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EFFECT OF GOVERNMENT AGRICULTURAL EXPENDITURE ON ECONOMIC GROWTH: EVIDENCE FROM A DEVELOPING COUNTRY

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Abstract: Fiscal policy has been used by various governments to promote economic growth. The effectiveness of government expenditure on economic growth depends on recipient sector of government expenditure. This study contributes to this research area by investigating the effect of government agricultural expenditure on economic growth in the Kingdom of Lesotho. The government of Lesotho identified the agricultural sector as a productive sector that is central to the achievement the economic growth goal and development plan. Descriptive statistics and inferential econometric techniques (ARDL, DOLS and VEC Granger causality) over time-series data for the period 1982-2019 were utilized in this study. The results suggest that while current level and pattern of government agriculture expenditure cannot stimulate the desired economic growth and prosperity in the country, domestic investment appear to be a stimulant of the desired economic prosperity. Consequently, any economic growth policy or strategy that is premised on government agricultural sector expenditure would fail. Thus study recommends that countries including Lesotho should prioritize sustained increase in domestic investment.

JEL Classification: H50, Q14, O10
Keywords: Government Expenditure, Agriculture Sector, Economic Growth, Keynesian Hypothesis

1. Introduction

Economic growth is generally agreed as a necessity or a prerequisite for the achievement of economic development, it is a macroeconomic goal that every government strives to achieve and sustain. According to Haseeb et al., (2019),

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economic growth is the rise in the value and quantity of goods and services produced within a geographical territory over time. Economic growth reflects how healthy or vulnerable to shocks an economy is, as well as the size and productive capacity of a country. Economic expansion in the form of economic growth is important because it improves living standard and reduces poverty level through higher per capita income. Likewise, sustained economic growth improves government finances through lowering of government borrowing, higher tax revenue, increased government investment and expenditure in productive and social sectors (e.g. health and education), and lowers unemployment amongst others. The capability of an economy to attain and sustain its' growth depends on the viability and productivity of individual sectors in the economy and type of economic policies that is being implemented. One of the economic policies used by various government of the world for the realization of several macroeconomic targets (including economic growth) and economic stabilization is fiscal policy (Onifade et al., 2020).

Public expenditure, as one of the fiscal policy tools has been used by governments of the world to regulate the economy which comes through budgetary expansion or contraction that moderate private sector demand and expenditure (Ahuja and Pandit 2020), maximize economic wellbeing (Tanzi and Zee, 1997; Pula and Elshani, 2018), and ensures redistribution (Atkinson and Stiglitz, 2015), a perspective that is in line with the Keynes postulation on government expenditure and economic growth relationship. Pula and Elshani (2018) further emphasize that government expenditures are imperative because they aid the provision of public goods and correction of imperfections and failures of the market economic system. However, while some empirical literatures have validated the Keynes theory by demonstrating a positive effect of government expenditure on growth, unidirectional causal relationship from government expenditure to economic growth and bidirectional causal relationship between both economic variables (Diyoke et al. 2017; Sedrakyan and Varela-Candamio, 2019; Campo and Mendoza 2018; Ho and Iyke 2020; Ahuja and Pandit 2020; Natarajan et al., 2022; Le 2020; Gurdal et al., 2021), others (Sáez et al. 2017; Thabane and Lebina, 2016;Olaoye et al., 2020; Sedrakyan and Varela-Candamio, 2019) negated the Keynes theory in their study by upholding Wagner's rule only or finding no significant relationship between government expenditure and economic growth. Apparently there is an inconclusiveness regarding government expenditure and growth relationship, which could be as a result of dissimilarity in aim, source of financing, size, income level of country and recipient sector of government expenditure (Amusa and Oyinola, 2019; Arestis et al., 2021; Lupu et al., 2018; Selvanathan et al., 2021; Sedrakyan and Varela-Candamio, 2019).

In term of sectoral contribution to economic growth and effect of sector level expenditure, the agricultural sector is a sector that is unarguably important for economic growth and development, especially among developing economies. This is based on the Rostow stages or sequences of growth which identified the traditional, extractive, and primary sector specifically agricultural sector as a necessary and precondition sector for take-off and economic growth. Ruttan (1965) did buttress that the agriculture sector is expected to provide food for a rapidly increasing population, promote demand for products targeted towards the agricultural sector needs from emerging manufacturing and ICT sectors, and through agricultural export foreign earnings provide necessary capital investment for the economy. Hence, over the years, the sector has been identified to be a contributor to

employment of large labour force, food security, foreign exchange earnings, rural development, and economic transformations (Maïga et al, 2021; Ebenezer et al., 2019). Likewise, according to Anríquez and Stamoulis (2007), the agricultural sector has both forward linkage (e.g. agricultural and food processing industries servicing the hospitality sub-industry like restaurant and hotel industries) and backward linkage (e.g. sub-industry that produce animal feed and fertilizer with the chemical and mineral industry for agricultural sector use), as well as rural-urban linkages, agricultural and non-agricultural activities (FAO, 2020) that make the agriculture sector essential for economic growth and development. The sector is still recognized as key to the realisation of the Sustainable Development Goals (SDGs), and most especially for post-Covid-19 economic recovery and livelihood.

