Economic Growth and Government Spending Nexus: Empirical Evidence from Lesotho

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Abstract
This study examines the long-run and causal relationship between government spending and economic growth in Lesotho using the ARDL bounds testing procedure for the period 1980 to 2012. Although several studies, have investigated causality between government expenditure and economic growth, none explored differentiating short run and long run causality. The results of our study indicate a stable long-term relationship between government spending and economic growth in Lesotho. However, the Granger causality test shows the direction running from economic growth to government expenditure, confirming Wagner's Law in Lesotho. In addition, the outcomes of this study fail to support the Keynesian theory. The results highlight the need for policy makers to shift public outlays towards investment in physical infrastructure which will stimulate growth and consequently improve fiscal sustainability as opposed to recurrent expenditure.

JEL Classification: C32, E12, H55, O47.
Keywords: Economic Growth, Fiscal Policy, Cointegration, Causality, Wagner' Law,

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1. Introduction

The purpose of this study is to investigate the relationship between fiscal policy and economic growth. In order to achieve this, the paper attempts to test the validity of Wagner's Law in Lesotho. Wagner's Law has been used extensively in existing literature with the aim of generating empirical evidence to inform policy decisions. However, there seems to be inconclusive results relating to validation of Wagner's Law in existing body of knowledge. The results differ from country to country based on the level of development and methods employed in the validation process. Some results support the Keynesian theory while others support Wagner's Law. Our aim is to contribute to the growing debate by testing the validity of Wagner's Law in Lesotho in order to establish the relationship between fiscal policy and economic growth.

We use Lesotho as a case study for our investigation due to the fact that Lesotho has one of the highest wage bill in Southern Africa. Fiscal consolidation is increasingly becoming a challenge to most developing countries, especially the Lesotho. Public sector wage bill relative to GDP of 23 percent between 2009 -2014 is the highest in sub-Saharan Africa, partly due to political pressures to expand employment (IMF (2014). In addition, the challenge is further exacerbated by the expansionary fiscal policy stance which has been adopted by Lesotho to meet its own development needs as espoused in the National Strategic Development Plan. However, a closer look at the public outlays of Lesotho indicates that a greater percentage of their budgetary resources are devoted to cater for public recurrent costs. These public recurrent costs have been on the rise in the recent years. Hence our aim is to contribute to the growing debate on Wagner's Law by empirical understanding its validity in a country with high recurrent expenditures and wage bill.

On the theoretical front, however, there are two main strands of theories regarding the relationship between public expenditure and economic growth. The first is Wagner's hypothesis or Wagner's Law (Wagner, 1876), and second is Keynesian hypothesis (Keynes, 1936). These two theories perceive the functional relationship between these two variables under a different perspective. Wagner's law argues that public expenditure is an endogenous factor, driven by the growth of national income. In contrast, Keynesian hypothesis postulates that economic growth occurs as a result of rising private and public expenditure, with public expenditure considered as an independent exogenous variable to influence the economic growth. Furthermore, in Wagner's law the causality runs from economic growth to public expenditure while in Keynesian theory, the direction of causality is the opposite, making the two theories fundamentally different.

In Lesotho, the relationship between the two variables has been studied indirectly by Motelle and Masenyetse (2013), Thamae (2014) and Ramashamole and Thamae (2015), who investigated the dynamics of government spending growth in Lesotho for the period 1980-2010. Our study adds to the findings of these authors by investigating the two variables directly and differentiating between long-run and short-run causality of the public expenditure and economic growth. In order to achieve this, the study first reviews existing literature. Secondly, the study describes the methods and materials used to test for existence of long-run and short run relationship together with the direction of causality. This is followed by a discussion of the results and some concluding comments.

2. Literature Review

As previously mentioned, a lot of studies have been conducted to investigate the existence and direction of causality between public spending and economic growth. On the theoretical front, there are two main strands of theories regarding the relationship between public expenditure and economic growth. The first one is Wagner's Law), and second is Keynesian hypothesis. These two theories perceive the functional relationship between these two variables under a different perspective. Wagner's law considers public expenditure to be an endogenous factor that is driven by the growth of national income. In contrast, Keynesian hypothesis asserts the opposite: that economic growth occurs as a result of rising public expenditure which is considered an exogenous variable, making these two theories are fundamentally different.

