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-RESEARCH ARTICLE-

THE IMPACT OF FISCAL POLICY ON ECONOMIC GROWTH AND DEVELOPMENT IN SOUTH AFRICA

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─Abstract─

The democratic government of South Africa has implemented a variety of fiscal policies aimed at promoting economic growth. However, numerous scholars argue that the country's growth over the past few decades remains unconvincing. Empirical studies highlight that poverty levels remain alarmingly high across the majority of the country's provinces. To further explore this issue, this research investigates the relationship between fiscal policy, economic growth, and development in South Africa from 1970 to 2021. The autoregressive distributed lag (ARDL) model is employed due to its capacity to handle two orders of integration (at level and first difference). The findings indicate that fiscal policy has a significant impact on both economic growth and development in South Africa. Long-term growth is supported by public sector investment and tax revenue, whereas government consumption expenditure and budget deficits hinder economic progress. Economic development, as measured by the human development index, is positively influenced by public sector investment in infrastructure and education, highlighting their crucial role in fostering human capital. However, inefficient public expenditure adversely affects both growth and

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development. These results suggest that effective fiscal policy, through strategic public sector investment and increased tax revenue, can foster long-term growth and development in South Africa by enhancing infrastructure and human capital. In contrast, excessive government consumption and budget deficits restrict sustainable growth by displacing private sector investment.

Keywords: Fiscal Policy; Economic Growth; Development; South Africa

Classification code: O1, O4, O23

INTRODUCTION

Keynes (1937) argues that aggregate demand is the principal driver of economic growth, irrespective of whether it arises from expansionary or contractionary fiscal policies. Horton (2023) note that the objectives of fiscal policy, along with their relative significance, depend on the specific circumstances faced by a country. International Monetary Fund (IMF) (2023) asserts that governments implement fiscal policies to maintain macroeconomic stability, either by stimulating growth through expansionary measures or controlling inflation with contractionary approaches in the short term. However, in the long run, fiscal policy aims to foster sustainable development by reducing poverty, improving human capital through advanced skills programmes, and raising living standards (International Monetary Fund (IMF), 2023). The United Nations (2023) defines sustainable development as progress that meets present needs without compromising the ability of future generations to meet their own.

In South Africa, the National Treasury oversees the country's economic policy and public finances, focusing on sustainable growth, employment creation, and equitable income distribution through its fiscal framework (Ibadoghlu, 2021). It pursues gradual fiscal consolidation, prioritises capital investment, and seeks to stabilise the public debt-to-GDP ratio to stimulate strong economic growth (National Treasury of South Africa, 2016). To ensure macroeconomic stability, policymakers combine fiscal measures with monetary policy, the latter being managed by the (South African Reserve Bank, 2021) which adjusts the repo rate to influence borrowing costs across the economy (Chugunov et al., 2021). Fiscal policy, encompassing government expenditure, taxation, and borrowing, aims to reduce the budget deficit and maintain a stable debt-to-GDP ratio (Chugunov et al., 2021). However, Zungu et al. (2022) highlight that despite rising public debt, South Africa's growth has remained stagnant since the recession triggered by the 2008 global financial crisis.

The International Labour Organization (ILO) categorises South Africa as a prosperous middle-income country, ranking it as the second-largest economy in southern Africa (Weißschnur, 2021). Like many developing nations, South Africa adopted a Keynesian

economic model at the outset of its democratic transition (Zungu et al., 2022). Following the end of apartheid in 1994, the Reconstruction and Development Programme (RDP) was introduced as a key socio-economic policy to address historical inequalities and promote an inclusive democratic society. In parallel, the Growth, Employment, and Redistribution (GEAR) strategy was launched to focus on fiscal objectives such as reducing the budget deficit and controlling inflation, aiming for a 6% growth rate by the year 2000 (Khamfula & Tesfayohannes, 2004). Further initiatives, including the Skills Development Act (1998) and the Broad-Based Black Economic Empowerment Act (2003), were implemented to combat persistent unemployment and improve income distribution, with the goal of stimulating economic growth. Nevertheless, (Zungu et al., 2022) report an average growth rate of just 2.5% between 2000Q1 and 2020Q2, indicating underperformance relative to the GEAR target. Meanwhile, government expenditure as a percentage of GDP rose from 20% in 2006 to 29.91% in 2016, reaching 35.98% by 2020 (Tendengu et al., 2022), reflecting an expansion of fiscal efforts amid economic challenges.

According to Statistics South Africa (StatsSA) (2022), key sectors driving the supply side of the economy include agriculture, finance, transportation, and industry, while exports and government consumption largely shape demand. (Akanbi, 2013) observes that government consumption, which constitutes nearly 25% of South Africa's aggregate demand, is predominantly (95%) financed by tax revenue, underscoring the importance of examining fiscal policy's role in promoting growth and development. Iwegbunam and Robinson (2019), in their analysis of data from 1970Q1 to 2016Q1 within the frameworks of South Africa's New Growth Path and (Solow, 1956) neoclassical growth model, found that excessive government spending may weaken the positive impact of foreign direct investment (FDI) on economic performance. Similarly, Zungu et al. (2022), using a Bayesian vector autoregressive (BVAR) model, argue that gross fixed capital formation fosters growth, cautioning against an overreliance on government consumption and public debt at the expense of investment-oriented expenditure. Tendengu et al. (2022) further assert that public investment and tax revenue support long-term growth, unlike consumption spending, and advocate for investments in infrastructure and technology to strengthen human capital.

This study builds on previous empirical research to assess the role of fiscal policy in driving South Africa's economic growth, as measured by real GDP. Consistent with the findings of Tendengu et al. (2022), Zungu et al. (2022), and Iwegbunam and Robinson (2019), it explores the argument that public infrastructure investment is crucial for long-term human capital development and technological progress. A distinctive feature of this study is the inclusion of the Human Development Index (HDI) as a second dependent variable, enabling an evaluation of how human capital formation through fiscal policy instruments can support sustainable economic development—an aspect not addressed in previous studies. Human capital highlights the significance of health and

education in enhancing economic productivity, while HDI provides a comprehensive measure of well-being (Danquah & Amankwah-Amoah, 2017). As Appleton points out, traditional methods of measuring aggregate income often fail to fully capture the multifaceted nature of human well-being, focusing more on government expenditure than on the actual benefits to the population's welfare.

This study explores the impact of fiscal policy instruments on the growth and development of the South African economy, with a particular emphasis on the role of human capital, especially through education, in enhancing welfare by promoting technological adoption and increasing income levels driven by production. The research has two main objectives. First, it examines how fiscal policy influences South Africa's economic growth, focusing on the roles of government expenditure, public investment, and tax revenue in stimulating aggregate demand. Second, contingent upon the effectiveness of these fiscal measures, the study assesses the extent to which human capital development can drive economic progress, thereby improving well-being and living standards. Building on the work of Tendengu et al. (2022), this study underscores the importance of boosting gross capital formation for South Africa's economic growth. It proposes a shift in government spending from public expenditure (e.g., social grants, healthcare) towards public investments in education, infrastructure, and technology to enhance human capital, employment, and economic growth. Using the ARDL model, the study investigates both the long-term and short-term effects of fiscal policy on economic growth and development, providing detailed insights into the specific impacts of each fiscal tool. The structure of this study consists of five main sections. After the introduction, a review of relevant literature is presented, followed by an outline of the research methodology. The empirical results are then discussed, concluding with policy recommendations and a reflection on the study's limitations.

