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Exploring Factors Influencing Economic Growth in the South African Economy

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Abstract:
This research aims to investigate the determinants of economic growth in South Africa using quarterly data spanning from 1967 to Q2 2023. The Autoregressive Distributed Lag (ARDL) model is employed to analyze variables such as gross fixed capital formation, exports, GDP, consumption, and employment across various sectors. The analysis reveals that factors like investment, exports, household consumption, and employment in the private sector play substantial roles in promoting economic growth. Conversely, government spending and public sector employment appear to have limited effects. These findings underscore the vital role of the private sector in achieving sustainable economic growth and suggest that government policies should focus on strengthening private sector activities to stimulate economic development. This study enriches the ongoing debate about the importance of the private sector in driving economic growth, providing new insights into its pivotal role.

Keywords: economic growth, private sector, autoregressive distributed lag, South Africa.

探索影响南非经济增长的因素

摘要：
本研究旨在使用1967年至2023年第二季度的季度数据来调查南非经济增长的决定因素。采用自回归分布滞后(远程教育实验室)模型分析各个部门的固定资本形成总额、出口、国内生产总值、消费和就业等变量。分析表明，投资、出口、家庭消费和私营部门就业等因素在促进经济增长方面发挥着重要作用。相反，政府支出和公共部门就业似乎影响有限。这些发现强调了私营部门在实现可持续经济增长方面的重要作用，并表明政府政策应侧重于加强私营部门活动以刺激经济发展。这项研究丰富了关于私营部门在推动经济增长方面的重要性的持续辩论，为其关键作用提供了新的见解。

关键词：经济增长、私营部门、自回归分布滞后、南非。

1. Introduction

Economic growth is a cornerstone of South Africa's development and presents significant strategic and policy challenges for policymakers, as highlighted by Khamfula (2004). A range of factors, including the nature and quality of economic policies and various macroeconomic elements, play crucial roles in determining a country's economic growth trajectory. Karabo (2007) pointed out that extensive research has been conducted in developing economies to examine the impact of macroeconomic factors on economic growth, noting that the GDP growth rate in these countries is affected by a complex mix of factors, some negatively correlated and others positively. According to Kira (2013) and Nach (2016), macroeconomic models are vital tools used worldwide to shape economic policies, making understanding variations in economic growth essential. Following the global economic downturn, the demand-side approach emerged as a key strategy for recovery, with the revival in many developing countries, including South Africa, attributed to consumption-led rather than production-led measures. Despite overcoming the 2009 stagflation, South Africa faces declining GDP and employment levels that remain below pre-crisis levels. Policymakers in South Africa, like their counterparts in other developing countries, concentrate on achieving sustainable and higher growth rates to eradicate poverty and unemployment. This necessitates a continuous evaluation of the economy performance at high growth rates to achieve and maintain these objectives, as emphasized by Dewan and Hussein (2001).

Understanding the factors driving economic fluctuations is crucial for crafting effective policies that promote long-term economic growth and tackle socioeconomic development challenges. South Africa has experienced significant structural changes since 1994, marking distinct stages of its economic evolution. Following the transition in 1994, expectations were high for a substantial improvement in economic performance, especially with the removal of trade and banking restrictions. Although improvements in GDP production were observed post-1994, growth has generally been reported as moderate by both global and South African standards. Notably, South Africa experienced rapid growth, averaging 4.5% per year from 2002 to 2008, marking the fastest rate since the 1994 democratic transition, as highlighted by Nach (2016).

