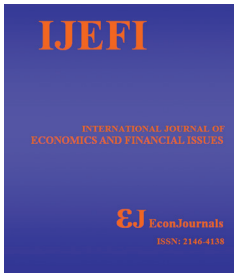

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The Effect of Government Expenditure and Private Sector Investment on the Agricultural Sector: A Comparative Analysis of South Africa and Namibia

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ABSTRACT

This study investigated the impact of government expenditure and private investment on the agricultural output of two countries in SACU, namely, South Africa and Namibia. The Autoregressive distribution lag model (ARDL) bounds test and Granger causality tests were applied on secondary data spanning the period 1990-2021 to test for the long run relationship and to ascertain if the Keynesian theory and the Wagner theory hold in the economies of the two countries. The Bounds test revealed a significant long-run influence of government expenditure in agriculture, private investment in agriculture and employment in agriculture in both countries. The ARDL test results showed that government expenditure has a positive influence on agricultural output, thus confirming that the Keynesian theory holds in South Africa while being insignificant in Namibia. Private investment showed a positive influence on agricultural output in both countries, thus confirming both the Keynesian and Wagner theories hold. Employment was found to positively influence agricultural output in South Africa, but was negatively related to output in Namibia. The study recommends that government agricultural sector spending should be increased yearly to reach the 10% threshold that is in line with the Malabo declaration.

Keywords: Agriculture, SACU, ARDL, Granger, Malabo declaration
JEL Classifications: C22, N50, N57, Q18

1. INTRODUCTION

Agriculture is important to both the South African and Namibian economies since it has the potential to eradicate poverty and extreme hunger. The significant contribution of agriculture has become one of the United Nations Sustainable Development Goals (SDGs), which aims at the eradication of poverty and extreme hunger by at least 2030 (Hambrey, 2017). However, a multitude of problems persist in the sector, thus making agricultural productivity and efficiency a priority towards ensuring a growing economy that can be able to support livelihoods (Jambo, 2017).

The introduction of the Sustainable Development Plan (SDP) by the African Union (AU) saw the need to adopt the initiative by the United Nations, and later introduced the Comprehensive African Agricultural Development Program (CAADP) in 2009. The 2002 Southern African Customs Union (SACU) agreement, as mentioned in Article 39 (agricultural policy), outlines that member countries recognise the importance of the agricultural sector to their economies and agree to work together to improve agricultural policies to ensure corresponding development in their respective agricultural sectors. The objective of the Comprehensive Africa Agriculture Development Programme (CAASP) was to improve food security and ultimately eradicate poverty (Benin and Yu, 2013). AU and the SACU nations pledged to increase government expenditure to at least 10% of GDP to achieve an estimated agricultural growth of 6%, which aligns with the Maputo Declaration of 2003. According to Jambo (2017), policymakers

have realised that agricultural spending has the potential to enable sustainable economic growth.

Agriculture is one of the sectors that most often than not, produce a trade surplus. For instance, in the year 2017, the consolidated surplus on agricultural products for SACU against the USA was calculated at $340 million (SACU, 2022). The agricultural sector also provides employment to the low-skilled labour force and has the potential to sustain livelihoods, as well as providing strong links to the rest of the economy (Mkhabela et al., 2022). Additionally, the sector boosts the country's foreign exchange reserves through its surpluses, provides raw materials for production and acts as a market for goods and services to other sectors. It can be noted that during the pandemic in 2020, the agricultural sector was the only sector that had a positive growth rate in the last quarter of 2020 in the Republic of South Africa. The data makes economic sense considering that agriculture was one of the sectors that remained fully operational during level four and five lockdowns in South Africa as a result of the global pandemic, COVID-19.