LITERATURE REVIEW

This section aims to discuss the theoretical and empirical literature reviewed for this research. It outlines the theoretical framework, incorporating the Keynesian economic theory and the endogenous growth model.

Theoretical Literature

This section explores the theoretical foundations of the two models presented in this paper. The first model investigates the impact of fiscal policy on economic growth, drawing upon Keynesian economic theory, while the second model evaluates the effects of fiscal policy on economic development, utilising the endogenous growth theory. The theoretical framework for this research is rooted in the Keynesian school of thought. Keynes (1937) proposed that variations in government spending and taxation can significantly influence overall output, thereby having a profound effect on economic

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activity. This theory advocates for expansionary fiscal policies during periods of high unemployment and sluggish economic growth. This study examines the link between fiscal policy and economic development through the lens of endogenous growth theory. It asserts that growth stems not only from traditional production factors but also from technological advancements, with internal factors like human capital investment and innovation driving progress. Advocates argue that long-term productivity gains are supported by government and business contributions to R&D, technological progress, and knowledge accumulation (Romer, 1986).

Empirical Literature

This section examines empirical research informed by Keynes (1937) theory of development. Barro (1990) investigated the influence of fiscal policy on economic growth through a panel analysis of 47 nations, uncovering a positive correlation between these factors. Conversely, Engen and Skinner (1992) observed a negative association in their examination of 107 countries. Makhoba et al. (2019) explored the long-term and short-term impacts of fiscal policy on growth in South Africa, employing the Johansen Vector Error Correction Model (VECM). Their findings highlighted a significant positive link between tax revenue, gross fixed capital formation (GFCF), and economic growth. Similarly, Kofi Ocran (2011) demonstrated that tax revenue, GFCF, and public expenditure positively influence economic growth. In contrast, Van Zyl and Bonga-Bonga (2008) concluded that government expenditure, particularly in education, does not contribute to economic growth in South Africa. Nuru and Gereziher (2022) utilised the Nonlinear Autoregressive Distributed Lag (NARDL) model to assess the asymmetric effects of fiscal policy on South Africa's economic growth from the second quarter of 2004 to the first quarter of 2018. By employing government spending (divided into consumption and investment) as the primary variable and real GDP as the growth indicator, their results revealed a significant positive relationship between government expenditure and growth, indicating a crowding-in effect on private investment. This finding aligns with Iwegbunam and Robinson (2019), who contend that excessive government spending may elevate interest rates, thereby diminishing private and foreign direct investment and ultimately hindering economic growth.

To understand the role of human capital in economic development, it is important to explore its links with physical capital, national income, and growth, grounded in the endogenous growth model (Romer, 1986). Danquah and Amankwah-Amoah (2017) note that much of the research on human capital and innovation's impact on development has focused on high-income countries, making it uncertain whether these findings apply to developing nations like South Africa. Their panel study, using the Malmquist productivity index approach, investigates human capital's role in technology adoption across 45 Sub-Saharan African countries, revealing that skilled labour positively impacts technological adoption, though it has limited effect on innovation.

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Similarly, Ricciardelli et al. (2017) highlight human capital as a key driver of sustainable growth and welfare.

Abdullah et al. (2019) examined the impact of fiscal policy on economic growth in ASEAN-5 from 1970 to 2016, driven by economic vulnerabilities and a small fiscal multiplier. Using the ARDL model, they found that government expenditure significantly influences economic growth across ASEAN-5, except Indonesia. Fiscal instruments, such as tax and non-tax revenue, showed varying effects, impacting policy recommendations for sustainable growth. Pasichnyi (2020) expanded on fiscal policy's effects on economic development, employing dialectical, systemic, and structural methods. The study analysed fiscal policy instruments, considering the impact of budget deficits on OECD countries' GDP growth from 1981 to 2017. It found that tax regulation affects labour and capital markets, driving migration and influencing investment, consumer demand, and GDP growth. The study emphasized the need for productive expenditures, such as those on education and healthcare, to stimulate economic growth and for systematic fiscal consolidation to counteract rising budget deficits that hinder growth.

Kim et al. (2021) investigated the Chinese fiscal system and its effects on economic growth, finding that local expenditure growth had a greater impact on output than central expenditure. Liquidity constraints limited responses to tax changes, with public investment in manufacturing historically driving output growth, while recent growth has stemmed from R&D investment. Long-term debt was also found to significantly affect government revenues within China's fiscal framework. In contrast, Chugunov et al. (2021) sought to refine the coordination of fiscal and monetary policies for sustainable economic growth. Their model, examining the fiscal-monetary mix in 19 emerging economies from 1995 to 2018, showed that general government expenditures had no positive impact on GDP growth. They advocated for increasing productive expenditures and combining inflation-targeting monetary policies with adaptive tools.

Finally, Aisyah et al. (2024) explored the impact of fiscal policy on economic stability and growth in Indonesia, focusing on government spending as a stabilising tool. Unlike developed countries facing downturns, Indonesia maintained consistent positive growth. Their research highlighted how fiscal measures, including tax adjustments and spending, influence aggregate demand, resource allocation, income distribution, and employment opportunities, underscoring the crucial role of fiscal policy in maintaining economic stability. Based on the above empirical studies, the research hypothesis of this study is as follows:

H0: *Fiscal policy has no impact on economic growth and development in both the short run and long run in South Africa.*

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H1: *Fiscal policy has an impact on economic growth and development in both the short run and long run in South Africa.*

METHODOLOGY

Data and Description of Variables

This study employs quantitative annual time series data from 1970 to 2021, sourced from reputable databases such as the World Bank Development Indicators (WDI) and the South African Reserve Bank (SARB). Missing data for specific variables are addressed using extrapolation and interpolation techniques, as demonstrated in previous studies (e.g., Saba, 2023a, 2023b). Table 1 presents the variables used in the econometric models, including real GDP (representing economic growth), the Human Development Index (HDI, a measure of economic development), government consumption expenditure, public sector spending, tax revenue, gross fixed capital formation, budget deficit, trade, and secondary school enrolment (a proxy for human capital). Real GDP, reflecting the inflation-adjusted value of total output, is utilised as an indicator of economic growth. Economic development is proxied by the HDI, which, according to the United Nations Development Programme (UNDP) (2010), measures development through health, education, and living standards, capturing key socio-economic factors influencing human capital (Klugman et al., 2011).