2.1 Wagnarian School of thought

Wagnerian hypothesis is represented by equation (1):

$$GS = \alpha + \beta_1 X + \beta_2 Z + \mu_t \tag{1}$$

Where:

GS = government spending is the endogenous variable Granger-caused by economic growth and other economic variables in equation (1)

X = economic growth

Z = other explanatory variables

μ_t = error term

Wagner offered three reasons why this would be the case namely: the administrative and protective functions of the state substituting public for private activity; economic development leading to an increase in "cultural and welfare" expenditures; and government intervention being required to manage and finance natural monopolies.

2.2 The Keynesian School of Thought

Keynesian macroeconomic framework perceives the relationship between economic growth and public expenditure to be the opposite: a fiscal expansion through the multiplier process increases output many times larger than the initial expenditure, on the assumption that of price rigidity and the existence of excess capacity. The Keynesian view is illustrated by equation (2).

$$Y = demand = C + I + G + (X - M) \tag{2}$$

Where: C = consumption
I = investment
G = government spending

(X-M) = net export

From the Keynesian point of view, an expansionary fiscal policy shifts the aggregate demand (AD) curve to the right, moves the existing market equilibrium in the short-run to a higher level of output and a higher price level. Over time, the short-run AS curve will shift to the left to restore equilibrium the output (to its natural rate and the price rises further. The AD-AS framework can also be used to rationalize Wagner's law: an increase in Y raises C, I increases as well through accelerator effect. However, Wagner's law views government spending as endogenous.

Wagner's view is closer to those of the Classical economists' view of the impact of government expenditure on economic growth. The Classical view is that an increase in government spending will not result in an increase in the national output. Government spending according to the Classical economists is seen as the destabilising force in the economy rather than the driving force of economic growth as the Keynesian economists has postulated. Classical economists believe in the markets forces to guarantee full employment equilibrium. Therefore, the economy should be left to operate on its own and only prescribed a limited role for the government such as promoting the rule of law (Peacock and Wisemen, 1961). .

Classical economists believe that increases in government expenditure, unless financed by money creation would not affect either employment or the price level (Ju-Huang, 2006). This is because if government spending increases while money supply is fixed, the government will compete with the private firms in the money market resulting in higher interest rates. Higher interest rates discourage private investment and lead to the undertaking of public investments. This is because the costs of financing loans will be high for the private firms. Thus, an increase in government spending with constant money supply will crowd out private business investments with the public programs (Froyen, 2008).

Although Wagner recognized that the expansion spending has an upper limit he did not provide his hypothesis in a way that can be tested empirically. As such there are at least 6 different versions of Wagner's validating law namelynamely: Peacock and Wiseman (1961), Gupta (1967), Goffman (1968) , Pryor (1969), Musgrave (1969), Goffman and Mahar (1971) and Mann (1980).

Peacock-Wiseman version

$$LG_t = \alpha_0 + \alpha_1 LY_t + e_t, \qquad \alpha_1 > 1 \tag{3}$$

Peacock-Wiseman share version (Mann Version)

$$L\left(\frac{G}{Y}\right)_t = \beta_0 + \beta_1 LY_t + e_t, \qquad \beta_1 > 1 \tag{4}$$

Musgrave Version

$$L\left(\frac{G}{Y}\right)_t = \gamma_0 + \gamma_1 L\left(\frac{Y}{P}\right)_t + e_t, \quad \gamma_1 > 1 \tag{5}$$

Gupta Version

$$L\left(\frac{G}{P}\right)_t = \delta_0 + \delta_1 L\left(\frac{Y}{P}\right)_t + e_t, \quad \delta_1 > 1 \tag{6}$$

Goffman version

$$LG_t = \lambda_0 + \lambda_1 L\left(\frac{Y}{P}\right)_t + e_t, \quad \lambda_1 > 1 \tag{7}$$

Pryor version

$$LGC_t = \theta_0 + \theta_1 LY_t + e_t, \quad \theta_1 > 1 \tag{8}$$

In equations (3) to (8) G is real government expenditures, C is real government consumption expenditure, P is population, L(G/Y) is the log of the share of government spending in total output, L(Y/P) is the log of the per capita real output, L(G/P) is the log of the per capita real government expenditures ,L Y is the log of real GDP.

Majority of the studies undertaken postulated different approaches to testing Wagner's Law. These studies differ with respect to econometric approach undertaken, the nature of the data used and the countries under investigation. The direction of the causality between public spending and aggregate income could be categorized into four types, each of which has important implications for economic policy. These are:

Neutrality hypothesis: if no causality exists between GDP and public spending. The absence of Granger-causality supports the neutrality hypothesis, as documented by Demirbas (1999), Bagdigen and Cetintas (2003), Huang (2006), Sinha (2007), Chimobi (2009), and Afzal and Abbas (2010).

