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2023

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Tsabedze, Simanga. (2023). The Relationship between Fiscal Policy and Unemployment in South Africa [Master's dissertation, University of the Witwatersrand, Johannesburg]. WireDSpace.https://hdl.handle.net/10539/40730

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The Relationship between Fiscal Policy and Unemployment in South Africa

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2023

Protocol number: (**WWBS/BA0003989V/300**)

(Version February 2018)

DECLARATION

I, Simanga Tsabedze, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Simanga Andrew Tsabedze

(Type your name in full here, and sign in the space above)

Signed at ……

On the …….. day of …… 20…..

DEDICATION

I dedicate this report to my wife, Pakama Tsabedze, my son, Phiwa Tsabedze, and to my parents. I am profoundly grateful for your prayers, love and sacrifices given towards the successful completion of my studies.

ACKNOWLEDGEMENTS

I thank God for granting me the opportunity, the motivation and the strength to complete this research study.

I also extend my sincere appreciation to my supervisors, Professor Eric Schaling and Professor Jones Odei-Mensah, for the invaluable guidance and support they provided from the proposal stage to the final report of my research.

Lastly, I thank my family and friends for their unconditional support, encouragement and overwhelming generosity.

Thank you to all of you and may God bless you abundantly.

SUPPLEMENTARY INFORMATION

Nominated journal: Journal of Economic and Financial Sciences

Supervisor / Co-author: Prof. Eric Schaling & Prof. Jones Odei-Mensah

Word count †: 14292

† Including abstract references, etc.

ABSTRACT

South Africa has long been confronted by persistent and worsening unemployment. Since 1994, the democratic government has relied on fiscal policy to drive social development, to grow the economy and to alleviate high rates of unemployment. This research undertakes an empirical examination of the effect that fiscal policy has had on unemployment over the period from 1994 to 2021. The Autoregressive Distributed Lag (ARDL) technique together with other econometric methods are used for the analytic exercise. The estimated model comprises of unemployment rate as the dependent variable which is regressed onto fiscal policy variables in the form of government expenditure, government tax revenue, fiscal deficit, together with selected determinants of unemployment that serve as explanatory variables. The study results reveal that a long-run relationship exists between unemployment and the fiscal policy variables. The long-run relationship between unemployment versus tax revenue is found to be statistically insignificant however the relationship between unemployment and fiscal deficit is found to be significant. Tax is found to have a negative relationship with unemployment for both long-run and short-run cases. Government expenditure is determined as having an insignificant but positive effect on unemployment in the long-run, whilst for the short-run it is revealed as having a negative relationship with unemployment. Deficit is shown to have a positive effect on unemployment for both short-run and long-run cases, yet the short-run relationship is found to be insignificant. This result demonstrates that persistent fiscal deficits by South Africa have failed to achieve meaningful job-creation but worsening unemployment. Government expenditure is determined to be more efficient and effective as a short-run policy tool when compared to tax and fiscal deficit. The research arrives at the conclusion that the government's fiscal policies, implemented since 1994, have been ineffective at addressing the challenge of unemployment. Policy recommendations are made with emphasis on the need for suitably designed policy tools and effective evaluation and efficient correction of policy plans.

Keywords: Unemployment, Fiscal Policy, Keynesian theory, ARDL, Cointegration

1. Introduction

South Africa's unemployment rates are persistently high and compare poorly among OECD countries (OECD, 2018). The advent of the COVID-19 pandemic in 2020 has brought considerable strain on the economy and job losses due to the disruption of economic activities and uncertainty. The general call from most sectors of society is for an increase in government intervention within the economy to drive growth and development with the effect of reducing unemployment.

Unemployment rate is defined as a measure of the percentage proportion of unemployed against the economically active that are of working age (Lestrade-Jefferis, 2002). The equation expressing unemployment rate is given as: (ls – ld)/ls * 100; Where ls is labour supply (labour force) and ld is labour demand (Parkin et al., 2020). Statistics South Africa calculate unemployment rate according to the official definition (also known as strict definition) by considering the unemployed as persons actively seeking work or self-employment over a month; with desire to work but without work over seven days before the date of the unemployment survey (Lestrade-Jefferis, 2002).

In all economies, at all times, there exists some who are unemployed, with varying degrees across different countries. Unemployment is classified into three main types namely, cyclical unemployment, frictional unemployment and structural unemployment (D'Souza, 2008, Parkin et al., 2020).

Cyclical unemployment occurs as a result of business cycle patterns such that a decrease in economic output, during periods of recession, leads to higher than normal unemployment due to employers halting business expansion and retrenching some workers (D'Souza, 2008, Parkin et al., 2020). Therefore, cyclical unemployment will continue to persist whilst the business cycle is in recession.

Frictional unemployment is associated with the continuous flow of people in and out of the labour force, the natural process of destruction of work and the formation of new work, with people moving from one job to the next and the time it takes for job-seekers and employers to be suitably matched (Parkin et al., 2020). Frictional unemployment is generally marked by short-durations, yet it is an inevitable and permanent part of a vibrant economy (Yu, D. and Roos, 2018).

Structural unemployment is chronic in its nature and is the result of a mismatch in labour supply against labour demand, due to significant change in technology and the manner in which businesses compete, such as a change towards highly skilled work or a shift to capital utilization (Parkin et al., 2020). Structural unemployment is also a consequence of labour market barriers to employment such as legislation on minimum wage, discrimination and job security laws (D'Souza, 2008).

However, the prevalence of unemployment, at considerable levels, suggests that real labour markets differ from the idealized-classical labour supply-demand model (Romer, 2019). This is supported by the fact that whilst labour markets are cyclical in nature, real wages display inflexibility in response to economic business cycles. Wage rates that are maintained higher than the equilibrium wage, for the purpose of enhancing worker productivity or attracting quality workers, have the effect of dampening labour demand, which in turn yields higher than normal unemployment levels according to the labour supply and demand model (Romer, 2019; Parkin et al., 2020).

1.1 Unemployment in South Africa

At the end of apartheid, the onset of South Africa's democratic era brought an expansion of economic opportunities. Structural changes in the labour market saw labour supply increasing significantly, particularly of low skilled workers and from a large inflow of employment-seeking African women, yet still growth in new jobs remained weak (Banerjee et al., 2008). Figure 1 represents the unemployment rate

and GDP growth rate recorded in South Africa from 1994 to 2021. The graph shows relatively high unemployment rates when contrasted to the annual average unemployment rate of 6.9% for collective OECD countries, from 2005 to 2021 (OECD, 2022). The 2022, Global Competitive Report, by IMD, ranks South Africa as second to last, from a total of 63 countries, for its high unemployment rate (IMD, 2022). Kingdon and Knight (2007) contend that the nature of unemployment is structural and partly due to the country's historical context of racial discrimination and international sanctions under apartheid. Despite government effort to drive job creation via fiscal policy action, the period between 1995 to 1999, incurred average annual GDP growth of 2,6%. Over the same period, structural changes were experienced in labour intensive resource sectors (mining and agriculture) decreased in their proportion of contribution to the economy, whilst incurring decrease in demand for low-skilled labour for higher skilled workers (Banerjee et al., 2008).

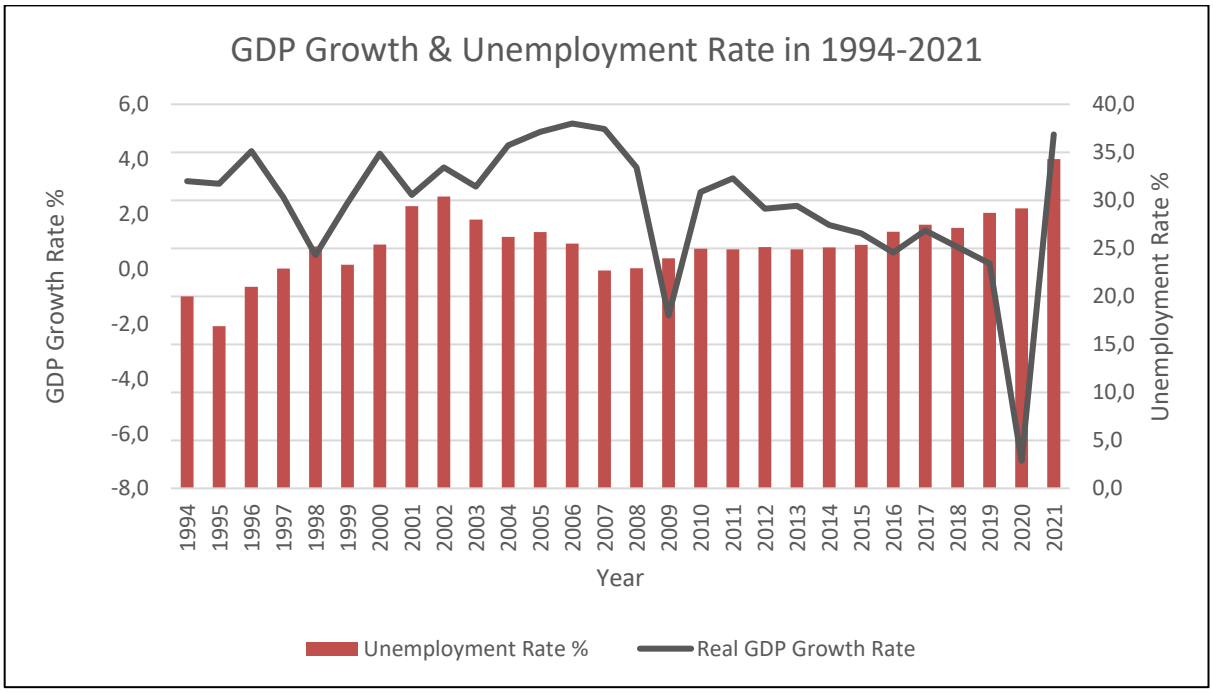


Figure 1: Unemployment rates (as per strict definition) and Real GDP Growth rate from 1994 – 2021

(Sources: GDP & Unemployment Data - Statistics South Africa; Strict definition of unemployment rate considers persons to be unemployed if: are without work seven days before household-survey interview; must desire and be available to begin work within seven days of household-survey interview and must be actively seeking work or self-employment four weeks before interview.)

The determinants of unemployment are diverse, however, those that commonly feature as notable predictors of unemployment include GDP growth, population growth, foreign direct investment (FDI), inflation rate, human capital development outcomes (Bhorat, 2008; Du Toit et al., 2018; Tsaurai, 2020). Whilst there is generally consensus that GDP growth is a major determinant that stimulates employment; South Africa's output growth has persistently performed below expectations, resulting in an insignificant impact towards the rise in unemployment (Ferreira & Rossouw, 2016).

Unemployment is one of the most pressing challenges confronting modern South Africa, which is largely concentrated among historically disadvantaged groups (Statistics South Africa, 2022). The legacy of apartheid still persists as Black-Africans continue to endure the greatest burden of unemployment, with an annual average unemployment rate of 20,8% in 1995, growing to 49.6% in 2021, followed by coloureds (15,7% and 36.9% respectively), Indian/Asian (10,3% and 27.3% respectively) and lastly whites (3,3% and 10.9% respectively) (Statistics South Africa, 2022).