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Table 1: Data and Variable Description

Variables	Description	Expected Sign	Source
Dependent Variables			
RGDP (Proxy for Economic Growth)	**Real Gross Domestic Product (real GDP)** is the most common variable that measures economic growth because it is adjusted for inflation and comprises of aggregate output (WDI, 2023).		WDI Database
HDI (Proxy for Economic Development)	The **Human Development Index (HDI)** HDI holds value in the economic perspective on well-being. It measures the development of a country by incorporating key data on the health, knowledge, and standard of living of its people (UNDP, 2010).		WDI Database
Independent Variables			
GCEX (% of GDP);	**Government Consumption Expenditure** can harm long-term economic growth if it is unconstrained; however, public spending can benefit the economy in the short run (Nuru & Gereziher, 2022). Government consumption expenditure is selected as an independent variable because it directly influences economic activity by altering aggregate demand. The expected sign is positive, as increased government spending typically stimulates economic growth by boosting consumption and investment, thereby expanding overall economic output and development (Nuru & Gereziher, 2022).	+/-	**SARB** Database
PSI	**Public Sector Investment** has a substantial effect on the growth and development of the economy, enhancing human capital formation and technology innovation (Tendengu et al., 2022; Zungu et al., 2022). Public sector investment is selected as an independent variable due to its critical role in enhancing infrastructure, health, and education, which are vital for economic growth. The expected sign is positive, as increased government investment typically stimulates economic activity, boosts productivity, and potentially leads to higher GDP growth and overall level of development (Tendengu et al., 2022; Zungu et al., 2022).	+	**SARB** Database

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Variables	Description	Expected Sign	Source
BDEF	**Budget Deficit** or public debt results from excessive government expenditure, restricting both private investment and foreign direct investment (FDI), subsequently harming economic growth (Iwegbunam & Robinson, 2019). Budget deficits and public debt are key fiscal policy instruments reflecting government borrowing to finance expenditures. In economic growth models, a budget deficit (expected sign: negative) may indicate over-spending, potentially crowding out private investment, while public debt (expected sign: negative) signals future tax obligations, possibly hindering growth by reducing disposable income and investment (Akram, 2011; Iwegbunam & Robinson, 2019; Lee & Ng, 2015; Van et al., 2020)	-	**SARB** Database
GFCF (% GDP)	**Gross Fixed Capital Formation:** Increased capital per worker leads to higher labour productivity, which in turn grows the economy, encouraging development (Makhoba et al., 2019). GFCF represents investment in physical assets and is crucial for economic growth. As an independent variable in fiscal policy studies, GFCF is expected to have a positive sign, indicating that higher investment levels can boost economic development by enhancing productivity and creating jobs (Babalola, 2015; Hassan, 2021; Makhoba et al., 2019).	+	**WDI** Database
TAXR	**Tax Revenue:** The more money the government earns, the greater chances of infrastructural development and economic growth (Kofi Ocran, 2011). In studying fiscal policy's impact on economic growth, tax revenue as an independent variable reflects government's ability to fund public services and investments. Positive tax revenue growth typically signals increased government capacity to support economic activity, suggesting a positive expected sign on growth due to enhanced public expenditure and infrastructure development (Addison et al., 2018; Stoilova & Todorov, 2021).	+	**SARB** Database
SSE (Proxy for Human Capital)	**Secondary School Enrolment Proxy for Human Capital: Human Capital** is the skills and knowledge acquired by a person, enabling them to improve production capacity and boost total income, fostering economic development (Hess, 2016). Secondary school enrolment, as a proxy for human capital, reflects the investment in a skilled workforce, essential for productivity and economic growth. In studies of fiscal policy's impact on growth, higher enrolment rates typically signal positive effects on GDP, thus expected to have a positive sign as an independent variable.	+	**WDI** Database

Source: Author's Compilation.

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Analytical Framework and Model Specification

To investigate the economic growth-development-fiscal policy nexus in South Africa, our models are based on Musgrave's (1959) fiscal policy theory. This theory views macroeconomic factors such as growth as parameters influenced by adjustments in fiscal and monetary measures, including tax rates, government spending, interest rates, gross capital formation, and exchange rates. Musgrave (1959) presents his equation as follows:

$$Y_i = f(p1, p2, p3, \dots \dots pj). \quad (1)$$

Where Y_i refers to economic growth (dependent variable); f is a function of policy instruments , $p1$ *to* pj (independent variables). According to Musgrave (1959), control variables are considered effective in influencing economic growth if minor changes in these variables lead to significant effects on the independent variables.

This study adopts and modifies the model proposed by (Tendengu et al., 2022) which is also based on Musgrave's (1959) theory. Therefore, the baseline equation for this study is presented below:

Model 1: Economic Growth Model

$$LogGDP_{RATE_t} = \beta_0 + \beta_1 \log GCEX_t + \beta_2 \log PSI_t + \beta_3 \log GFCF_t + \beta_4 \log TAXR_t + \beta_5 \log BDEF_t + \beta_6 \log SSE_t + \mu_t. \quad (2)$$

Model 2: Economic Development Model

$$LogHDI_t = \beta_0 + \beta_1 logGCEX_t + \beta_2 logPSI_t + \beta_3 logGFCF_t + \beta_4 logTAXR_t + \beta_5 logBDEF_t + \beta_6 logSSE_t + \mu_t. \quad (3)$$

Where $\boldsymbol{\beta_0}$ is a constant, $\boldsymbol{\beta_1}$ to $\boldsymbol{\beta_8}$ is the respective coefficients of the independent variables, $\boldsymbol{t}$ is the year in which each variable is observed, $\boldsymbol{\mu_t}$ is the error term. It is therefore important to note that logarithms are suitable for the above equation since it is a growth function that needs to be expressed in terms of percentage changes for each variable (Tendengu et al., 2022).

Pre-Estimation Tests

This section outlines two essential pre-estimation tests applied to the data before model estimation: the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. These tests are crucial for confirming the stationarity of variables, thereby preventing spurious regression and ensuring the robustness of subsequent ARDL model estimations. Non-stationary or trending data can distort ordinary least squares (OLS) regression outcomes, leading to unreliable results (Asteriou & Hall, 2007). To address this, we use the ADF test, a widely recognised and straightforward method for assessing

stationarity by determining the necessary order of differencing (Nuru & Zeratsion, 2022). The ADF test improves estimation reliability by incorporating lagged dependent variables to correct for autocorrelation in residuals, building on the original Dickey-Fuller (DF) framework. The PP test, in turn, adjusts for heteroskedasticity and serial correlation, further reinforcing the ADF findings (Makhoba et al., 2019). These results are further supported by a correlation matrix and lag length criteria, enhancing the econometric model's specification and overall reliability.

ARDL Estimation Technique

This section outlines the technique used for estimating the models in this study. Presented below are the long-run and short-run ARDL models, derived from linear equations (2) and (3) above. Here, Δ represents that each logged variable is integrated at the first order, μ denotes the error term, and β and α refer to the long-run and short-run coefficients, respectively. The lag operators for the dependent and independent variables are u and v, respectively. The maximum lag length is t-1, which is selected based on the information criterion.