Wagnerian hypothesis: the unidirectional causality running from GDP to public spending. This hypothesis had empirical supports in Yousefi and Abizadeh (1992), Hsieh and Lai (1994), Ansari et al. (1997), Osoro (1997), Thornton (1999), Islam (2001), Al-Faris (2002), Chang (2002) Oxley (1994), Ahsan, Kwan, & Sahni (1996), Ansari et al. (1997), Chletsos and Kollias (1997), Abizadeh and Yousefi (1988), Asseery et al. (1999), Thornton (1999), Islam (2001), Tang (2001), Albatel (2002), Tan (2003), Iyare and Lorde (2004), Sideris (2007), Samudram et al. (2009), Kalam and Aziz (2009), Kumar (2009), Kumar et al. (2009), and Abdullah and Maamor (2010).

Keynesian hypothesis: the unidirectional causality running from public spending to GDP. This hypothesis is in line with empirical findings in Hsieh and Lai (1994), Ansari et al. (1997), Ghali (1998), Rodrick (1998), Fasano and Wang (2001), Burney (2002), Chang (2002), Blanchard and Perotti (2002), Iyare and Lorde (2004), Dogan and Tang (2006), Babatunde (2007), and Govindaraju *et al.* (2010).

Feedback hypothesis: there exists a bi-directional causality flow between GDP and public spending. The feedback hypothesis is documented by Singh and Sahni (1984), Thornton (1999), Chow, Cotsomitis, and Kwan (2002), Abu-Bader and Abu-Qarn (2003), Dritsakis and Adamopoulos (2004), Iyare and Lorde (2004), Halicioˇglu (2005), Narayan, Nielsen, and Smyth (2008), Ziramba (2009), Ghorbani and Zarea (2009), and Yay and Tastan (2009).

Despite the voluminous research carried out to test the validity of Wagner's law, there seems to be no consensus even for a single country. However, it should be mentioned that majority of these studies have not considered short run and long run causality separately. Differentiating between long run and short run causality is the main contribution of this paper.

3. The Methodology
The data used in this study were obtained from the World Bank development Indicators of 2012 covering 1980-2012, with the empirical analysis using total Government Expenditure (GE) and the Real Gross Domestic Product (RGDP)**.** This study adopted the Peacock and Wiseman (1961) method of understanding the relationship between government spending and economic growth. This method is used extensively in literature because of its ability to identify expenditure growth nexus, which fits the objective of the current study.

The Estimation Techniques
The Autoregressive Distributed Lag (ARDL) bounds testing approach was employed in this study to observe the relationship between government spending and economic growth specifically in Lesotho. The ARDL modeling approach was originally introduced by Pesaran and Shin (1999) and further extended by Pesaran, Shin and Smith (2001). This approach enjoys several advantages over other types of cointegration techniques. Foremost, it provides strong results in small samples. Since the sample size used in this is small, the ARDL is adopted over traditional methods of conducting time series analysis. The ARDL approach offers numerous advantages for time series analysis, neamely: It can be used with a mixture of I(0) and I(1) data. Secondly it involves just a single-equation set-up, making it simple to implement and interpret and, lastly different variables can be assigned different lag-lengths as they enter the model. It is against this background that the ARDL approach was adopted over conventional cointegration.

The ARDL used in this study is specified in the following form:

$$\Delta \ln RG = \beta_0 + \sum_{I=1}^{P} \beta_{1i} \Delta \ln GE_{t-1} + \sum_{t=0}^{q} \beta_{2i} \Delta \ln RGDP_{t-1} + \beta_3 \ln RGDP_{t-1} + \beta_4 \ln GE_{t-1} + \varepsilon_t \qquad (9)$$

$$\Delta \ln GE = \alpha_0 + \sum_{I=1}^{P} \alpha_{1i} \Delta \ln RGDP_{t-1} + \sum_{t=0}^{q} \alpha_{2i} \Delta \ln GE_{t-1} + \alpha_3 \ln GE_{t-1} + \alpha_4 \ln RGDP_{t-1} + \varepsilon_t \qquad (10)$$

Where Δ is the first difference operator, ln(GE) is the natural log of government spending per capita, ln(RGDP) is the natural log of real GDP per capita, p is the lag Length, α_0, α_{1i}, α_{2i}, α_3, α_4, β_0, β_{1i}, β_{2i}, β_3 and β_4 are parameters to be estimated, and ε_t is a white-noise error term.

