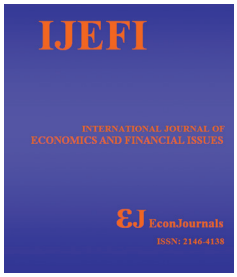

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2023, 13(1), 35-45.

Effect of Unemployment and Inflation on Economic Growth in South Africa

Dimakatso Sekwati[1], Mbulaheni Albert Dagume[2]*

[1]Department of Economics, University of Venda, South Africa, [2]University of Venda, Private Bag X 5050, Thohoyandou, South Africa. *Email: dagume@univen.ac.za

Received: 20 August 2022 **Accepted:** 04 December 2022 **DOI:** https://doi.org/10.32479/ijefi.13447

ABSTRACT

The key macroeconomic objectives being pursued by any developing country are low unemployment, low inflation, and sustainable growth. The main aim of this study was to analyze the effect of unemployment and inflation on economic growth in South Africa for the period of 1994 to 2018, using quarterly data. The results of the unit root test using the Augmented Dickey Fuller and Phillips Perron tests showed that all the variables have a unit root in levels and became stationary after first differencing. The Johansen co-integration test outcomes showed that there is a long-run relationship among variables, and the Vector error correlation model confirmed that inflation and unemployment have a negative impact on economic growth. Furthermore, the results of the tests for White Heteroskedasticity, Jarque -Bera and Serial correlation LM reveal that there is no problem of Heteroskedasticity, data distribution or serial correlation respectively. The government should implement workable pricing regulations and enforce them to maintain stable price levels. The government should also through the Department of Higher Education and Training, establish a structure that connects the educational system with the industries in South Africa, allowing for the development of skills at the tertiary level and increasing employment.

Keywords: Economic Growth, Inflation, Unemployment, South Africa
JEL Classifications: E24, E31

1. INTRODUCTION

Regardless of the abundant natural resources that the South African economy has, per capita income is low, unemployment and inflation are high; this has resulted in the economy showing a downfall in growth, a situation which is very disturbing. The macroeconomic objective of the economy is to achieve price stability, full employment, and sustained growth, unfortunately the country is currently, unable to achieve that and government interventions have not been very successful. This kind of economic crises can lead to other economic problems such as high inflationary pressure, high exchange rate and debts affecting balance of payment (Umaru, 2014). Unemployment and inflation continue to be an issue of concern in South Africa, because these two variables are regarded as macroeconomic indicators and determinants of economic growth (Ademola and Abdullahi, 2016). Inflation and unemployment impact economic growth and development of any economy; these two factors are mainly used to examine the level of poverty in developing economies. Countries, therefore, are encouraged to continually increase their level of produce because this will help to cushion the effect of inflation in the economy. Also, increase in the level of goods and services will improve the standard of living, hence, create social harmony within the country (Jelilov et al., 2016).

According to Pal (2018) cited in Impin and Kok (2021), a nation's ability to withstand strong competition on the global market is determined by its economic growth, which is defined as the steady increase in national income or output, which largely entails an expansion of an economy's flow of goods and services. A nation

without a strong economy won't be able to survive in the outside world. This is evident from the numerous financial crises that have struck several nations, including Argentina in 2001-2002, Asia in 1997-1998 and Mexico in 1994, to name a few. The economic growth of the countries has been significantly impacted by these crises. One of the key areas of interest for researchers is to investigate what can help or hinder economic growth, although little agreement has been established thus far (Impin and Kok, 2021). The importance of economic growth has led booming of various studies on its determinants for effective policy formulation. Economic growth provides advantages for the people living in a country. Positive economic growth can lead to a reduction in poverty, improved health, longer lives, better living standard, more jobs creation, lower unemployment, provides political stability, etc. Economists often associate slow economic growth with a high unemployment rate, and high poverty (Impin and Kok, 2021).

The South African economy reveals the following growth figures- in the 1960s it was 5.8%; in the1970s it was 3.6% which decreased to 2.6% in the 1980s and 1.5% during the 1990s and in 2000s it was 4% (World Bank, 2019). The growth rate between the period of 1994 and 2018 was recorded as follows: in 1994 it was 3.2% and in 2000 it was much better at 4.2%. Its lowest performance was recorded during 2009 with −1.5% and the best performance was last recorded in 2006 at 5.6%. This trend shows that the South Africa's economy keeps on fluctuating (World Bank, 2019). This trend from 1994 to 2018 does not show any improvement as unemployment and inflation continue to soar with adverse effects on the South African economy. The low economic growth in South Africa is a concern which needs serious attention for when the per capita income is low, unemployment and inflation continue to rise drastically. For several decades, economic growth has not been impressive, therefore there is a need for better solutions and recommendations (Umaru, 2014). From 1994 to 2018, similar fluctuating trends were seen in the country's unemployment and inflation rates. Average unemployment rates ranged from 29.9% between 1995 and 1997 to 29.9%, 31.3%, 30.3%, 25.7%, 24.3%, and 26.4% between 1997 and 1999, 2000-2002, 2003-2005, 2006-2008, 2009-2011, 2012-2014, and 2015-2018 respectively. Regarding inflation, the highest rate was recoded 9.3% in 2009, while its lowest rate of 4.1% was witnessed in 2004 and 2010 respectively. The average inflation rate was 8.3% between 1994 and 1996, while 6.9%, 6.8%, 3 %, 6.5%, 5.5%. 5.9% and 5.2% have been recorded over the period 1997-1999, 2000-2002, 2003-2005, 2006-2008, 2009-2011, 2012-2014 and 2015-2018 respectively. It averaged 27.6% for unemployment rate and 6**%** for inflation rate in the period under study. These trends are reflections of how macroeconomic policy objectives did not translate into sustainable economic growth in the country (World Bank, 2019).

Unemployment can largely contribute to poverty and increase income inequality, therefore, the urgency for a solution for that is within a government's interest. There is a need for both pro-active and reactive policies for addressing inflation in the country. This can revive the economy and increase of jobs in the labor market. Most developing and underdeveloped countries experience unemployment challenges and South Africa is not an exception as is indicated by a fluctuation in the country. Over the past years, the rate of job creation in South Africa has not been congruent with growth in labor force absorption. If these trends continue, economic growth will remain unattainable (Banda et al., 2016). To come up with better solutions, one must understand the relationship between unemployment and inflation that leads to shrinking of economic growth. The relationship between the two variables (inflation and unemployment) was first studied by Phillips (1958), who found an inverse relationship between unemployment and inflation in the UK. In the short term the Phillips curve happens to be a declining curve. The Phillips curve in the long term is separate from the Phillips curve in the short term. It has been observed in the literature that in the long run, unemployment and inflation are not related (Anning et al., 2017). Ademola and Abdullahi (2016) state that inflation can be caused by high money circulation around the economy and suggest that when there is too much money supply, price of commodities goes up as well; this is known as inflation.