Model 1: Economic Growth Model

$$\Delta \log RGDP_t = \beta_0 + \sum_{j=1}^{u} \beta\, 1\Delta \log RGDP_{t-j} + \sum_{j=0}^{v1} \beta 2\, GCEX_{t-j} + \sum_{j=0}^{v2} \beta 3\, \Delta \log PSI_{t-j} + \sum_{j=0}^{v3} \beta 4 \Delta \log GFCF_{t-j} + \sum_{j=0}^{v4} \beta\, 5\Delta \log TAXR_{t-j} + \sum_{j=0}^{v5} \beta 6 \Delta \log BDEF_{t-j} + \sum_{j=0}^{v6} \beta 7 \Delta \log SSE_{t-j} + \alpha_1 \log R_{GDPt-1} + \alpha_2 \log GCEX_{t-1} + \alpha_3 \log PSI_{t-1} + \alpha_4 \log GFCF_{t-1} + \alpha_5 \log TAXR_{t-1} + \alpha_6 \log BDEF_{t-1} + \alpha_7 \log SSE_{t-1} + \mu_t \quad . \quad (4)$$

Model 2: Economic Development Model

$$\Delta logHDI_t = \beta_0 + \sum_{j=1}^{u} \beta\, 1\Delta logHDI_{t-j} + \sum_{j=0}^{v1} \beta 2 \Delta log\, GCEX_{t-j} + \sum_{j=0}^{v2} \beta\, 3\Delta logPSI_{t-j} + \sum_{j=0}^{v3} \beta 4 \Delta logGFCF_{t-j} + \sum_{j=0}^{v4} \beta\, 5\Delta logTAXR_{t-j} + \sum_{j=0}^{v5} \beta 6 \Delta logBDEF_{t-j} + \sum_{j=0}^{v6} \beta 7 \Delta logSSE_{t-j} + \alpha_1 logR_{HDI_{t-1}} + \alpha_2 logGCEX_{t-1} + \alpha_3 logPSI_{t-1} + \alpha_4 logGFCF_{t-1} + \alpha_5 logTAXR_{t-1} + \alpha_6 logBDEF_{t-1} + \alpha_7 logSSE_{t-1} + \alpha_8 BDEF_{t-1} + \mu_t. \quad (5)$$

Before examining the long-run relationship between fiscal policy and economic growth and development, we first evaluate whether the variables in Model 1 and Model 2 are co-integrated. The ARDL bounds testing approach, developed by (Pesaran et al., 1996), is used as the estimation technique. This method includes sufficient lags to accurately capture the data-generating process and addresses endogeneity and autocorrelation issues (Tendengu et al., 2022). Unlike the Engle and Granger (1987) method, the ARDL bounds test can evaluate long-run relationships among time series with variables integrated at I(0), I(1), or a combination of both, but not if any variable is integrated at

I(2) (Nuru & Gereziher, 2022). If the calculated F-statistic exceeds the critical F-value, the null hypothesis of no co-integration is rejected, confirming a long-run relationship among the variables. Co-integration ensures that non-stationary time series do not diverge indefinitely, maintaining equilibrium (Pesaran et al., 1996). For the short-run relationship, the Error Correction Model (ECM) is applied to both models. The ECM measures the speed at which co-integrated variables return to long-run equilibrium after short-run deviations and estimates their short-run dynamic interactions. The coefficient of the error correction term (CointEq(-1)) indicates the annual adjustment rate towards restoring long-run equilibrium, expressed as a percentage of the estimated coefficients (Zungu et al., 2022).

Post-Estimation Tests

This section outlines the post-estimation tests used to validate the accuracy of the ARDL model in this study. Tse (2002) emphasizes the significance of residual diagnostic tests for ensuring reliable estimates by addressing potential issues with the error term (Gujarati, 1995). To assess model validity, we apply the Breusch-Godfrey test for autocorrelation, the Breusch-Pagan test for heteroskedasticity, the Jarque-Bera test for normality, and the Ramsey RESET test for misspecification. To detect structural breaks, the CUSUM and CUSUMSQ stability tests are employed. Makhoba et al. (2019) highlight that macroeconomic variables often experience breaks due to political changes or external shocks like the global financial crisis or COVID-19. Unlike the Chow test, CUSUM detects breaks without pre-specified dates (Tendengu et al., 2022). The model is deemed stable if the CUSUM or CUSUMSQ blue line remains within the 5% significance red lines.

EMPIRICAL RESULTS AND DISCUSSION

Descriptive Statistics Analysis

Table 2 presents a statistical summary of the variables under review. The mean values for fiscal policy components—government consumption expenditure, public sector investment, and tax revenue—are positive, reflecting expansionary fiscal policies implemented by the government through tax cuts and increased spending on social grants, healthcare, and education from 1970 to 2021. The mean real GDP value indicates an average economic growth rate of 2.25%. The maximum and minimum values, along with the standard deviation of real GDP, highlight growth driven by macroeconomic stabilisation, which supports international trade, job creation, and infrastructure development. The mean HDI value suggests improvements in living standards, attributed to rising human capital and social welfare, supported by public spending and infrastructure investment. Except for the budget deficit, the Kurtosis values for all variables are below three, indicating a normal distribution. Government

consumption expenditure and tax revenue exhibit negative skew, while the other variables show positive skew.

Table 2: Descriptive Statistics Results

Variable	Mean	Median	Max.	Min.	Std. Dev.	Skew-ness	Kurtosis	Jarque-Bera	P-Value
RGDP	26.0811	26.0079	26.6080	25.4631	0.3492	0.0931	1.7688	4.9839	0.0827
HDI	0.6154	0.5890	0.7400	0.5315	0.0624	0.6163	2.0691	5.1692	0.0754
GCEX	16.2627	16.8341	20.7925	10.2976	2.6852	-0.7173	2.5677	4.8639	0.0879
PSI	23,1754	21,7269	24,3407	22,7924	0.8367	0.8903	1.9056	9.4649	0.0088
BDEF	0.9356	0.4806	9.8555	-0.7687	1.6391	3.56290	18.7884	650.11	0.0000
GFCF	19.5583	18.1551	29.2010	13.0919	4.5564	0.5797	2.0912	4.7019	0.0953
TAXR	20.7832	20.9804	25.1340	15.0271	2.9488	-0.2089	1.9649	2.6994	0.2593
SSE	79.3407	78.9079	109.4441	54.4996	16.4666	0.3397	1.7993	4.1237	0.1272

Note: The number of observations is 52. RGDP=real GDP (proxy for growth); HDI= (proxy for development); GCEX=government consumption expenditure; PSI= public sector investment; BDEF= budget deficit; GFCF=gross fixed capital formation TAXR=tax revenue; SSE= secondary school enrolment (proxy for human capital).
Source: Author's Own Calculations.

