). The data were required for stationary tests using two unit root tests that are mentioned above. Each variable was non-stationary at level form; however after being differenced once, all the variables become stationary, and for that reason, the study confirms that the variables were integrated of order 1 or I(1). After the stationarity test was done, cointegration tests are needed to find out if there is any long-run relationship between unemployment rate and other independent variables. The Johansen cointegration approach was employed. The trace test found two cointegrating vectors, whereas Max-Eigenvalue test found zero cointegrating vectors. Since the study found more than one cointegrating vector, restriction on components was applied on the long and short-run model. There are two cointegrating equations but only one equation is considered in which the unemployment rate (UNR) model and a vector error correction model was estimated for unemployment rate (UNR). The model was tested for diagnostic and stability checks.

The results of long-run model equation 1 showed that FDI negatively impacted on UNR. GEEDU and GDP positively impacted on UNR. All the independent variables were statistically significant explaining UNR, as the value of absolute t-value is more than 2. The results of long-run model equation 2 showed that GEEDU and GDP negatively impacted on PG. FDI has positively impacted on PG. The value of foreign direct investment (FDI) and gross domestic product (GDP) are statistically insignificant in explaining population growth as the absolute t-value is not more than 2. The value of government expenditure on education (GEEDU) is statistically significant as the absolute t-value is in excess of 2.

The results of the short-run model 1 showed that it is consistent with literature. The estimate equation is theoretically accurate as the sign of the vector error correction model of D (LOGUNR) are negative and stated as -1.125. This reveals that the speed of adjustment is around 112.52 percent and is slightly higher compared to those from previous studies on South Africa. The speed of adjustment was found to be statistically significant with a negative value of t-stats at -3.90766. As per short-run model 2, the D (LOGUNR) coefficient is negative at -0.239986. This indicates the speed of adjustment is around 23.99 percent. This implies, a deviation from equilibrium, simply 23.99 percent will be rectified in one year as the variable moves in the direction of re-establishing equilibrium. The speed of adjustment was statistically significant with a negative value of t-stats at -3.599.

All the diagnostic and stability tests reveal that residuals are normally distributed, and there is no heteroscedasticity. There are also no serial correlations as well since the model is steady. Since all the tests results are correct, therefore it could be concluded that our estimated model for South Africa is a good predictor and may be utilized for further analysis.

The outcomes of the Impulse response were found to be reliable with the long-run dynamic model. Shocks on UNR, and GEEDU positively impacted on UNR. Shocks on PG, FDI, and GDP generated a negative reaction on UNR. The shocks were significantly not the same from zero.

The result of variance decomposition demonstrates that GEEDU is the most vital component in explaining UNR in South Africa at the end of the period of this study. This likewise indicates, shock toward the variables accounting for less variation in UNR in the short-run but on the long-run, the shock toward GEEDU and PG add to great variation of the forecast error. Shock to FDI and GDP add less towards the fluctuation in UNR, both in the short-run and the long-run. Variables such LOGGEEDU, and LFDI provide unidirectional granger relationship and LOGGDP reinforce the inverse relationship suggested by economic theory. Therefore, in order to reduce and possibly eradicate the unemployment level, means to draw up and implement policies that will create an enabling environment for economic growth that are required.

6.3 Policy Implications

Numerous policy implications may be drawn after the results obtained from the study. The problem of unemployment is the main concern for all policy makers and researchers. Unemployment leads to rise in crime, suicide, as well as the poverty rates. This have negatively impacted on workers (employees) together with their families and also the country affected in the sense that if no job opportunities means there will be no income is generating at specific and national level. There are many macroeconomic factors affecting the

unemployment rate in South Africa. However, the study focused on population growth, government expenditure on education, foreign direct investment, and economic growth.

In this study, population growth was imposed as a restriction by zero. Based on the results population growth does not have any impact on unemployment. However, unemployment is one of the consequences of overpopulation and lack of employment opportunities, which affects the economy ultimately. Therefore, this results in an expansion of the rate of unemployment in the country. On other hand unemployment and population growth should be calculated to determine economic growth, such that a decrease in the rate of unemployment and an increase in population growth ultimately raise the number of labourers and this would lead to an increase in growth of the economy.