Researchers who have investigated the impact of unemployment and inflation on economic growth, came up with different views. This has been a controversial in both theory and empirical findings (Majumder, 2016). Mallik and Chowdhury (2001); Umaru and Zubairu (2012) and Muhammad et al. (2011) found a positive relationship between inflation and economic growth. On the other hand, Mamo (2012) pointed out that, the relationship between inflation and economic growth is neither negative, positive or neutral. Regarding the effects of unemployment on economic growth, Banda et al. (2016) and Akeju and Olanipeun (2014), found a positive relationship between the two variables, while Rafindadi (2012), Li and Liu (2012), Hussain et al. (2010) and Airi et al. (2016) found a negative relationship**.** Against this background, there is a need for the current study to investigate the impact of unemployment and inflation on economic growth in South Africa.

This study examines the relationship between unemployment, inflation, and the overall growth of the economy. The examination additionally tries to recognize the impact of expansion on the South African economy as well as the reasons for joblessness in the South African economy. Findings of this investigation will furnish policy makers with a superior comprehension of the relationship between unemployment and inflation on the growth of the economy. The examination could give a depiction of the circumstances and results of expansion and joblessness, therefore give a premise to basic leadership for different government departments. This will help researchers to diagnose the problem while adding to existing information and identifying possible solutions. In addition, the society is exposed to the current economic conditions and have an insight into how macroeconomic indicators can affect the economic growth of a country and thus can understand how the economy is working as a whole. This study will adopt economic growth as a dependent variable while using inflation and unemployment as independent variables to determine the relationship among them.

The sections of the paper are structured as follows - the second reviews the literature; the third outlines the study methods; the fourth gives the results and discussions and the fifth presents the conclusion and policy recommendations.

2. LITERATURE REVIEW

2.1. Conceptual Literature on Economic Growth, Unemployment, and Inflation

2.1.1. The concept of economic growth

Economic growth is the expansion in estimation of definite goods delivered or produced by the economy after some time; for the most part it is estimated as the rate increment in GDP (Afshan and Sabeen, 2017). Khan (2005) cited in IMF (2012) classified growth rate into three categories, namely, high, moderate and low. High growth rate refers to an annual average growth in per capita GDP of 4% or more. The logic of this is that high growth rate should translate into an annual average growth in per capita personal consumption of 2.5-3% or more, which should provide a reasonable base of poverty. Moderate growth refers to a minimum of 2.5% growth in per capita GDP which hopefully translates to a minimum of 1.5% annual growth in per capita personal consumption. Lastly, low growth rate represents an annual growth in per capita income of 2.5% or less. Economic growth is the increase in the number of final goods produced and sold within the boundaries of a country. It is conventionally measured as the percent rate of increase in real gross domestic product, or real gross domestic product (IMF, 2012).

2.1.2. The concept of unemployment

The International Labour Organization (2007) cited in Michael et al., (2016) explain joblessness as the work power that is not working yet is accessible, willing, and ready to work, hence, is a situation where people are scanning for employments. Unemployment represents the number of people in the work force who want to work but do not have jobs. It is generally stated as a percentage and calculated by dividing the number of people who are unemployed by the total work force. There are different types of unemployment - cyclical, structural, frictional, and seasonal. McGaughey (2018) maintains that the causes of unemployment are still open for debate, even today.

Unemployment is often defined by the classical economists as the excess supply of labour over the demand for labour which is cause by adjustment in real wage. The Classical or real-wage unemployment occurs when real wages for job are set above the market clearing level, causing number of job-seekers to exceed the number of vacancies (Ademola and Badiru, 2016).

Cyclical unemployment takes place when the aggregate demand is not enough in the economy to provide jobs for everyone who is willing and able to work, therefore, few goods are produced. In this situation, the demand for those goods falls and few workers are required because there is not much to be produced, as a result unemployment takes over. In cyclical unemployment, jobs vacancies available is less than the number of people willing to work, so even if all the available job vacancies are occupied, others will remain unemployed. Frictional unemployment is similar to structural unemployment which occurs when the skills of workers fail to correspond with what is required for that job (Akeju and Olanipeun, 2014).

2.1.3. The concept of inflation

Inflation refers to the long-term rise in the prices of goods and services caused by the devaluation of currency. Inflation leads to reduced purchasing power of people especially when incomes are not increased accordingly. This results in the slowing or stagnation of the economy. Excessive inflation can also wreak havoc on retirement savings as it reduces the purchasing power of the money that savers and investors have put away (Richmond, 2018).

2.2. Theoretical Framework

2.2.1. Keynesian theory of aggregate demand

John Maynard Keynes is often referred to as the father of macroeconomics. His pioneering work "The General Theory of Employment, Interest and Money" published in 1936 provided a completely new approach to the modern study of macroeconomics. The notion "effective demand" and its influence on economic activity was the central theme in Keynes's Theory of Effective Demand. Refuting the Classical theory which believed in strong general tendency of market mechanism to move output and employment towards full employment, Keynes explained that, in some situations, no strong automatic mechanism moves output and employment towards full employment levels. Keynes was the first economist to advocate the role of government, especially fiscal policy, as the primary means of stabilizing the economy. In his theory, the concept of aggregate demand (AD) refers to the total demand for goods and services in an economy. AD is related to the total expenditure flow in an economy in a given period. It consists of the following:

- Consumption demand by households (C)
- Investment demand, - demand for capital goods (I) by the business firms
- Government expenditure (G)
- Net income from abroad minus Net income from domestic goods (X-M).

Thus, symbolically, it can be written as equation (1)

$$AD = C + I + G + (X–M) \quad (1)$$

According to Keynes, full employment is not a normal situation as stated in the Classical theory. He argued that economy's equilibrium level of output and employment may not always correspond to the full employment level of income, therefore, it is possible to have macroeconomic equilibrium at less than full employment. If current level of aggregate demand (expenditure) is not adequate to purchase all the goods produced in the economy (that is, a situation of excess supply) then output will be cut back to match the level of aggregate demand. Aggregate demand or what is called 'aggregate demand price' is the number of total receipts which all the firms expect to receive from the sale of output produced by a given number of workers employed, hence, aggregate demand increases with increase in the number of workers employed (Suleiman et al., 2019).