Correlation Matrix

Table 3 shows a positive correlation between economic growth (RGDP) and all variables, except for GFCF and PSI. GCEX and TAXR exhibit strong positive correlations with both economic growth and development (HDI). A moderate relationship exists between RGDP and HDI, as economic growth is influenced by developmental factors. There is no serial correlation (i.e. no correlation greater than 0.9) between any of the independent variables. Serial correlation can lead to biased regression coefficients, inflated t-statistics, and unreliable hypothesis testing (Gujarati, 1995).

Table 3: Correlation Matrix Results

	LRGDP	HDI	LGCEX	LPSI	BDEF	LGFCF	LTAXR	LSSE
LRGDP	1.0000							
HDI	0.5387	1.0000						
LGCEX	0.8264	0.7867	1.0000					
LPSI	-0.0520	-0.1315	0.1902	1.0000				
LBDEF	0.4024	0.3956	0.2261	-0.0150	1.0000			
LGFCF	-0.6468	-0.6133	-0.7463	-0.5119	-0.3856	1.0000		
LTAXR	0.9230	0.8738	0.8762	-0.0193	0.3606	-0.6903	1.0000	
LSSE	0.9303	0.9281	0.7533	-0.0827	0.3472	-0.5956	0.8312	1.0000

Source: Author's own calculations.

Unit Root Test

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As shown in Table 4, only HDI, BDEF, and TAXR are stationary at both the level and first difference, while the other variables are integrated at the first order at their respective levels of significance. Consequently, since no variable is integrated at the second order, we can proceed with running our model.

Table 4: Unit Root Test Results

	ADF T-Statistic			PP T-Statistic		
Variable	**Constant & Trend**	**Constant**	**None**	**Constant & Trend**	**Constant**	**None**
At level: I(0)						
LRGDP	-1.9187	-1.2996	6.3722	-1.6797	-1.2316	5.7607
HDI	-2.0282	-0.2617	-3.7689**	-1..7453	-0.3142	-3.4089**
LGCEX	-1.9999	-1.9933	1.7944	-1.9060	-2.1198	2.0348
LPSI	-1.8430	-1.9104	-0.0722	-1.8540	-1.9104	-0.0670
LBDEF	-4.2097**	-3.0046***	-1.9276***	-4.0866***	-2.8795***	-1.9276
LGFCF	-2.2676	-1.2636	-1.0303	-1.5896	-0.7577	-1.0269
LTAXR	-3.4582**	-1.1581	1.0582	-3.6043**	-0.7243	2.0372
LSSE	-3.9884	-1.4532	0.9553	-3.7474	-0.9988	3.4754
At 1st difference: I(1)						
ΔLRGDP	-5.4631***	-5.4817***	-3.6449***	-5.4135**	-5.4341**	-3.5483*
ΔHDI	-4.5782***	-4.6869***	-4.0081***	-4.4962***	-4.6092***	-3.9195***
ΔLGCEX	-7.2289***	-7.2189***	-6.8975***	-7.2494***	-7.2226*	-6.8988***
ΔLPSI	-7.2670*	-7,2725***	-7.3473***	-7.3269***	-7.3185***	-7.3998***
ΔLBDEF	-7.7788*	-7.6555**	-7.7025*	-4.0866***	-2.8795*	-1.9276**
ΔLGFCF	-4.7101***	-4.7442***	-4.6627***	-4.4594***	-4.4958***	-4.4495*
ΔLTAXR	-7.8759*	-7.9671***	-7.8357***	-9.2761***	-9.4422**	-7.9600***
ΔLSSE	-6.6145	-6.6907	-7.6969	-16.6922	-17.1561	-7.7539

Note: *, (**), [***] denotes the stationarity of variables at either 10%, (5%), or [1%] level of significance. Δ represents variables at first order difference.
Source: Author's own calculations.

Lag Length Criteria

Before estimating our models, we determined the maximum lag length criteria and applied it to our empirical results. As shown in Table 5, this study follows the Schwarz Information Criterion (SC), retaining lag 1 across all estimations. The selection of SC is based on its preference for fewer lags compared to other information criteria, which enhances the robustness of our estimated results, especially given the large sample size used in this research (Nuru & Gereziher, 2022).

Table 5: Lag Length Criteria Results

Lag	LogL	LR	FPE	SC

0	133.947	N/A	7.26e-13	-4.9359
1	430.4666	481.8443	-4.67e-17	**-12.1293***
2	498.9610	88.4719*	4.83e-17	-9.8216
3	571.0770	69.1112	6.59e-17	-7.6649
4	700.1645	80.6797	2.14e-17*	-7.8819

Note: The lag order selection is denoted by [*] LR= t-statistic at 5% significance level. ; FPE= final prediction error; SC= Schwarz information criterion ([*] denotes the lag order selection).
Source: Author's own calculations.

ARDL Estimation Technique Results Interpretation

Model 1: Economic Growth Results

This model examines the relationship between fiscal policy and economic growth, with real GDP serving as the measure of economic growth.

Long-Run Analysis

Table 6 reveals that the calculated F-statistic of 6.83 exceeds the upper bound critical value of 2.86 at the 5% significance level, suggesting the existence of a long-run relationship among the variables in Model 1.

Table 6: Bounds Test Results for Economic Growth Model

F-Statistic	6.8369		
Level of Sig.	**10%**	**5%**	**1%**
Lower Bound	1.52	2.01	2.74
Upper Bound	2.45	2.86	4.06

Source: Author's Own Calculation.

Table 7 presents p-values significant at the 5% level for PSI, GFCF, TAXR, and SSE. The PSI coefficient indicates that an increase in public sector investment not only drives growth but also contributes to overall investment in the economy. The positive relationship between GFCF and growth suggests that the accumulation and enhancement of production factors boost output, thereby promoting economic expansion. A 1% increase in TAXR leads to a 0.3772% rise in growth, indicating that higher government revenue enhances infrastructure investment. The positive correlation between SSE and economic growth highlights the role of education in fostering growth through skill acquisition. A 1% increase in GCEX is associated with a 2.54% decrease in growth at the 1% significance level. The negative and significant relationship between BDEF and growth implies that public debt hampers economic expansion, as investors tend to withdraw funds from high-risk financial assets in an uncertain economic environment.

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Table 7: Long-Run Results for Economic Growth Model

Variable	Coef	Std. Error	T-Stat.	P- Value
LGCEX	-0.0254	5.6884	-1.6645***	0.0033
LPSI	0.0364	5.1257	1.9955***	0.0026
LBDEF	-0.3010	0.3392	0.9947**	0.0007
LGFCF	0.2667	0.4119	0.7238*	0.3165
LTAXR	0.3772	3.1594	0.1175**	0.0437
LSSE	0.0535	4.2711	0.4496*	0.0279
C	-7.4253	28.2251	-0.2114	0.6082

Note: *, (**), [***] denotes the level of significance at 10%, (5%), or [1%]. Coef is coefficient.
Source: Author's own calculations.