Mongale and Monkwe (2015) highlighted South Africa's struggle with sluggish economic growth, as evidenced by the World Bank's downward revision of the country's 2014 growth forecast from 3.2% to 2.7%. Despite this adjustment, the Bank remains optimistic, anticipating growth to surpass the previous year's 1.9% and reach 3.4% in 2015, driven by increasing international demand and exports. However, sustained economic expansion proved challenging in 2013 due to domestic factors that hinder recovery efforts, worsening the slowdown observed in 2012. Long-standing structural constraints were compounded by labor unrest, dampening morale, and impacting consumer spending and private investment, which grew at subdued paces of 2.3% and 2.6%, respectively. The growth outlook for 2014 was further revised downward to 2% in the second quarter, with the estimate for 2016 remaining unchanged at 3.5%, attributed to tight monetary policy, labor disputes, and energy supply instability. Leshoro (2013) underscored the relationship between GDP growth and employment, emphasizing the role of increased employment in driving economic growth. This study aims to contribute to the existing literature by examining the role of the private sector in the growth process, specifically by dissecting total employment and consumption expenditure into private and public sectors and household and government expenditures, respectively, across various sections of the paper.

2. Literature Review

Numerous empirical studies have explored the relationship between employment and economic growth, revealing diverse findings across regions and methodologies. For instance, Marelli and Signorelli (2010) observed a phenomenon in the European Union, where an increase in employment coincided with a decline in economic growth. Similarly, Caporale and Škare (2011) conducted a comprehensive investigation across 119 nations, utilizing Vector Error Correction Models (VECM) and Granger causality tests, and found evidence of causation between GDP and employment growth in most economies. Country-specific research, such as that conducted by Asari et al. (2011) in Malaysia using data from 1982 to 2006, revealed a short-term unidirectional relationship between GDP and employment. Conversely, Kumo (2012) examined the relationship between economic growth, private and public employment, and infrastructure investment in South Africa from 1960 to 2009, employing traditional Granger causality tests and Autoregressive Distributed Lag (ARDL) models (Nkoro, and Uko, 2016). Contrary to expectations, the findings did not support the hypothesis that GDP promotes employment in both the public and private sectors, nor did they indicate a reverse relationship. However, it was discovered that an increase in investment leads to GDP growth. Further corroborating this notion, studies by Phelps (1994) and Ball and Moffit (2011) found that economic growth corresponds to an increase in job opportunities. These studies highlight the complexity of the relationship between employment and economic growth, highlighting varied outcomes that are dependent on factors such as region, time frame, and methodology.

In the study conducted by Leshoro in South Africa, the direction of causality between economic growth and

employment was investigated using quarterly data spanning 2001Q1 to 2012Q2. The Toda Yamamoto technique of causality was employed to determine whether changes in Gross Domestic Product (GDP) lead to changes in employment and vice versa. Despite rigorous analysis, the results of the researcher's regression failed to reject the null hypothesis at all significant levels, indicating that causality does not flow from employment to South Africa's GDP. However, the findings align with Keynesian general theory, affirming that economic expansion influences employment (Keynes, 1936). These findings underscore concerns of "rising unemployment within the South African economy, as highlighted by Leshoro (2013).

Anyanwu (2014) employed an empirical growth model to examine the factors influencing economic growth in Africa and China. The analysis revealed several noteworthy findings. For Africa, increased domestic investment, urban population, mental price index, net official aid, government effectiveness, and secondary school enrollment demonstrated a positive and significant relationship with economic growth. This conclusion was drawn from time series data spanning 1984 to 2010 and cross-country panel data covering the period from 1996 to 2010. Conversely, there was a significant and positive correlation between China's' economic growth and trade openness, and domestic investment. Additionally, the analysis revealed a significant and inverse relationship between economic growth and oil price indices, population growth, inflation, agricultural material price, private sector credit, and official development aid. These findings shed light on the complex dynamics shaping economic growth trajectories in Africa and China.

Kira (2013) applied the Keynesian model to explore the determinants of GDP in underdeveloped nations, with Tanzania serving as a representative case. Utilizing Ordinary Least Squares (OLS) regression with GDP as the dependent variable and consumption, government expenditure, net exports, and investment as explanatory variables, this study found that consumption plays a significant role in determining GDP in Tanzania. Similarly, Adepoju and Ogundunmade (2019) employed time series cross-sectional panel data covering 126 countries from 2010 to 2014 to investigate the impact of various factors, such as public debt, government expenditure, policy interest rates, unemployment, fiscal policy, and trade openness, on GDP. These results affirmed the multifaceted nature of economic growth, with fiscal balances consistently showing a positive association with economic growth across the studied regions. Moreover, the growth of African countries was found to be positively influenced by their unemployment rates and fiscal balances, whereas some regions experienced significant impacts from increases in trade openness and inflation (Francis, 2020). However, the exchange rate yielded no significant coefficients across any sub-region examined. This study underscores the diverse array of factors influencing economic growth across regions and highlights the importance of considering various economic indicators when analyzing GDP dynamics.