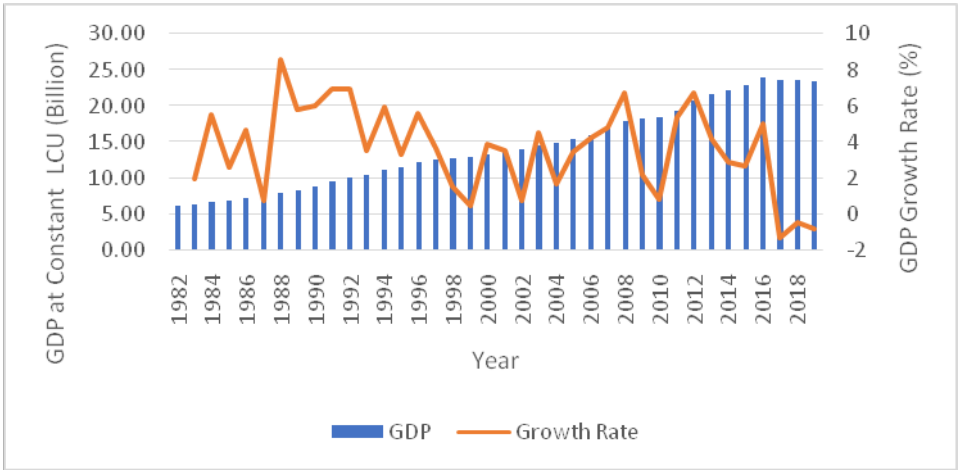
With respect to the agricultural sector, Mogues et al., (2015) and Armas et al., (2012) argued that the need to correct externalities, address market and information asymmetries (with regard to agricultural research and development, technology generation and adoption, and regulations), distribute goods and services that are biased against the majority of rural-based agriculture-dependent people provide a rationale for involvement of government in the agricultural sector. Also, in reaffirming the significance of the agricultural sector in attaining the continental vision of shared prosperity and better-quality livelihoods through accelerated agricultural growth and transformation and emphasizing the need for government expenditure in the agricultural sector, head of governments in Africa adopted the 2003 Malabo Declaration on Accelerated Agricultural Growth and Improved Livelihoods and Transformation for Shared Prosperity. A commitment to spending a minimum of 10 percent of total government expenditure to the agricultural sector is one of the highlights of the 2003 Malabo agreements. According to Pernechele et al., (2021), investment in agriculture is a driver of both economic and social development, respectively. The extent to which the agricultural sector can perform optimally and contribute to economic growth varies and depend on issue like government expenditure in the sector. Considering the multiple challenges facing the agricultural sectors in Africa including Lesotho in form of climate change, land fragmentation, global pandemic (Covid-19), obsolete farm technologies and farm management practices, inadequate access to irrigation, limited technical know-how, and farming infrastructure, and restricted access to financial credit facilities, this study aim to answer the research question that is current level of government involvement in the sector sufficient in achieving targeted macroeconomic goals? This study analyses the impact of government agricultural sector expenditure on economic growth in Lesotho. The rest of the article is arranged as follows, section 2 presents stylized fact about Kingdom of Lesotho, section 3 provides a review of related empirical literature while section 4 presents the methodology which entail data source and analytical techniques adopted in the study. Results and discussion are presented in section 5, while conclusions and recommendations follow in section 6.

2. Stylized Fact about Kingdom of Lesotho

Lesotho is a small and developing landlocked country that is bordered by South Africa. The economic growth rate of Lesotho has been fluctuating and undesirable in recent times, such that the growth rate has been less than 5

percent. Specifically, the annual GDP growth rate of the country stands at 2.34 percent on average during the period 2012-2019.