Short-Run Analysis

Table 8 presents the short-run ARDL model for economic growth, showing a significant Error Correction Term (CointEq(-1)) with an 18% adjustment speed toward equilibrium and a p-value of 0.0000, confirming long-run causality. GCEX has a 3.53% coefficient, highlighting its substantial short-run impact on growth, supporting Keynesian views on public spending. PSI shows a 1.77% coefficient, indicating a positive effect on growth, consistent with theories on infrastructure and technological investment. BDEF has a small positive coefficient of 0.37%, suggesting a slight short-run growth boost, which contrasts with long-run theories that link high debt to slower growth. GFCF shows a 0.58% positive coefficient, reinforcing the idea that capital investment enhances productivity and output. Lastly, TAXR shows a modest positive effect on growth, with a coefficient of 0.04%, indicating that higher tax revenues facilitate government spending on infrastructure and public services, thus supporting growth.

The human capital coefficient of 0.26% shows that higher secondary school enrolment, a proxy for human capital, positively impacts economic growth, as educated labour forces enhance productivity and innovation. The positive effects of PSI and GFCF support developmental economic theories highlighting infrastructure and capital investment as growth drivers. These findings align with Keynesian economics, where short-term increases in GCEX and BDEF are stimulative. The positive role of human capital, reflected by SSE, supports human capital theory, which posits that education enhances workforce productivity. The negative coefficient of the error correction term indicates an active adjustment mechanism, restoring long-term equilibrium, with around 18% of any disequilibrium corrected each period.

Table 8: Short-Run Results for Economic Growth Model

Variable	Coefficient	Std. Error	T-Stat.	P- Value

D(LRGDP(-1))	**0.2707**	**0.0958**	**2.0196**	**0.0007**
D(LGCEX)	3.5333	5.4947	2,6579***	0.0510
D(LPSI)	1.7685	0.2016	0.8188***	0.0198
D(LBDEF)	0.3720	3.0380	0.1551**	0.0340
D(LGFCF)	0.5834	0.3792	0.4916***	0.0476
D(LTAXR)	0.0411	4.9521	2.2219**	0.0145
D(LSSE)	0.2588	2.5771	0.9137*	0.0200
CointEq(-1)	-0.1849	0.1002	-6.4071***	0.0000

Note: *, (**), [***] denotes the level of significance at 10%, (5%), or [1%].
Source: Author's own calculations.

Model 2: Economic Development ARDL Results

This model analyses the relationship between fiscal policy and economic development. Table 9 indicates that the F-statistic of 4.8 surpasses the upper bound critical value of 2.39 at the 5% significance level, confirming a long-run equilibrium relationship between economic development (measured by HDI) and the variables GCEX, PSI, BDEF, GFCF, TAXR, and SSE.

Table 9: Bounds Test Results for Economic Development Model

F-Statistic	4.8002		
Level of sig.	**10%**	**5%**	**1%**
Lower Bound	1.02	1.69	2.64
Upper Bound	3.44	2.39	3.87

Source: Author's own calculations.

Long-Run Analysis

Table 10 reveals a long-run, statistically significant positive relationship between secondary school education and economic development, as measured by HDI. This supports the view that public investment in secondary education is crucial for human capital development, fostering skill acquisition and technological innovation. The results suggest that public expenditure benefits development when focused on human capital, rather than being treated as mere social grants. The negative coefficient of 3.15% for GCEX indicates that, in the long run, excessive government spending may hinder development by crowding out private investment and creating inefficiencies, aligning with theories positing that excessive public spending can crowd out private investment and, in the long run, create inefficiencies in the economy (Hajamini & Falahi, 2014). The positive coefficient of 0.06% for tax revenue suggests a minimal but positive impact on development, implying that higher tax revenue can facilitate government investment in infrastructure and services, but the small coefficient suggests a nuanced impact, potentially due to the efficiency of tax use in South Africa. This aligns with Laffer Curve principles. Public sector investment (PSI) shows a positive coefficient of 2.08%, indicating its contribution to long-term economic development,

supporting the idea that investments in public infrastructure and technology enhance human capital formation and overall productivity, which are crucial for sustained economic development (Canh & Phong, 2018; Rabnawaz & Sohail Jafar, 2015; Ramirez & Nazmi, 2003). The small positive coefficient of 0.03% for the budget deficit suggests that budget deficits have a minimal direct impact on economic development in the long run, reflecting situations where deficit spending is used effectively for growth-enhancing projects, though the effect size suggests cautious interpretation.

Table 10: Long-Run Results for Economic Development Model

Variable	Coef	Std. Error	T-stat.	P- Value
LGCEX	-3.1466	7.932	-1.3210***	0.0000
LPSI	2.0759	4.4500	1,8146***	0.0055
LBDEF	0.0306	0.3200	0.7256**	0.0131
LGFCF	0.2061	2.5550	-1.5320*	0.0199
LTAXR	0.0565	8.6283	0.0520**	0.0233
LSSE	0.0379	0.1921	0.2224*	0.0125
C	-5.8777	28.5161	-0.7281	0.9668

Note: *, (**), [***] denotes the level of significance at 10%, (5%), or [1%]. Coef is Coefficient *Source: Author's own calculations.*

Short-Run Analysis

Table 11 presents the short-run ARDL model results for economic growth and development, showing that the Error Correction Term (CointEq(-1)) is negative and statistically significant, with a 13% adjustment speed towards equilibrium in economic development. A p-value of 0.0000 confirms the presence of long-run causality. Government expenditure has a positive impact of 0.02% on HDI, suggesting that public spending contributes to improving health, education, and living standards in the short run, supporting the findings of (Nuru & Zeratsion, 2022) on the short-term benefits of public spending. Although the human capital coefficient is small (0.01%), it is positive and statistically significant, indicating that improvements in education positively influence development, aligning with the views of (Hess, 2016) and (Bertoletti et al., 2022).

The significant positive effect of a 0.95% increase in tax revenue on development suggests that higher tax revenues, reflecting better government capacity to finance public services, positively impact human development, consistent with (Ocran, 2019). The positive impacts of LTAXR and LSSE underline the importance of effective fiscal capacity and education in supporting development objectives. Surprisingly, the model indicates a positive association between budget deficits and HDI in the short run. This may reflect deficit-financed investments in sectors critical to human development, though budget deficits are traditionally viewed as harmful to economic growth (Brender & Drazen, 2008; Molocwa et al., 2018; Van & Sudhipongpracha, 2015). Public sector investment and GFCF both show strong positive impacts, highlighting the importance

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of infrastructure and capital investments in enhancing the productive capacity of the economy, thereby improving human development outcomes.

Table 11: Short-Run Results for Economic Development Model

Variable	Coefficient	Std. Error	T-stat.	P- Value
D(HDI (-1))	**0.0348**	**0.0944**	**2.0196**	**0.0731**
D(LGCEX)	0.0199	3.2216	2,812***	0.0257
D(LPSI)	2.2222	4.4325	3.0481***	0.0189
D(LBDEF)	0.0211	7.4346	8.1181**	0.0232
D(LGFCF)	0.8033	0.7789	5.2012***	0.0000
D(LTAXR)	0.9547	1.4009	2.2787**	0.0133
D(LSSE)	0.0146	3.6817	2.2520*	0.0005
CointEq(-1)	-0.1301	0.4937	-9.386***	0.0000

Note: *, (**), [***] denotes the level of significance at 10%, (5%), or [1%].
Source: Author's own calculations.