The cointegration investigation among variables is conducted using the Wald *F*-statistic by restricting the estimated long-run coefficients to be equal to zero. The critical *F* values, the lower and upper bound values for a given level of significance are reported by Pesaran and Shin (1999) and Pesaran et al. (2001) for large sample sizes and Narayan (2005) for small sample data. The lower bound values assume that all variables in the ARDL model are integrated of order zero, or *I*(0), whereas the upper bound values assumes that the variables are integrated of order one, or *I*(1). Subsequently, if the computed *F*-statistic is below the lower bound value, *I*(0), the null hypothesis of no cointegration cannot be rejected. Conversely, if the computed *F*-statistic exceeds the upper bound value, *I* (1), the null hypothesis is rejected and it is concluded that the variables are cointegrated. The result becomes inconclusive if the *F*-statistic falls between the two bounds. The study then investigates the short-run and long-run causal relationships between government spending and economic growth using the method of Granger causality test (Granger, 1969, 1988), once the cointegration analysis has been undertaken. This technique is selected since it performs better than other alternative tests of causality in both small and large samples (Guilkey and Salemi, 1982). Now, the test for Granger causality can be done using the following error-correction model:

$$\Delta \ln RGDP = \beta_0 + \sum_{I=1}^{P} \beta_{1i} \Delta \ln GE_{t-1} + \sum_{t=0}^{q} \beta_{2i} \Delta \ln RGDP_{t-1} + \delta_1 ECT_{t-1} + \varepsilon_t \qquad (11)$$

$$\Delta \ln GE = \alpha_0 + \sum_{I=1}^{P} \alpha_{1i} \Delta \ln RGDP_{t-1} + \sum_{t=0}^{q} \alpha_{2i} \Delta \ln GE_{t-1} + \delta_2 ECT_{t-1} + \varepsilon_t \qquad (12)$$

Where ECT_{t-1} is the lagged error-correction term obtained from the long-run equation and the δ_1 and δ_2 are corresponding adjustment coefficients. The significance of the *F*-statistic on explanatory variables will determine the direction of short-run causality, while the long-run causal effect will be shown by the *t*-statistic on the coefficient of the lagged error-correction term, if only there is cointegration between government spending and economic growth. However, if there is no cointegration between the variables, equations (11) and (12) will be estimated without the error-correction term and only the direction of the short-run causality will be determined.

4   Analysis of the results

4.1   Unit Root Test Results

As a first step, we test the stationarity of the variables by conducting the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. Table 1 shows the Phillips-Perron and Augmented Dickey-Fuller unit root results for the two variables, government expenditure and economic growth. The null hypothesis indicates that there is a unit root and failure to reject the null shows that the series is non-stationary. The results presented in Table 1 offer strong evidence that government expenditure and economic growth are integrated of order one. For both government expenditure and economic growth, the null hypothesis of the unit root is not rejected by at least one of the tests for the series in levels suggesting that the variables are non-stationary. However, the two variables are found to be stationary in the first difference. Since all variables in our model are integrated of order one, according to the Augmented Dickey Fuller Tests and the Phillips Peron tests employed, the use of bounds testing approach to cointegration is justified.

Table1: The Augmented Dickey Fuller and Phillips Perron Tests Results.

Variable	Phillips Peron				Augmented Dickey Fuller			
	Level		First Difference		Level		First Difference	
	Stat	P-value	Stat	P - Value	Stat	P-Value	Stat	P-Value
LNRGDP	-2.3050	0.1768	-5.6104	0.001	-1.7354	0.3757	-5.5869	0.0001
LN(GE)	-1.7574	0.3937	-4.1150	0.0033	-1.9674	0.2989	-4.0385	0.0040

Where LNRDGP is Log (Real GDP) and LN (GE) is Log (Total Government Expenditure)

4.2 Cointegration Test results

In the second step cointegration test is applied to identify the long run equilibrium relationship between the variables, using the ARDL modelling approach. Table 2 presents the cointegration results. The cointegration test indicates the equilibrium relationship between the dependent and independent variables in the long run, as the short-run dynamic relationship are no less important than in the long run.