Mongale and Monkwe (2015) analyzed key factors contributing to South Africa's' economic growth, using the Co-integrated Vector Autoregressive (CVAR) approach for estimations. Their findings revealed that imports, exports, infrastructure investments, and real GDP were cointegrate, suggesting long-term relationships among these variables. Regardless of whether the effects were positive or negative, all variables exhibited long-run relationships according to the estimates.

On the other hand, Chirwa and Odhiambo (2016) explored macroeconomic indicators of economic expansion across industrialized and developing nations using a qualitative approach. They identified fiscal policy, human capital development, monetary policy, foreign direct investment, natural resources, investment trade, reforms, foreign aid, and political, geographical, and regional factors as crucial determinants of economic growth in developing economies. For advanced economies, variables such as human capital, demography, physical capital, monetary policy, fiscal policy, technological advancements, and financial components were found to influence economic growth. These studies underscore the multifaceted nature of economic growth dynamics and highlight the diverse range of factors influencing economic expansion across different types of economies.

Based on the findings of Chirwa and Odhiambo's study (2016), economic expansion analysts have increasingly turned to incorporating numerous variables into their analyses, provided that sufficient degrees of freedom and pooled country data are available for estimation, as noted by Ciccone and Jarocinski (2010). Research has supported this approach, suggesting that including various determinants of economic growth can help ensure the stability of growth drivers, as argued by Bayraktar (2006). However, this technique can also be misleading for policymakers who focus on country-specific economic strategies. Many countries remain unaware of the primary drivers of economic growth despite the straightforward analytical approach provided by pooled data analysis. Recent studies, such as Durlauf and Johnson (1995) and Azariadis and Drazen (1990), emphasize the significance of diverse equilibria or temporal paths for per capita income growth, highlighting the importance of economic reforms and country-specific development plans in shaping these trajectories.

Determining the primary contributors to economic growth within and between nations remains challenging. The existing literature on this subject, particularly in South Africa, is limited and often yields conflicting results on the factors influencing economic growth across countries. Addressing this gap, the current analysis leveraged a wide array of macroeconomic variables and considered the underlying factors affecting economic growth (Agalega, and Antwi, 2013). Following the recommendation by

Chirwa and Odhiambo (2016), incorporating numerous macroeconomic factors may lead to more robust outcomes. Furthermore, while much of the existing research has relied on cross-sectional and panel data, this study utilized time series data, thereby contributing to filling this gap in the literature.

3. Method

This paper explores the determinants of South Africa's economic growth using quarterly time series data spanning from 1967 to the second quarter of 2023. The data were obtained from the South African Reserve Bank. This study incorporates various economic indicators, including Gross Fixed Capital Formation (GFCF), Final Consumption by Government (CG), Final Consumption by Household (CH), Gross Domestic Savings (GDS), Total Employment by the Public Sector (EMG), Exports (EXP), Total Employment by the Private Sector (EMP), and Gross Domestic Product (GDP). To investigate the relationships among these parameters, the paper employs the Autoregressive Distributed Lag (ARDL) bounds test, following the approach recommended by Pesaran et al. (2001). The ARDL method is particularly suitable for analysis with small and finite data sample sizes. Additionally, it provides unbiased estimates in long-run models, as emphasized by Harris and Sollis (2003). The test involves estimating an Unrestricted Error Correction Model (UECM) with GDP as the dependent variable.