Post-Estimation and Diagnostic Test Results

This section evaluates the diagnostic and stability test outcomes to verify the reliability of our models, specifically ensuring the precision of the ARDL model estimates. The diagnostic test results for Model 1 and Model 2, presented in Table 12 and Table 13, confirm the robustness of our findings. The test results and conclusions in Table 12 and Table 13 affirm the consistency of our models, indicating that global external shocks, such as financial crises and the coronavirus pandemic, do not affect the stability of Model 1 and Model 2.

Table 12: Economic Growth (Model 1) Diagnostic Test Results

Test	Null Hypothesis	T-stat.	P-Value	Conclusion
Breusch- Godfrey	No serial-correlation.	LM stat= 2.986	0.5814	No serial-correlation.
Breusch Pagan	No hetero-skedasticity	Obs R-squared= 5.8417	0.1211	No hetero-skedasticity.
Ramsey RESET	No mis-specification.	F-stat= 3.0314	0.2396	No mis-specification.
Jarque- Bera	Normal distribution.	JB stat= 0.3195	0.7564	Not normally distributed.

Note: The null hypothesis is rejected at 5% level of significance.
Source: Author's own calculations.

Table 13: Economic Development (Model 2) Diagnostic Test Results

Test	Null Hypothesis	Test Statistic	P- Value	Conclusion
Breusch-Godfrey	No serial-correlation.	LM stat =5.2013	0.3724	No serial-correlation.
Breusch Pagan	No hetero-skedasticity.	Obs R-squared= 9.1755	0.0843	No hetero-skedasticity.
Ramsey RESET	No mis-specification.	F-stat= 2.3651	0.9657	No misspecification.
Jarque- Bera	Normal distribution.	JB stat= 0.1000	0.0232	Normally distributed.

Note: The null hypothesis is rejected at 5% level of significance.

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Source: Author's own calculations.

Stability Test Results

To ensure that our models are stable, we perform the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) stability test results.

Economic Growth (Model 1) Stability Test Results

Figure 1 demonstrates the model's stability, as the blue lines of the CUSUM test remain within the red critical lines for each figure. This indicates that the time series variables are stable throughout the entire sample period, with no economic shocks affecting the model.

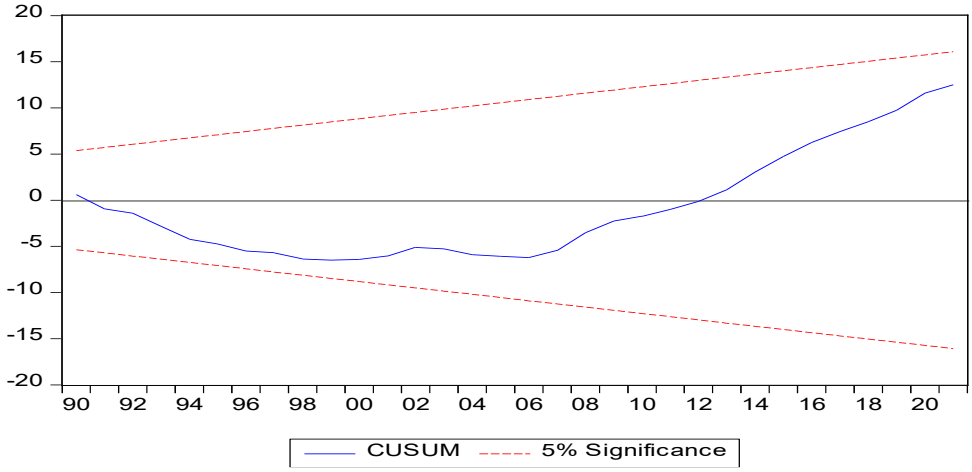

Figure 1: CUSUM Test
Source: Author's own calculations.

In Figure 2, the blue line lies outside the red line between 2007 and 2008, indicating instability during this period. This instability is attributed to the 2008 global financial crisis (Zungu et al., 2022).

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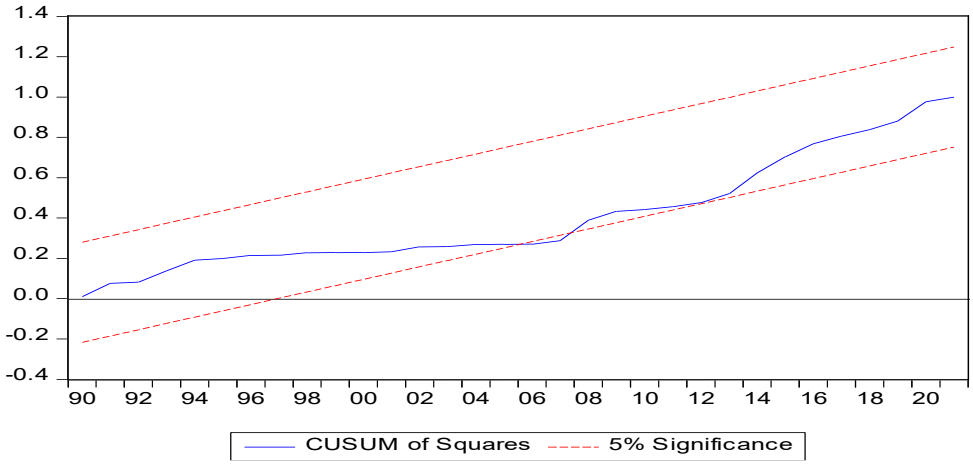

Figure 2: CUSUMSQ Test
Source: Author's own calculations.

Economic Development (Model 2) Stability Test Results

In Figure 3, the blue line remains within the red lines, indicating that Model 2 is stable.

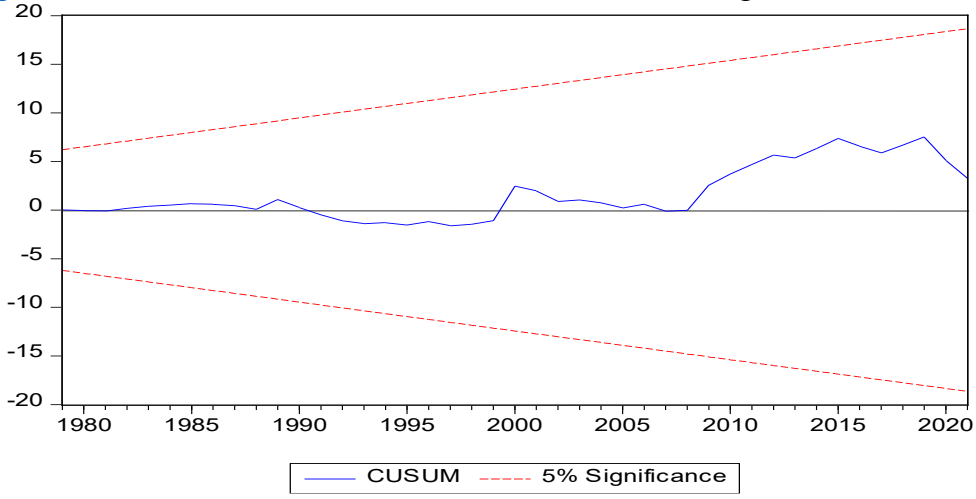

Figure 3: CUSUM Test
Source: Author's own calculations.