The outcomes of the estimated econometric model of this study revealed a positive relationship between unemployment and government expenditure on education. As per economic theory, this suggests that government expenditure would reduce unemployment in the South African economy and the outcomes of the model differ from this economic theory. Previously, government expenditure on education has been observed to be exceptionally high even though there have not been any positive economic advantages derived from the expenditure incurred. Government should invest its financial resources concerning with the macroeconomic issues, for example, unemployment. Government is given over to improving the quality of fundamental education and one of the components of this is creating a conductive environment for learning and teaching.

The results of the foreign direct investment showed a negative relationship with unemployment. The results of this study confirm the traditional verdicts from economic theory that suggest foreign direct investment creates more domestic jobs and this would help to moderate the rate of unemployment in the nation. Therefore, a rise in foreign direct investment boosts the economy of the country.

In view of the study outcomes a growth in GDP brings about expansion in unemployment. The Okun's Law explains the relationship between GDP and unemployment rate. Theoretically, for each increase by 1 percent in unemployment rate, GDP of a particular nation will bring about the decreasing by 2 percent than its potential GDP, holding other factors steady. If GDP growth equals to labor force growth in the presence of productivity growth, more people will be entering the labor force than are needed to produce a given amount of goods and services. The portion of the labor force that is employed will fall and the unemployment rate will rise (Levine, 2013). There is no need to implement polices to reduce economic growth because it economic growth reduce then it would bring about high unemployment compared to recent unemployment rate. Government need to focus more on unemployment and should give unemployment as first priority.

6.4 Recommendations of the Study

The government should provide grants and bursaries to students at all levels (primary, secondary, and tertiary) for particular subjects, in order to encourage them to perform better. Government should invest more in education and training to help reduce structural unemployment and government should consider education as the first priority. The government should adopt an expansionary fiscal policy that spends money correctly towards measures set at reducing the level of unemployment. Government should improve the skills levels as this accelerates growth, and promotes an increase in the production level in the economy. South Africa could begin implementing policies that encourage foreign direct investment, particularly alleviating macroeconomic factors and promoting the appraisals of organisations. Government must likewise implement such policies to entice and lure foreign investors to come to South Africa and invest. By doing this, it would promote sustained economic growth which would generate more job opportunities within the country.

However, from the theoretical framework, some cases are not applicable to reality as there are numerous impacts influencing on the variable. In any cases, reasons for such impact might be the limited data or excluding relevant variables from the estimated model, which may make the data false some of the time.

6.5 Areas for Further Research

This study focused on the determinants of unemployment, an area considered the most debatable and most concerning topic for researchers as well as for policy makers. This study is not a conclusive one; therefore, there is a dire need for further research. There are various ways that could be investigated with respect to unemployment in South Africa. Firstly, this research employed monthly time series data but other studies could explore use of weekly, monthly, or quarterly time series data to increase the sample size. Secondly, other macroeconomic variables can be included in the model or can replace the variables examined in this study in order to expand the analysis. Thirdly, further research could examine the problem of unemployment amongst youth and graduates in the country, problem of unemployment in provinces, and also the social effects of unemployment. Lastly, other studies could assess different methods of testing in a different research methodology.

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Appendix 1: Data of the variables used in this study

Unemployment Rate: Data compiled from IMF Bank

Population Growth: Data compiled from World Bank

Government Expenditure on Education: Data compiled from South African Reserve Bank (SARB)