The contribution of the agricultural sector to Namibian and South African economies is often taken lightly because of its small contribution to gross domestic product (GDP) (Marson, 2025). However, agriculture is the backbone of both economies, and its contribution goes beyond its contribution to GDP. The sector has both backwards and forward links to the rest of the sectors of the economy. Moreover, the agricultural sector has proven that it is a money-spinning sector for investment and that it can be used to support economic growth (Tomšík et al., 2015; Jambo, 2017). Additionally, the sector can assist in achieving other macroeconomic objectives such as the creation of jobs, alleviating poverty and reducing the high rate of inequality in the SACU area. For the same reasons, the success of land reforms and changing Section 25 of the Constitution of South Africa is vital to achieving a more democratic society. Given the conduciveness of the environment within which the agricultural sector operates, it is assumed that the sector can continue to thrive and contribute to economic growth and ensure food security (Mkhabela et al., 2022). Ensuring the success of agriculture is to have a sensible and vital macroeconomic policy intervention that should be pursued in SACU and Africa at large. Thus, this paper investigates to what extent government expenditure and private sector investment in the agricultural sector affect the growth of output in both South Africa and Namibia.

This section discusses both the theoretical framework and empirical literature. Subsection 2.1 presents literature rooted in theories of government expenditure, specifically Keynesian and Wagner's theories. Subsection 2.2 reviews literature based on previous studies pertinent to this research.

2. LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1. Keynesian growth model

The notion of raising government spending to boost agricultural productivity is consistent with Keynesian theory, which holds that the state can raise spending to have an impact on economic activity. According to Keynes, government spending is an exogenous component that can be employed as a tool in policy formulation to improve performance. According to the Keynesian school of thought, the multiplier effect applies to an economy's productivity. The multiplier is therefore specified as:

$$Y = C + I + G\,(X\text{-}M) \quad (1)$$

where: Y = Output, C = Consumption, I =Investment, G = Government Expenditure, X-M = Net Export (Export minus Import).

The multiplier times the change in government spending is conceivable to impact macroeconomic performance and subsequently boost output growth by implementing an expansionary fiscal policy. In many developing countries, agriculture is a large share of GDP and employment, so boosting its output can have strong economy-wide effects. The African Union's Maputo Declaration explicitly calls for African governments to allocate at least 10% of their budgets to agriculture, reflecting the premise that adequate government investment is needed to transform the sector. In the context of Keynesian economics, such spending is meant to stimulate government expenditure and thereby increase economic activity. By increasing spending on agriculture in particular, a sector often plagued by market failures and underinvestment, governments can leverage the multiplier effect to achieve higher productivity and output. This Keynesian prescription of expansionary fiscal policy thus provides a coherent theoretical justification for using public funds to stimulate agricultural growth and, through it, the broader economy. In this case, government spending can stimulate economic activities vital for the economy (like the agriculture sector) to thrive since agricultural output depends on government spending on agriculture, private investment, and employment in the agricultural sector.

2.1.2. Wagner's theory

German economist Adolph Wagner, in the late 19th century, introduced the theory of expanding government participation, which presents a foundational framework in the analysis of government expenditure trends in economic growth. According to Wagner, a strong and systematic relationship exists between the level of economic growth and an increase in government spending. As nations undergo industrialisation and enjoy sustained increases in per capita income, the responsibilities and functions of government naturally grow, leading to a proportionate rise in government expenditure.

This theory is rooted in the assumption that economic growth inspires increased societal demand for critical public goods and services. Wagner argued that these demands are not merely a by-product of growth but a necessary outcome of the structural changes linked with economic transformation. Unlike Keynesian theory, which advocates that government expenditure can be used as a tool to inspire economic growth, Wagner's theory emphasises that it is economic growth that leads to increased government expenditure. In this view, government expansion is endogenous to the growth process and reflects the growing scope and scale of state functions in a modern economy.

Therefore, Wagner's theory holds relevance in the context where economic growth leads to sustained increases in national income and per capita income. It suggests that the rising demand for regulatory frameworks, public infrastructure, and social welfare mechanisms is an essential aspect of a developing economy. Consequently, understanding Wagner's perspective is crucial for analysing long-term trends in government expenditure, especially in economies undergoing structural transformation and pursuing inclusive development goals.

2.2. Empirical Literature

This section discusses key prior studies that are relevant to the methods and variables employed in this study and serve as foundational references for the empirical analysis. A significant body of literature has explored the relationship between the agricultural sector and economic growth, providing valuable insights that inform the current study.