2.2.2. The Theory of Inflation

According to the Classical theory, the key factor in inflation is the money supply because in accordance with the quantity theory of money, only an increase in the money supply can raise the

general price level. In modern income theory, however, demand-pull is interpreted to mean an excess of aggregate money demand relative to the economy's full employment output level. The theory assumes that prices of goods and services as well as for economic resources are responsive to supply and demand forces, and will, thus, move readily upward under the pressure of a high level of aggregate demand. Economists like Friedman, Hawtrey, Golden Weiser, who regard inflation as a purely monetary phenomenon, strongly support this theory of inflation caused by excess money supply. The excess demand in the economy develops owing to large scale investment expenditure, either in the public or in the private sector, thereby exceeding the total output. As a result of this excess demand, prices will rise and excess demand inflation or demand-pull inflation comes to exist (Suleiman et al., 2019).

2.3. Empirical Literature

In this section, empirical literature on the relationship between economic growth, unemployment and inflation were reviewed.

2.3.1. Effects of inflation on economic growth

The effect of inflation on economic growth is still complicated. Conclusion about the nature of these effect has not been made in previous empirical studies (Xiao, 2009), however, Mallik and Chowdhury (2001) revealed that there is a positive impact between inflation and economic growth. Mamo (2012) emphasized that these two variables are difficult to predict since the impact can either be negative, positive, or neutral. Working with countries under transition, Gillman and Harris (2010) investigated the effect of inflation on economic growth from 1990 to 2003 using panel data evidence of 13 transitional countries with different equations - growth, money, demand, and inflation. The results of the study revealed a strong effect between inflation and economic growth, therefore, Gillman and Harris suggested that monetary policy should intervene to stabilize inflation targeting and fiscal policies to control budget deficit. Imoisi et al. (2017) examined the impact of inflation on economic growth using time series data for the period 1990 -2011 in Tanzania. The study confirmed the negative impact of inflation on economic growth. The study also revealed that there was no cointegration between inflation and economic growth during the period of study, thus no long-run relationship between inflation and economic growth. In Tanzania, Kasidi and Mwakanemela (2013) used Correlation Coefficient and Cointegration technique to investigate the impact of inflation on economic growth for the period 1990-2011. The results of the study revealed that the effect between these variables are negative and co-integration does not exist between inflation and economic growth. In Nigeria, Osuala and Onyeike (2013) investigated the impact of inflation on economic growth from the period 1970-2011. The techniques employed in the study was Dickey Fuller (ADGF), Philip-Perron and Error Correlation model. The study confirmed that the link between inflation and economic growth and is statistically significant. Hasanov (2010) investigated the threshold effect of inflation using annual data set of real GDPs, consumer price index and real gross fixed capital formation from the period of 2001 to 2009. The results of the study revealed that the economic growth and inflation are nonlinear, it was 13% level of threshold inflation on GDP and if inflation level is lower than 13%, there is a significant positive effect on GDP, but if inflation level exceeds 13%, then the effect becomes negative. Furthermore, Khan and Senhadji (2001) investigated threshold inflation level using nonlinear least squares on a panel of 140 countries at 1% for industrial countries and 11% for developing countries. The results of the study revealed that the effect of inflation on economic growth is positive even though it becomes statistically considerable for industrial countries, however, when the threshold level is above inflation, then the relationship becomes coheritor for both countries. Espinoza et al. (2010) investigated the effect of inflation on economic growth using panel smooth transition regression of 165 countries to estimate inflation threshold at 10% in developing countries and 13% for countries exporting oil. The results of the study revealed that there is nonlinearity correlation among these variables. In Nigeria, Umaru and Zubairu (2012) investigated the effect of inflation on economic growth from 1970 to 2010 using Augmented Dickey Fuller and Granger Causality tests. The results of the study revealed that inflation and economic growth are positively related and concluded that if the country can encourage growth in productivity and level of output then economic growth can be achieved. Bawa and Abdullahi (2012) conducted a similar study in Nigeria on the threshold effect of inflation on economic growth using a quarterly time series data for the period 1981-2009. They used threshold regression model developed by Khan and Senhadjie (2001) to estimate a threshold inflation level of 13%. Below the threshold level, inflation has a mild effect on economic activities, while above it, the magnitude of the negative effect of inflation on growth was high. In Turkey, Karahan and Colak (2020) investigated the relationship between inflation and economic growth using Nonlinear Autoregressive Distributed Lag (NARDL) model for the quarterly data set between 2003 and 2017. A negative relationship between inflation and economic growth was found in the study. A study by Ngoc (2020) investigated the asymmetric effect of inflation and money supply on economic growth using the Nonlinear Autoregressive Distributed Lag approach for Vietnam over the period 1990-2017. The study confirmed the negative impact of inflation on economic growth and asymmetric in the long run. Madurapperuma (2016) used the framework of Johansen cointegration test and Error Correction model to investigate the impact of inflation on economic growth in Sri Lanka for the period 1988-2015. A long run negative and significant relationship between economic growth and inflation was found in the study.

2.3.2. Effects of unemployment on economic growth

In South Africa, Banda et al. (2016) researched about the effect of unemployment on economic growth from 1994 to 2012, using Johansen cointegration. The results were that long-run unemployment and economic growth are positively correlated, however, Rafindadi (2012) also investigated the impact between these two variables using ordinary least square and threshold model to investigate this relationship. The findings revealed that there is a negative nonlinear impact between output and unemployment. In Nigeria, Akeju and Olanipeun (2014) investigated their effect by applying error correlation model and Johansen cointegration test. The study revealed that there is positive effect among these variables. Onwachukwu (2015) also investigated the effect of unemployment on economic growth from 1984 to 2010 using Ordinary Least Square and Augmented Dickey-Fuller methods.