Figure 1: Trend in Kingdom of Lesotho GDP and GDP Growth

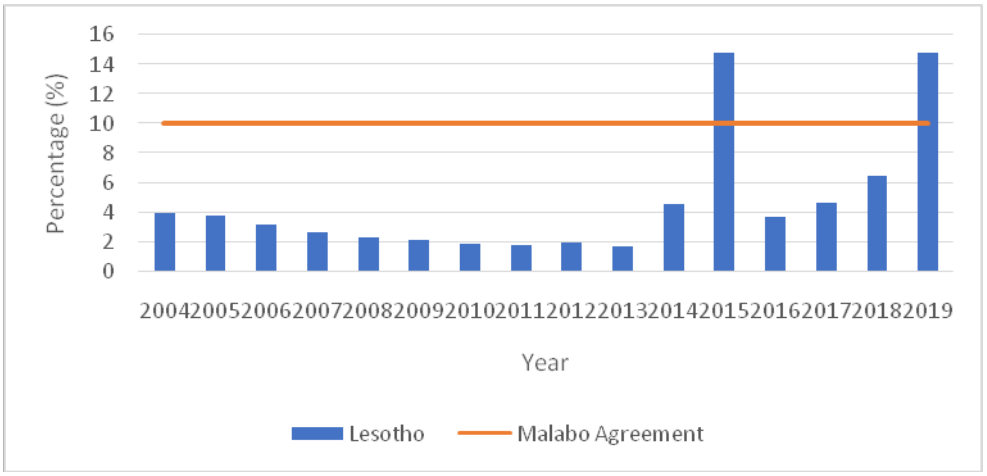


The Kingdom of Lesotho's agricultural sector is observed to be indispensable for the country's economy. Especially in a situation where about 60 percent of the general population reside in countryside, and whose welfare is dependent on their engagement in agriculture either directly or indirectly, and thereby making improvement and growth critical for reduction in poverty situation (World Bank, 2019). Besides, the 1980s performance of sector (the most important sector accounting for 15.2% of GDP) before its' recent low performance indicate that the sector can still salvage the country's economy. Considering the potential of the sector in promoting food security, reducing poverty and aiding economic development in general, the Government of Kingdom of Lesotho positioned the agricultural sector alongside other three productive sectors that is essential to the achievement of laid out goals in the recent National Strategic Development Plan (NSDP) II 2018/19–2022/23, hence making efforts to develop the sector. The capacity of a sector to function as expected however depends on the extent of involvement of either the public or private sector with respect to financing and investment.

Regarding public sector involvement in the agricultural sector, Lesotho is one of the Africa countries that subscribed to the Comprehensive Africa Agriculture Development Programme (CAADP) agreement of government devotion of 10% of total national expenditure to the agricultural. The level of commitment of the country to the 2003 CAADP Malabo agreement is graphically presented Figure 2. Between the year 2004 and 2019, the share of government agriculture expenditure in total government expenditure ranges between 1.72 percent in 2013 and 14.781 percent in 2019. There was a consistent decrease in the share of government expenditure from 3.99 percent in 2004 to 1.72 percent in 2013, it however rose to

14.780 percent in 2015 A reduction in the share of government agricultural expenditure is further observed in the year 2016 to 3.75. Nonetheless, a sustained increased his seen in the years 2017, 2018 and 2019 respectively.

Figure 2: Graphical Representation of Level of Commitment to 2003 CAADP Malabo Agreement



The Figure 2 presenting a graphical representation of alignment or commitment of Government of Lesotho to CAADP Malabo agreement, clearly show that out of the sixteen years of the commitment to the agreement Lesotho was able to meet the target in the years 2015 and 2019 only, respectively. Hence, it can be said that Lesotho has not been able to adequately meet with the Comprehensive Africa Agriculture Development Programme (CAADP) requirements or priority performance metrics of devoting 10% of total national expenditure to agriculture. This trend is however not only familiar to Lesotho, Pernechele et al., (2021) noted that several other Sub-Saharan African countries have not reached the target of allocating 10 percent of national budgets to agriculture. According to Pernechele et al., (2021) this is a result of financial constraints such as burden of debt repayment and weak revenue growth and unmonitored expenditure in the sector.

3.Literature Review

Economic Growth and Government Expenditure: Theory

Theoretically, the link between government expenditure and growth can be deduced from, views, theories, and models of various economic schools of thought that have been put forward in the economic field. These the Neoclassical Growth Theories, Endogenous Growth Theories, Wagner's law along with the Keynes postulation. The neoclassical growth model posits that upsurges in labour quality and quantity (through education and population growth), improved technology and

increases in capital (through investment and saving), are factors that stimulate economic growth. Barro (1996) further argued that, eventually economic growth would be exogenously determined by human capital and technology (in the form health, experience and education). The neoclassical position is however deficient in that it did not make provision for institutional factors and public policy including government expenditure in prompting economic growth (Petchko, 2018; Bassanini and Scarpetta, 2001). This short-coming motivated the development of Endogenous growth theories also known as the new growth theories (Petchko, 2018; Mankiw, 2013) which posited that economic growth is generated by factors within the production process, such as increasing returns or induced technological change (Todaro and Smith, 2015). Here, technology is considered to be endogenous due to its reliance on research and development investment decision and extent of diffusion (Petchko, 2018; Bassanini and Scarpetta, 2001). Cortright (2001) noted that Endogenous growth theories posits that long period knowledge-based economic growth is a result of increasing return to scale in technological development. The theory relaxes the proposition of exogenous savings and capital formation of Solow (1956) and institutional dynamics that could shape economic growth related policies (Bassanini and Scarpetta, 2001). Petchko (2018) citing Barro (1996) maintained that growth rates differences among countries arise from variances in saving propensity, technology access, and government policy. Such that any government that increases its' expenditure to alleviate distortions in market, ensures secured right to own property, provides infrastructural facilities, and ensure financial markets improvement would generate efficiencies that translate into desirable growth than government that does otherwise (Petchko, 2018).