Okpala et al. (2022) evaluated the impact of government spending on agriculture and agricultural output on Nigeria's economic growth from 1980 to 2014, finding a long-run relationship between the variables, with agricultural output significantly connected to GDP growth. Similarly, Olabisi and Adegboro (2025) revisited the nexus between the agricultural sector and economic growth in Nigeria. Their study found that agricultural output significantly contributes to economic development and emphasised the need for strategic and consistent government expenditure in the agricultural sector to ensure sustainable growth.

Intensifying this debate, Chandio et al. (2016) established in Pakistan that government agricultural expenditure significantly enhances agricultural output and economic growth, suggesting that targeted investments result in strong economic returns. Meanwhile, in Nigeria, Rita et al. (2020) strengthened these findings by showing that both recurrent and capital expenditures have positive effects on economic development. Ahmed et al. (2019) further reinforced the positive effect of public spending on agricultural technology and infrastructure, revealing a productive link to agricultural output in Pakistan. Moreover, Diyoke et al. (2017), using static panels and the GMM estimator, confirmed that government spending positively impacts economic growth in Sub-Saharan Africa.

Marson (2025) provided a continental viewpoint by evaluating public agricultural expenditure across 36 African countries. Using an instrumental variable approach, and found that aligning with the Maputo-Malabo target of allocating 10% of public expenditure to agriculture significantly reduces hunger, especially in countries with strong governance. Complementing this, Abdulrahman et al. (2025) highlighted the centrality of agriculture in poverty reduction policies in less developed countries, arguing for targeted support services, irrigation investments, and farmer assistance to expand agricultural output and economic resilience.

However, not all findings uniformly support the growth suggestion. Ngobeni and Muchopa (2022), in their investigation of South Africa, found that while government spending positively influenced agricultural production, private investment had a negative influence, conflicting with earlier studies like Benin et al. (2010), which emphasised the beneficial impact of private farm investment on productivity in Ghana. Jambo (2017) also warned that the composition of agricultural spending, mainly excessive funding for input subsidies and price supports in Zambia, can hinder broader sectoral growth if not complemented with creative investments.

Odhiambo (2015) provided added insights into the causality direction between government spending and economic growth, showing a long-run unidirectional causality from economic growth to government spending and a short-run bidirectional causality in South Africa. These mixed findings suggest that the effectiveness of government expenditure in agriculture depends not only on the extent but also on the structure and governance environment, making policy planning and implementation critically important.

3. METHODOLOGY

This section outlines the methodological framework employed to investigate the relationship between the agricultural sector and economic growth. The approach adopted is designed to ensure the robustness, validity, and reliability of the empirical results.

3.1. The Empirical Model

The study is quantitative and is based on secondary annual time series data spanning the period 1990-2021. Data was retrieved from the South African Reserve Bank (SARB) and, World Bank, which are freely accessible databases. For both countries, agricultural output is the dependent variable and is regressed against government expenditure, private sector investment and employment, all in the agricultural sector. The study adopts a single equation of the ARDL to specifically capture the determinants of agricultural output. Thus, the functional form adapted for this study becomes:

$$output_t = f(gov_t, emp_t, gfc_t,) \quad (2)$$

where:
$output_t$ = Agricultural output (dependent variable). gov_t = Government expenditure on agriculture (capital input). emp_t = Agricultural employment (labour input). gfc_t,= Private agricultural investment (capital input).

Therefore, equation 1 can be formally expressed as equations 2 and 3, representing South Africa and Namibia, respectively and are specified as follows:

$$logOutput_t = \alpha + \beta_1 logGov_t + \beta_2 logGcf_t + \beta_3 emp_t + \mu_t \quad (3)$$

$$logOutput_t = \Omega + \theta_1 logGov_t + \theta_2 logGcf_t + \theta_3 emp_t + \partial_t \quad (4)$$

where:

$logOutput_t$ representing agricultural output as the dependent variable, $logGov_t$ represents the logarithm of government spending

Table 1: Unit root test results for South Africa (ADF test)