Foreign Direct Investment: Data compiled from IMF Bank

Gross Domestic Product: Data compiled from IMF Bank

YEARS	UNR	PG	GEEDU	FDI	GDP
1986	16.049	2.250013	18.1	21.021	1,502.95
1987	16.592	2.139572	18.3	17.784	1,534.52
1988	17.238	2.10325	18.3	21.228	1,598.98
1989	17.829	2.162887	17.6	22.746	1,637.27
1990	18.784	2.277104	17.7	19.413	1,632.06
1991	20.162	2.413668	19.1	19.025	1,615.45
1992	21.213	2.500606	20.3	16.769	1,580.92
1993	22.163	2.485874	20.8	15.162	1,600.42
1994	22.89	2.342285	18.3	17.72	1,652.18
1995	16.5	2.1183	20.4	19.167	1,703.66
1996	20.3	1.873402	21.2	18.04	1,777.03
1997	22	1.671073	22	17.715	1,824.07
1998	26.1	1.531779	21.3	17.992	1,833.50
1999	23.3	1.479682	20.6	17.035	1,876.74
2000	23	1.488015	20.3	16.365	1,954.71
2001	25.95	0.922481	20.4	15.745	2,008.18
2002	27.8	1.19022	20.1	16.278	2,081.84
2003	27.65	1.219672	19.6	17.106	2,143.23
2004	25.15	1.24923	19.5	18.467	2,240.85
2005	24.65	1.278909	18.3	18.315	2,359.10
2006	23.55	1.308723	18.4	20.183	2,491.30
2007	23	1.338686	18.1	20.986	2,624.84
2008	22.525	1.368812	18.1	23.15	2,708.60

2009	23.7	1.399113	18.3	20.705	2,666.94
2010	24.875	1.429604	19.6	19.513	2,748.01
2011	24.8	1.460296	20.1	19.721	2,838.26
2012	24.875	1.491203	19.9	19.966	2,901.08
2013	24.725	1.522336	19.4	21.258	2,973.29
2014	25.1	1.553706	19.3	20.836	3,023.83
2015	25.35	1.585325	19	20.706	3,063.10
2016	26.725	1.617203	19.15	19.409	3,071.66

Appendix 2: Johansen Cointegration Tests Results

Lag Length Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LOGUNR LOGPG LOGGEEDU LOGFDI LOGGDP
Exogenous variables: C
Date: 05/18/18   Time: 19:47
Sample: 1986 2016
Included observations: 29

Lag	LogL	LR	FPE	AIC	SC	HQ
0	127.8171	NA	1.44e-10	-8.470145	-8.234404	-8.396314
1	264.4378	216.7088*	6.75e-14	-16.16813	-14.75368*	-15.72514*
2	292.0009	34.21624	6.69e-14*	-16.34489*	-13.75174	-15.53275

 * indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion

Trace and Max-Eigenvalue Tests

Date: 05/18/18   Time: 19:48
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: LOGUNR LOGPG LOGGEEDU LOGFDI LOGGDP
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.639562	82.22999	69.81889	0.0037
At most 1 *	0.597035	52.63733	47.85613	0.0166
At most 2	0.442837	26.27904	29.79707	0.1205
At most 3	0.263743	9.316994	15.49471	0.3369
At most 4	0.014986	0.437891	3.841466	0.5081

 Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.639562	29.59266	33.87687	0.1492
At most 1	0.597035	26.35829	27.58434	0.0711
At most 2	0.442837	16.96205	21.13162	0.1738
At most 3	0.263743	8.879103	14.26460	0.2964
At most 4	0.014986	0.437891	3.841466	0.5081

Max-eigenvalue test indicates no cointegration at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Restrictions:

b(1,1)=1,b(1,2)=0,b(2,1)=0,b(2,2)=1,a(4,1)=0,a(4,2)=0

Tests of cointegration restrictions:

Hypothesized No. of CE(s)	Restricted Log-likehood	LR Statistic	Degrees of Freedom	Probability
2	275.9719	5.779104	2	0.055601
3	287.3424	NA	NA	NA
4	291.7820	NA	NA	NA

NA indicates restriction not binding.