Wagner's law posits that as the economy expands through time, government's operations and functions expand. An increase in government expenditure is here seen as indispensable for a developing and progressive economy (Ansari et al., 1997). As it is observed, that social, security and administrative functions of government and expenditure to meet these functions increases as an economy expands. The financing of these expanding functions is however premised on the growth of the economy (Peacock and Wiseman, 1961), because economic growth is an indication of more revenue for the government. Hence, government expenditure is rather considered as an outcome or endogenous variable, caused by growth in national income in Wagner's law. Keynes on the contrary argued that total income of an economy, depends on the spending patterns of economic agent (that is government), in the short run. Keynes postulated that the increase in government expenditure will increase output, a unidirectional causation from government expenditure to economic growth. Thus, government expenditure is considered as an independent and exogenous factor, and a fiscal policy tool to stimulate growth (Peacock and Wiseman, 1961; Gatsi et al., 2019). Here, government spending is seen as one of the components of aggregate demand, any rise in it will raise aggregate demand, and because of the multiplier effect potential could lead to increased employment and output, respectively.

Government Expenditure and Economic Growth: Empirics

Literature that has empirically studied economic growth and government expenditure interaction are abundant. These literatures have been examined from different perspectives including aggregate expenditure vs. growth perspective,

disaggregated expenditure vs. growth perspective, and specific sector expenditure vs growth perspective. This section presents review of relevant literature from aggregate expenditure vs growth perspective, disaggregated expenditure vs. growth perspective, and agricultural sector expenditure vs. growth perspective. From and aggregate expenditure perspective, Odhiambo (2015) established a bidirectional short-run causality between government expenditure and economic growth and a long-run period unidirectional causality from economic growth to government expenditure in South Africa through Granger Non-Causality Test. Ho and Iyke (2020) applied the ARDL testing procedure to investigate the determinants of economic growth in Ghana. It was found that government expenditure only influences economic growth in the short-run. Similarly, Diyoke et al. (2017) investigated the impact of government spending on economic growth in among Sub-Saharan African countries (SSA) for the period 1980 to 2015 and applying both static panels and Arellano and Bond (1991) GMM estimators. The findings revealed that the government spending have a significant positive impact on the region's growth. Campo and Mendoza (2018) studied the impact of public spending on regional GDP in 24 Colombian departments to see whether Keynesian or Wagnerian approaches are valid in the country. The findings reveal that public spending has a large and positive effect on GDP, which is consistent with the Keynesian approach and supports the concept that more public spending contributes to economic growth. Related conclusion was found in the studies of Ahuja and Pandit (2020), Gurdal et al., (2021) and Le (2020). However, Sáez et al. (2017), Thabane and Lebina (2016) and Olaoye et al. (2020) reported contrary evidence in this regard.

Similarly, Chu et al., (2020), Amusa and Oyinola (2019), Ndubuisi (2018), Garoma and Bersisa (2018), Selvanathan et al., (2021), Arestis et al., (2021), Lupu et al., (2018), Mazorodze (2018) demonstrated using various analytical techniques that effect of government expenditure on growth depends on the sector recipient or functional component of government expenditure. In relation to government agricultural expenditure and economic growth Shuaib et al. (2015), Ebenezer et al., (2019), and Dkhar and De (2018) showed that government expenditure on agriculture does influence agricultural productivity and economic growth positively in Nigeria, South Africa and Russia, respectively. Furthermore, evidence from empirical literature further show that several macroeconomic factors besides government expenditure influence the level of growth in an economy, the extent of their influences however differs across countries, regions, and income groups. Some of these factors include but not limited to; foreign direct investment (Wang et al., 2021), international trade (Nguyen, 2020), human capital development (Ogundari and Awokuse, 2018), financial development (Ruiz-Vergara, 2018), energy consumption (Salari et al., 2021), tax (Stoilova, 2017), inflation (Nyambe and Kanyeumbo, 2015) and domestic investment (Meyer and Sanusi, 2019; Aslan and Altinoz, 2021; Gyimah et al., 2022; Wani, 2022) among others.