Table 2: Cointegration Test results

Model	F-Statistic	Inference
F_{LNGE} (LNGE/LNRGDP)	6.0151	Cointegration
F_{LNRGDP} (LNRGDP/LNGE)	2.2305	No Cointegration

Where LNRDGP is Log (Real GDP) and LN(GE) Log (Total Government Expenditure)

Table 3: Critical value bounds of F-statistic; intercept and no trend

K=1	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	4.013	4.637	5.913	6.710	3.273	3.780

Where LNRDGP is Log (Real GDP) and LN (GE) is Log (Total Government Expenditure)

The results in Table 2 and Table 3 show that when government spending (LN(GE)) is a dependent variable, the null hypothesis of no cointegration is rejected since the calculated *F*-statistic is higher than the upper-bound critical value at 5% significance level. Nevertheless, when economic growth (LN*RGDP*) is a dependent variable, the computed *F*-statistic falls below the lower-bound critical value at 10% level of significance and hence the null hypothesis of no cointegration cannot be rejected. This implies that there is one cointegrating relationship between government spending and economic growth.

4.3 Granger Causality Test

The existence of a long-run relationship between government spending and economic growth indicates that the Granger causality must at least run in one direction. As a result, the study tests for the direction of causality by estimating equation (11) with the lagged error correction term, while equation (12) is estimated without that term since no cointegration is found when real GDP is used as a dependent variable. Table 4 then reports the causality test results, which show that there is a unidirectional causal flow from economic growth to government expenditure in the long-run. The short-run causal effect from economic growth to government spending is supported by the statistically significant *F*-statistic, while the coefficient of the error-correction term, which is negative and statistically significant, provides support for the long-run causality. On the other hand, the reverse short-run causality from government spending to economic growth is rejected by the statistically insignificant *F*-statistic in the economic growth function. Therefore, these findings confirm the conservation hypothesis and imply that government spending in Lesotho is determined by economic growth. Thus the result of the study indicate that fiscal expenditure and economic growth in Lesotho exhibits more of the Wagner's Law than the Keynesian Hypothesis.

Table 4: Granger Causality Test

Dependent Variable	Causal Flow	F-statistic	T-test on ECT	R-squared
LNGE	LNGE→LNRGDP	5.4594(0.10)	-3.1617(0.004)	0.27
LNRGDP	LNRGDP→LNGE	2.3771(0.11)		0.14

Note: t-statistics in parenthesis
Where LNRDGP is Log (Real GDP) and LN(GE) is Log (Total Government Expenditure)

4.4 Discussion of Results

The aim of this study is to empirically investigate the existence and the direction causality in Lesotho. The results indicated existence of a long-run relationship relation between public

spending and economic growth, with the direction of long-run causality running from economic growth to public spending. Furthermore, this relationship is statistically significant in both the short and the longrun, thus suggesting the existence of Wagner's Law in Lesotho. This finding is however not consistent with Thamae (2014) which suggests that Wagner's Law is not valid in Lesotho. These divergent views may be attributed to the variables used to measure economic growth which was measured by real economic growth in this study and by real per capita GDP in the case of Thamae (2014). However, even though the final outcome from both studies are divergent, they both indicate indicate that public expenditure in Lesotho is growing at a rate faster than economic growth. The observed increase in the share of public expenditure relative to GDP is a result of continued growth in expenditure on subsidies, interest payments, wage bill and transfer payments some of which are non-developmental in effect. The suggestion in this paper of Wagner's Law for Lesotho may be the result of the fact that the public sector wage bill relative to GDP of 23 percent between 2009 -2014 is the highest in sub-Saharan Africa, partly due to political pressures to expand employment (IMF (2014)). This suggests the need for fiscal prioritisation in Lesotho towards capital expenditure. This ratio can only be reduced if the balance between recurrent and capital expenditure shifted towards capital expenditure, such as physical infrastructure to promote economic activity.

5. Conclusion

This paper examined the long-run and short-run relationship between government spending and economic growth in Lesotho for the past thirty years through application of an Autoregressive Distribution Lag (ARDL) approach. The results reveal a positive and statistically significant long run causal effect running from economic performance towards the public spending giving support to Wagner's Law in Lesotho. The findings, therefore, lend no support to any theoretical prediction that the fiscal policy is effective in enhancing economic growth in Lesotho. However, the findings of this study pave way for further research to broaden this study by disaggregation of public expenditure and by including more macroeconomic variables in the econometric model.

Disclaimer

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy stand of the National University of Lesotho or FANRPAN.

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