2 Cointegrating Equation(s): Convergence achieved after 71 iterations.

Restricted cointegrating coefficients (standard error in parentheses)

LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1.000000	0.000000	-0.890017	1.005531	-0.487284
(0.00000)	(0.00000)	(0.32228)	(0.20658)	(0.06526)
0.000000	1.000000	3.132391	-1.380016	0.559982
(0.00000)	(0.00000)	(1.40048)	(0.89770)	(0.28360)

Adjustment coefficients (standard error in parentheses)

D(LOGUNR)	-1.125151	-0.239986
	(0.28793)	(0.06669)
D(LOGPG)	1.092216	-0.038747
	(0.51962)	(0.12035)
D(LOGGEEDU)	-0.073907	-0.049423
	(0.27481)	(0.06365)
D(LOGFDI)	0.000000	0.000000
	(0.00000)	(0.00000)
D(LOGGDP)	0.046151	0.013224
	(0.08875)	(0.02056)

3 Cointegrating Equation(s): Convergence achieved after 297 iterations.

Restricted cointegrating coefficients (not all coefficients are identified)

LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1.000000	0.000000	37.86863	4.455354	-2.595663
0.000000	1.000000	2.167345	-1.987047	0.709827
-17.92594	3.725855	-11.26768	-31.08485	13.77020

Adjustment coefficients (standard error in parentheses)

D(LOGUNR)	0.057682	-0.516840	0.051537
	(0.01593)	(0.13445)	(0.01745)
D(LOGPG)	-0.044865	0.159719	-0.045873
	(0.02835)	(0.23928)	(0.03125)
D(LOGGEEDU)	-0.012255	0.024764	-0.001632
	(0.01337)	(0.11286)	(0.01455)
D(LOGFDI)	0.000000	0.000000	0.028315
	(0.00000)	(0.00000)	(0.00877)

D(LOGGDP)	0.001730	0.001085	0.001193	
	(0.00466)	(0.03929)	(0.00511)	

4 Cointegrating Equation(s): Convergence achieved after 39 iterations.

Restricted cointegrating coefficients (not all coefficients are identified)

LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1.000000	0.000000	104.0185	229.7237	-41.46739
0.000000	1.000000	-73.04839	-80.60692	16.36057
-8.634861	-10.43757	-22.75626	-144.9913	22.40088
-31.96140	1.647778	-34.36026	-82.06094	27.02365

Adjustment coefficients (standard error in parentheses)

D(LOGUNR)	0.032033	0.017588	0.031032	0.018422
	(0.00997)	(0.00992)	(0.00943)	(0.00764)
D(LOGPG)	0.016340	0.048132	0.009329	-0.024266
	(0.01797)	(0.01787)	(0.01701)	(0.01395)
D(LOGGEEDU)	0.000317	0.005772	-0.002792	-0.000187
	(0.00857)	(0.00852)	(0.00810)	(0.00655)
D(LOGFDI)	0.000000	0.000000	-0.002179	0.017875
	(0.00000)	(0.00000)	(0.00155)	(0.00538)
D(LOGGDP)	0.001257	0.001460	0.001697	0.000742
	(0.00275)	(0.00274)	(0.00260)	(0.00211)

Appendix 3: Vector Error Correction Estimates Results

Vector Error Correction Estimates
Date: 05/18/18   Time: 19:48
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
   B(1,1)=1,B(1,2)=0,B(2,1)=0,B(2,2)=1,A(4,1)=0,A(4,2)=0
Convergence achieved after 71 iterations.
Restrictions identify all cointegrating vectors
LR test for binding restrictions (rank = 2):
Chi-square(2)   5.779104
Probability   0.055601

Cointegrating Eq:	CointEq1	CointEq2
LOGUNR(-1)	1.000000	0.000000
LOGPG(-1)	0.000000	1.000000
LOGGEEDU(-1)	-0.890017	3.132391
	(0.32228)	(1.40048)
	[-2.76166]	[2.23665]
LOGFDI(-1)	1.005531	-1.380016
	(0.20658)	(0.89770)
	[4.86761]	[-1.53728]
LOGGDP(-1)	-0.487284	0.559982
	(0.06526)	(0.28360)
	[-7.46661]	[1.97454]
C	0.299122	-10.01540