4.Methodology

Model Specification

The empirical model specified in investigating the effect of government agriculture sector spending on economic growth which is the second objective of this study, is premised on the Keynesian hypothesis that government spending is a

fiscal policy tool often utilized to induce consumption and production of goods and services, and on the study of Selvanathan et al., (2021) which re-examined Wagner and Keynesian hypothesis relating to sector level spending of government and economic growth in Sri Lanka. The mathematical representation of relationship between government agricultural expenditure and economic growth in the Kingdom of Lesotho is presented in equation (1).

$$lnGDP = \delta_0 + \delta_1 lnGEA + \mu \dots\dots\dots\dots\dots\dots\dots\dots (1)$$

However, to avoid limitations related to bivariate models, a moderating variable was introduced, which is reflected in equation (2).

$$lnGDP = \delta_0 + \delta_1 lnGEA + \delta_2 lnDI + \mu \dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Description of Variable

Economic Growth can be defined as a long-term increase in a country's capacity to deliver increasingly diverse economic commodities to its population, which it is made possible by an increase in gross domestic product (GDP). GDP measures the total value of the final use of output produced by an economy, by both residents and non-residents (Nnadozie and Jerome, 2019). In this study, the variable economic growth is the dependent variable, and it is proxied by real gross domestic product (GDP). **Government Agricultural Expenditure (GEA)** are transfer made from the government to economic agents (producers and input suppliers), for general support for agricultural infrastructure, R&D and extension services, marketing, storage, or inspection facilities, among others, and administrative costs (that cost linked to policy formulation and coordination and running costs of ministries and other public entities (Pernechele et al., 2021). Based on the Keynes postulation and previous studies (Dkhar and De, 2018; Tijani et al., 2015; Shuaib et al., 2015), this study posits that government agricultural expenditure would have a positive effect of economic growth. **Domestic Investment (DI)** is an essential component that can enable economic growth (Overseas Development Institute, ODI, 2016). It is defined as the sum of investment that support and promote industrial growth in an economy and by extension promote industrialization by stimulating aggregate demand and boosting productive capacities (Haraguchi et al., 2019; Weiss and Clara, 2016). Higher domestic investments play a key role in sustaining the development of the local industry, fostering structural transformation and therefore become a pre-requisite for long-term growth (Cornia and Martorano, 2012; Haraguchi et al., 2019). The variable is included in this study in line with past studies (Meyer and Sanusi, 2019; Aslan and Altinoz, 2021; Gyimah et al., 2022; Wani, 2022). The variable is proxied by gross fixed capital formation and it is expected that the variable will have a positive relationship with economic growth.

Data Source and Sample

In line with the objectives of this study and variables presented in the mathematical representations in equations (2), secondary data on gross domestic

product (GDP) at constant prices, government agricultural expenditure, and gross fixed capital formation were sourced from the World Bank Group website and Regional Strategic Analysts and Knowledge Support System (ReSAKSS) website-www.resakss.org, respectively. The time series data used for this study is from the period 1982-2019.

Analytical Techniques

Both descriptive and inferential analytical technique was employed in this study. Descriptive statistics such as mean, median, standard deviation, and tables were used in describing the variables used in this study. A graph was also used in addressing the first objective of the study. Also, in econometric analysis, it is necessary to know the stationarity properties of variables being used. Stationarity test is used to detect variations that may arise to avoid the problem of spurious regression. Any variable that is not stationary at its levels form is expected to be stationary at its' first differenced form. In this study the stationarity properties of variables were examined using the Philip-Peron test. The decision rule is that we reject the null hypothesis of non-stationary if $T_t < T_{critical}$ and accept null hypothesis of non-stationarity if $T_t \geq T_{critical}$. If the variables are integrated in same order or in a mixed order not beyond I(1), a long run relationship among the variable could be considered using VECM or ARDL respectively. This study however chose to utilize ARDL cointegration technique.

The ARDL-Bound estimation technique is utilized in this study to analyze the long-term relationship between variables through ARDL model, in terms of establishing the existence of a cointegration relationship among economic model variables in a model or not. Cointegration often refers to the fact that two or more series share a stochastic trend (Stock and Watson), it focuses on whether there is a long-term linear relationship between two or more-time series. An ARDL Bounds test for cointegration proposed by Pesaran and Shin (1999) is applied in this study in order to ascertain the existence of a long-run relationship among the variables under consideration in model in equation (3) or not.

$$\Delta lnGDP_{nt} = \delta_0 + \sum_{i=1}^{n} \delta_{1i} \Delta lnGDP_{t-i} + \sum_{i=0}^{n} \delta_{2i} \Delta lnGEA_{t-1} + \sum_{i=0}^{n} \delta_{3i} \Delta lnDI_{t-i} + \delta_4 lnGDP_{t-1} + \delta_5 lnGEA_{t-1} + \delta_6 lnDI_{t-1} + \varepsilon_{1t} \dots\dots\dots\dots\dots (3)$$

The bounds test decision rule is that the value of the F-statistics should be higher than the lower I(0) and upper I(1) bounds, respectively to establish a cointegrating relationship or otherwise. If an existence of cointegrating relationship is confirmed between dependent and independent variables, then the estimation and determination of the size of effect of the independent variables on the dependent in both the long-term and short-run is conducted through ARDL model.

$$\Delta lnGDP_{nt} = \delta_0 + \sum_{i=1}^{n} \delta_{1i} \Delta lnGDP_{t-1} + \sum_{i=0}^{n} \delta_{2i} \Delta lnGEA_{t-1} + \sum_{i=0}^{n} \delta_{3i} \Delta lnDI_{t-1} + \gamma_{1i} ECM_{t-1} + \varepsilon_{1t} \dots\dots\dots\dots\dots (4)$$

where $\delta_1 - \delta_3$ are long-run coefficients; and ε is the white noise error term.