The results disclosed that unemployment does not have any impact on economic growth. In Nigeria, Airi et al. (2016) also confirmed a negative impact of unemployment on economic growth. In Pakistan, Hussain et al. (2010) investigated the impact of unemployment on economic growth using time series data from 1972 to 2006. The techniques employed in the study were Augmented Dickey Fuller test and Johansen Cointegration test. The study confirmed the negative impact of unemployment on economic growth. In Spain, Villaverde and Maza (2008) investigated the effect of unemployment on output from 1980 to 2004; a negative effect of unemployment on economic growth was found. In Nigeria, Yelwa et al. (2015) also investigated the relationship between unemployment and economic growth from 1987 to 2012. A negative relationship between unemployment and economic growth was found in this study. They reached a conclusion that, government should intervene so that the economic environment can be manageable. Makaringe and Khobai (2018) investigated the trends and impact of unemployment on economic growth in South Africa using quarterly data over the period 1994Q1 to 2016Q4. They employed the Auto Regressive Distribution Lag (ARDL) bounds test approach and the results from the ARDL model suggest that there is a long run relationship between unemployment and economic growth. The empirical results obtained confirmed that there is a negative relationship between unemployment and economic growth both in the long and short run. Mosikari (2013) also conducted a study on the effect of unemployment on gross domestic product in South Africa. He employed Augmented Dickey-Fuller (ADF) stationary test, cointegration and Granger causality test. The study revealed that the variables proved to be integrated of order one, and no causation between unemployment rate and GDP growth. Using time series data from the period 1999 to 2017, Iloabuchi (2019) examined the effect of unemployment on economic growth in Nigeria. The Central Bank of Nigeria's database and the World Bank's data bank were used as sources for the data. OLS, Augmented Dickey-Fuller, Philip-Perron Unit root tests, Pair-wise Granger Causality, and OLS were all used in the explanatory study. A unidirectional association between unemployment and Nigeria's economic growth is revealed using the Granger causality test. The results of the model's population increase component, which is also present, occur concurrently with economic expansion. Hussain et al. (2010) researched on the impact of unemployment on economic growth based on data collected; the findings established a negative impact of unemployment on economic growth. Additionally, Shah et al. (2022) conducted research in Pakistan on the effect of unemployment on economic growth, and the empirical results from the study reveal that unemployment has a negative relationship with economic growth that is statistically significant.

2.3.3. Effects of unemployment and inflation on economic growth

Shahid (2014) explored the effect of rapid price increases and unemployment on economic growth in Pakistan utilizing the time arrangement information for the time span of 1980 to 2010. The unit root ADF and Phillips Perron illustrated that economic growth is stationary on level just as first distinction, yet unemployment and expansion are stationary on first contrast. The ARDL result confirmed that there is a long-run connection between the variables. In Nigeria from 1981 to 2016, Gyang et al. (2018) investigated the relationship between unemployment, inflation, and economic growth. The analysis made use of the Johansen Co-integration test, the Pairwise Granger Causality Test, and the Ordinary Least Squares (OLS). The unit root test findings showed that at the first difference I, all the variables were stationary (1). Since the estimation result suggested at least two co-integrating equations, the co-integration test provided evidence of a long-term equilibrium relationship between the variables. The Pairwise Granger causality test result showed that there was no causal connection between unemployment, inflation, and growth. Additionally, the results of the Ordinary Least Squares (OLS) analysis show that the unemployment rate (UNR) and inflation rate (INFR) have a negative and insignificant impact on the contribution to the growth of Nigerian domestic economy, while Total Government Expenditure (TGE) show a positive and significant relationship to the economic growth. Ademola and Bandiru (2016) used the ordinary least square (OLS) method and several diagnostic test approaches to examine how unemployment and inflation affected economic growth in Nigeria. The results of the unit root test indicate that all the model's variables are stationary at the first difference, and those of the Johansen cointegration show the existence of two cointegrating equations, indicating the existence of a long-term relationship between inflation, unemployment, and economic growth. The findings also showed that unemployment and inflation have a positive relationship with economic growth. Suleiman et al. (2019) investigated the impact of inflation and unemployment on the Nigeria monetary development (GDP) from 1985 to 2017. The techniques employed in the study was OLS and Granger Causality test. The after-effects of OLS from the model demonstrate that unemployment and inflation have an irrelevant association with GDP which infers that with increment in GDP, ceteris paribus inflation rate will increase, so also unemployment rate. The findings of the Causality test, likewise, propose that LGDP does not cause inflation as showed in the Probability esteem (0.0755); that LINF additionally does not cause joblessness as demonstrated in the probability esteem (0.0593. Using annual time series data covered the period 1986-2020, Idris (2021) investigated how unemployment and inflation affected economic growth in Nigeria. The ordinary least squares method is used to assess the model coefficient. According to findings, inflation has a positive impact whereas unemployment has a negative and significant impact on economic growth in Nigeria. Mohseni and Jouzarjan (2016) conducted an empirical study concerning the effect of inflation and unemployment on economic growth in Iran from 1996 to 2012. The study employed Autoregressive Distributed Lag (ARDL), Microfit version 4.0 and Eviews version 6 for model estimation. The study revealed a significant and negative effect of inflation and unemployment on economic growth in the long run. Enejoh and Tsauni (2019) examined the effect of inflation and unemployment on economic growth in Nigeria from 1970 to 2016. The outcome was that the rate of inflation has a positive and an inconsequential effect on the monetary development while unemployment has a negative and an unimportant effect on the financial development in Nigeria over the long run. Umaru et al. (2013) investigated the effect of unemployment and inflation on economic growth in Nigeria between 1986 and 2010. The techniques employed in the study

was Johansen integration Augmented Dickey-Fuller and Granger causality test. The study confirmed the negative impact of two variables on economic growth and the results of causality suggest that unemployment and inflation cause economic growth, and not economic growth causing unemployment and inflation. Thus, the result shows a one-way causation running from unemployment and inflation to economic growth. The relationship and effect of unemployment and inflation on economic growth are still unclear from the literature reviewed above, necessitating further study, which is why this study was undertaken.

2.4. Limitations of the Study and Areas for Further Research

The principal significant restriction was the inaccessibility of quarterly information on certain factors recommended by the hypothetical and observational writing with respect to how joblessness influences financial development. Also, a portion of the auxiliary information utilized in this examination were gotten from fluctuated sources which may utilize diverse estimating systems; hence, the quality of the information cannot be ensured. Based on this, the researcher suggests further research on how different macroeconomics factors, for example, genuine loan fees and cash supply may influence monetary development in South Africa.

3. METHODS OF THE STUDY

3.1. Data Sources and Description

The study employed ordinary least square and Granger Causality test for multiple regression method and data analysis. The data used for this study are basically time series quarterly data, secondary in nature, ranging from 1994 to 2018 and the data were sourced from World Development bank.

3.2. Model Specification

The study focuses on analyzing the relationship between inflation, unemployment and economic growth and adopt economic growth as dependent variable while unemployment and inflation as the independent variables. The study adopted the model of growth by Aminu and Anono (2012) to determine the impact of inflation and unemployment on economic growth of South African.