Evidence shows that aggregate unemployment levels continue to trend upwards, yet explaining the root problems remains complicated, as it relates to labour demand elasticities, liberalization of the economy, mechanization of operations and labour market structure (Du Plessis and Smit, 2007; Ferreira & Rossouw, 2016). Leibbrandt et al. (2010) recommend employing fiscal policy intervention towards addressing the structural unemployment, with particular focus given towards

improving the quality of education and skills development for previously disadvantaged persons. South Africa must continue with sound policy interventions and efficient implementation in the fight against unemployment because it is a matter that deals with sustaining livelihoods, which is fundamental to preservation of quality of life and human dignity (Yu and Roos, 2018).

1.2 Fiscal Policy

There is widespread agreement that fiscal policy yields a positive effect of stimulating economic growth through dampening of business cycles and delivering on social development such as providing affordable healthcare and education, which helps in reducing unemployment in short-term and long-term periods. However, scholars also have some uncertainty and contention concerning its effectiveness in achieving economic stabilization objectives (Ocran, 2009; Romer, 2019; Marire, 2022). Within the developing world, optimal fiscal policy serves a vital role in achieving full employment, sustained GDP growth and price-level stability (Parkin et al., 2020).

The IMF defines fiscal policy as a mechanism by which governments influence the aggregate economy and its trajectory through revenue collection and policies on expenditure (Horton and El-Ganainy, 2020). The role played by fiscal policy has steadily gained prominence as a result of global economic crises necessitating government intervention to sustain economic activity whilst also providing aid to vulnerable parts of society (Horton and El-Ganainy, 2020).

Through fiscal policy instruments, which comprise national taxes and government expenditure, the government has a direct and indirect influence on how resources are deployed to contribute to the economy's gross domestic product (GDP), as represented by equation [1.1] below (Horton and El-Ganainy, 2020):

$$GDP = C + I + G + (X - M) \quad \text{.....[1.1]}$$

Where:

C = Aggregate Private Consumption

I = Aggregate Private Investment

G = Government expenditure on goods and services

(X – M) = Exports minus Imports

Equation [1.1] shows the government has direct control over its expenditure (G), which entails investment and consumption. Private consumption (C), private investment (*I*) and net exports (X-M) are influenced indirectly by the government, through levied taxes and transfers to the public. Expansionary fiscal policy stimulates aggregate demand through increasing government spending, whilst contractionary fiscal policy dampens demand through reduced spending (Horton and El-Ganainy, 2020). Most governments design long-term fiscal policy objectives to support economic growth with productive actions such as infrastructure investments; whilst in the short-term, fiscal policy priorities reflect an appropriate response to business cycle dynamics (Horton and El-Ganainy, 2020). The final fiscal policy adopted will also depend on the fiscal flexibility that each government has available.

1.2.1 Fiscal Policy in South Africa

South Africa's fiscal policy is delivered by National Treasury through national budget plans that consolidates aggregate revenue and expenditure (Parkin et al., 2020). For over 25 years, since the political transition in 1994, the government has employed fiscal policy to improve the socio-economic conditions of many South Africans.

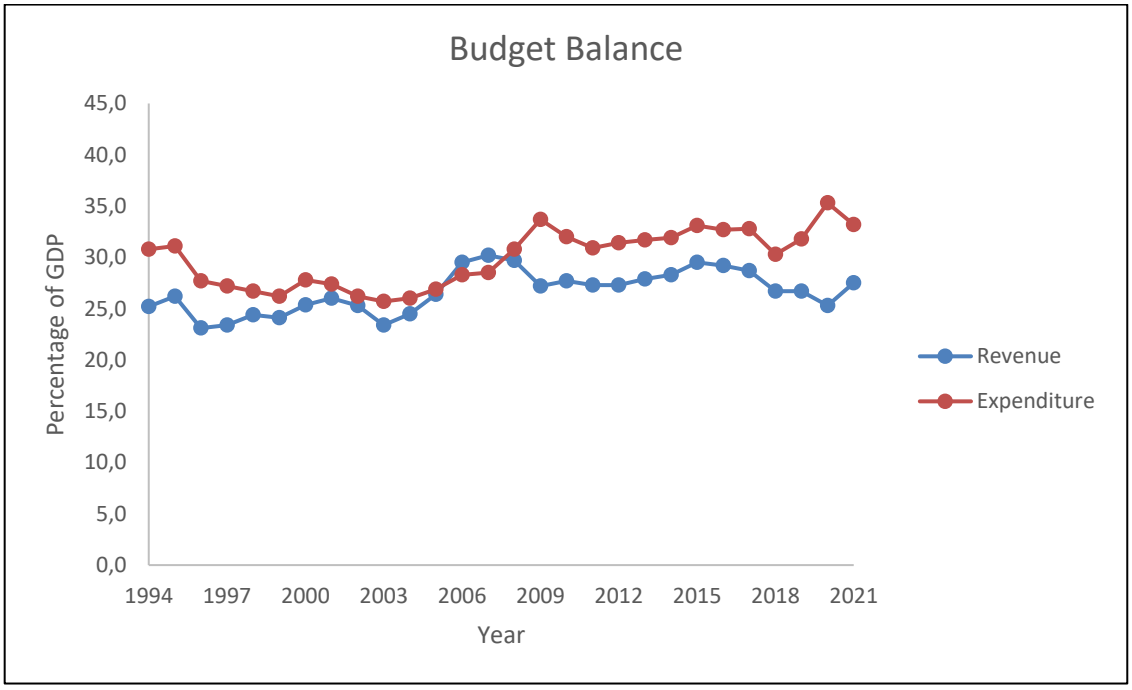


Figure 2. Consolidated Government Revenue and Expenditure, 1994 – 2021

Source: National Treasury. (n.d.)

Figure 2 shows trends in government revenue and expenditure since 1994. Budget deficits were recorded in most of the period under review, which yield an annual average deficit of 3,3% of GDP between 1994 to 2021. Over the period from 1994

to 2021, budget surplus was attained only in 2006 and 2007, driven by strong revenue collection and well-controlled expenditure (IMF, 2006). However, after the global financial crisis, in 2008, a budget deficit trend was re-established, from which the country has not yet recovered. Each yearly deficit, when funded by debt-borrowing, accumulates as part of government debt, with the consequence of higher debt-servicing costs incurred. In this regard, South Africa's estimated deficit for the 2021 fiscal year is -5,7% of GDP (R 355,7 billion), with a corresponding total debt of 69,5% of GDP (R 4 345,7 billion) and debt service costs of 4,3% of GDP (R 268,3 billion) (National Treasury, 2022). The overall effect of budget deficits is a rise in unproductive budget allocation for servicing the cost of government debt, which may require funds to be diverted from productive expenditure.

Tax Trends

The main source of government revenue is tax, collected in accordance with the Income Tax Act of 1962 (South African Revenue Services, n.d.). The largest tax revenue component over the period from 1994 to 2020 is personal income tax (PIT) with an annual average contribution of 36% to total tax, followed by value added tax (VAT), with an annual average of 25,6% share in total tax revenue, then corporate income tax (CIT) with an annual average of 17,7% contribution (South African Revenue Services, 2020).

Tax reform took place after 1994 to widen the tax base, enhance collection efficiency and equity, and ensure support of fiscal policy programs (National Treasury, 1995). Over the years, during low GDP growth periods, from 1994 to 1999, PIT grew incrementally from 39,5% to 42,6% of total tax revenue (South African Revenue Services, 2008). In view of the varied economic conditions since 1994, it can be concluded that South Africa has enjoyed a stable tax policy and that tax collection has remained relatively robust, thus achieving an annual average Tax-to-GDP ratio of 24,2% from 1994 to 2020 (South African Revenue Services, 2020). The long-term tax buoyancy ratio, which measures tax revenue sensitivity to

variation in GDP growth, is greater than one, demonstrating stable tax collection that can support the government's long-term fiscal policy strategy (South African Revenue Services, 2020).

Policies for Economic Growth and Job Creation

Expansionary fiscal policy strategic plans adopted by the government include the Reconstruction and Development Programme (RDP), established in 1994; followed by Growth Employment and Redistribution (GEAR) strategy in 1996; the Accelerated and Shared Growth Initiative of South Africa (ASGISA) deployed in 2006; the New Growth Path (NGP) launched in 2010 and the National Development Plan (NDP) adopted in 2012.

The RDP

The RDP was a policy framework aimed at socio-economic development and redistribution, comprising of building basic needs and services; developing human capital; growing the economy; democratisation; and RDP implementation (Government Gazette, 1994; Yu and Roos, 2018). Despite the ambitious socio-economic objectives, the policy incurred modest achievements, with sluggish economic growth. and was unable to reach its goals to tackle rising unemployment levels (Bhorat and Oosthuizen, 2005).

GEAR

The GEAR strategy was introduced in 1996 to replace the RDP. The policy was conceived to deliver a fast-growing economy, targeting average of 4.2% GDP growth and the creation of 270 000 jobs per annum, as a means to address unemployment and poverty (National Treasury Republic of South Africa, n.d.). GEAR policies were not fully implemented and the economic projections were not realized, as economic growth averaged at 2.6% per annum for the first five years post 1994 (3.1% average GDP growth between 1995 to 2004) and subsequently,

employment growth was lower relative to the labour force expansion, leading to an increase in unemployment rate (Bhorat, 2004; Du Plessis and Smit, 2007).

ASGISA

ASGISA was announced in 2005 with the primary goal of halving unemployment and poverty by 2014 (Yu and Roos, 2018). The economic policy was largely focused on growth-stimulating interventions targeted at achieving an average GDP growth of 4.5% for the period 2004 –2009 and 6% average growth between 2010 - 2014 (The Presidency, n.d.). At the time, South Africa's GDP growth had recorded levels occurring above 4% since 2004, driven by a surge in commodity prices and foreign capital inflows. In 2008, GDP growth declined to 3.1% from 5.1% in 2007, due to the onset of electricity supply constraint combined with the impact of the global financial crisis (The Presidency, n.d.). These shocks worked to compromise the achievements made by AsgiSA's and resulted in unemployment levels rising to 25.7% by 2009 (Statistics South Africa, 2011).

The NGP

In November 2010, the government issued the New Growth Path (NGP) founded on a developmental framework. The NGP policy was aimed at improving GDP growth, whilst also prioritizing job creation by investing in energy, mining, agriculture and key infrastructure (South African Government, n.d.). The NGP plan had ambitious targets of achieving five million jobs and reducing unemployment rate to 15% by 2020, of which Nattrass (2011) regarded as counterproductive to the pursuit of economic growth with decent work. Furthermore, the NGP included an industrial policy action plan (IPAP), which was designed with the objective of promoting labour-absorbing industrialization (Ferreira & Rossouw, 2016). However, due to slow GDP growth trend from 2011 onwards, yet again, the policy proved unsuccessful at meeting its job creation goals.

The NDP

The NDP was adopted in 2012 as a long-term economic strategy to produce meaningful development and socio-economic progress (National Planning Commission, n.d.). The policy is continuously informed by expert knowledge from scholars and professionals forming part of a body known as the National Planning Commission. The NDP establishes two central targets to be achieved by 2030, which are the eradication of poverty and reduction in the level of inequality, equivalent to a Gini coefficient of 0.6. These targets are underpinned by the need for stimulating economic activity, supporting industrial expansion and small-to-medium sized enterprise growth to achieve sustained GDP growth at a minimum annual average of 5% (National Planning Commission, n.d.). From 2012 onwards, South Africa continuously recorded low output growth until the year 2020, at which a 7% GDP contraction was incurred on account of COVID-19 lockdowns (Statistics South Africa, 2021).