The advantages of the ARDL estimation technique over other long-run cointegration test techniques motivated for its' adaption in this study. ARDL technique is programmed to allow estimations regardless of the combination of order of integration of series in the model which should not be above an order of one. ARDL can estimate both short-run and long-run dynamics simultaneously, and it is useable when sample appear to be small (Pesaran et al., 2001; Ewetan et al., 2020, Ho and Iyke, 2020).

5. Results and Discussion

The findings are presented in this section.

Table 1: Summary of Descriptive Statistics of Variables

	GDP	GEA	DI
Mean	143000000	49451 000	3390000000
Median	13600000000	37856 000	3020000000
Maximum	24000000000	212934 000	8530000000
Minimum	6270000000	18721 000	1730000000
Std. Dev.	5670000000	0.033803	2380000000
Observations	38	38	38

Source: Authors' Computation

The statistics show that the gross domestic product of Lesotho has averaged $143 million over the sampled period. The minimum amount of the gross domestic product was $6.27 billion, and the maximum amount was $24 billion. The statistics also shows that government agricultural expenditure of Lesotho has an average of $49 million over the sampled period, while the minimum agriculture sector expenditure recorded is $19 million the maximum was $213 million recorded in the years 2011 and 2019, respectively. The statistics also show that domestic investment of Lesotho has a mean of $3.39 billion, the minimum amount of domestic investment was $1.73 billion, and the maximum amount was $8.53 billion.

Unit Root

The result of the unit root test for stationarity conducted using the Phillips-Perron test is presented in Table 2. The result showed that some variables were non-stationary and other stationary in levels. Those that were not stationary become stationary after first difference. For example, Log of GDP, GEA and DI are integrated of order one I (1), The mixture of I(0) and I(1) variables validates the use of ARDL estimation techniques in this study.

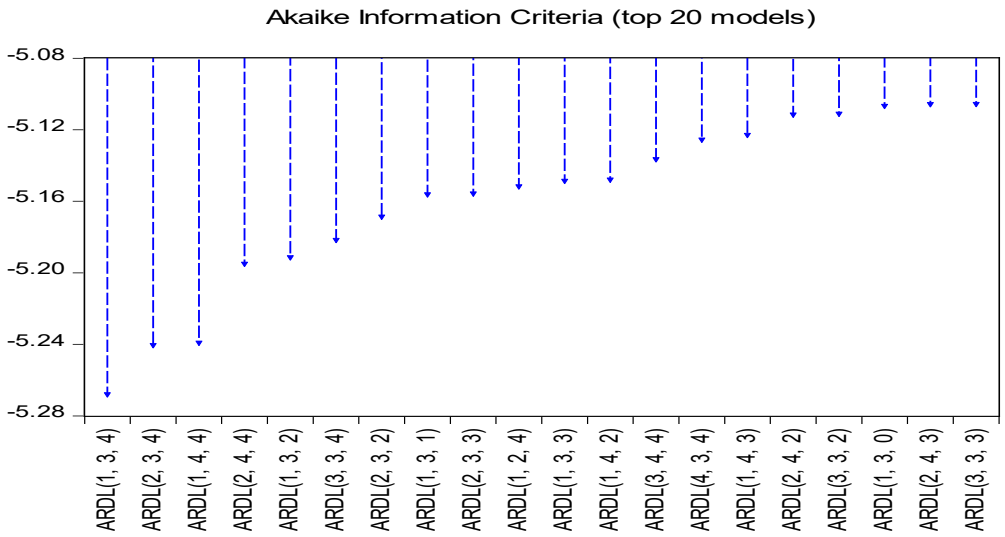
Table 2:Phillip-Perron Unit Root Test Result

Variable	Level	First Difference	Decision
lnGDP	-2.0808	-4.2659*	I(1)
lnGEA	-0.5116	5.5907*	I(1)
lnDI	-2.2211	-4.9025*	I(1)

*Source: Authors' Computation; Note: * indicate the level of significance at 1%.*

Determining the order of lag structure is first conducted before the establishment of long-run relationship or not, and before the short and long-run ARDL model estimation. This is imperative to avoid estimation error arising from lag length under or over in over estimation. Schwarz information criteria (SIC) and Akaike information criteria (AIC) and are the most often used lag selection approach. The best model is provided from a lower SIC or AIC values. Hence, the optimal lag structure in this study was found by using the Akaike Information Criterion. The Akaike Information Criterion graph reflecting the optimum lag structure is presented in figure 2. From the figure, the selected optimal lag structure for the ARDL estimation is ARDL (1, 3, 4) for the equation 1.

