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# Government Expenditure-Growth Nexus: Evidence from Namibia

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**Abstract**

The paper is motivated by the two theoretical divergent views on direction of causality between government expenditure and economic growth based on Wagner's law that higher growth rates are expected to induce higher levels of government expenditure and Keynesian hypothesis that higher levels of government spending are expected to drive economic growth. Using the annual time series data for the period 1980 to 2013 the paper investigates the long-run and causal relationship between government expenditure and economic growth in Namibia using the ARDL bounds test approach. As per the cointegration results there exists a long-run relationship between government expenditure and economic growth in Namibia. Granger causality results indicate that economic growth drives and fuels government expenditure only in the short-run. Government expenditure, however, amplifies and catalyses economic growth both in the short-run and long-run in Namibia. Hence policies aimed at enhancing economic growth in Namibia both in the short-run and long-run should stimulate and spur meaningful government expenditure levels, but at the same time should not compromise on the price stability since excessive public spending may be inflationary.

**Keywords:** ARDL Bounds Test Approach, Granger Causality, Government Expenditure, Economic Growth, Namibia

## 1. Introduction

The direction of causality between government expenditure and economic growth in literature is inconclusive and has and continues to be a subject of debate among economists, researchers as well as policy makers. Theoretically, there are two divergent views on direction of causality between government expenditure and economic growth based on Wagner's law that higher growth rates are expected to induce higher levels of government expenditure and Keynesian hypothesis that higher levels of government spending are expected to drive economic growth. A unidirectional causality running from government expenditure to economic growth suggests that government expenditure precede and drive economic growth. Keynesians advocate for fiscal policy in promoting economic growth and argue that higher public spending is a catalyst to an increased rate of growth of an economy (Keynes, 1936). Some empirical studies such as Dogan and Tang (2006), Omoke (2009) and Olugbenga and Owoye (2007) also support the argument that increases in government expenditure induce economic growth. As per this hypothesis, fiscal policy is an important tool in stimulating economic activity and hence policies aimed at enhancing economic growth should encourage higher public spending levels.

A unidirectional causality from economic growth to public expenditure suggests that economic growth causes growth of public expenditure. Proponents of Wagner's law argue that increases in national income lead to increases in public spending (Wagner, 1883). The works of Tang (2001), Al-Faris (2002) and Abu-Bader and Abu-Qran (2003) provide evidence that economic growth causes government expenditure. According to this hypothesis, therefore, policies that induce government expenditure may have little or no effect on economic growth. However, policies that aim at boosting government expenditure should accelerate economic growth.

Empirically, however, two more views on direction of causality between government expenditure and economic growth namely, two-way causality and no causality between the two respectively have been established. Government expenditure and economic growth bi-directional causality implies that the two are interrelated, such that one may precede or cause the other and that they may complement each other. The findings of Abu-Bader and Abu-Qran (2003) that there is a bi-directional causality in the cases of Israel and Syria support the two-way causality hypothesis. Olugbenga and Owoye (2007) also found a bi-directional causality between government expenditure and economic growth for four countries from a group of 30 OECD countries. Lastly, no causality between government expenditure and economic growth implies that there is no causal relationship between the two. Therefore policies pursued to accelerate one may not necessarily boost the other. Singh and Sahni (1984) presented evidence that there is no causality between savings and economic growth in India. Dogan and Tang (2006) also found no causal relationship between government expenditure and national income for Indonesia, Malaysia, Singapore and Thailand. Therefore these findings neither confirm Wagner's law nor Keynes

 

hypothesis.

According to the literature, then, it is evident that the direction of causality between government expenditure and economic growth is inconclusive, as different studies in different countries by different authors have varying conclusions. Some studies have found government expenditure to cause economic growth, while some have found the reverse. Some studies found feedback between the two and others independence. This motivates the paper to determine the direction of causality between government expenditure and economic growth in the specific case of Namibia.

The rest of the paper is organized as follows. Section two presents data and empirical methodology used in the study. Section three presents empirical results and analysis, and finally section four concludes the study.

## 2. Data and Empirical Methodology

The study uses annual time series data for the period 1980 to 2013. The data on economic growth (proxied by real GDP) and government expenditure (proxied by general government final consumption expenditure) respectively are extracted from the World Bank Development indicators.