Yet still, the South African economy continues to face several impediments, which include electricity supply shortages, the prevalence of corruption, poor service delivery and mismanagement of state resources, which erode confidence in South Africa as a capable state (Kirsten and Fourie, 2021). The occurrence of state capture corruption in South Africa was deep, prevalent and long-lasting and had the effect of misdirecting government's developmental plans for the benefit of corrupt individuals, whilst defrauding the public (Martin and Solomon, 2016). The seriousness of South Africa's economic challenges confirms the likelihood that the NDP objectives will not be realized in their original design, by 2030.

The fiscal policy strategies introduced from the RDP to the present NDP have been informed by the need to resolve pervasive poverty and unemployment. However, appraisal studies demonstrate that these policies have been mostly ineffective. Beside the presence of weak labour demand from slow economic growth, other reasons that have served to constrain job creation are extensively documented within the South African labour market literature, of which the structural nature of unemployment, as it relates to skills shortage, rising labour costs and increased capital-intensive production, is a prominent feature (Banerjee et al., 2008; Leibbrandt et al., 2010; Ferreira & Rossouw, 2016).

1.3 Problem Statement

Since 1994, the South African government has been preoccupied with expanding job opportunities and reducing unemployment. Macroeconomic policies and programs, including RDP, GEAR, ASGISA, NGP, IPAP and NDP, have been implemented; however, modest socio-economic gains have been achieved (Ferreira & Rossouw, 2016). Despite government actions, unemployment has reached crisis levels for prolonged periods (Yu and Roos, 2018), with South Africa recording an unemployment rate of 35,3% (46,2% as per expanded definition) (Statistics South Africa, 2022) in the fourth quarter of 2021; and the annual average unemployment rate persists above 25% over the period from 1994 till 2021. Moreover, youth unemployment increased from 35,8% in 2015 to 42,1% in 2020 and then surpassed 60% in Q1 of 2022, whilst Black Africans accounted for 88,9% of the unemployed population in 2020 (Statistics South Africa, 2020; Statistics South Africa, 2022). Government policies such as affirmative action, which aim to redress exclusion from economic participation, suffered by previously

disadvantaged persons, have clearly had limited effect, with Black-African unemployment levels trending upward from 1995 onwards (Leibbrandt et al., 2010).

Labour market indicators clearly demonstrate an inability of government policies and economic levers to address the unemployment challenge. As such, it is vital to interrogate and improve understanding of the efficacy of the government's fiscal policy since 1994 to contribute towards addressing the unemployment crisis. When considering government's expenditure, taxation and budget deficit characteristics over the past two decades, the questions that stand out are:

What has been the effect of fiscal policy, regarding government expenditure, taxation and fiscal deficit, on unemployment?

How does adopted fiscal policy compare against empirical findings on the effect that fiscal policy has on unemployment and what guidance should policymakers consider to enhance fiscal policy performance?

This study seeks a response to these questions by investigating the relationship between fiscal policy and unemployment in South Africa.

Research Objective

- To evaluate the impact of fiscal policy on unemployment, with respect to government expenditure, taxation and the budget deficit in South Africa from 1994 to 2021.

1.4 Rationale of The Study

Despite plentiful macroeconomic policies, South Africa is failing to achieve meaningful job creation required to alleviate the mounting unemployment crisis. Yu and Roos (2018) provide compelling arguments that unemployment is of utmost priority, as it has strong linkages with other socio-economic problems, such as deteriorating levels of crime, poverty, standard of living and lawlessness, all of which pose a risk of national instability. Hence, after 25 years from the onset of a new democratic dispensation, it is meaningful to examine the relationship between fiscal policy and unemployment and appraise economic policy effectiveness with regards to addressing unemployment.

This study will add to available empirical information and contribute to improving understanding of the relationship between fiscal policy and unemployment in order to optimize policy formulation for enhanced reduction of unemployment.

2. Literature Review

The section commences with literature on the prevailing theoretical framework for unemployment from a Keynesian perspective, theoretical foundations for fiscal policy and then proceeds to review literature based on empirical studies on the relationship between fiscal policy and macroeconomic variables.

2.1 Keynesian Theory of Unemployment

The Keynesian theory explains unemployment as a natural occurrence resulting from deficient aggregate demand, leading to reduced production levels, thus, the economy is unable to generate enough employment for job seekers (Mouhammed, 2011; Parkin et al., 2020). An essential aspect to the theory is its assumption of

wage rigidity which prevents clearing of the market at a lower equilibrium wage, and in turn produces unemployment. At its core, the Keynesian model advocates for increased spending and a lowering of taxes as a means of stimulating aggregate demand, which consequently increases employment. Despite its popularity, the theory has faced criticism that government spending could stifle spending by private enterprises, whilst also that continuous aggregate demand stimulation would lead to inflation and that this could be corrected through monetary policy (Parkin et al., 2020).

There are three main explanations to wage rigidity which give rise to unemployment, namely the efficiency-wage theory, contracting models and searching-matching models (Romer, 2019). Efficiency-wage models are based on the premise that higher wages encourage worker loyalty and improved effort which in turn raises productivity levels. Enterprises are thus driven to hire and absorb labour based on their demand, whilst ensuring the marginal product and revenue from labour is greater or equal to the associated cost. Long-term contract relationships that workers and employers enter into results in real wages remaining constant. In this context, rigid wages cease to serve an allocative role in order for labour market to adjust to an optimal position of equilibrium. As such, the labour market settles at a suboptimal position. Searching and matching models are founded on the principle of diversity amongst workers and the jobs within a decentralized labour market. The process of absorbing workers into firm vacancies is laborious and with recruitment friction, as effort is made to match-up skills with job profiles. The complex and ongoing nature of searching and matching models consequently leads to stable levels of unemployment (Romer, 2019).

2.2 The Theory of Fiscal Policy

The theory of fiscal policy has been advanced by the writings of Richard Musgrave (1959) on economic stabilization, resource allocation and income distribution. The

theory is based on the assumption that fiscal policy officials are driven by the goal to achieve social well-being, which is determined by a diverse set of socio-economic variables (y_i), such as GDP growth and the level of unemployment (Tanzi, 2006). The relationship between social welfare, modelled as function (W) and socio-economic variables (y_i) is expressed algebraically as:

$$W = f(y_1, y_2, \dots, y_n) \quad \text{.....[2.1]}$$

The variables (y_i) display sensitivity to change in specific corresponding fiscal policy tools, which are modelled as (x_i). Examples of policy tools include taxes and various types of government expenditure and the relationship between variables and tools is expressed in equation format as:

$$y_i = f(x_1, x_2, \dots, x_n) \quad \text{.....[2.2]}$$

Policy tools have differing degrees of efficiency and are regarded as efficient when a small variation in a given tool results in substantial variable change. Therefore, efficient tools are most desirable to ensure fiscal policy effectiveness. Scholars have also argued that no single fiscal policy tool is able to sufficiently reflect the fiscal policy position of a country (Fu et al., 2003; Ocran, 2009). This theoretical framework forms the heart of fiscal policy and is founded upon several crucial assumptions (Tanzi, 2006) outlined in the subsequent section.

The theoretical framework of fiscal policy assumes existence of a centralized policy unit within government, with suitable powers and responsibility over all policy development, policy tool selection and prioritization of socio-economic variables. All

policy officials are assumed to act with a singular focus of serving for the good of public society, without interference or adverse influence from external forces. This assumption disregards the fundamental economic principle that all persons are driven by self-interest (Parkin et al., 2020), which renders the assumption as problematic in real practice.

Further assumptions are that policy decisions are made based on the latest, reliable data and best analyses to achieve the best outcomes suited for the intended purpose, that is free of bias. The legislation and national laws by which fiscal policy is implemented are assumed to be precise and unambiguous to enable efficient action.

Tanzi (2006) offers contrary evidence and criticism against the fiscal policy framework by arguing that the theory and its assumptions are based on normative rationale, as they prescribe how governments ought to ideally behave. The theory is found to be far-removed from the reality experienced by numerous countries, both developed and developing, and thus offers limited use in predicting real-world conditions how countries perform.

The reviewed theoretical frameworks lead to the conclusion that fiscal policy is able to contribute towards economic stabilization, resource allocation and income distribution. Through the use of appropriately designed fiscal policy tools, with knowledge of how instruments x's affect y's, governments are able to address the socio-economic challenges they face.

2.3 Literature from Empirical Studies

Within Musgrave's (1959) exposition of public finance, the author contends that fiscal policy has an appreciable influence on unemployment. Since then, fiscal policy has found wide recognition as an important economic lever for promoting

income distribution, resource allocation and economic stabilization. The following section explores empirical literature, with a focus on the South African economy.

The study by Fatás and Mihov (2001) was carried out on the effect of fiscal policy on consumption and employment variables pertaining to the United States economy between 1960 – 1996. The study contrasts results computed from a set of general equilibrium models against empirical outcomes generated from vector autoregression (VARs) methods. Findings from the study's empirical results show significant expansionary effect from rising government expenditure, with the corresponding multiplier greater than one. The findings present evidence of strong rise in consumption and employment as a response to increase in government expenditure. The study results show agreement with the Keynesian theory of unemployment and the theoretical premise of fiscal policy, thus suggesting that fiscal policy is able to stimulate aggregate demand with the consequence of driving job creation.

Kingdon and Knight (2007) study the case of unemployment in post 1994 South Africa and interrogate root causes and associated problems over the period from 1995 to 2003. They find that slow economic growth, translating to slow growth in labour demand against rapid expansion in the labour force, as the predominant cause to rising unemployment. The study concludes by recommending economic growth stimulating policies together with reform on labour to achieve higher levels of job creation. The central finding and recommendation, that economic growth promoting policies, stimulate demand, which in turn drives job creation is consistent with the Keynesian theory, which suggests that growth targeting fiscal policies in South Africa have been correctly adopted to remedy the challenge of high unemployment.

Banerjee et al. (2008) identify a rapid increase in labour supply, relative to stagnant demand, together with a shift in labour preference towards highly skilled workers as significant factors to have led to rising structural unemployment in South Africa.

Structural changes in labour-intensive sectors, relatively high reservation wages and skills shortages are highlighted as imposing constraints to job creation, which require correction by policy intervention. Banerjee et al. (2008)'s findings are in agreement with Kingdon and Knight's (2007) conclusion on the use of policy as a suitable means in stimulating labour demand.

Fedderke et al. (2006) conduct a study to explore the effect that government investment in infrastructure has on economic growth in South Africa. The study relies on the vector error correction model (VECM) and analyses data spanning from 1976 to 2002. The outcome demonstrates strong evidence that government spending in infrastructure leads to growth in economic output. The study findings prove consistent with the theoretical premise of Keynesian theory and the theory of fiscal policy. Productive infrastructure expenditure by government is an enabler of entrepreneurial activity, encouraging private investment, thus yielding economic growth and job creation.

Ferreira and Rossouw (2016) appraise South Africa's economic policies aimed at addressing unemployment for the period of 20 years post-1994. The researchers review changes in domestic capital-to-labour (K/L) ratio and employ a dynamic general equilibrium model for the South African economy as part of their analysis. The study finds a distinct rise in the capital-to-labour ratio, suggesting a structural shift of increased preference of capital over labour. The authors also find the existing economic policies to be sub-optimal and conclude that there is need for suitably designed policies to fix the unemployment crisis.