The stability shown in Figure 4 is influenced by the decline in global demand for South Africa's exports between 1995 and 2000, which resulted in significant job losses (Makhoba et al., 2019). The economic recession triggered by the 2008 global financial crisis also contributed to instability, though Model 2 remains stable apart from these periods. The findings of this model align with (Keynes, 1937) development theory, which argues that fiscal policy tools—such as government consumption expenditure, public sector spending, and tax revenue—stimulate economic growth. However, Engen

and Skinner (1992) caution that this relationship may not hold universally, noting a negative correlation between fiscal policy and growth in certain economies. In contrast, this study reinforces Keynes's perspective within South Africa's context, in line with (Nuru & Gereziher, 2022) and (Makhoba et al., 2019), who used similar methodologies. Using time-series data and the ARDL estimation technique, the study assesses the long-run link between fiscal policy components and economic growth in South Africa, complemented by the ECM for short-run dynamics. Iwegbunam and Robinson (2019) highlight that excessive government consumption expenditure can hinder long-term growth by inflating public debt, leading to persistent budget deficits and crowding out private and foreign investment, a finding supported here. Similarly, (Zungu et al., 2022) and (Tendengu et al., 2022) confirm a strong connection between public sector investment and economic expansion across both time horizons. Kofi Ocran (2011) further establishes that higher tax revenue correlates with growth, while (Makhoba et al., 2019) stress the role of gross fixed capital formation in boosting production and aggregate demand.

The results also align with Romer (1986) endogenous growth model, which posits that economic growth is driven by improvements in human capital and innovation. Our findings echo Hess (2016), who confirms a positive relationship between human capital investment and welfare improvement. The results suggest that human and physical capital (infrastructure) are complementary, requiring a balance between skills and machinery (Hess, 2016). These findings also resonate with Danquah and Amankwah-Amoah (2017), who affirm a positive relationship between human capital and technological advancement, fostering growth in developing countries like South Africa.

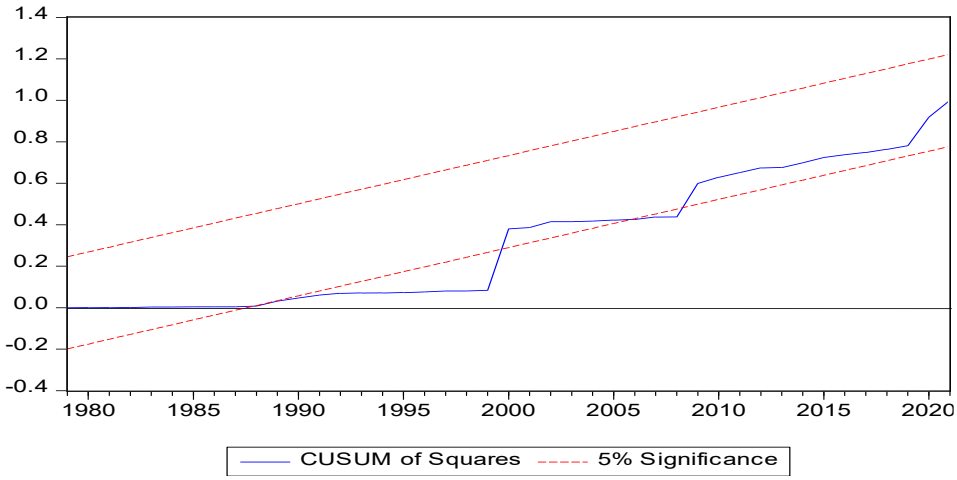

Figure 4: CUSUMSQ Test
Source: Author's own calculations.

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CONCLUSION AND POLICY RECOMMENDATIONS

This study examines the fiscal policy-economic growth nexus in South Africa using time-series data from 1970 to 2021, highlighting key events such as apartheid, the 2008 global financial crisis, and the COVID-19 pandemic. The ARDL and ECM methods are used to analyse the long-run and short-run relationships between fiscal policy and economic development, differentiating between growth and development. Results align with the two main theories followed in the paper. In the growth model, long-run analysis reveals significant relationships between fiscal policy and real GDP, with PSI and TAXR positively impacting growth by enhancing infrastructure and public goods. In contrast, GCEX and BDEF negatively affect growth, reflecting potential crowding-out and inefficiencies from high public debt. In the short run, increased government spending stimulates growth, consistent with Keynesian theory, while PSI and TAXR also contribute positively to short-term economic dynamics.

For the development model, fiscal policy impacts on economic development, measured by HDI, show a significant long-term relationship among the variables. Investments in PSI and education (SSE) are key for sustainable development, contributing to human capital and innovation, essential for improving quality of life. However, the negative impact of GCEX suggests that not all public spending supports development, highlighting the need for efficient fiscal planning. In the short run, increased government expenditure positively impacts HDI, providing immediate benefits in health, education, and living standards, especially in underdeveloped areas. These findings underscore the complex effects of fiscal policy on growth and development. While public investment and efficient tax administration are beneficial, high consumption expenditure and large budget deficits can hinder long-term progress. The results align with economic theories advocating a balanced fiscal approach, prioritising investment in human capital and infrastructure while maintaining fiscal discipline. This analysis provides empirical support for these theories and offers policy guidance for South Africa, suggesting that efficient spending on public investment and education, alongside careful management of consumption and deficits, can foster sustained growth and development.

We recommend that policymakers focus on promoting effective financial management and maintaining a balanced government budget. Regulations should be developed to encourage the equitable growth of human capital, physical capital, and gross fixed capital formation, achieved through controlled public consumption spending and adequate public sector investment. This will lead to increased tax revenue, reduced budget deficits, and higher growth and development. Specific policy measures should include increasing allocations for infrastructure and technology to enhance economic productivity, capitalising on the positive long-term effects of public sector investment on GDP growth. The government should streamline tax administration to improve efficiency and broaden the tax base without increasing the tax burden, ensuring stable

funding for essential public services. Additionally, government consumption expenditure should be reviewed and potentially reduced to mitigate its negative long-term effects, prioritising spending in high-multiplier sectors. Collaboration with educational institutions to improve the quality and accessibility of secondary education will bolster human capital, crucial for long-term development. These measures can stimulate immediate economic activity while supporting sustainable growth in the long term. Two main limitations were encountered in this study. First, due to data limitations, some variables were excluded, though alternative variables were used to achieve accurate results. Second, the study could not cover the post-COVID-19 period. Future research should consider this period to better understand the role of fiscal policy in aiding South Africa's recovery and its impact on growth and development.

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