The study employs autoregressive distributed lag (ARDL) bounds testing approach to cointegration developed by Pesaran and Shin (1999) and later extended by Pesaran et al. (2001) to examine the long-run and causal relationship between government expenditure and economic growth in Namibia for the period 1980-2012. The ARDL bounds test approach to cointegration has several advantages that have recently made it popular and preferred to other traditional cointegration techniques such as Engel and Granger (1987) and Johansen and Juselius (1990). The ARDL approach to cointegration performs better in small samples such as in our case. Unlike Johansen's cointegration technique that requires that variables under consideration be integrated of the same order the ARDL allows the undertaking of cointegration analysis regardless of whether the variables are integrated of order zero [I(0)], order one [I(1)] and or mixture of the two . Furthermore, since the ARDL method can identify dependent and explanatory variables, it gives estimates that are consistent because it avoids problems related to endogeneity.

The ARDL framework for government expenditure and economic growth is expressed as follows:

$$\Delta GE_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i}\Delta GE_{t-i} + \sum_{i=0}^{m} \alpha_{2i}\Delta RGDP_{t-i} + \alpha_3 GE_{t-1} + \alpha_4 RGDP_{t-1} + \varepsilon_t \quad (1)$$

$$\Delta RGDP_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i}\Delta RGDP_{t-i} + \sum_{i=0}^{m} \beta_{2i}\Delta GE_{t-i} + \beta_3 RGDP_{t-1} + \beta_4 GE_{t-1} + \varepsilon_t \quad (2)$$

where $\Delta$ is the first difference operator, $GE$ is government expenditure, $RGDP$ is economic growth, $m$ is the lag length, $\alpha$'s and $\beta$'s are parameters to be estimated, and $\varepsilon$ is a white-noise error term. The *F*-test is used to determine the existence of the long-run relationship in equations 1 and 2 by testing for the joint significance of the coefficients of the lagged levels of the variables $GE$ and $RGDP$. The null and the alternative hypotheses of the long-run relationship in equation 1 are $H_0: \alpha_3 = \alpha_4 = 0$ and $H_1: \alpha_3 \neq \alpha_4 \neq 0$ respectively. In equation 2, when economic growth is the dependent variable, the null and the alternative hypotheses of the long-run relationship are $H_0: \beta_3 = \beta_4 = 0$ and $H_1: \beta_3 \neq \beta_4 \neq 0$ respectively. Two sets of critical values, lower and upper bound values, for large sample data sets are developed by Pesaran et al. (2001). Narayan (2005) reports small sample critical values. The upper bound critical values are estimated assuming that all variables in the ARDL model are integrated of order one [I(1)], and the lower bound critical values are computed assuming that the variables are integrated of order zero [I(0)]. At any chosen significance level if the computed *F*-statistic falls between the lower and upper bound critical values, the decision about cointegration between the underlying variables is inconclusive. However, if the computed *F*-statistic exceeds the upper bound critical value the null hypothesis is rejected and the decision is that the underlying variables are cointegrated. On the other hand if the computed *F*-statistic is less than the lower bound critical value the null hypothesis is not rejected and it is concluded that the variables are not cointegrated.

If the variables in question are cointegrated as per the cointegration test results then the implication is that there exists causality in at least one direction. After establishing cointegration status between government expenditure and economic growth, the study uses the Granger causality test (Granger, 1969) to determine short-run and long-run causal relationships between the two variables. The study uses the following error-correction specification to test for causality:

$$\Delta GE_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i}\Delta GE_{t-i} + \sum_{i=0}^{m} \alpha_{2i}\Delta RGDP_{t-i} + \lambda_1 EC_{t-1} + \varepsilon_t \quad (3)$$

$$\Delta RGDP_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i}\Delta RGDP_{t-i} + \sum_{i=0}^{m} \beta_{2i}\Delta GE_{t-i} + \lambda_2 EC_{t-1} + \varepsilon_t \quad (4)$$