Mathematically, the model can be stated as follows:

$$GDP = F(CPI, UNEMPO) \quad (2)$$

Where:
GDP = Gross domestic product
CPI = Inflation
UNEMPO = Unemployment rate

The econometric model that was used for this study to analyze the relationship between unemployment, inflation and economic growth is as follows

$$GDP_t = \beta_0 + \beta_1 CPI_t + UNEMPO_t + \mu_t \quad (3)$$

The function above illustrates the relationship between economic growth which is the dependent variable and inflation and unemployment as the independent variables, where μ_t represent the error term which consists of variables that can affect the dependent variables but due to some reason have been analyzed in the study (interest rate, government expenditure and investment) the β_0 and β_1 are the parameters, the slope and intercept of the study, to estimate the changes of economic growth in respect of inflation and unemployment.

The above function can also be presented in logarithm form as follows:

$$Log\ GDP_t = \beta_0 + \beta_1\ log\ CPI_t + \beta_2\ log\ UNEMPO_t + \mu_t \quad (4)$$

The above equation measures the responsiveness of South African GDP toward changes in inflation and unemployment rate.

The apriori expectations are as follows:

It is expected that: $\beta_1 > 0$ and $\beta_2 > 0$

4. EMPIRICAL RESULTS AND DISCUSSION

This section presents the data analysis, results interpretation, and discussions. The first subsection covered the unit root test in which Augmented Dicky Fuller and Philip Peron tests were used. Subsequently, lag order selection criteria were presented in which the number of lags used in the study were identified. Next, Johansen co-integration test which checks if there is any co-integration equation was presented thereafter. Having identified the cointegration equation, the vector error correction model was presented and ultimately, diagnostic tests in which serial correlation, heteroscedasticity and Jargue-bera estimates were presented.

4.1. Unit Root Test Results

The introductory stage of the Johannsen procedure is to test for stationarity series, thus, results for unit root test are presented in Table 1 below. Augmented Dicky Fuller test is one of the main methods used to test whether time series are stationary or non-stationary.

Table 1 shows results for Augmented Dickey-Fuller (ADF) test and Philip-Perron (PP) results. The results on both ADF and PP tests were carried out under the null hypothesis (Ho) which assumes that the data has a unit root or is non-stationary against the alternative Hypothesis (H1) which states that data do not have unit root, hence, is stationary. The calculated values of ADF and PP were all equated to the critical values obtained. If the calculated statistic value is bigger than the calculated critical value, the null hypothesis is rejected, and it is concluded that the series data is stationary. Similarly, if the calculated statistics values are less than the computed critical value, the null hypothesis is not rejected, and it can be concluded that the series has a unit root, hence, not stationary. In this regard, in Table 1, results are presented under intercepts and trends as well as intercepts and none. As such, the results for GDP, CPI and UNEMPO were found to be less than

the critical value at 1%, 5% and 10%. As shown in Table 1, the calculated statistics display that all variables in levels, both for ADF and PP tests were found to be not stationary in intercept, trend, and intercept, hence, contain a unit root. After first differencing, however, all computed values were greater than the critical values of 1%, 5% and 10% levels of significance respectively. GDP, CPI and UNEMPO, thus became stationary at first difference. For the Phillips-Peron tests, the results confirm that all variables were not stationary in levels, intercept, trend, and intercept, however, after first differencing, all variables' computed statistics values were greater than the critical value as show in Table 1. The PP results, thus, confirmed that indeed the data became stationary after first differencing, and this supports the ADF results as explained above. As such, it can be concluded that the series were integrated in the same order (1) since ADF, and PP revealed that the data series were non-stationary in levels and became stationary after first being differenced. GDP, CPI and UNEMPO are integrated of the same order; this necessitates the use of cointegration analysis, and the current study employed Johansen Approach as presented below.

4.2. Cointegration Test (Johansen Approach)

Johansen approach is a technique used to determine whether there is long-run association between given variables (Gujarati, 2004). The current study tested the time series data to check if there is any long run association between the variables and the results are presented in Table 2 below. To clearly demonstrate if there is any long-run association between the variables, it is imperative to know the number of lags to be used (Asteriou and Hall, 2011). As such, the Akaike Information Criterion (AIC) was used, and the results are presented in Table 3.

Table 3 shows that the selected lag order for the study is 3 lags since the computed value of 1.54332 on Lag 3 under AIC is the lowest. Gujarati (2004) stated that the lowest AIC value computed may present a good model for cointegration analysis. As such, the study considered lag 3 and after identifying this number of lags, it necessitated the use of Johansen cointegration test and the results are presented in Table 2 below.

Results in Table 2 show the Johansen Approach for cointegration which covered Trace results and Maximum-Eigen results. The computed trace statistics was compared to the critical value at 5% level of significance. According to Asteriou and Hall (2011), if the computed test statistic is greater than the critical value at 5% level of significance it can be concluded that there is no cointegrating equation. As such, the computed trace statistic (45.118) was found to be greater than the critical value (29.797) and 5% level of significance. Similarly, the computed Max-Eigen Statistic (25.044) was greater than the critical value (21.131) at 5% level of significance. Given these results, the current study failed to reject the null hypothesis at None* which states that there is no cointegrating equation. Also, the corresponding P-value for Trace results (0.001) and Maximum-Eigen results (0.019) show that the results are significant at None, hence, failed to reject the null hypothesis. Considering *at most 1* cointegrating equation, the computed Trace statistic (20.074) is less than the Critical Value (21.495) and the corresponding P-value (0.383) is >5% hence, the null hypothesis was rejected. Similarly, the max-eigen statistic value (15.268) is less than critical value (17.264) and the P-value (0.09736) is >5% and the null hypothesis was rejected; the current study concluded that at most, one equation is cointegrated, hence, there is a long run relationship between GDP, CPI and UNEMPO.