Variables	Intercept		Trend and intercept		None		Conclusion
	ADF	PP	ADF	PP	ADF	PP	
Loutput	0.3156	0.2068	0.7421	0.5966	0.6221	0.1346	Non stationary
D (loutput)	0.0818*	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	Stationary
LGCF	0.6181	0.1813	0.4624	0.7884	0.9847	0.9992	Non stationary
D (LGCF)	0.0007***	0.0004***	0.0024***	0.0000***	0.0002***	0.0001***	Stationary
GOV	0.0697*	0.0635*	0.0410**	0.0323**	0.2609	0.2466	Non stationary
D (GOV)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	Stationary
EMP	0.4055	0.4469	0.0860*	0.9923	0.0000***	0.0029***	Non stationary
D (EMP)	0.0170**	0.0104**	0.0241**	0.0118**	0.0104**	0.0070***	Stationary

Source: Author compilation

Table 2: Unit root test results for Namibia (ADF test)

Variables	InterceSept		Trend and intercept		None		Conclusion
	ADF	PP	ADF	PP	ADF	PP	
Loutput	0.0402**	0.0470**	0.0860*	0.0860*	0.5723	0.6484	Non stationary
D (loutput)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	Stationary
LGCF	0.2647	0.2899	0.5066	0.5281	0.7107	0.7377	Non stationary
D (LGCF)	0.0000***	0.0000***	0.0001***	0.0001***	0.0000***	0.0000***	Stationary
GOV	0.0790*	0.0790	0.0611*	0.0646	0. 3871	0.4731	Non stationary
D (GOV)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	Stationary
EMP	0.2178	0.0046***	0.3623	0.9028	0.0074***	0.0001***	Non stationary
D (EMP)	0.0022***	0.0198**	0.0040**	0.0016***	0.0022***	0.0018***	Stationary

Source: Author compilation

Table 3: ARDL bounds test results for South Africa

Equation	F-statistic	K	Lower bound I0 AT 1%	Upper bound I1 at 1%	Outcome
$output_t=f(gov_t, emp_t, gfc_t)$	6.710348	3	3.65**	4.66**	Cointegration

Critical value bounds

Significance	Lower bound (0)	Upper bound (1)
10%	2.37**	3.2**
5%	2.79**	3.67**
1%	3.65**	4.66**

Source: Author's calculations, EViews 12

in the agricultural sector, $logGcf_t$ is the logarithm of private sector investment in the agricultural sector, emp_t represents employment in the sector $\beta_1, \beta_2, \beta_3, \theta_1, \theta_2, \theta_3$ represent the coefficients in both models with μ_t and ∂_t representing the error terms.

3.2. Methods

The study will test for the unit roots of the series using the Augmented Dickey-Fuller (ADF) unit root test (Dickey and Fuller, 1979) to determine the cointegration method to be employed. The study employs the bounds test to examine the long-run relationships between the variables, as proposed by Pesaran et al. (2001).

Following cointegration, the Autoregressive Distributed Lag (ARDL) approach is employed in this study to estimate the responses of agricultural output to changes in government expenditure, private sector investment, and employment, both in the long and short run, for South Africa and Namibia. The same ARDL model also helps generate the error correction term from the estimation of the ARDL model and is used to determine the speed of adjustment towards long-run equilibrium after a shock to the model.

In the study, the robustness of the models is tested by employing econometric tests, namely the Jarque-Bera test for normality, the Breusch-Pagan Godfrey LM test for heteroskedasticity and the ARCH LM test for heteroscedasticity. The CUSUM and CUSUM of squares are employed to test for the stability of the South African and Namibian models.

4. RESULTS AND DISCUSSIONS

EViews 12 statistical software was used to generate empirical results for this study. Time series analysis methods are employed in this section, including preliminary tests for stationarity, bounds test cointegration, along the ARDL model estimation for both countries and the associated diagnostic and stability tests.

4.1. Unit Root Test Results

Tables 1 and 2 show the unit root results for South Africa and Namibia, respectively. The analysis for South Africa demonstrates that the variables are integrated of the same order of integration I(1). As a result, the investigation disproves the null hypothesis that variables have unit roots at 1st difference. Given that all the variables are all I(1) for the model variables for South Africa and Namibia, the ARDL Bounds test methodology was applied since it can handle such precision as stated by Pesaran et al. (2001), and Nkoro and Uko (2016).