Pamba (2022) investigates the effectiveness of fiscal policy in influencing economic growth in South Africa, from 1980 to 2020. The study employs "the Johansen Co-integration test, Granger causality test and Vector Auto-Regression (VAR) method" (Pamba, 2022), as part of the analysis. The results from the Granger causality test display a causal association, from government deficit, to economic growth.

Moreover, Pamba's (2022) analysis indicates that for short-term consideration, gross fixed capital formation and government expenditure (supply side policies) have a positive influence on real GDP per capita, whilst government deficit displays a negative effect on real GDP per capita. The finding of positive association between fiscal policy variables and economic growth supports the use of fiscal policy as an effective supply side means for stimulating economic growth and job creation in South Africa.

The study findings are compatible with earlier research, by Ocran (2009), on the effect of fiscal policy on South African economic growth, between 1990 and 2004. Using vector auto-regression technique, results were produced that led to the conclusion that fiscal policy variables, which include tax revenue, gross fixed capital formation and consumption expenditure by government, have positive effect on economic growth, whilst fiscal deficit displayed insignificant influence on output growth (Ocran, 2009).

In a similar manner, a study on South African government investment and consumption and its effect on economic growth was conducted by Leshoro (2017) for the period 1976 to 2015. The study employs the autoregressive distributed lag (ARDL) method for analysis and yields findings that exhibit significant positive influence by government investment and consumption on economic growth for the short-term. However, results for long-run consideration show government investment with significant positive effect on economic growth, but government consumption achieves a statistically insignificant outcome (Leshoro, 2017). Thus, the results prove consistent with findings by Ocran (2009) and Pamba (2022), which broadly support the Keynesian theory that government expenditure has a positive effect on the economy and employment.

The study by Iwuoha (2020) analyses the effect that public debt has on unemployment in Nigeria, between 1981 to 2019. By employing vector error correction model, the study generates results that indicate a negative relationship

between public debt and unemployment. This finding displays consistency with the thesis made by the Keynesian theory. Moreover, Iwuoha (2020) states that corruption must be avoided by utilizing proper checks in order to ensure that national borrowings are suitably expended on productive investments.

The relationship between national budget deficits and unemployment in South Africa was researched by Marire (2022) for the period spanning between 1994 to 2019. The author examines the effect of fiscal consolidation on unemployment by use of analytical methods which include “the Toda-Yamamoto Granger noncausality test and the Autoregressive Distributed Lag Modelling” (Marire, 2022). The findings from the study show that fiscal deficits have an effect of reducing unemployment in the short-run, proving congruent with the Keynesian theory view. The results also show that deficits increase unemployment in the long-run, but if managed within an optimal range, they are able to reduce unemployment. These results present a differing view from the writings of Michal Kalecki, that argue for continuous fiscal deficits, as they are regarded as self-financing by virtue of the multiplier effect (Sawyer, 2020 as cited in Marire, 2022). Marire (2022) concludes by recommending active labour market policies as a suitable intervention to the high levels of unemployment experienced in South Africa.

Conclusion

Whilst literature on the relationship between fiscal policy and unemployment in South Africa remains limited, the reviewed literature demonstrates that the effect of fiscal policy on economic growth and unemployment is varied. Both theoretical and empirical literature do not provide a definitive explanation to the relationship fiscal policy has with economic growth and unemployment. Since the beginning of the ANC-led government, the South African economy has mostly incurred fiscal deficits, with job-creating policies adopted, however economic growth has been relatively low and unemployment levels have continued to rise. The findings from the empirical literature provide wide compatibility with the Keynesian theoretical

framework, which suggests that the fiscal policy effect is mostly positive and this is corroborated by findings made by Alqadi and Ismail (2019). The literature review also indicates broad acceptance that appropriately designed fiscal policies, implemented correctly, can deliver meaningful effect in addressing persistent high levels of unemployment.

3. **Methodology**

This study constructs a model based on the theory of fiscal policy (Tanzi, 2006). Unemployment as a dependent variable is regressed as a function of selected determinants of unemployment, together with fiscal policy variables. The adopted model includes past values of dependent and descriptor variables, which validates the use of Autoregressive Distributed Lag (ARDL), as described in the analytical method by Adu and Marbuah (2011). The study employs three fiscal policy indicators, which is regarded as acceptable representation of fiscal policy position (Fu et al.,2003), namely: tax, government expenditure and budget deficit are each selected to participate in a distinct ARDL model to eliminate the concern of multi-collinearity, induced by a high degree of correlation. The three regression equations are given in general format as follows:

$$Unemployment_t = \beta_0 + \beta_1 Tax_t + \beta_2 GDP_{growth} + \beta_3 Inflation + \beta_4 FDI + \beta_5 Pop_{growth} + \beta_6 HDI + \varepsilon_t \quad \text{[3.1a]}$$

$$Unemployment_t = \beta_0 + \beta_1 GovExpend_t + \beta_2 GDP_{growth} + \beta_3 Inflation + \beta_4 FDI + \beta_5 Pop_{growth} + \beta_6 HDI + \varepsilon_t \quad \text{[3.1b]}$$

$$Unemployment_t = \beta_0 + \beta_1 Deficit + \beta_2 GDP_{growth} + \beta_3 Inflation + \beta_4 FDI + \beta_5 Pop_{growth} + \beta_6 HDI + \varepsilon_t \quad [3.1c]$$

Where:

$\boldsymbol{\beta_0}$ represents the model constant term

$\boldsymbol{\beta_1, \ldots, \beta_6}$ represent variable coefficients

$\boldsymbol{\varepsilon_t}$ is the error term

GDP growth, represents real GDP growth rate (economic output) in South Africa which has a positive linkage with stimulating employment creation and is thus expected to have a negative effect on unemployment (Bhorat, 2008; Tsaurai, 2020)

Inflation, represented by inflation rate, is argued to have a negative effect on unemployment according to short-run Phillips curve (Parkin et al. 2020). However extensive empirical studies yield contrary outcomes, indicating that inflation has varied effect on unemployment (Tsaurai, 2020).

FDI, Foreign Direct Investment inflows, represented as a percentage of GDP, act as monetary injection, with the effect of stimulating national growth and development that creates jobs and thus reducing unemployment. However, Tsaurai's (2020) study indicates that FDI has increased unemployment in Africa.

Pop growth, represents percentage growth in the national population of South Africa, which has potential of adversely influencing the rate of unemployment for cases in which high population growth yields an oversupply of labour in contrast to demand, which results in rising unemployment. A positive relationship between population growth and unemployment is expected (Tsaurai, 2020)

HDI, Human development Index, is a widely recognized measure, established by the United Nations, which captures the quality and level of education and professional capacity within a country, which is strongly association with unemployment (Sumaryoto et al., 2020). However, Tsaurai's (2020) study presents varied results of the effect human capital development has on unemployment.

The first step is to review the predictor variables correlation matrix and ensure that correlations are within acceptable levels before proceeding to test variable data for stationarity. Testing of variable data for stationarity, to establish a constant mean and variance, allows for generalizability, whilst also avoiding spurious regression results (Gujarati, 2003). If a given series is not stationary, it must be differenced multiple (n) times until stationary, with (n) referred to as the order of integration and expressed as I(n) (Gujarati, 2003). The study will use the Phillips-Perron (PP) test for stationarity.

The assessment for long-run and short-run relationship between the dependent variable (Unemployment rate) and regressor variables is performed according to ARDL bounds testing method developed by Pesaran et al. (2001) as cited in Abu and Marbuah (2011). The ARDL bounds test offers the advantage being applicable without need for stationarity testing, on condition that variables are free from integration order 2 and higher, for the procedure's viability (Abu and Marbuah, 2011). Other advantages include the ability to generate estimations with regressor variables displaying endogeneity (Leshoro, 2017) and the technique proves robust at analysis of small samples (Pesaran et al.,2001 as cited in Abu and Marbuah, 2011).

Only one of the three equations in [3.1] is used for demonstration in the subsequent model development sections. Equation [3.1a] is shown in natural log-linear format as follows:

$$\ln Unemployment_t = \beta_0 + \beta_1 \ln Tax_t + \beta_2 \ln GDP_{growth} + \beta_3 \ln Inflation + \beta_4 \ln FDI + \beta_5 \ln Pop_{growth} + \beta_6 \ln HDI + \varepsilon_t \quad \text{[3.2a]}$$

Transforming equation [3.2a] into ARDL structure yields:

$$\Delta \ln Unemployment_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 \Delta \ln Unemployment_{t-i} + \sum_{i=0}^{n} \alpha_2 \Delta \ln Tax_{t-i} + \sum_{i=0}^{n} \alpha_3 \Delta \ln GDPgrowth_{t-i} + \sum_{i=0}^{n} \alpha_4 \Delta \ln Inflation_{t-i} + \sum_{i=0}^{n} \alpha_5 \Delta \ln FDI_{t-i} + \sum_{i=0}^{n} \alpha_6 \Delta \ln Pop_growth_{t-i} + \sum_{i=0}^{n} \alpha_7 \Delta HDI_{t-i} + \beta_1 \ln Unemployment_{t-1} + \beta_2 \ln Tax_{t-1} + \beta_3 \ln GDPgrowth_{t-1} + \beta_4 \ln Inflation_{t-1} + \beta_5 \ln FDI_{t-1} + \beta_6 \ln Pop_growth_{t-1} + \beta_7 HDI_{t-1} + \varepsilon_t \quad \text{[3.3a]}$$

Where:

Δ represents the difference operator

$\alpha_1, \ldots, \alpha_7$ represents short-run elasticities

$\beta_1, \ldots, \beta_7$ represents long-run elasticities

$\boldsymbol{\varepsilon_t}$ is the error term

The null hypothesis, $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$ **,** points to a non-existing long-run relationship. The alternative hypothesis, $H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$ **,** indicates an existing long-run relationship.

Unemployment represents unemployment rate in South Africa, according to the strict definition.

Gov Expend represents consolidated government expenditure, conditioned via GDP deflator. Government expenditure is expected to have a negative association with unemployment (Rendahl, 2014; Leshoro, 2017; Pamba, 2022).

Tax represents total tax collected expressed as a percentage of GDP. A negative correlation is expected between government tax revenue (Tax) and unemployment, due to unemployment being lessened by higher economic output (Ocran, 2009).

Deficit represents the South African budget deficit as a percentage of GDP. Budget deficit is expected to have a negative effect on unemployment in the short-run, however, a positive effect is expected for long-run considerations (Marire, 2022).

The F-test is conducted to determine cointegration among the variables and the calculated F-statistic value contrasted with critical values from Pesaran et al. (2001). If the F-statistic is greater than the upper limit then the null hypothesis of non-existing cointegration is rejected; if the F-statistic is between upper and lower limit then it is inconclusive if cointegration exists; if the F-statistic lies below the lower limit the null hypothesis, of non-existing cointegration, cannot be rejected.