Error Correction:	D(LOGUNR)	D(LOGPG)	D(LOGGEEDU)	D(LOGFDI)	D(LOGGDP)
CointEq1	-1.125151	1.092216	-0.073907	0.000000	0.046151
	(0.28793)	(0.51962)	(0.27481)	(0.00000)	(0.08875)
	[-3.90766]	[2.10197]	[-0.26894]	[NA]	[0.52002]
CointEq2	-0.239986	-0.038747	-0.049423	0.000000	0.013224
	(0.06669)	(0.12035)	(0.06365)	(0.00000)	(0.02056)
	[-3.59854]	[-0.32195]	[-0.77648]	[NA]	[0.64334]
D(LOGUNR(-1))	0.141724	-0.040930	-0.032895	0.141263	-0.073364
	(0.17046)	(0.28393)	(0.13535)	(0.20397)	(0.04761)
	[0.83140]	[-0.14416]	[-0.24304]	[0.69258]	[-1.54088]
D(LOGPG(-1))	0.122697	-0.413101	-0.020098	0.097528	-0.028247
	(0.13109)	(0.21834)	(0.10408)	(0.15685)	(0.03661)
	[0.93597]	[-1.89196]	[-0.19309]	[0.62177]	[-0.77147]
D(LOGGEEDU(-1))	0.905282	0.863271	-0.054454	-0.794708	-0.110774
	(0.36760)	(0.61228)	(0.29187)	(0.43985)	(0.10267)
	[2.46266]	[1.40993]	[-0.18657]	[-1.80678]	[-1.07889]
D(LOGFDI(-1))	0.187140	-0.261634	0.009870	-0.179633	-0.086806
	(0.25076)	(0.41766)	(0.19910)	(0.30004)	(0.07004)
	[0.74630]	[-0.62643]	[0.04958]	[-0.59870]	[-1.23940]

D(LOGGDP(-1))	-1.443735	-0.291151	-0.992763	1.803931	0.635626
	(1.09531)	(1.82435)	(0.86965)	(1.31057)	(0.30593)
	[-1.31811]	[-0.15959]	[-1.14156]	[1.37645]	[2.07770]
C	0.049713	-0.008427	0.026312	-0.041087	0.009281
	(0.02921)	(0.04866)	(0.02320)	(0.03496)	(0.00816)
	[1.70167]	[-0.17319]	[1.13434]	[-1.17541]	[1.13740]

R-squared	0.697736	0.419734	0.172115	0.416860	0.467511
Adj. R-squared	0.596981	0.226312	-0.103847	0.222479	0.290015
Sum sq. resids	0.074586	0.206918	0.047019	0.106784	0.005819
S.E. equation	0.059596	0.099263	0.047318	0.071309	0.016646
F-statistic	6.925102	2.170040	0.623690	2.144559	2.633922
Log likelihood	45.31573	30.52036	52.00592	40.11237	82.30360
Akaike AIC	-2.573499	-1.553128	-3.034891	-2.214646	-5.124386
Schwarz SC	-2.196314	-1.175943	-2.657706	-1.837461	-4.747201
Mean dependent	0.016437	-0.009652	0.001566	0.003015	0.023931
S.D. dependent	0.093876	0.112851	0.045037	0.080870	0.019755

Determinant resid covariance (dof adj.)	1.67E-14
Determinant resid covariance	3.32E-15
Log likelihood	275.9719
Akaike information criterion	-15.58427
Schwarz criterion	-13.22686

Appendix 4: Diagnostic and Stability Tests Results

(1) Jarque-Bera Test

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 05/18/18   Time: 19:49
Sample: 1986 2016
Included observations: 29

Component	Skewness	Chi-sq	df	Prob.
1	0.018977	0.001741	1	0.9667
2	-1.136514	6.243048	1	0.0125
3	-0.072299	0.025264	1	0.8737
4	0.144399	0.100780	1	0.7509
5	-0.120101	0.069717	1	0.7917
Joint		6.440550	5	0.2657

Component	Kurtosis	Chi-sq	df	Prob.
1	3.678448	0.556185	1	0.4558
2	5.141804	5.543016	1	0.0186
3	3.473709	0.271150	1	0.6026
4	2.795219	0.050672	1	0.8219
5	3.864395	0.902840	1	0.3420
Joint		7.323863	5	0.1976

Component	Jarque-Bera	df	Prob.
1	0.557926	2	0.7566
2	11.78606	2	0.0028
3	0.296414	2	0.8623
4	0.151452	2	0.9271
5	0.972557	2	0.6149
Joint	13.76441	10	0.1840