4.2. Cointegration Test Results

To examine the existence of a long-run equilibrium relationship among output, government expenditure, employment, and gross

Table 4: ARDL bounds test results for Namibia

Equation	F-statistic	K	Lower bound I0 AT 1%	Upper bound I1 at 1%	Outcome
$output_t=f(gov_t, emp_t, gfc_t)$	7.497874	3	3.65**	4.66**	Cointegration

Critical value bounds		
Significance	Lower bound (0)	Upper bound (1)
10%	2.37**	3.2**
5%	2.79**	3.67**
1%	3.65**	4.66**

Source: Author's calculations, E-views 12

Table 5: ARDL long run results for South Africa and Namibia

Variable	Coefficient	P-value
GOV		
SA	0.5234	0.0319**
NAMIBIA	0.2219	0.5165
LGCF		
SA	6.7952	0.0182**
NAMIBIA	0.2722	0.0747*
EMP		
SA	0.2688	0.0000***
NAMIBIA	−0.2511	0.0423**
C		
SA	−0.8086	0.3252
NAMIBIA	26.5121	0.0298**

Source: Author compilation E-views 12

Table 6: ARDL error correction model for South Africa and Namibia

Variable	Coefficient	P-value
CointEq(−1): SA	−0.6968	0.0000
CointEq(−1): NAMIBIA	−0.6154	0.0021

Source: Author compilation

fixed capital formation in South Africa and Namibia, the ARDL bounds test was employed. As outlined by Pesaran et al. (1997), this method is particularly suitable for small sample sizes and mixed orders of integration.

Confirming the presence of a statistically significant long-run relationship among the model variables, for South Africa, the calculated F-statistic (6.710348) in Table 3, exceeds the upper critical bound at the 1% level (4.66). This implies that output, government spending, employment, and gross fixed capital formation move together over time, emphasising the long-run sustainability of government interventions in the agricultural sector.

Similarly, in Namibia, a long-run cointegration among the same variables was found as presented in Table 4, confirmed by the F-statistic (7.497874), which is also significantly higher than the 1% upper bound. The robustness of these findings across the two countries provides strong empirical evidence that public investment, mainly in agriculture and capital formation, plays a sustained role in supporting national output.

These findings align with earlier literature, such as that by Marson (2025) and Chandio et al. (2016), which emphasises that targeted government expenditure on agriculture and infrastructure fosters long-run economic growth. The results further highlight those policies intended to increase government agricultural investment can have robust macroeconomic benefits in SACU countries.

4.3. ARDL Long-run Results

The ARDL long-run results in Table 5 reveal that for South Africa, the value of agricultural output and government spending on agriculture have a positive, significant long-term relationship. A rise of 1% in government spending on agriculture is expected to raise agricultural output by 0.52% and thus confirming the a priori expectation. However, for Namibia, the variables have an insignificant long-run relationship, indicating that output is not influenced by government spending.

The study demonstrates that private investment (LGCF) has a beneficial long-term influence on agricultural output in the South African agricultural sector. An increase of 1% in private investment is likely to raise output by 6.80%, and this is consistent with the a priori expectation. The same can also be said for Namibia, with a 1% rise in private investment leading to a 0.27% increase in output. The stark contrast in the result between the 2 countries may be due to the sheer size of their economies, with South Africa having an economy 31 times bigger than the Namibian economy; hence, it can theoretically afford more spending through government intervention and private investment into the agricultural sector.

The study reflects that there is a long-term, positive, significant association between agricultural employment and the value of agricultural output in South Africa, but a negative and significant relation in Namibia. Agricultural output would grow by 0.27% if agricultural employment were to rise by 1% in South Africa, but would decline by 0.25% in the Namibian agricultural sector. Both results are consistent with the a priori expectation based on the Keynesian theory.

4.4. Error Correction Model

The study's estimated ECMs are indicated in Table 6, and for both countries, the speed of adjustment towards long-run equilibrium is negative, as expected and significant at 1%. For South Africa, disturbances to the model would be corrected by about 69.68% each year, with 61.53% correction for Namibia. Both are very high speeds of adjustment values, indicating that full convergence will be quicker.