$$\Delta GDP = a_{01} + \sum_{i=1}^{p} a_{1i}\,\Delta GDP_{t-i} + \sum_{i=1}^{q} a_{2i}\,\Delta GFCF_{t-i} + \sum_{i=1}^{q} a_{3i}\,\Delta CG_{t-1} + \sum_{i=1}^{p} a_{4i}\,\Delta CH_{t-i} + \sum_{i=1}^{q} a_{5i}\,\Delta GDS_{t-i} + \sum_{i=1}^{q} a_{6i}\,\Delta EMG_{t-1} + \sum_{i=1}^{p} a_{7i}\,\Delta EMP_{t-i} + \sum_{i=1}^{q} a_{8i}\,\Delta EXP_{t-i} + b_{11}GDP_{t-1} + b_{21}GFCF_{t-1} + b_{31}CG_{t-1} + b_{41}CH_{t-1} + b_{51}GDS_{t-1} + b_{61}EMG_{t-1} + b_{71}EMP_{t-1} + b_{81}EXP_{t-1} + \varepsilon_{1t} \quad (1)$$

Here, the variables are as defined earlier and Δ is the difference operator. In ARDL bound test, the null hypothesis; H_0: $b_{1i}=b_{2i}=b_{3i}=\cdots=b_{8i}=0$ is tested against the alternative one; H_1: $b_{1i}\neq b_{2i}\neq b_{3i}\neq\cdots\neq b_{3i}\neq 0$ for $i=1,2,3\ldots.8$

If the estimated value exceeds the upper critical value, a long-run association between the parameters exists, leading to the rejection of the null hypothesis. Conversely, if the estimated value falls below the lower critical value, it suggests that no long-run relationship exists; thus, the null hypothesis cannot be rejected. However, when the estimated value falls between these two bounds, the result is deemed inconclusive.

Once co-integration among variables is confirmed, the investigation proceeds to assess short-run and long-run causality using Equation 2. This step is crucial because the presence of long-run causality does not automatically imply short-run causality. Following the methodology outlined by Odhiambo (2009), Narayan and Smyth (2008), and Belloumi (2014), the Error Correction Model (ECM) was estimated to identify short-run parameters associated with long-run measurements. The t-statistic on the coefficient of the lagged error correction term indicates the causal effect in the long-run, whereas the F-statistic on the explanatory variables indicates short-run effects. In the ARDL model, the ECM is expressed as follows:

$$\Delta gdp = a_0 + \sum_{i=1}^{p} a_{1i}\,\Delta gdp_{t-i} + \sum_{i=1}^{q} a_{2i}\,\Delta GFCF_{t-i} + \sum_{i=1}^{q} a_{3i}\,\Delta CG_{t-1} + \sum_{i=1}^{p} a_{1i}\,\Delta CH_{t-i} + \sum_{i=1}^{q} a_{2i}\,\Delta GDS_{t-i} + \sum_{i=1}^{q} a_{3i}\,\Delta EMG_{t-1} + \sum_{i=1}^{p} a_{1i}\,\Delta EMP_{t-i} + \sum_{i=1}^{q} a_{2i}\,\Delta tEXP_{t-i} + \alpha ECT_{t-1} + \varepsilon_{1t} \quad (2)$$

where $a_{1i}, a_{2i}, \ldots$.and a_{8i} are short run coefficients of the variables and α is the coefficient that estimates the speed of adjustment of the model back to long-run equilibrium.

4. Result Analysis

4.1. Unit Root Tests

The standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) time series tests were used to determine the order of integration of the variables under examination. The results of the unit root test, presented in Table 1, indicate that all series become stationary after the first differencing, except for employment by the private sector, employment by the government, and exports as a percentage of GDP.

Table 1. Unit root test results (Compiled by the authors)

Variables	ADF		PP	
	PVal (level)	PVal (1st dif)	PValue (level)	PVal (1st diff)
GDP	0.9226	0.0000	0.7065	0.0000
GFCF	0.6388	0.0000	0.6184	0.0000
CG	0.6314	0.0042	0.2524	0.0019
CH	0.104512	0.00012	0.9654	0.00032
EMG	0.0011	0.00002	0.0000	0.0000
EMP	0.0001	0.0000	0.0023	0.0000
GDS	0.3245	0.0016	0.5671	0.0000
EXP	0.0012	0.0000	0.0001	0.0000

4.2. Bound Testing (Cointegration Results)

The cointegration analysis was conducted using bound testing cointegration, and the results are presented in Table 2. The calculated F-Statistic, which is 10.350, exceeds the upper bound value (6.25) at the 5% significance level. Consequently, the null hypothesis is rejected, signifying the presence of a long-run relationship between economic growth and variables under investigation.