After cointegration is established, the short-run and long-run error correction models are estimated respectively as follows (Abu and Marbuah, 2011):

$$\Delta\ln Unemployment_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 \Delta\ln Unemployment_{t-i} + \sum_{i=0}^{n} \alpha_2 \Delta\ln Tax_{t-i} + \sum_{i=0}^{n} \alpha_3 \Delta\ln GDPgrowth_{t-i} + \sum_{i=0}^{n} \alpha_4 \Delta\ln Inflation_{t-i} + \sum_{i=0}^{n} \alpha_5 \Delta\ln FDI_{t-i} + \sum_{i=0}^{n} \alpha_6 \Delta\ln Pop_growth_{t-i} + \sum_{i=0}^{n} \alpha_7 \Delta HDI_{t-i} + \gamma ECT_{t-1} + \varepsilon_t \quad \text{[3.4a]}$$

$$\ln Unemployment_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 \ln Unemployment_{t-i} + \sum_{i=0}^{n} \alpha_2 \ln Tax_{t-i} + \sum_{i=0}^{n} \alpha_3 \ln GDPgrowth_{t-i} + \sum_{i=0}^{n} \alpha_4 \ln Inflation_{t-i} + \sum_{i=0}^{n} \alpha_5 \ln FDI_{t-i} + \sum_{i=0}^{n} \alpha_6 \ln Pop_growth_{t-i} + \sum_{i=0}^{n} \alpha_7 HDI_{t-i} + \varepsilon_t$$

…….[3.5a]

Where

$\boldsymbol{\gamma}$ represents the coefficient of the error correction term (ECT) and measures the short-run speed of settling (annual correction) towards long-run equilibrium.

Data Sources

This study relies on secondary data which extends over the period from 1994 to 2021. The data is obtained from records stored by various national and international institutions. Unemployment related data is obtained from Statistics South Africa databases. Tax data is obtained from the South African Revenue Services databases. Data on government expenditure and deficits is obtained from the National Treasury databases. GDP growth rate (real-gdp) data is obtained from Statistics South Africa databases. Inflation data is obtained from the International Monetary Fund (IMF) database. FDI data is obtained from the World Bank database. Population growth rate data is obtained from the World Bank Database. HDI data is obtained from the United Nations Development Programme database.

The frequency of the data series is standardized on annual basis due to constraints presented by unemployment data. Unemployment data, for the period 1994 to 1999, was generated once every year according to October Household Surveys archived within Statistics South Africa databases and hence the adoption of annual data for subsequent analysis.

4. **Empirical Results**

This section develops econometric models according to the methodology described in section 3, in order to evaluate the effect that fiscal policy variables and determinants of unemployment have on unemployment in South Africa. The section commences with a determination of correlation matrices of the independent variables. The section then proceeds to present unit root tests of time series data, followed by optimal lag structure determination. ARDL cointegration modelling is then employed for the estimation of the short-run and long-run relationship between unemployment rate (dependent variable) and corresponding explanatory variables. The section then concludes with diagnostic testing.

4.1 **Correlation Matrices**

Correlation matrices of the explanatory variables occurring in each corresponding equation, namely equations 3.1a, 3.1b and 3.1c, are presented below as a check for multi-collinearity.

Table 4.1a Correlation Matrix of Variables corresponding to Equation 3.1a

	Real GDP Growth Rate (%)	*Inflation Rate (%)*	*FDI (% of GDP)*	*Population Growth (%)*	*HDI (Index)*	*Tax (% of GDP)*
Real GDP Growth Rate (%)	1,000					
Inflation Rate (%)	0,177	1,000				
FDI (% of GDP)	0,013	0,218	1,000			
Population Growth (%)	0,086	0,480	-0,229	1,000		
HDI (Index)	-0,620	-0,235	-0,158	0,047	1,000	
Tax (% of GDP)	-0,219	-0,242	0,074	-0,356	0,674	1,000

Table 4.1b Correlation Matrix of Variables corresponding to Equation 3.1b

	Real GDP Growth Rate (%)	*Inflation Rate (%)*	*FDI (% of GDP)*	*Population Growth (%)*	*HDI (Index)*	*Gov_Expenditure (% of GDP)*
Real GDP Growth Rate (%)	1,000					
Inflation Rate (%)	0,177	1,000				
FDI (% of GDP)	0,013	0,218	1,000			
Population Growth (%)	0,086	0,480	-0,229	1,000		
HDI (Index)	-0,620	-0,235	-0,158	0,047	1,000	
Gov_Expenditure (% of GDP)	-0,645	-0,048	-0,047	0,142	0,821	1,000

Table 4.1c Correlation Matrix of Variables corresponding to Equation 3.1c

	Real GDP Growth Rate (%)	*Inflation Rate (%)*	*FDI (% of GDP)*	*Population Growth (%)*	*HDI (Index)*	*Deficit (% GDP)*
Real GDP Growth Rate (%)	1,000					
Inflation Rate (%)	0,177	1,000				
FDI (% of GDP)	0,013	0,218	1,000			
Population Growth (%)	0,086	0,480	-0,229	1,000		
HDI (Index)	-0,620	-0,235	-0,158	0,047	1,000	
Deficit (% GDP)	-0,662	0,100	-0,175	0,576	0,578	1,000

The correlation results reported in Tables 4.1a, 4.1b and 4.1c show correlation coefficients which are relatively low, occurring below the threshold of 0.7. The only exception is identified as the correlation coefficient between the variable HDI and Government Expenditure, determined as 0.821. This coefficient achieves a corresponding p-value of 0.000, which proves that the high degree of correlation between HDI and Government Expenditure is statistically significant and thus introduces risk of multi-collinearity.

4.2 **Stationarity Testing**

The study adopts the Phillips-Perron (PP) method for stationarity testing, as it exhibits robust characteristics (Adu and Marbuah, 2011).

As part of the stationarity testing exercise, the regression model form with either an intercept only and the form with trend and intercept are considered (Adu and Marbuah, 2011). Unit Root test results are presented in Table 4.2.

The results show that the probability value for the alternative hypothesis (stationarity/ no unit root) is significant for the considered variables at level and at first difference, with the exception of Ln_HDI. The ARDL model's applicability imposes that variable stationarity be achieved at an integration order of less than two I(2) (Adu and Marbuah, 2011). Based on the results depicted in Table 4.2 it follows that the Human Development Index (Ln_HDI) variable, with integration order 2, is not suitable for the ARDL analytical assessment and is consequently discarded from subsequent sections. The omission of HDI is also informed by a panel data study with findings that human capital development yields insignificant effect to unemployment (Tsaurai, 2020) and is therefore considered as presenting minimal risk of misspecification error.

Table 4.2 Stationarity Test Results

Variable	**Model**	**PP-Test**		**I(n)**
		Level (prob-value)	**1st Diff (prob-value)**	
LN_Unemployment	Intercept	-1.252 (0.636)	-7.388 (0.000)***	I(1)
	Trend & Intercept	-2.815 (0.204)	-7.228 (0.000)***	

LN_Tax	Intercept	-2.243 (0.197)	-3.728 (0.010)***	I(1)
	Trend & Intercept	-2.073 (0.537)	-3.846 (0.030)**	
LN_GDP Growth	Intercept	-1.324 (0.601)	-5.492 (0.000)***	I(1)
	Trend & Intercept	-2.034 (0.553)	-8.573 (0.000)***	
LN_Inflation	Intercept	-3.147 (0.035)**	-7.501 (0.000)***	I(0)
	Trend & Intercept	-3.275 (0.092)*	-7.334 (0.000)***	
LN_FDI	Intercept	-5.009 (0.000)***	-14.288 (0.000)***	I(0)
	Trend & Intercept	-5.209 (0.001)***	-13.825 (0.000)***	
LN_Deficit	Intercept	-1.837 (0.355)	-6.932 (0.000)***	I(1)
	Trend & Intercept	-2.158 (0.490)	-11.412 (0.000)***	
LN_Gov Expend	Intercept	-1.260 (0.633)	-4.567 (0.001)***	I(1)
	Trend & Intercept	-2.821 (0.202)	-4.669 (0.005)***	
LN_HDI	Intercept	-0.417 (0.893)	-1.308 (0.611)	I(2)
	Trend & Intercept	-1.907 (0.623)	-0.941 (0.935)	
Pop Growth	Intercept	-3.697 (0.010)**	-2.057 (0.263)	I(0)
	Trend & Intercept	-3.091 (0.128)	-1.100 (0.910)	

***, **, * refers to statistical signficance at 1%, 5% and 10% respectively, LN refers to natural logarithm

For variables at level, Table 4.2 shows stationarity attained for LN_Inflation, LN_FDI and Pop_Growth, with the Intercept form proving more significant than the Intercept-Trend form. Variables which include LN_Unemployment, LN_Tax, LN_GDP Growth, LN_Deficit and LN_Gov Expend, all attain stationarity at integration order of one. Thus, the overall result displays variables with mixed order of integration I(0) and I(1), which justifies application of the ARDL analytical method.

With the variable of HDI suspended from further analysis, equations 3.1a, 3.1b and 3.1c are updated into linear equations which form the subject of subsequent econometric modelling. LN_Unemployment is regressed on a fiscal policy variables and determinants of unemployment, which gives the following equations:

$$\ln Unemployment_t = \beta_0 + \beta_1 \ln Tax_t + \beta_2 \ln GDP_{growth} + \beta_3 \ln Inflation + \beta_4 \ln FDI + \beta_5 Pop_{growth} + \varepsilon_t \quad \text{[4.1a]}$$

$$\ln Unemployment_t = \beta_0 + \beta_1 \ln GovExpend_t + \beta_2 \ln GDP_{growth} + \beta_3 \ln Inflation + \beta_4 \ln FDI + \beta_5 Pop_{growth} + \varepsilon_t \quad \text{[4.1b]}$$

$$\ln Unemployment_t = \beta_0 + \beta_1 \ln Deficit_t + \beta_2 \ln GDP_{growth} + \beta_3 \ln Inflation + \beta_4 \ln FDI + \beta_5 Pop_{growth} + \varepsilon_t \quad \text{[4.1c]}$$

4.3 **Lag Length Selection**

Economic variables commonly respond to stimuli from independent variables with lapse in time, which is also referred to as a lag (Gujarati, 2003). When modelling

economic behaviour, an optimal lag length must be selected to avoid errors introduced by either over-estimation or under-estimation of lags. Optimal lag length selection is performed according to that which minimizes a given information criterion (Akaike, Schwarz, Hannan-Quinn and R^2). For the present study lag selection is carried out by using the Akaike Information Criterion (AIC), which is a strict model selection criteria (Gujarati, 2003).

The optimal lag length for the model corresponding to equation [4.1a] is 2, by lowest AIC, and the ARDL model obtained is ARDL(1, 2, 2, 0, 2, 2). For the model corresponding to equation [4.1b], the optimal lag is determined as 2 and ARDL(1, 1, 1, 0, 1, 0) as the obtained model. However, the model corresponding to equation [4.1c] achieves an optimal lag of 1 and the obtained ARDL model is ARDL(1, 1, 0, 1, 0, 1).

4.4 **Cointegration Testing**

Cointegration bounds testing is used to determine the presence of a long-run relationship between dependent and independent variables by comparing F-statistic values against critical values which correspond to the sample size and the number of regressors of the ARDL model (Narayan, 2005). Cointegration bounds testing is conducted on EViews 12 (EViews, 2017) and the results are presented in Table 4.3.

Table 4.3 Cointegration Bound Test Results

Test Statistic	Equation 4.1a Model		Equation 4.1b Model		Equation 4.1c Model	
	F-statistic	Sample Size	F-statistic	Sample Size	F-statistic	Sample Size
	4.176*	21	9.074***	23	11.95***	22
Significance	Critical Value Bounds		Critical Value Bounds		Critical Value Bounds	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
10%	2.485	3.636	2.466	3.605	2.475	3.621
5%	3.053	4.390	3.020	4.339	3.037	4.364
1%	4.489	6.229	4.408	6.123	4.448	6.176

Critical Values are estimated from Narayan (2004); 5 Regressors are applied in each model; ***, **, * denotes significance level at 1%, 5% and 10% respectively.