(2) Heteroscedasticity Test

VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 05/18/18   Time: 19:51
Sample: 1986 2016
Included observations: 29

Joint test:

Chi-sq	df	Prob.
244.6081	210	0.0509

Individual components:

Dependent	R-squared	F(14,14)	Prob.	Chi-sq(14)	Prob.
res1*res1	0.755974	3.097924	0.0213	21.92325	0.0802
res2*res2	0.425201	0.739737	0.7099	12.33082	0.5798
res3*res3	0.796550	3.915220	0.0077	23.09996	0.0587
res4*res4	0.782112	3.589519	0.0114	22.68125	0.0657
res5*res5	0.751171	3.018817	0.0237	21.78395	0.0832
res2*res1	0.721567	2.591530	0.0428	20.92545	0.1036
res3*res1	0.836149	5.103105	0.0022	24.24832	0.0428
res3*res2	0.696231	2.291970	0.0663	20.19068	0.1242
res4*res1	0.715964	2.520684	0.0474	20.76297	0.1079
res4*res2	0.610068	1.564547	0.2063	17.69196	0.2212
res4*res3	0.763878	3.235099	0.0178	22.15246	0.0755
res5*res1	0.756636	3.109066	0.0210	21.94244	0.0798
res5*res2	0.487033	0.949441	0.5380	14.12394	0.4405
res5*res3	0.535094	1.150972	0.3981	15.51772	0.3437
res5*res4	0.809120	4.238881	0.0053	23.46447	0.0531

(3) Serial Correlation Test

VEC Residual Serial Correlation LM Tests

Null Hypothesis: no serial correlation at lag order h

Date: 05/18/18   Time: 19:51

Sample: 1986 2016

Included observations: 29

Lags	LM-Stat	Prob
1	26.24926	0.3944
2	21.41515	0.6692

Probs from chi-square with 25 df.

(4) Variance Decomposition Result

Variance Decomposition of LOGUNR:

Period	S.E.	LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1	0.059596	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.110610	34.91862	22.95245	34.36701	6.562378	1.199547
3	0.151262	22.20384	32.34192	33.00300	8.366801	4.084436
4	0.175531	18.93517	33.19542	32.88693	9.575507	5.406972
5	0.199464	16.88571	33.57592	33.64390	10.10072	5.793756
6	0.224025	15.20534	33.40063	34.96186	10.29794	6.134225
7	0.248382	14.10301	32.98355	36.14598	10.17410	6.593353
8	0.272176	13.33207	32.41189	37.22452	9.938031	7.093485
9	0.295450	12.74800	31.90456	38.09938	9.670120	7.577942
10	0.317779	12.28756	31.48395	38.77268	9.433241	8.022569

Variance Decomposition of LOGPG:

Period	S.E.	LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1	0.099263	6.411786	93.58821	0.000000	0.000000	0.000000
2	0.137865	5.998035	81.11532	2.684698	9.682040	0.519907
3	0.180680	3.688010	78.76214	5.793927	11.18739	0.568539
4	0.216126	2.605519	71.70006	13.20320	12.08633	0.404890
5	0.262650	2.030514	63.55755	23.22733	10.58548	0.599125
6	0.316746	1.902990	55.39774	32.18348	8.874578	1.641221
7	0.374810	2.049453	49.40566	38.03265	7.386368	3.125873
8	0.431671	2.181121	45.27310	41.62586	6.365455	4.554470
9	0.485301	2.273027	42.58923	43.74393	5.680954	5.712863
10	0.534618	2.316785	40.80476	45.06080	5.234168	6.583488

Variance Decomposition of LOGGEEDU:

Period	S.E.	LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1	0.047318	6.203917	20.81383	72.98226	0.000000	0.000000
2	0.068559	3.442597	24.80006	68.88651	0.017930	2.852906
3	0.082841	2.565344	24.10271	67.91339	0.211434	5.207124
4	0.094920	2.119411	24.53049	66.55992	0.299380	6.490803
5	0.104964	2.038168	25.33813	65.15519	0.307869	7.160642
6	0.112926	2.138582	26.19086	63.91704	0.309869	7.443653
7	0.119495	2.339831	26.88577	62.99871	0.310689	7.465004
8	0.125323	2.561862	27.47651	62.29175	0.311485	7.358393
9	0.130720	2.768528	27.95198	61.75128	0.313470	7.214742
10	0.135853	2.940593	28.33685	61.33121	0.317476	7.073868