Table 2. Bound testing results (Compiled by the authors)

Estimated F-statistic		
Critical Values	Pesarran et al.'s (2001) Table	
	Lower Bound	Upper Bound
10%	3.17	4.14
5%	5.79	6.85

Continuation of Table 2		
1%	5.15	6.36

4.3. Long-Run Analysis

The empirical findings indicate several significant relationships between key variables and economic growth in the SA economy. Gross Fixed Capital Formation exhibits a long-term positive relationship with economic growth, as does export activity. Consumption expenditure, Gross Domestic Savings, and private sector employment also demonstrate significant positive impacts on economic growth. In contrast, government employment and consumption expenditure does not significantly positively influence economic growth. This lack of significance in government employment could be attributed to issues such as poor work attitudes, bureaucratic tendencies, and high levels of corruption. Similarly, the insignificant impact of government consumption expenditure may stem from a focus on high levels of recurrent expenditure rather than investment that drives growth. This section should completely, accurately, and concisely highlight the principles and their generalizability revealed by the results of the investigations or experiments on the research subjects; whether there are any exceptions found in the research or problems that are difficult to explain and solve in the paper; the similarities and differences to other research work (including to that of the authors themselves); the theoretical and practical significance and the value of the paper; and suggestions for further research on this topic.

Additionally, diversion or overinflation of budgeted capital expenditure due to corruption may contribute to this lack of significant impact.

Table 3. Long run results (Compiled by the authors)

Variable	Coefficient	Probability
GFCF	0.6127	0.0010***
EXP	0.5172	0.0008***
EMG	0.8016	0.5284
CG	0.1452	0.3681
CH	0.0416	0.0000***
GDS	0.7615	0.0005***
EMP	0.6149	0.003***
C	0.6765	0.8507***

*** connotes significance at 5%.

4.4. Short-Run Relationship and ECM Results

Table 4 presents the empirical results for the short-run relationship. The error correction term (-0.8623) is negative and significant, indicating the presence of at least a long-run causation from the independent variables to economic growth. The magnitude of the error correction term suggests that 86% of the short-run disequilibrium is corrected in the long-run. Additionally, the findings reveal that Gross Fixed Capital Formation, employment by the private sector, government consumption expenditure, household consumption expenditure, and private sector employment positively and significantly influence the short-run growth of the economy. Interestingly, exports and domestic savings are not found to be significant drivers of growth in the short-run in the South African economy. This observation is not entirely surprising, as savings alone are not expected to translate into growth; rather, the investment of savings fosters economic expansion (Jagadeesh, 2015).

Table 4. Short run results (Compiled by the authors)

Variable	Coefficient	Probability
GFCF	0.3577	0.000***
EXP	0.7512	0.0712
EMG	0.5480	0.5124
CG	0.4812	0.0003***
CH	0.0604	0.0000***
GDS	0.6312	0.6125
EMP	0.7986	0.000***
Coint Eq(-1)*	-0.823	0.0000***

*** connotes significance at 5%.

Table 5 presents the results of the Granger causality test. These findings provide evidence of bidirectional causality between Gross Fixed Capital Formation and economic growth, suggesting that investment and growth reinforce each other in the economy. Similarly, bidirectional causality is established between private sector employment and economic growth. Furthermore, unidirectional causality is identified between household consumption, savings, and exports. However, government expenditure on consumption and public sector employment has no causal relationship with economic growth.