 

where $EC_{t-1}$ is the lagged error-correction term. The error-correction specification in testing for causality is advantageous because it allows testing for short-run as well as long-run causality. The lagged differenced regressors help capture short-run causality and the lagged error-correction term helps capture long-run causality. In line with equations 3 and 4 the following null hypotheses can help determine granger causality between government expenditure and economic growth:

i) For long-run Granger causality: ($H_0 = \lambda_1 = 0$ and $H_0 = \lambda_2 = 0$)
ii) For short-run Granger causality: ($H_0 = \alpha_{2i} = 0$ and $H_0 = \beta_{2i} = 0$)

## 3. Empirical Results and Analysis

### *3.1 Stationarity Test*

The study uses both Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root tests to test for stationarity nature of the variables. However, the necessity of performing the unit root test is to verify that none of the variables in question are integrated of any order higher than one since the ARDL bounds testing approach to cointegration collapses for variables that are integrated of order two and above. Tables I and II present unit root tests results respectively. As per the results both variables, government expenditure and economic growth, are non-stationary at level but become stationary after first differencing. That is, both unit root test results show that the two variables are I(1), a condition that allows us to proceed to the ARDL cointegration test.

**TABLE I: ADF UNIT ROOT TEST RESULTS**

| Variables | Level | | 1st difference | |
|---|---|---|---|---|
| | ADF Statistic (trend and intercept) | Critical Value (5%) | ADF Statistic (trend and intercept) | Critical Value (5%) |
| GE | -0.2157 | -3.5562 | -6.2208 | -3.5670 |
| RGDP | -0.0659 | -3.5562 | -6.5991 | -3.5670 |

**TABLE II: PHILLIPS-PERRON UNIT ROOT TEST RESULTS**

| Variables | Level | | 1st difference | |
|---|---|---|---|---|
| | PP Statistic (trend and intercept) | Critical Value (5%) | PP Statistic (trend and intercept) | Critical Value (5%) |
| GE | -0.0821 | -3.5514 | -9.1034 | -3.5614 |
| RGDP | 0.1263 | -3.5514 | -7.5327 | -3.5614 |

### *3.2 Cointegration Test*

Before using the newly developed ARDL bounds testing approach to cointegration to determine the existence of long-run relationship between government expenditure and economic growth, we determine the optimal lag length using VAR lag order selection criteria. Table III presents lag length selection results. The results indicate an appropriate lag length of one.

**TABLE III: VAR LAG ORDER SELECTION CRITERIA RESULTS**

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| o | -1318.275 | NA | 3.37e+34 | 85.17903 | 85.27154 | 85.20919 |
| 1 | -1220.815 | 176.0571 | 5.93e+31* | 78.81949* | 79.42688* | 79.03059* |
| 2 | -1215.752 | 8.492656 | 7.62e+31 | 79.08076 | 79.54334 | 79.23155 |
| 3 | -1207.702 | 12.46410* | 8.12e+31 | 79.14934 | 79.46710 | 79.23981 |

N.B: * indicates lag order selected by the criterion

After determining the lag length we proceed to the cointegration test. Table IV presents cointegration test results. According to the results when government expenditure (GE) is a dependent variable, computed F-statistic lies above the upper bound critical value at 5% significance level hence the null hypothesis of no cointegration is rejected. When economic growth (RGDP) is a dependent variable computed F-statistic is also above the upper

 

bound critical value at 5% significance level hence the null hypothesis of no cointegration is rejected. Therefore, there exist two cointegrating relationships between government expenditure and economic growth.

**TABLE IV: BOUNDS TEST FOR COINTEGRATION RESULTS**

| Dependent Variable | F-statistic | 95% bounds | | 90% bounds | |
|---|---|---|---|---|---|
| | | I(0) | I(1) | I(0) | I(1) |
| ΔGE | 8.7982 | 5.3753 | 6.2653 | 4.3153 | 5.0843 |
| ΔRGDP | 11.7875 | 5.3753 | 6.2653 | 4.3153 | 5.0843 |