The Cointegration Bounds test corresponding to equation [4.1a], (with LN_Tax fiscal policy variable) gives an F-statistic value of 4.176. For the case of 5% significance, the F-statistic value occurs between, lower bound value (3.053) and upper bound value (4.390) and therefore prescribes the result as inconclusive. The null hypothesis of No-Cointegration cannot be conclusively rejected nor accepted at 5% significance level and consequently, the model is unable to indicate if a long-run relationship exists between the dependent variable (LN_Unemployment) and the explanatory variables.

However, when considering the 10% significance level, the F-statistic value (4.176) occurs above the I(1) upper bound value of 3.636, and therefore results in rejection of the null hypothesis of No Cointegration. This indicates weak evidence of a long-

run equilibrium relationship between LN_Unemployment and corresponding explanatory variables as depicted in equation 4.1a.

Table 4.3 shows F-statistic results corresponding to Equation 4.1b (9.074) and Equation 4.1c (11.95) as greater than the corresponding upper bound critical values at 5% and 1% significance levels, thus the null hypothesis of no cointegration is rejected. Conclusion is made that the results display a strong suggestion of a long-run equilibrium relationship, between LN_Unemployment and explanatory variables, corresponding to each model (Equations 4.1b and 4.1c).

4.5 **ARDL Long-Run and Short-Run Analysis**

The ARDL models, for equation 4.1a, equation 4.1b and equation 4.1c, were found to have cointegrated variables at 10%, 1% and 1% significance levels, respectively, thus allowing for determination of short-run and long-run elasticities. The Error Correction Model is employed in estimating the error correction term (ECM_{t-1}), which measures the rate of adjustment from the short-run to long-run equilibrium (Gujarati, 2003). The long-run and short-run coefficient results are reported in tables 4.4 and 4.5, respectively.

Table 4.4 Long-Run Unemployment Models

Panel 1 Model (Eqn. 4.1a)			**Panel 2 Model (Eqn. 4.1b)**			**Panel 3 (Eqn. 4.1c)**		
Variable	**Coeff**	**t-Stat**	**Variable**	**Coeff**	**t-Stat**	**Variable**	**Coeff**	**t-Stat**
LN_Tax	-20,941	-0,167	**LN_Gov Expend**	0,154	0,979	**LN_Deficit**	0,126	3,465***
LN_GDP Growth	-0,631	-0,203	**LN_GDP Growth**	-0,072	-3,531***	**LN_GDP Growth**	-0,026	-1,503
LN_Inflation	2,531	0,164	**LN_Inflation**	-0,052	-1,455	**LN_Inflation**	0,121	1,949*

LN_FDI	-3,253	-0,161	**LN_FDI**	0,059	2,071*	**LN_FDI**	-0,008	-0,351
Pop Growth	-6,356	-0,173	**Pop Growth**	-0,411	-6,287***	**Pop Growth**	-0,748	-6,714***
Constant	73,868	0,176	**Constant**	3,438	6,632***	**Constant**	4,007	37,38***

LN_Unemployment is dependent variable; t-Stat refers to t-Statistic value; Coeff refers to Variable Coefficient; Models are selected based on AIC; ***, **, * denotes significance level at 1%, 5% and 10% respectively;

Table 4.4, Panel 1, displays results in which explanatory variables (LN_Tax, LN_GDP Growth, LN_Inflation, LN_FDI, Pop_Growth), excluding LN_Inflation, have negative long-run elasticities and thus suggesting a negative effect on unemployment in the long-term. The negative coefficient corresponding to the control variable of interest, LN_Tax, suggests that increasing levels of tax collection, within a vital economy, has the effect of reducing unemployment. Panel 1 data indicates that each of the regressors have a t-Statistic value of less than 2 (in absolute value) and corresponding probabilities exceed the statistical significance threshold of 5%. This result confirms that the long-run coefficients determined for the specific ARDL model are statistically insignificant. However, in studying unemployment in South Africa, Mbekeni and Phiri (2020) attain contrary findings that income tax has a significant relationship with unemployment.

The second fiscal policy variable of interest, LN_Gov Expend, presented in Panel 2, is reflected with a positive coefficient which implies that government expenditure has a positive effect on unemployment for the long-run case. This relationship is inconsistent with previous findings of a negative relationship by Leshoro (2017) and Pamba (2022) who study government expenditure and fiscal policy efficacy respectively, whilst Alrayes and Wadi (2018) also find a significant negative relationship in Bahrain. The variable LN_Gov Expend also has a statistically

insignificant t-statistic value (0.979), which characterizes the variable's effect on unemployment as insignificant for the long-run basis.

LN_Deficit, as presented in Panel 3, is the third fiscal policy variable of interest. The variable's long-run elasticity is determined as positive (+0.126), suggestive of a positive relationship in which an increase in fiscal deficit has the effect of raising unemployment levels for long-run consideration. Whilst proving inconsistent with Keynesian theory, the positive relationship is compatible with findings made by Marire (2022) and Pamba (2022). Panel 3 shows LN_Deficit with a t-statistic value of 3.465 at 1% significance level, which confirms statistical significance of the positive long-run relationship shared with unemployment. Accordingly, a 1% rise in fiscal deficit would have the effect of increasing unemployment levels by 0.126% for the long-run case.

Explanatory variables, which include LN_GDP Growth, LN_Inflation, LN_FDI and Pop_Growth are presented with varied results in Panel 2 and Panel 3. The variable LN_GDP Growth has a consistent negative relationship with unemployment across all panel results, which confirms that rising GDP growth has a decreasing effect on unemployment for long-run consideration. This relationship is consistent with widely accepted economic theory (Parkin et al., 2020) and is supported by findings made by Bhorat (2008) and Tsaurai (2020). Panel 2 presents a statistically significant LN_GDP Growth variable with an inelastic coefficient (-0.072), suggestive of a low sensitivity by unemployment rate towards an increase in economic growth for long-run cases.

LN_Inflation is reported on Panel 3, with 10% significance level and an inelastic coefficient value of +0.121. The positive elasticity indicates that raising inflation by

one percent yields an effect of increase in unemployment levels by 0.121%, for long-run consideration. However, Leshoro (2017) states that inflation can either assume a positive or negative effect on unemployment due to threshold effects. Other studies present varied findings, with a positive effect on unemployment as the most prominent (Tsaurai, 2020).

LN_FDI, at a significance level of 10%, is presented in Panel 2 with a positive inelastic coefficient (0.059), which suggests that 1% rise in FDI has the effect of increasing unemployment by 0.059%, for the long-run. The positive relationship is compatible with empirical research findings from Africa (Tsaurai, 2020).

Population growth is reported within Panel 2 and Panel 3 with a negative elasticity coefficient, at 1% significance level. This strongly suggests of a significant negative relationship between population growth and unemployment for the long-run context. However, contrary to the results, Tsaurai (2020) finds a positive relationship between population growth and unemployment in Africa.

Table 4.5 Short Run and Error Correction Results

Panel 1: ARDL (1, 2, 2, 0, 2, 2) - (Eqn. 4.1a)		
Variable	**Coefficient**	**t-Statistic**
ΔLN_TAX	-0,356	-2,088*
ΔLN_TAX(-1)	-0,357	-2,124*
ΔLN_GDP_GROWTH	-0,077	-9,160***
ΔLN_GDP_GROWTH(-1)	-0,019	-2,168*
ΔLN_FDI	-0,022	-3,597**
ΔLN_FDI(-1)	0,055	8,173***
ΔPOP_GROWTH	-4,171	-10,353***

ΔPOP_GROWTH(-1)	3,355	8,989***
ECTt-1	-0,043	-7,646***
Panel 2: ARDL (1, 1, 1, 0, 1, 0) - (Eqn. 4.1b)		
Variable	**Coefficient**	**t-Statistic**
ΔLN_Gov Expend	-0,821	-4,530***
ΔLN_GDP_Growth	-0,064	-5,587***
ΔLN_FDI	0,015	2,221**
ECTt-1	-0,908	-9,635***
Panel 3: ARDL (1, 1, 0, 1, 0, 1) - (Eqn 4.1c)		
Variable	**Coefficient**	**t-Statistic**
ΔLN_Deficit	0,024	1,070
ΔLN_Inflation	0,121	5,378***
ΔPop_Growth	-0,696	-6,401***
ECTt-1	-1,019	-11,202***

Table 4.4 Note: LN_Unemployment is dependent variable; ***, **, * denotes significance level at 1%, 5% and 10% respectively; Models are selected based on AIC

Table 4.5 Panel 1 displays short-run coefficients for ARDL model corresponding to equation 4.1a. The R squared and adjusted R squared values for the model were determined as 96% and 93% respectively, which demonstrates a good model fit. The fiscal policy variable of interest, LN_Tax, has t-statistic values greater than 2 (in absolute value) at 10% significance level and thus indicates weak statistical significance. However, for two lag cases, LN_Tax is reflected with a negative coefficient, which is congruent with the study's expectations and subsequently implies a negative relationship between Tax variable and Unemployment for the short-run case. The LN_Tax coefficient magnitude (-0.35) reflects an inelastic

negative relationship, such that for every 1% increase in Tax collection will result in a decrease of Unemployment levels by 0.35% for the short-run context.

The 1 lag Error correction term (ECT_{t-1}) reflected in Panel 1 with a coefficient value of (-0.043) and a corresponding t-statistic value of -7.6, at 1% significant level, renders the correction term coefficient as statistically significant. Furthermore, the Error correction term's negative characteristic (-0.043), whilst also occurring between 0 and -1, confirms its validity of effecting disequilibrium correction at the rate of 4.2% correction annually, from the short-run to long-run equilibrium. The low error correction rate of 4.3% implies that disequilibrium correction would continue for a long period of years to achieve long-run equilibrium and that continuous control variable stimulus is required to effect desired long-run conditions.

Panel 2 shows the second variable of interest, LN_Gov Expend with a t-statistic value of (-4.53) and a corresponding significance level of 1%, which suggests that the variable results are statistically significant. LN_Gov Expend has a negative short-run coefficient (-0.821), consequently a negative relationship with unemployment. This result is supported by Keynesian economic theory (Parkin et al., 2020), whilst also consistent with findings by Fatás and Mihov (2001), Leshoro (2017) and Pamba (2022). Moreover, the results assert that 1% expansion in government expenditure will lead to a 0.82% decrease in the unemployment rate.

The Error correction term presented in Panel 2 shows a negative coefficient value (-0.908), with a t-statistic value of (-9.635), at 1% significant level, which confirms statistical significance and validity of disequilibrium correction at the rate of 90.8% annually, from the short-run to long-run equilibrium.

The third fiscal policy variable of interest, LN_Deficit, is displayed in Panel 3 with an inelastic coefficient of 0.024 is found to be statistically insignificant for the short-run case. However, there is consistency in the positive relationship that fiscal deficit

has with unemployment reflected for both long-run and short-run results, and this finding is supported by Pamba (2022), whilst Marire (2022) finds a negative effect on unemployment for the short-run.

The Error correction term (ECT_{t-1}), applicable to LN_Deficit in Panel 3 has a coefficient value of (-1.019) and a t-statistic value of -11.2 at 1% significant level is considered stable and statistically significant. However, the ECT coefficient attaining a value less than -1 (outside of 0 to -1 ideal range) does not raise concern over cointegration validity, but rather suggests that the error adjustment from short-run to long-run occurs via a process of diminishing oscillation about the long-run equilibrium until convergence is achieved (Narayan and Smyth, 2006).