Table 5. Pairwise Granger causality results (Compiled by the authors)

Variable	Prob	Direction
GFCF— GDP	0.0008	Bidirectional
EXP—GDP	0.005	Unidirectional
EMG—GDP	0.0701	No causality
CG—GDP	0.6779	No causality
CH—GDP	0.003	Unidirectional
GDS—GDP	0.012	Unidirectional
EMP—GDP	0.0001	Unidirectional

4.5. Diagnostic Examination and Structural Stability Testing

The ARDL model was validated using diagnostic tests, as outlined in Table 6. The findings indicate that the error term of the model follows a normal distribution and is devoid of serial correlation at the 5% level of significance. Additionally, the functional form results confirm the proper specification of the model. Furthermore, the stability of the NARDL models was verified using the cumulative sum (CUSUM) technique for recursive residuals. The model parameters are considered unstable if the lower and upper bounds do not fall between the blue lines, which is essential for model stability. The CUSUM for the models is depicted in Figure 1, where it can be observed that the blue lines fall within the crucial bounds, indicating the legitimacy and appropriateness of the models for drawing conclusions.

Table 6. Diagnostic test results (Compiled by the authors)

Test	Results	Probability
Serial Correlation	0.3710	0.6928
Normality	0.9107	0.6342
Heteroskedaticity	1.0663	0.3932
Functional Form	0.7716	0.4468

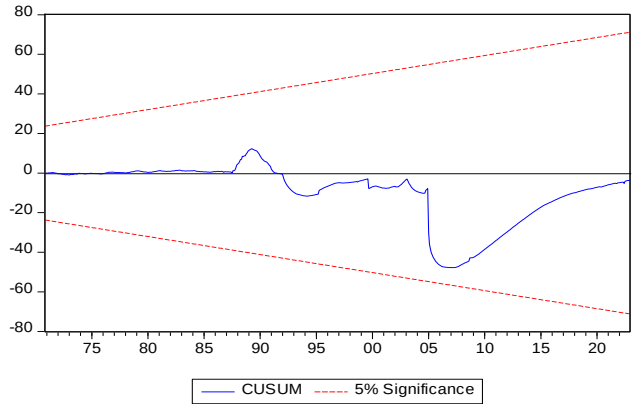

Figure 1. CUSUM of the models (Compiled by the authors)

5. Conclusion

South Africa, as one of the largest economies on the African continent and a prominent member of the BRICS economies, serves as a crucial model for the growth and development strategies of many African nations. Evaluating the determinants of economic growth in South Africa holds strategic importance not only for the country but also for the entire African region. This paper investigates the factors influencing economic growth in South Africa using quarterly data from 1967 to the second quarter of 2023, sourced from the South African Reserve Bank. The principal contribution of this study is the disaggregation of total employment into private and public sectors and the differentiation between household and government consumption expenditures. This refinement adds depth to the existing literature by underscoring the significance of the private sector to the growth process. Empirical findings from the Autoregressive Distributed Lag model (ARDL) reveal a long-run relationship between economic growth and the variables under investigation. Gross Fixed Capital Formation, exports, Gross Domestic Savings, and private employment exhibit significant positive impacts on economic growth, whereas government employment and consumption expenditure have no significant positive effects. The Error Correction Model (ECM) further confirms the long-run relationship among variables and establishes short-run positive impacts of gross fixed capital formation, household consumption, employment, and government expenditure on economic growth. Exports, savings, and public sector employment do not exert significant short-run impacts. Causality tests demonstrate bidirectional causal relationships between Gross Fixed Capital Formation and economic growth, and between private sector employment and economic growth. Unidirectional causality is observed between the remaining variables and economic growth, except for government consumption and public sector employment, which lack causal relations with economic growth in the South African context. Overall, the study underscores the importance of private sector development in driving growth and emphasizes the need for governments to create an enabling environment to stimulate growth. Additionally, the study recommends strengthening institutions to minimize corruption and ensure that government consumption expenditure positively impacts growth.

6. Limitations and Further Study

Given that South Africa operates as an open economy with extensive trade links worldwide, it is plausible that global economic shocks and uncertainty indices could significantly influence its growth trajectory. Future research on this topic might benefit from incorporating global economic shocks or uncertainty indices into the variables examined.

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Authors' Contributions

All authors equally contributed to all sections of the study.

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