Figure 3: Akaike information Criteria (AIC)



Cointegration Test Result- Bound Test

From Table 3, It can be seen that the F-statistic computed is greater than the upper bound value at 10 percent, 5 percent and 2.5 percent levels of significance for this model. It is therefore concluded that there is a long run relationship among the variables in this model.

Table 3: ARDL Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	17.435	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Long-run and Short-run Estimate of Effect of Government Agricultural Expenditure on Economic Growth

In the long run, the coefficient of government agricultural expenditure is negative and significant, this implies that 1 percent increase in government agricultural expenditure will lead to a reduction in gross domestic product by 0.296 percent. This contradicts the 2003 Malabo position that agricultural expenditure is expected to influence growth positively. This is consistent with Thabane and Lebina (2016) who established that government expenditure cannot drive growth in Lesotho. This can however be justified by the fact that in most cases, fund allocated to the agricultural sector in Lesotho are either misappropriated or embezzled. Equally, Mudaki and Masaviru (2012) established a negative relationship between agricultural expenditure and growth for Kenya, which is argued to be fallout of no mechanized farming system. This situation arises when expenditure is not in a subsector that has multiplier effect for economic growth, as a result the spending is essentially ineffective for the pursuance of economic growth. However, this result is inconsistent with Shuaib et al., (2015) and Selvanathan et al., (2021) who both found a positive relationship between agricultural expenditure and growth in Nigeria and Sri Lanka, respectively. This finding invalidates the Keynesian proposition that government expenditure in the agricultural sector can stimulate economic growth in Lesotho. Furthermore, the coefficient of domestic investment is positive and significant in the long-run at 1 percent significance level and it is consistent with the *a priori* expectation and previous studies of Meyer and Sanusi (2019), Aslan and Altinoz (2021) Gyimah et al., (2022) and Wani (2022) who all established a positive and significant effect of domestic investment on economic growth. This implies that a 1 percent increase in domestic investment would lead to about 0.38 percent in economic growth. This finding supports the fact that higher domestic investment is imperative for the development of the local industry, structural transformation and long-term growth (Cornia and Martorano, 2012; Haraguchi et al., 2019).

Table 4: Long-run and Short-run Estimate of Effect of Government Agricultural Expenditure on Economic Growth- ARDL(1, 3, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long-run Estimate				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGEA	-0.295	0.073	-4.030	0.001
LNDI	0.378	0.035	10.889	0.000
C	14.428	0.789	18.293	0.000
Short-run estimate				
D(LNGEA)	-0.028	0.010	-2.951	0.007
D(LNGEA(-1))	0.046	0.011	4.114	0.000
D(LNGEA(-2))	0.026	0.010	2.484	0.020
D(LNDI)	0.095	0.020	4.878	0.000
D(LNDI(-1))	0.017	0.021	0.844	0.407
D(LNDI(-2))	0.032	0.020	1.577	0.129
D(LNDI(-3))	-0.045	0.019	-2.433	0.023
CointEq(-1)*	-0.114	0.013	-8.879	0.000
R-squared	0.717			
Adjusted R-squared	0.641			
Durbin-Watson stat	1.965			

Source: Authors' Computation

Postestimation Test

Necessary post-estimation tests were conducted to check the validity of the estimated model; the results of the test are presented in Table 5. The normality test which was checked using Jarque-Bera indicates the series are normally distributed at 5 percent level of significance. Evidence from the Table 5 further show that there is no serial correlation in this model as probability value of the F-statistics is greater than 5% significance level. The Breusch-Pagan-Godfrey test for heteroscedasticity also suggest that the series does not series suffers from heteroscedasticity.

Table 5:Diagnostics Test Results

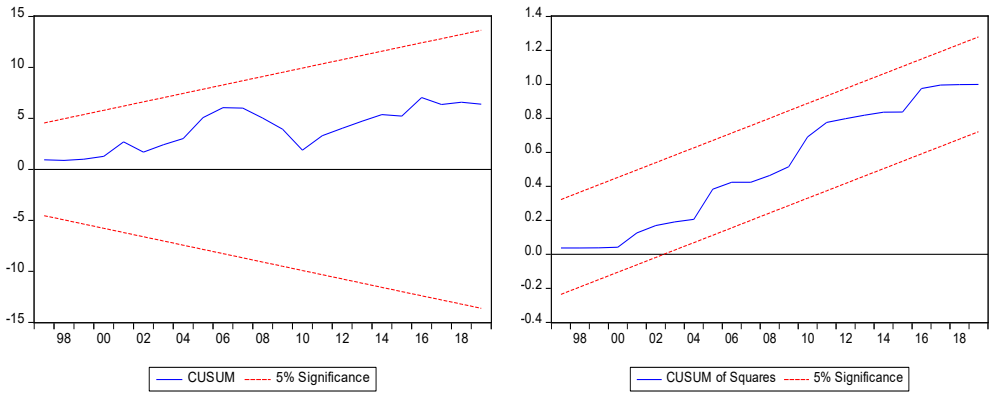
Normality Test	
Jarque-Bera	1.883
Probability	0.389
Serial correlation: Breusch-Godfrey Serial Correlation LM Test:	
F-Statistic	0.094
Prob.	F (2,21) = 0.910
Heteroskedasticity Test: Breusch-Pagan-Godfrey	
F-Statistic	0.609
Prob.	F(10,23): 0.790