4.5. Diagnostic and Stability Tests

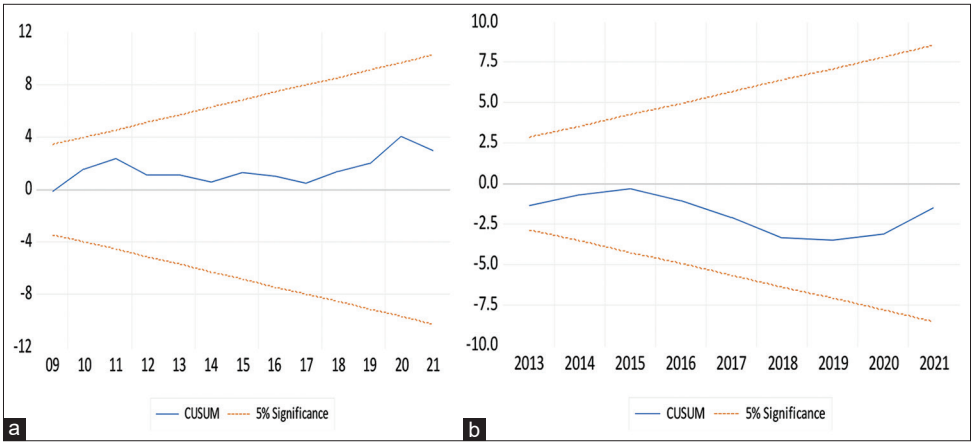
As indicated in Table 7, the Jarque-Bera test for normal distribution reveals that the residuals are normally distributed. The null hypothesis was rejected when the LM Test was employed to check for serial correlation, and it was discovered that there was none for both the South African and Namibian models. The ARCH Test was applied to determine if the variance of the errors was stable over time. The results conclude that neither model is heteroscedastic.

Table 7: Diagnostic test results for South Africa and Namibia

Test	Null hypothesis (H_0)	P-value	Decision
Jarque-Bera			
SA	Residuals are normally distributed	0.5897	Accept H_0.
NAMIBIA		0.2615	Residuals are normally distributed
Breusch-Godfrey LM test			
SA	No serial correlation	0.2876	Accept H_0.
NAMIBIA		0.3509	No serial correlation
ARCH test			
SA	No Heteroscedasticity	0.8321	Accept H_0.
NAMIBIA		0.6368	No Heteroscedasticity

Source: Author compilation E-views 12

Figure 1: Cusum test for (a) South Africa and (b) Namibia



Source: Author compilation E-views 12

For the entirety of the sample period, the parameters are estimated inside the critical lines of the 5% level of significance, and the results show that the models are stable, as shown in Figure 1.

5. CONCLUSION AND RECOMMENDATIONS

The study aimed to determine how government spending and private investment affected South Africa and Namibia's agricultural industry. Annual time series data from 1990 to 2021 were used to accomplish this. The study sought to determine if public and private spending would raise the level of agricultural produce and boost employment in the agricultural industry, thus enabling policymakers in both countries to determine if they would be able to achieve the SDGs set by the UN. Only in South Africa was it determined that government intervention could grow and advance the agricultural industry.

The study recommends an improvement of at least 10% of the state revenue in both countries to be allocated to agriculture and be in line with the CAADP goals. This will help to maintain increased agricultural productivity, thus simultaneously ensuring food security for the poorer communities and society as a whole. Private investment in the sector showed a significant positive impact on the agricultural sector. The results concur with the literature stating that private investment and public investment are important for the growth of the economy. Therefore, the study recommends effective policies and adequate regulations that will ensure a conducive environment for both private and public investment. Employment was found to influence output positively in South Africa but negatively in Namibia. Since both countries also have a high percentage of unemployment (including high youth unemployment), the study recommends that policymakers in both countries formulate policies which encourage greater investment in the sector so that employment can be stimulated. Also, there should be programmes to skill the youth to work in the agricultural sector while ensuring that there are specific regulations dealing with minimum wages and exploitation. With all the recommended interventions, social development can be fostered and unemployment, poverty and inequality can be reduced.