There is long relationship between GDP, CPI and UNEMPO, thus, it is imperative to check for long run relationship between these variables. In this regard, Error Correction Model (ECM)

Table 1: Unit root test: Augmented Dickey-Fuller and Phillip-Perron

Order of variables integration	Variables	ADF			PP		
		Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
Level	LGDP	1.542900	1.919103	1.639540	1.542901	1.924850	1.084347
1st difference	DGDP	13.1567 8*	13.0851 5*	13.2271 0*	13.4694 8*	13.4361 2*	13.3790 8*
Level	LCPI	3.19928 4	3.25798	1.29900	2.23598 7	2.26621 4	1.61974 8
1st difference	DCPI	4.682049*	4.661369*	−4.69492*	5.998398*	5.750022*	6.029329*
level	LUNEMP O	2.349870	2.764531	0.321399	2.116062	2.628339	0.687268
1st difference	DUNEMP O	11.05385*	10.99940*	11.06622*	11.63094*	11.59289*	11.38560*
1%	Critical values	4.43554	3.42121	2.12321	4.42123	3.4532	2.45121
5%		4.23134	3.21232	2.26543	4.21221	3.4215	1.2143
10%		4.12311	3.13113	2.31412	4.1143	3.1321	1.21321

Values marked with a * represent stationary data at 1% and 5% level of significance, Source: own computation

Table 2: Trace results and Maximum-Eigen results

Hypothesized No. of CE (s)	Trace results				Maximum-Eigen results			
	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**	Eigen value	Max- Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.2339	45.118	29.797	0.001	0.234	25.044	21.131	0.01933
At most 1	0.1500	20.074	21.495	0.383	0.145	15.268	17.264	0.09746
At most 2	0.0500	4.8053	6.8414	0.079	0.050	4.805	6.8414	0.32784

Source: Own computation

Table 3: Lag order selection criteria

Lag	Log	LR	FPE	AIC	SC	HQ
0	−135.760945	NA	0.01432	6.231224	6.414574	8.30456
1	−36.454643	423.7633	4.34e-12	2.356256	2.565746*	2.85673*
2	−19.564764	44.54665	4.13e-12	2.187657	4.5657e8	3.206783
3	98.516754	72.25643*	2.55e-12*	1.545332*	6.949564	3.778667

Source: own computation, *indicates lag order selected by the criterion, LR: Sequentially 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

and Vector Error Correction Model (VECM) is used check for short run and long run association respectively and the results are presented below.

4.3. Error Correction Model (VCM)

Vector Error Correction Model usually belongs to a category of multiple time series models which are commonly used for data, where the underlying variables have a long- run stochastic trend, thus, the current study first assessed the short run dynamics, and the results are presented in Table 4.

Results in Table 4 above show that at least one variable is statistically significant since the computed P-value is <5% level of significance. LNCPI computed a P-value of 0.0416 which is <5% hence the results are not spurious. Subsequently, the coefficient RESID01 (−1) of 0.93 implies that approximately 93% of variation in the model is corrected in the first quarter and the model reverts to equilibrium condition. This indicates that there is a strong pressure on economic growth in re-establishing short-run equilibrium every time the economy experiences an external shock. The speed of adjustment is statistically significant at 5% since the computed P-value of 0.0120 is <5% and the corresponding t-statistic of 3.090821 is >3. In this regard, it is concluded that there is a negative relationship between economic growth and Consumer Price Index in the short run. A unit increase in CPI in the short-run leads to a decrease in economic growth by 0.44575 units, thus, there is a negative association between CPI and economic growth in South Africa. In terms of unemployment rate, the computed results show a negative association, but the results are insignificant since the computed P-value of 0.3422 is >5% and the corresponding t-statistics of 0.40138 is <3, hence the results are spurious. In this regard, the study further assessed the long run association between economic growth and the above-mentioned variables, and the results are presented below.

4.4. Vector Error Correction Model (VECM)

The Vector Autoregression (VAR) is a technique used mainly in econometrics to establish the joint dynamic behaviour between dependent and independent variables (Asteriou and Hall, 2011). The structural behaviour identified by Johannsen Cointegration Approach, necessitated the use of VECM. The VECM technique gives the long run impacts of independent variables on the dependent variable, thus, VECM was estimated, and the results are presented in Table 5 below.

The variables in the current study are cointegrated at the same order, hence there is a long run relationship between GDP and the given independent variables (consumer price index and aggregate unemployment) from 1994 quarter one to 2018 quarter four. The computed VECM is presented in equation 5 below.

Table 4: Error correction model results

Variable	Coefficient	Standard error	t-statistic	P-value
LNUNEMPO	−0.21341	0.531269	−0.40138	0.3422
LNCPI	−0.44574	0.126231	−3.53114	0.0416
RESID01(-1)	0.932193	0.309081	3.090821	0.0120
R-squared 0.45871; F-statistic 25.67583; DW stat 1.451671				

Source: own computation

Table 5: Vector error correction model (VECM)

Variable	Coefficient	Standard error	t-statistic	Prob.
Ct	2.568876	0.565716	4.50931	0.0000
Y_GDP	1.000000	-	-	-
LNUNEMPO	−0.057579	0.021236	−2.711374	0.0079
LNCPI	−0.086464	0.021067	−4.104297	0.0001
R-squared	0.46			
F-statistic DW	9.580840 2.98889			

Source: Own computation

$$GDP = 2.568876 - 0.057579*UNEMPO - 0.0864647*CPI. \quad (5)$$

Given the results in Table 4 and equation 5, several conclusions may be derived. First, the computed r-squared value of 0.46 shows that at most 46% of the variation in equation 5 is explained by VECM model. From the results in Table 5, it can be concluded that CPI and UNEMPO are statistically significant since the corresponding t-statistics in absolute terms are >2. Gujarati (2004) stated if the computed t- statistic is two and above, the results are considered significant, hence, it can be concluded that CPI and UNEMPO results are statistically significant. Furthermore, the computed P-values (UNEMPO = 0.0079 and CPI = 0.0001) are <5% signifying significant results. In this situation, it can be concluded that in the long run, a unit increase in consumer price index (CPI) may lead to 0.05 unit decrease in Gross Domestic Product in South Africa. Similarly, the results in Table 4 show that a unit increase in unemployment may lead to 0.08 units decrease in GDP in South Africa.

The results showed a negative relationship between GDP and consumer price index and unemployment. Based on this, the results support the findings of Akeju and Olanipeun (2014) and Banda et a. (2016) who investigated the impact of inflation and unemployment on economic growth and revealed that imported inflation and structural unemployment have a negative effect on GDP, in developing nations. Also, Michael *et al.,* (2016) stated

Table 6: Diagnostic test results

Diagnostic test	Corresponding null hypothesis	t-statistic	Probability
Lagrange Multiplier (LM)	There is no serial correlation	0.975999	0.587098
White (Ch-sq.)	There is no conditional heteroscedasticity	0.799664	0.576780
Jarque-Bera (JB)	The data is normal distribution	1.498091	0.324765

Source: Own computation

that unemployment has a negative effect on economic growth since the unemployment population may devote their energies to unscrupulous activities which may lead to a deterioration in the aggregate output. Considered as such, the study further assessed the validity of the parameters used to justify the worthiness of the results, using diagnostic tests.

4.5. Diagnostic Tests

Diagnostic tests which include Lagrange Multiplier (serial correlation), White noise Chai square (heteroscedasticity) and Jargue-Bera (normal distribution) are presented in this section. These tests were carried out to test the goodness of fit of the model; the results are presented in Table 6 below.