*3.3 Granger Causality*

When two variables are cointegrated then Granger causality exists between them in at least one direction. Since bounds test results indicated that long-run relationship exists between government expenditure and economic growth when each of them is a dependent variable the lagged error-correction term is included when estimating equations 3 and 4 to test for causality. Causality test results are presented in table V. The results indicate Granger causality from economic growth to government expenditure only in the short-run, as the corresponding F-statistic is statistically significant and the error-correction term coefficient though carries the appropriate sign is statistically insignificant. On the other hand, government expenditure Granger causes economic growth both in the short-run and long-run. This is evident from the corresponding statistically significant F-statistic and negative statistically significant lagged error-correction term coefficient. The results therefore support both the Keynesian and Wagner hypotheses that government expenditure amplifies and catalyses economic growth and that the opposite is also the case in the short-run. In the long-run, however, the results only support the Keynesian hypothesis. Hence policies aimed at enhancing economic growth in Namibia both in the short-run and long-run should stimulate and spur meaningful government expenditure levels, but at the same time should not compromise on the price stability since excessive public spending may be inflationary.

**TABLE V: GRANGER CAUSALITY TEST RESULTS**

| Dependent Variable | Causal flow | Short-run (or weak) Granger causality test | | Long-run Granger causality test | |
|---|---|---|---|---|---|
| | | F-statistic | P-value | $ECT_{t-1}$ | P-value |
| ΔGE | RGDP to GE | 5.9330 | 0.0014 | -0.0975 | 0.2766 |
| ΔRGDP | GE to RGDP | 5.9076 | 0.0015 | -0.2738 | 0.0169 |

## 3. Conclusion

Using the annual time series data for the period 1980 to 2013 the paper investigates the long-run and causal relationship between government expenditure and economic growth in Namibia using the ARDL bounds test approach. As per the cointegration results there exists a long-run relationship between government expenditure and economic growth in Namibia. Granger causality results indicate that economic growth drives and fuels government expenditure only in the short-run. Government expenditure, however, amplifies and catalyses economic growth both in the short-run and long-run in Namibia. Hence policies aimed at enhancing economic growth in Namibia both in the short-run and long-run should stimulate and spur meaningful government expenditure levels, but at the same time should not compromise on the price stability since excessive public spending may be inflationary.

## References

Abu-Bader, S., & Abu-Qran, A. (2003). Government Expenditures, Military Spending and Economic Growth: Causality Evidence from Egypt, Israel and Syria. Journal of Policy Modeling, 25, 567-583.

Al-Faris, A. F. (2002). Public Expenditure and Economic Growth in the Gulf Cooperation Council Countries. Applied Economics, 34, 1187-1193.

Dogan, E., & Tang, T. C. (2006). Government Expenditure and National Income: Causality Tests for Five South

 

East Asian Countries. International Business and Economics Research Journal, 5, 49-58.

Engel, R., F., & Granger, C.W. (1987). Co-integration and Error Correction: Representation, Estimation, and Testing. Econometrica, Journal of the Econometric Society, 251-276.

Granger, C. W. (1969). Investigating Causal Relations by Econometric Models and Cross-Spectral Methods. Econometrica, Journal of the Econometric Society, 424-438.

Johansen, S., & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration – with Applications to the Demand for Money. Oxford Bulletin of Economics and Statistics, 52, 169-210.

Keynes, J., M. (1936). The General Theory of Employment, Interest and Money. London: Macmillan.

Narayan, P. K. (2005). The Saving and Investment Nexus for China: Evidence from Cointegration Tests. Applied Economics, 37, 1979-1990.

Olugbenga, A., O., & Owoye, O. (2007). Public Expenditure and Economic Growth: New Evidence from OECD Countries [http://iaes.confex.com/iaes/Rome_67/techprogram/S1888.HTM].

Omoke, P. (2009). Government Expenditure and National Income: A Causality Test for Nigeria. European Journal of Economic and Political Studies, 2, 1-11.

Pesaran, M., & Shin, Y. (1999). An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis. In: Strom, S. (Ed.), Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium. Cambridge University Press: Cambridge

Pesaran, M., Shin, Y. & Smith R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16, 289-326.

Singh, B., & Sahni, B. S. (1984). Causality between Public Expenditure and National Income. The Review of Economics and Statistics, 66, 630-644.

Tang, T. C. (2001). Testing the Relationship between Government Expenditure and National Income in Malaysia. Analysis, 8, 37-51.

Wagner, A. (1883). Three Extracts on Public Finance, translated and reprinted in R.A. Musgrave and A.T. Peacock (Eds) (1958), Classics in the Theory of Public Finance. London: Macmillan.

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