REFERENCES

Abdulrahman RR, Salih AM, Hussein HHS, Aivas SA, Ahamd KH, Fatah NA, Karem LE, Yaqub KQ, Hakar, Bayz, B. (2025) The role of agriculture sector in eradicating poverty: challenges, policies, and pathways for economic growth in less developed countries, International Journal of Social Science and Education Research Studies, 5, 208-213.

Ahmed, T., Khan, K.S., Naeem, M. (2019), The effect of public spending on agricultural growth: Evidence from 1972 to 2014 in Pakistan. Sarhad Journal of Agriculture, 35(2), 349-357.

Benin, S., Kennedy, A., Lambert, M., McBride, L. (2010), Monitoring African Agriculture Development Processes and Performance: A Comparative Analysis. In: Annual Trends and Outlook Report.

Benin, S., Yu, B. (2013), Complying with the Maputo Declaration Target: Trends in Public Agricultural Expenditures and Implications for

Pursuit of Optimal Allocation of Public Agricultural Spending. In: ReSAKSS Annual Trends and Outlook Report.

Chandio, A.A., Jiang, Y., Rehman, A., Jingdong, L., Dean, D. (2016), Impact of government expenditure on agricultural sector and economic growth in Pakistan. International Journal of Advanced Biotechnology and Research, 7(3), 1046-1053.

Dickey, D.A., Fuller, W.A. (1979), Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74(366a), 427-431.

Diyoke, K., Yusuf, A., Demirbas, E. (2017), Government expenditure and economic growth in lower middle income countries in Sub-Saharan Africa: An empirical investigation. Asian Journal of Economics, Business and Accounting, 5(4), 1-11.

Hambrey, J. (2017), The 2030 Agenda and the Sustainable Development Goals: The Challenge for Aquaculture Development and Management. FAO Fisheries and Aquaculture Circular no C1141.

Jambo, N. (2017), The Impact of Government Spending on Agricultural Growth: A Case of Zambia, Malawi, South Africa and Tanzania [Doctoral Dissertation].

Marson, M. (2025), Effects of public expenditure for agriculture on food security in Africa. Empirical Economics, 2025, 1-32.

Mkhabela, T., Ntombela, S., Mazibuko, N. (2022), An economy-wide impact assessment of agriculture land reform in South Africa. Cogent Social Sciences, 8(1), 2137314.

Ngobeni, E., Muchopa, C.L. (2022), The impact of government expenditure in agriculture and other selected variables on the value of agricultural production in South Africa (1983-2019): Vector autoregressive approach. Economies, 10(9), 205.

Nkoro, E., Uko, A.K. (2016), Autoregressive distributed lag (ARDL) cointegration technique: Application and interpretation. Journal of Statistical and Econometric Methods, 5(4), 63-91.

Odhiambo, N.M. (2015), Government expenditure and economic growth in South Africa: An empirical investigation. Atlantic Economic Journal, 43(3), 393-406.

Okpala, C.M., Nwaolisa, E.F., Chijindu, A. (2022), Agricultural credit guarantee scheme fund, government expenditure on agriculture and agricultural output in Nigeria 1990-2020. The International Journal of Research and Innovation in Social Science, 6, 859-867.

Olabisi, O.E., Adegboro, M. (2025), Revisiting agricultural sector nexus economic growth in Nigeria. Journal of Academic Research in Economics, 17(1).

Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Pesaran, M., Shin, Y., Smith, R. (1997), An Autoregression Distributed-Lag Modelling Approach to Cointegration Analysis. In: Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium. Vol. 1. p1-33.

Rita, C.N., Chineze, N.D., Uche, O.M. (2020), Impact of Government Expenditure on Agriculture on Agricultural Sector Output in Nigeria (1981-2018). International Journal of Agricultural Policy and Research, 4, 15-26.

SACU. (2022), SACU Member States Country Profiles, SACU Investment Roundtable. Southern African Customs Union, SACU Secretariat. Windhoek: SACU.

Tomšík, K., Smutka, L., Lubanda, J., Rohn, H. (2015), Position of agriculture in Sub-Saharan GDP structure and economic performance. Agris On-Line Papers in Economics and Informatics, 7(1), 69-80.