Variance Decompo

sition of
LOGFDI:

Period	S.E.	LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1	0.071309	35.28103	12.33418	8.047544	44.33725	0.000000
2	0.119590	22.58490	21.58293	27.03584	25.64783	3.148504
3	0.155696	24.10456	19.49675	29.25083	19.61296	7.534898
4	0.190036	24.27981	18.48116	31.16116	15.77998	10.29788
5	0.221754	23.62512	18.42780	32.00211	13.72776	12.21721
6	0.248909	23.11864	18.62061	32.04642	12.66039	13.55394
7	0.271940	22.83645	18.80329	31.84223	12.12650	14.39152
8	0.292207	22.65730	18.98827	31.62258	11.85054	14.88132
9	0.310609	22.54043	19.14313	31.44161	11.69486	15.17997
10	0.327746	22.47060	19.25762	31.30729	11.58592	15.37856

Variance
Decompo
sition of
LOGGDP
:

Period	S.E.	LOGUNR	LOGPG	LOGGEEDU	LOGFDI	LOGGDP
1	0.016646	37.88066	0.708495	11.26687	0.203674	49.94031
2	0.031770	29.98782	0.495483	18.16032	1.642857	49.71353
3	0.046187	26.05796	1.270331	20.75838	1.552366	50.36096
4	0.058377	23.40040	2.075850	21.14731	1.356485	52.01995
5	0.067999	21.99614	2.534885	20.43978	1.227193	53.80201
6	0.075586	21.22165	2.779217	19.63054	1.141468	55.22713
7	0.081838	20.77388	2.923519	18.94872	1.080567	56.27331
8	0.087281	20.51034	3.002909	18.41511	1.038070	57.03358
9	0.092261	20.35278	3.044995	18.01328	1.008994	57.57995
10	0.096980	20.24795	3.069673	17.71858	0.988406	57.97540

Cholesk
y
Ordering:
LOGUNR
LOGPG
LOGGEE
DU
LOGFDI
LOGGDP

Appendix 5: Granger Cauasality Test

Pairwise Granger Causality Tests
Date: 02/05/19   Time: 01:34
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LOGPG does not Granger Cause LOGUNR	29	1.77981	0.1902
LOGUNR does not Granger Cause LOGPG		0.31463	0.7330
LOGGEEDU does not Granger Cause LOGUNR	29	11.0800	0.0004
LOGUNR does not Granger Cause LOGGEEDU		0.27224	0.7640
LOGFDI does not Granger Cause LOGUNR	29	2.64046	0.0919
LOGUNR does not Granger Cause LOGFDI		0.00160	0.9984
LOGGDP does not Granger Cause LOGUNR	29	1.09788	0.3498
LOGUNR does not Granger Cause LOGGDP		3.60370	0.0428
LOGGEEDU does not Granger Cause LOGPG	29	2.74681	0.0843
LOGPG does not Granger Cause LOGGEEDU		0.80140	0.4603
LOGFDI does not Granger Cause LOGPG	29	1.42493	0.2602
LOGPG does not Granger Cause LOGFDI		0.17743	0.8385
LOGGDP does not Granger Cause LOGPG	29	1.44857	0.2547
LOGPG does not Granger Cause LOGGDP		1.58637	0.2254
LOGFDI does not Granger Cause LOGGEEDU	29	0.23276	0.7941
LOGGEEDU does not Granger Cause LOGFDI		1.78599	0.1892
LOGGDP does not Granger Cause LOGGEEDU	29	1.26829	0.2995
LOGGEEDU does not Granger Cause LOGGDP		0.78093	0.4693
LOGGDP does not Granger Cause LOGFDI	29	4.32540	0.0249
LOGFDI does not Granger Cause LOGGDP		5.19966	0.0133