Results in Table 6 revealed several conclusions regarding diagnostic checks. Firs, the results on LM test computed a t-statistic of 0.975999 and a corresponding probability of 0.587098. As such, the computed t-statistics shows that the probability is >5%, hence the null hypothesis is not rejected; it is concluded that there is no serial correlation among the variables. Second, white noise Chi-square test computed a t-statistic 0.799664 and a probability of 0.576780, thus the t-statistic is <2 and the probability is >5%. In this regard, the null hypothesis which claims that there is no conditional heteroscedasticity is not rejected leading to the conclusion that the data does not suffer from white noise and there is no conditional heteroscedasticity. Last, the computed t-statistic (1.498091) under JB tests is <2 and the probability is >5%, hence, the null hypothesis is not rejected, and it can be concluded that there are normal distribution residuals, and the model is good for long run forecasting.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study looked at the Twin macroeconomic variables, confronting South African economy which have the propensity to be among the complex economic and social dimensions. The inability of government to find a listing solution to these problems has affected the economic life, economic activities, and political system of the country. This paper attempted to investigate the effect of unemployment and inflation on GDP in South Africa through the application of Ordinary Least Square and Granger causality test of causation between unemployment, inflation, and GDP. Consumer Price Index as a measure that inspects the weighted average of prices of a basket of consumer goods and services plays an important role in curbing inflation. Considering the results in this study, inflation may lead to a decrease in aggregate economic growth, therefore, there is a need for strong institutional collaboration for dealing with these triple macroeconomic variables - unemployment, inflation, and GDP-in South Africa. Policy options suggested by this study include the fact that the government should put practical price controls on the consumer price Index and keep it in check to maintain price levels constant. This can be achieved by setting maximum and minimum price levels on consumer goods and services which are used daily. Furthermore, for price indices which are calculated using national statistical measures, the government may use rent, wages, and salary control measures to regulate prices.

The study thus recommends that the government should also put control measures on wages and salaries and relate them to price movements. Once these statistical measures are kept in control, stable economic conditions may attract more investments leading to economic growth. Also, if consumers are protected from income injection, this may discourage strikes which normally affect production in an economy. Regarding unemployment, aggregate unemployment is defined as the overall state of an economy in which active job seekers are not employed and there are few jobs available in comparison to the demand for general jobs. From the outcome in the current study, the negative effect between unemployment and economic growth may be corrected, using the following policy recommendations-the government should encourage different skills development institutions to improve skills of its learners. Skills' development programmes may increase the chances of the unemployed work force being employed. One major reason for high unemployment rate is lack of necessary skills needed in the different industries, thus, investing in skills development programmes may help to reduce unemployment which in turn may improve economic growth. Furthermore, the government through Department of Higher Education and Training should create a system which links the education system and the industries around South Africa. This will enable skills development from tertiary level and employment can be increased.

REFERENCES

Ademola, A., Badiru, A. (2016), The impact of unemployment and inflation on economic growth in Nigeria (1981-2014). International Journal of Business and Economic Sciences Applied Research, 9(1), 47-55.

Afshan, A., Sabeen, S. (2017), Determinants of economic growth in Pakistan: A time series analysis (1976-2015). European Online Journal of Natural and Social Sciences, 6(4), 686-700.

Airi, S.E., Ounakpo, R.I., Anebi-Atede, H.A. (2016), Impact of graduate unemployment on the economic growth of the Nigerian economy. International Journal of Advanced Academic Research, 2(3), 1-16.

Akeju, K.F., Olanipekun, D.B. (2014), Unemployment and economic growth in Nigeria. Journal of Economics and Sustainable Development, 5(4), 138-144.

Aminu, U., Anono, A.Z. (2012), An empirical analysis of the relationship between unemployment and inflation in Nigeria: 1977-2009. Economics and Finance Review, 1(12), 42-61.

Anning, L., Tuama, A.S., Darko, S. (2017), Inflation, unemployment and economic growth: Evidence from the var model approach for the economy of Iraq. International Journal of Developing and Emerging Economics, 5(1), 26-39.

Asteriou, D., Hall, S.G. (2011), Applied Economics. New York: Palgrave Macmillan.

Banda, H., Ngirande, H., Hogwe, F. (2016), The impact of economic growth on unemployment in South Africa: 1994-2012. Investment Management and Financial Innovations, 13(2), 246-255.

Bawa, S., Abdullahi, I.S. (2012), Threshold effect of inflation on economic growth in Nigeria. CBN Journal of Applied Statistics, 3(1), 43-63.

Enejoh, S. Y., Tsauni, A. M. (2017), Impact of inflation and unemployment on economic growth in Nigeria: an econometric approach (1970-2016). International Journal of Academic Research in Accounting, Finance and Management Sciences, 7(4), 110-120.

Espinoza, R.A., Leon, H.L., Ananthakrishnan, P. (2010), Estimating the Inflation-Growth Nexus-A Smooth Transition Model. IMF Working Paper, WP/10/76. Washington, DC: International Monetary Fund.

Gillman, M., Harris, M.N. (2010), The effect of inflation and growth: Evidence from a panel of transition countries. Economics of Transition, 18(4), 697-714.

Gujarati, D.N. (2004), Basic Econometrics. 4th ed. New York: McGraw-Hill International. p22-27.

Gyang, E.J., Anzaku, P.E., Iyakwari, A.D., Eze, F. (2018), An analysis of the relationship between unemployment, inflation and economic growth in Nigeria: 1986-2015. Bingham Journal of Economics and Allied Studies, 1(1), 1-11.

Hasanov, F. (2010), Relationship between inflation and economic growth in Azerbaijani economy: Is there any threshold effect? Asian Journal of Business and Management Sciences, 1(1), 20-29.

Hussain, T., Siddiqi, M.W., Iqbal, A. (2010), A coherent relationship between economic growth and unemployment: Empirical evidence from Pakistan. International Journal of Human and Social Sciences, 10(1), 1-8.

Idris, M. (2021), Effect of unemployment and inflation on economic growth in Nigeria. Global Journal of Applied Management and Social Sciences, 21, 254-266.

Iloabuchi, C.C. (2019), Analysis of the effect of unemployment on the economic growth of Nigeria. IOSR Journal of Economics and Finance (IOSR-JEF), 10, 82-89.

IMF. (2012), Statistics on the Growth of the Global Gross Domestic Product (GDP) from 2003 to 2013. Washington, DC: International Monetary Fund.