Source: Authors' Computation

Model Stability

Finally, the stability of the model was tested using the CUSUM (Cumulative Sum) and the CUSUMSQ (Cumulative Sum of Squares). The stability test, according to Pesaran et al., (2001) determines if parameter estimations are stable over time. The CUSUM and CUSUMSQ null assumptions imply that the coefficient vector remains constant throughout time. At the 5% confidence level, the t statistics are shown against the critical bound. If the plots stay within the crucial boundaries at the 5% confidence level, the null hypothesis is not rejected, and we can conclude that all of the coefficients are stable.

Figure 1. CUSUM and CUSUM of Squares Test for Stability



Robustness analysis

This study further employed the Dynamic Ordinary Least Square (DOLS) to check the robustness effects of government agricultural sector expenditure on economic growth. DOLS method assesses the actual co-integrating and is consistent for long-run estimation of the ARDL method. The robust analysis results are presented in Table 6. The evaluation is significant, and coefficients are the same as ARDL long-run estimates.

Table 6: Results of DOLS Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGEA	-0.183	0.063	-2.888	0.008
LNDI	0.364	0.032	11.314	0.000
C	14.879	0.746	19.952	0.000
R-squared		0.953		
Adjusted R-squared		0.938		

Source: Authors' Computation

Furthermore, following the existence of cointegration relationship between economic growth, government agricultural expenditure and domestic investment that was earlier established, a further examination of causal relationship between the variables is conducted using the Granger causality/Block exogeneity Wald test, which is reported in Table 7. Result show unidirectional (one-way) causality relationship from domestic investment to GDP, and from domestic investment to government agricultural expenditure. No causal relationship was found between

Table 7: VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(LNGDP)			
Excluded	Chi-sq	df	Prob.
D(LNGEA)	3.709	2	0.157
D(LNDI)	9.536	2	0.009
All	14.549	4	0.006
Dependent variable: D(LNGEA)			
Excluded	Chi-sq	df	Prob.
D(LNGDP)	1.194	2	0.551
D(LNDI)	5.128	2	0.077
All	5.489	4	0.2401
Dependent variable: D(LNDI)			
Excluded	Chi-sq.	df	Prob.
D(LNGDP)	0.486	2	0.784
D(LNGEA)	0.934	2	0.627
All	1.522	4	0.823

Source: Authors' Computation the variables of interest (i.e. government expenditure and economic growth), meaning that government expenditure on agricultural sector cannot drive growth.

The non-causal relationship between government agricultural expenditure and economic growth further confirms the earlier finding of negative impact of government agricultural expenditure on growth. This shows that neither Keynes nor Wagner's postulations hold in the case of Kingdom of Lesotho. In this situation, policymakers should be careful in channel public finance toward the current expenditure pattern in the agricultural sector in the pursuit of achieving desire growth in the economy.

6. Conclusion and Policy Recommendation

Achieving and sustaining economic growth is the goal of every government of countries, and government expenditure is a fiscal tool that has been used by government to achieve this goal. Government expenditure has been used to regulate an economy during the period of economic expansion or recession, respectively. However, there has is a long-lasting debate on the relationship

between government expenditure and economic growth such that while some studies show that government expenditure influences economic growth, other found that it is economic growth that influences government expenditure. This contradictory evidence could be due to differences size, income level of country and recipient sector of government expenditure. It is against this backdrop that this study examines the effect of government agricultural expenditure on economic growth in Lesotho. ARDL, DOLS and VEC Granger causality estimation techniques were utilized over time-series data on economic growth, government expenditure and domestic investment for the period 1982-2019 to achieve the objective of the study. This study demonstrates that Lesotho government failed to meet CAADP agreement that a minimum of ten percent of government expenditure should be directed to agriculture. The empirical analytical techniques result suggests that expenditure of the government on agricultural sector cannot drive the desired economic growth of Lesotho, this an invalidation of the Keynesian model relating to government expenditure-growth relationship. The implication of this is that the agricultural sector of Lesotho and other African countries will not be able to attract the required private investment that could drive the agricultural sector performance and economic growth. Any growth policy and strategy that is premised on government agricultural sector expenditure would fail. Rather as revealed from this study, the government of countries should ensure an increase in domestic investment in order to achieve the needed economic growth.

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