Short-run GDP Growth results, reported in Table 4.5, demonstrate negative elasticity values proving consistent with determined long-run GDP Growth elasticities. This strongly indicates that the finding of a negative relationship with unemployment is significant. The short-run GDP Growth coefficient results are determined at a significance level of 1%, which proves that the variable results are statistically significant.

The lagged LN_FDI variable is depicted in Panel 1, with a t-statistic of 8.17 (1% significance level) and 0.055 as the coefficient, whilst Panel 2 shows a LN_FDI t-statistic value of 2.22 (5% significance level) and 0.015 as the coefficient. In both these cases the variable proves statistically significant and is shown to have a positive yet inelastic relationship with LN_Unemployment for the short-run case.

Pop_Growth variable is shown in Panel 1 and Panel 3, with t-statistic values of (-10.35) and (-6.4) respectively, at 1% significant level. The corresponding coefficient values are negative, which accordingly implies that Population growth has a decreasing (negative) effect on unemployment within the short-run context. Tsaurai (2020) finds contrary results, which present the relationship between population growth and unemployment as positive.

Short-run LN_Inflation results, displayed in Panel 3, reflect a t-statistic value of 5.378 at 1% significance level, thus confirming statistical significance. The corresponding elasticity value is (+0.121), which implies that inflation growth has a harmful (positive) effect on unemployment. A positive relationship between Inflation and unemployment is compatible and corroborated by several empirical studies (Tsaurai, 2020).

4.6 **Diagnostic Checks**

The following section presents Diagnostic Checks on the Unemployment Model, with an objective of ascertaining satisfactory residual characteristics and thus validating that the estimated model is a best fit. In this regard the study employs the following tests (Gujarati, 2003):

- Normality testing, conducted according to Jarque-Bera Test, is used to determine that the residuals are normally distributed. The test considers distribution skewness and kurtosis and has a null hypothesis condition that residuals are normally distributed.
- Serial correlation testing of residuals via Lagrange Multiplier (LM) test, seeks to identify the presence correlation between error-terms which introduce specification errors. The null hypothesis states that there is no presence of serial correlation.
- Residual heteroskedasticity testing, according to Breusch-Pagan-Godfrey test, detects if the variability of the regression error-term is non-constant. The null hypothesis confirms the condition of no heteroskedasticity.

- Testing for structural stability of the model is carried out by Recursive Least Squares, CUSUM Test.

The diagnostic checks results are presented in Table 4.6 and Figures 4.1, 4.2 and 4.3

Table 4.6 Diagnostic Check Results

Panel 1 - (Model related to Eqn. 4.1a)			
Diagnostic Test	**Null Hypothesis**	**T-Statistic/ F-Statistic**	**P-Value**
Jarque-Bera (Normality)	Normally Distributed Residuals	0.070	0.965
Breusch-Godfrey LM Test, F(2,4)	No Serial Correlation	1.384	0.349
Breusch-Pagan-Godfrey, F(14,6)	Homoskedasticity	0.837	0.636
Panel 2 - (Model related to Eqn. 4.1b)			
Diagnostic Test	**Null Hypothesis**	**T-Statistic/ F-Statistic**	**P-Value**
Jarque-Bera (Normality)	Normally Distributed Residuals	0.809	0.667
Breusch-Godfrey LM Test, F(2,11)	No Serial Correlation	0.049	0.952
Breusch-Pagan-Godfrey, F(9,13)	Homoskedasticity	0.523	0.834
Panel 3 - (Model related to Eqn. 4.1c)			

Diagnostic Test	Null Hypothesis	T-Statistic/ F-Statistic	P-Value
Jarque-Bera (Normality)	Normally Distributed Residuals	1.575	0.455
Breusch-Godfrey LM Test, F(1,11)	No Serial Correlation	0.250	0.627
Breusch-Pagan-Godfrey, F(9,12)	Homoskedasticity	0.705	0.695

If Probability (P-Value) is less than 5% ($P < 0.05$), then reject null hypothesis, otherwise cannot reject hypothesis

Analysis of the error-term distribution, via the Jarque-Bera test, yields a P-value much greater than 0.05 (5%) for all three ARDL models and consequently the null hypothesis is not rejected but retained. Therefore, it is concluded that the model residuals are normally distributed.

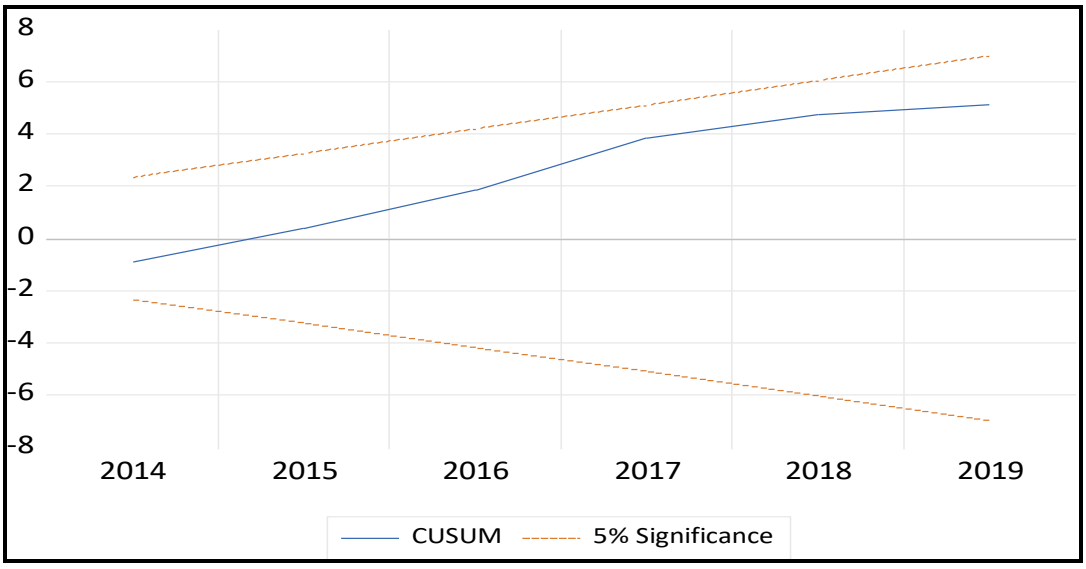
The Breusch-Godfrey LM test results, reported in Panel 1, 2 and 3, indicate F-statistic P-values greater than 0.05 (5%). This condition implies that the null hypothesis of no-serial correlation cannot be rejected, but alternatively, the conclusion is made that the ARDL models' error terms are not serially correlated.

Breusch-Pagan-Godfrey testing for residual heteroskedasticity produces results that reflect F-statistic-probability values that are higher than the significance threshold of 0.05 (5%). The null hypothesis of homoskedasticity is not rejected but retained and thus conclusion is reached that the ARDL model residuals do not exhibit heteroskedasticity but are homoscedastic.

Structural stability testing by Recursive Least Squares, CUSUM test is performed on the three ARDL models (related to equations 4.1a, 4.1b and 4.1c) and the results are presented in Figures 4.1, 4.2 and 4.3, respectively. The plots show that the CUSUM statistics occur within the 5% significance boundary which consequently indicates that the model parameters are stable.

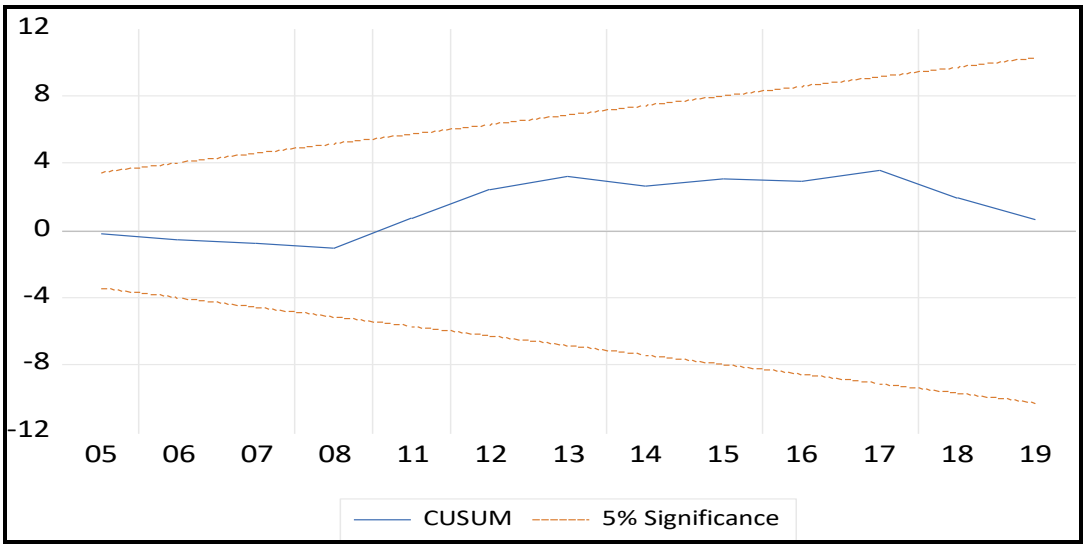
The results presented in Table 4.6 and Figures 4.1, 4.2 and 4.3, demonstrate that the subject ARDL models adequately pass the highlighted diagnostic tests, thus proving their suitability. Moreover, the results are suggestive of proper model construction that is free of bias and that the research findings can be regarded as reliable.

Figure 4.1 Stability Test - Plot of Cumulative Sum of Recursive Residuals (Related to Eqn. 4.1a)



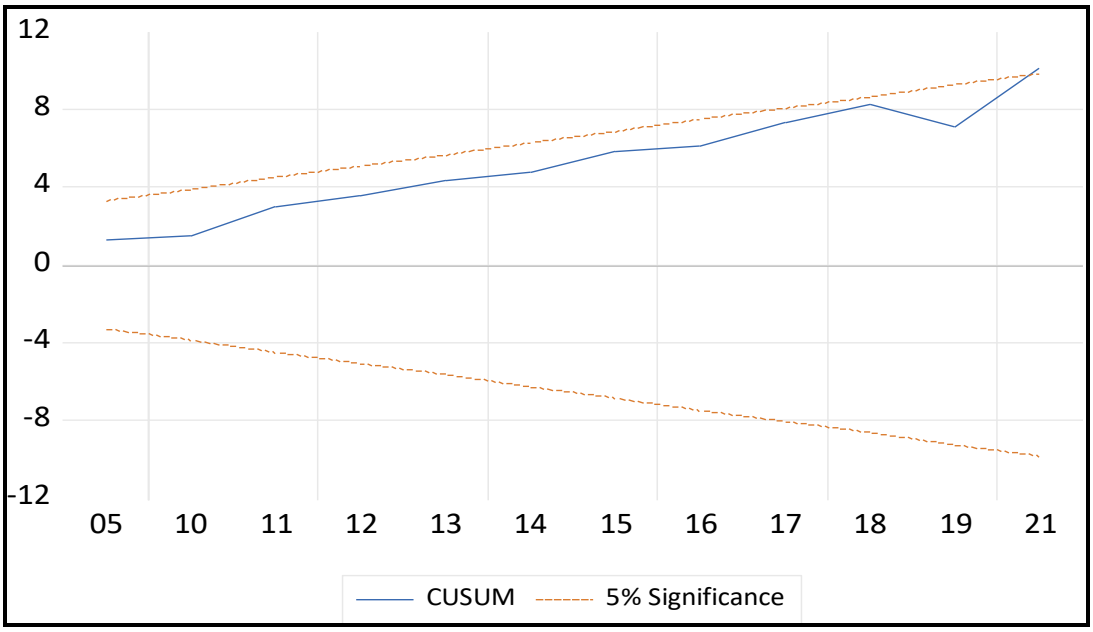
Source: EViews 12 Computation by Author

Figure 4.2 Stability Test - Plot of Cumulative Sum of Recursive Residuals (Related to Eqn. 4.1b)



Source: EViews 12 Computation by Author

Figure 4.3 Stability Test - Plot of Cumulative Sum of Recursive Residuals (Related to Eqn. 4.1c)



Source: EViews 12 Computation by Author

5. Conclusion and Policy Recommendations

5.1 Summary and Conclusion

This study's objective was to investigate fiscal policy's effect on unemployment, with particular focus on government expenditure, taxation and budget deficit over the democratic period in South Africa. Whilst there have been previous studies on unemployment in different countries reaching varied outcomes, the present study proves significant in its attempt to interrogate fiscal policy's effect on unemployment over the period of democratic South Africa, whilst also contributing towards improving understanding and to expanding on existing literature on the subject.