Imoisi, A.I., Amba, E.A.A., Okon, I.M. (2017), Unemployment rate and economic growth in Nigeria: An empirical analysis, 1980-2016. International Journal of Development and Sustainability, 6(7), 369-384.

Impin, P.D.A., Kok, S.C. (2021), The effect of inflation rate, interest rate and unemployment rate on the economic growth of Malaysia. Malaysian Journal of Business and Economics, 8, 125-140.

Jelilov, G., Obasa, O.J., Isik, A. (2016), Impact of inflation and unemployment on economic growth in ten (10) selected member's states of economic community of West Africa States (ECOWAS) (2001-2014). Advances in Economics and Business, 4(5), 222-244.

Karahan, O., Çolak, O. (2020), Inflation and economic growth in Turkey: Evidence from a nonlinear ARDL approach. In: Janowicz-Lomott, M., Łyskawa, K., Polychronidou, P., Anastasios Karasavvoglou, A., editors. Economic and Financial Challenges for Balkan and Eastern European Countries. Cham, Switzerland: Springer Nature, 33-46.

Kasidi, F., Mwakanemela, K. (2013), Impact of inflation on economic growth: A case study of Tanzania. Asian Journal of Empirical Research, 3(4), 363-380.

Khan, M.S., Senhadji, A.S. (2001), Threshold effects in the relationship between inflation and growth. IMF Staff Papers, 48(1), 1-21.

Kukaj, D. (2018), Impact of unemployment on economic growth: Evidence from Western Balkans. European Journal of Marketing and Economics, 1(1), 10-18.

Li, C.S., Liu, Z.J. (2012), Study on the relationship among Chinese unemployment rate, economic growth, and inflation. Matrix, 1(1), 4-13.

Madurapperuma, W. (2016), Impact of inflation on economic growth in Sri Lanka. Journal of World Economic Research, 5(1), 1-7.

Majumder, S.C. (2016), Inflation and its impacts on economic growth of Bangladesh. American Journal of Marketing Research, 2(1), 17-26.

Makaringe, S.C., Khobai, H. (2018), The Effect of Unemployment on Economic Growth in South Africa (1994-2016). MPRA Paper No. 85305.

Mallik, G., Chowdhury, A. (2001), Inflation and economic growth: Evidence from four South Asian countries. Asia Pacific Development Journal, 8(1), 123-135.

Mamo, F.T. (2012), Economic Growth and Inflation: A Panel Data Analysis. Master's Thesis. Sweden: Södertörns University.

McGaughey, E. (2018), Will Robots Automate your Job Away? Full Employment, Basic Income, and Economic Democracy. England: Centre for Business Research, University of Cambridge, Working Paper, (496).

Michael, E.O., Emeka, A., Emmanuel, E.N. (2016), The relationship between unemployment and economic growth in Nigeria: Granger causality approach. Research Journal of Financial and Accounting, 7(24), 153-162.

Mohseni, M., Jouzaryan, F. (2016), Examining the effects of inflation and unemployment on economic growth in Iran (1996-2012). Procedia Economics and Finance, 36, 381-389.

Mosikari, T.J. (2013), The effect of unemployment rate on gross domestic product: Case of South Africa. Mediterranean Journal of Social Sciences, 4(6), 429.

Muhammad, S. A., Oye, N. D., Inuwa, I. (2011), Unemployment in Nigeria: implication on the gross domestic product (gdp) over the years. Int. J. Eco. Res, 2(1), 66-71.

Ngoc, B.H. (2020), The asymmetric effect of inflation on economic growth in Vietnam: Evidence by nonlinear ARDL approach. The Journal of Asian Finance Economics and Business, 7(2), 143-149.

Onwachukwu, C.I. (2015), Does unemployment significantly impact on economic growth in Nigeria? Global Journal of Human Social Science E Economics, 15(8), 23-26.

Osuala, A.E., Osuala, K.I., Onyeike, S.C. (2013), Impact of inflation on economic growth in Nigeria: A causality test. Journal of Research in National Development, 11(1), 206-216.

Phillips, A.W. (1958), The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957. Economica, 25(100), 283-299.

Rafindadi, A. (2012), Empirical Analysis of the Effects of Central Bank Communications on Money Market Volatility in Nigeria: 2007-2011. Nigeria: Unpublished Master's Thesis Ahmadu Bello University.

Richmond, T. (2018), A Degree of Uncertainty: An Investigation into Grade Inflation in Universities. Reform Report. Available from: https://www.reform.uk/sites/default/files/2018-06/A%20Degree%20of% 20Uncertainty%20final_0.pdf [Last accessed on 2022 Mar 24].

Shah, S. Z. A., Shabbir, M. R., Parveen, S. (2022), The Impact of Unemployment on Economic Growth in Pakistan: An Empirical Investigation. iRASD Journal of Economics, 4(1), 78-87.

Shahid, M. (2014), Effect of inflation and unemployment on economic growth in Pakistan. Journal of Economics and Sustainable Development, 5(15), 103-106.

Suleiman, A.M., Yusuf, A.U., Suleiman, S. (2019), Effect of unemployment

and inflation on economic growth in Nigeria (1985-2017). Dutse Journal of Economics and Development Studies, 7(1), 113-120.

Umaru, A. (2014), Effects of Unemployment and Inflation on Economic Growth in Nigeria, 1986-2012. Department of Economics, Faculty of Social Science. Master Thesis. Nigeria: Ahmadu Bello University.

Umaru, A., Donga, M., Musa, S. (2013), An empirical investigation into the effect of unemployment and inflation on economic growth in Nigeria. Interdisciplinary Journal of Research in Business, 2, 1-14.

Umaru, A., Zubairu, A.A. (2012), Effect of inflation on the growth and development of the Nigerian economy (An empirical analysis). International Journal of Business and Social Science, 3(10), 187-188.

Villaverde, J., Maza, A. (2009), The robustness of Okun's law in Spain, 1980-2004: Regional evidence. Journal of Policy Modeling, 31(2), 289-297.

World Bank. (2019), World Development Indicators (WDI). Available from: https://www.data.worldbank.org/data-catalog/world-development-indicators [Last accessed on 2021 Mar 25].

Xiao, J. (2009), The Relationship Between Inflation and Economic Growth of China: Empirical Study from 1978 to 2007. Master Program in Economic Growth. Innovation and Spatial Dynamics. Sweden: Lund University.

Yelwa, M., David, O.O.K., Awe, E.O. (2015), Analysis of the relationship between inflation, unemployment and economic growth in Nigeria: 1987-2012. Applied Economics and Finance, 2(3), 102-115.