Over this period, South African economic trends reveal that fiscal policy has been characterized by disproportionately high government expenditure whilst tax collection has remained relatively stagnant and inadequate, thus leading to persistent fiscal deficit. The ANC government has adopted an expansionary fiscal policy position in support of policy framework plans which include the RDP, GEAR, ASGISA, NGP and NDP with the aim of stimulating economic growth and alleviating unemployment. However, unemployment trends clearly depict stubbornly high and a worsening unemployment situation, marked by an annual unemployment rate average of 25,5% over the democratic era. The reviewed literature find varied effect of fiscal policy on economic growth and unemployment, but mostly congruent with the Keynesian theory.

This study is based on annual data stretching over 28 years and the Autoregressive Distributed Lag (ARDL) technique is employed for econometric modelling as

outlined within the methodology section. The resultant specification yields 3 separate unemployment estimate models, each with five regressors, in which one of the regressors is a fiscal policy variable (LN_Tax or LN_Gov Expend or LN_Deficit).

The Cointegration bound test results show that a long-run relationship does exists between the dependent variable (LN_Unemployment) and explanatory variables. The ARDL model with LN_Tax as one of the control variables, confirms cointegration at a 10% statistical significance level, but inconclusive for 5% and 1% significance levels. The models with LN_Gov Expend and LN_Deficit each achieve cointegration at 1% significance level.

The long-run and short-run analysis determines a negative elasticity for LN_Tax as an explanatory variable, thus confirming a negative effect on unemployment (dependent variable) for the short-run and long-run cases. It can be concluded that a rise in levels of tax collection, is negatively correlated with unemployment. A plausible rationale for the negative effect is that tax revenue collection follows the pattern of business cycles. When economic performance improves, businesses are able to invest, hire more employees, declare more profit more and consequently tax revenue collected improves, whilst levels of unemployment decrease. The negative relationship found between tax and unemployment proves consistent with conclusions from the study on fiscal policy and South African economic growth by Ocran (2009). Despite the negative relationship between tax and unemployment, there exists an invariable optimal amount of tax revenue that can be collected over a given period without suppressing economic growth and job-creation. Therefore, the government should proceed with appropriate examination and stakeholder consultation towards finding the optimal balance in tax policy.

LN_Gov Expend achieves a positive variable coefficient (0.154), yet statistically insignificant for the long-run case. The result of a positive relationship between government expenditure and unemployment is contrary to findings by Pamba (2022) and Alrayes & Wadi (2018) and possibly indicates an inconclusive outcome due to the non-singular effect on unemployment by the different components of aggregated expenditure. A possible explanation is that the government's expenditure has been disproportionately focused on consumption and short-term investments, with a small share being allocated to long-term investment spending. Yet it is spending on infrastructure and long-term productive assets that assists in sustaining prolonged economic growth and job-creation in the long-run. This is supported by the findings of Fedderke et al (2006).

For the short-run case LN_Gov Expend attains a statistically significant negative short-run coefficient (-0,821), thus confirming the study's expectation of a negative relationship with unemployment. The achievement of a short-run coefficient value of (-0,821),by LN_Gov Expend obtains the largest elasticity value in comparison to Fiscal policy variables, LN_Tax (-0,35) and LN_Deficit (0,024), thus implying that it is the most efficient and effective, from the three fiscal policy variables of interest, at effecting change to unemployment within the short-run consideration. This indicates that government has been carrying out appropriate expenditure over the concerned period in order to stimulate the economy and alleviate unemployment in the short-run.

LN_Deficit, is found to have a positive effect on unemployment for both long-run and short-run consideration, even though statistically insignificant for the short-run case. This finding shows that the persistent fiscal deficits experienced over the democratic era have failed to stimulate appreciable and sustained job-creation, but instead deficits have had a worsening effect on the levels of unemployment. One of the major factors contributing to the ineffectiveness of deficits at alleviating

unemployment, is the temporary nature of interventions delivered by government, such as public works programs implemented during periods of economic difficulty and low GDP growth (Leibbrandt et al., 2010; Marire, 2022).

The study results consistently show that GDP growth has a negative effect on unemployment for both long-run and short-run cases – and this is corroborated by long-standing economic theory. Therefore, in order to effectively address the challenge of unemployment the government must implement policies and necessary measures that create an enabling environment to stimulate and drive optimal economic growth consistently.

FDI is found to have a positive relationship with unemployment for both short-run and long-run consideration. This is consistent with findings by Du Plessis and Smit (2007) that FDI stifles local investment, whilst evidence derived from Africa leads Tsaurai (2020) to assert that FDI does increase unemployment. This finding is rooted in the observation that FDI, along with opening of the economy to foreign trade, allow for an influx of foreign goods which undermine local businesses that are unable to compete thus leading to staff retrenchments or business failure in the long-term. In this regard, policy makers are advised to establish prescripts that ensure FDI serves towards stimulating job-creating growth.

The effect of inflation on unemployment is positive. However, the inflation dynamics over the concerned period have been relatively subdued due to continuous monitoring and inflation-targeting interventions employed by the South African Reserve Bank for the purpose of maintaining price-level stability. The long-run and short-run regression model results show that one percent rise in inflation produces an increase in unemployment by 0,121%, for short-run and long-run cases, which is relatively low sensitivity. On this basis it is concluded that inflation has not significantly contributed to the rise in unemployment levels.

Population growth achieves negative elasticities in its short-run and long-run relationship with unemployment. This is contrary to the study’s expectation and to

earlier research work by Tsaurai (2020). Given that unemployment is a consequence of a fast expansion of human population, resulting in over-supply of labour due to inadequate employment opportunities, the population growth results are found to be an inaccurate reflection of reality. Whilst fertility rates have declined significantly since 1994, South Africa's population growth continues at a gradual pace (Biney et al., 2020). In order to realise desired reduction in population growth, the government is advised to intensify promotion and access of education and economic opportunities targeted at females, whilst also expanding family planning educational programs targeted at age-appropriate males and females.

Notwithstanding the several economic policies and programs that have been published and implemented since 1994, it can be concluded that the government's fiscal policies have proven to be ineffective at addressing the unemployment crisis in South Africa. Consequently, the present policy program under implementation, the National Development Plan, must be subjected to continuous monitoring, evaluation and continuous improvement together with timely implementation by a fully supported body of experts.

5.2 **Policy Recommendation**

Tax

Based on the established negative effect that tax has on unemployment, the government is advised to pursue interventions that optimize the efficacy of tax policy with the effect of lowering unemployment. An example of such is that the government consider offering targeted tax breaks and incentives for businesses within the manufacturing sector due to its high job-creation potential in the economy. The current South African corporate tax of 27% (OECD, 2022) should also be reviewed with the aim of lowering it to competitive levels when compared amongst

OECD countries. Moreover, the government should consider looking outside South Africa's borders for the purpose of absorbing South African labour and thus utilise taxation as a policy instrument to improve the appeal of working outside the country. As the country improves at becoming an exporter of South African expatriate workers, the effect would be a lowering of pressure on the local economy to absorb the supply of labour.

Government Expenditure

The short-run model results conclude that for every 1% increment in government expenditure yields a 0,82% decrease in unemployment, which indicates a high degree of efficiency by government expenditure as a fiscal policy instrument that creates job opportunities and reduces unemployment in the short-run. The government should therefore focus on spending on productive expenditure and programs that yield long-term dividends in order to sustain economic performance, steady growth of job opportunities and reduction of unemployment for the long-run. Major government expenditure items, which include the public wage-bill and transfer-subsidies among others, need to undergo rigorous value-engineering and waste-elimination analysis in order to optimize and ensure appropriate expenditure that delivers maximum benefit commensurate to the expenditure.

Deficit

The study outcomes suggest that budget deficits have a deleterious effect on the economy, based on the finding of a positive effect on unemployment. Without effort made towards curtailing spending or expanding revenue, further deficits have consequence of adding pressure to the high debt burden and constrained fiscal flexibility, currently experienced by South Africa. Therefore, government should act prudently to pursue the path of fiscal consolidation, by eliminating wasteful expenditure, cutting and deferring low-priority spending to avoid fiscal slippage. This fiscal consolidation policy, based on reduced spending, is endorsed by the International Monetary Fund (Alesina et al., 2018). From their extensive study on

debt reduction, Alesina et al. (2018) conclude that fiscal consolidation based on decrease in expenditure (spending cuts) is less damaging and with negligible effect on economic growth, in comparison to plans based on increasing taxes.

However, in the event that borrowing is required for productive expenditure (i.e. development of critical infrastructure) or regarded necessary to address a special case (i.e. needs arising from the COVID-19 pandemic), government is encouraged to use fiscal deficits responsibly. In this regard, Marire's (2022) study, on the effect of deficits on unemployment, asserts that fiscal deficits, when kept to a narrow proportion of GDP, can prove effective at managing unemployment. In addition, the use of fiscal deficits must adhere to strict governance and control measures to ensure that funds are managed appropriately, free from corruption – importantly that the magnitude of borrowing is suitably reflected on desired outcomes and intended purpose.

5.3 **Further Research**

The study's use of data, which extends from 1994 to 2021, imposed a limitation of working with annual data, thus constraining the sample observations that were available. Future research should expand the available data pool and ensure a large sample size by considering data based on monthly or quarterly periods.

Given that the Human Development Index (HDI) was discarded from the independent variables, it is suggested that future unemployment models should incorporate an explanatory variable that reflects human development capacity of the country's population, in terms of professional development and educational achievement. This is justified based on the work of previous researchers who have found that skill level and education level are significant determinants of unemployment (Bhorat, 2008; Banerjee et al., 2008; Yu and Roos, 2018; Tsaurai, 2020).

An extension of this study should also evaluate the Granger causality between fiscal policy variables and unemployment, for the purpose of identifying variables that are useful at predicting unemployment.

This research relied on aggregate measures such as tax revenue and government expenditure. This condition prevents examination of individual subcomponents and their corresponding influence on unemployment. It is therefore advised that future studies be carried-out with disaggregated tax revenue and government expenditure variables. Aggregate unemployment rate as a dependent variable should also be decomposed and concerning components, such as youth unemployment or unemployment rate amongst African women, studied with corresponding determinants.

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