Examining the Validity of Wagner's Law versus Keynesian Hypothesis: Evidence from Turkey's Economy

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Abstract

The direction of the causality relationship between public expenditures and economic growth is one of the most controversial issues of the literature, which also causes great disagreements in the design process of economic policies. There are two approaches to this subject, which are opposite each other and called "Wagner's Law" and "Keynesian Hypothesis". This paper aims to examine the validity of Wagner's law and Keynesian proposition in Turkey using Autoregressive Distributed Lag (ARDL) model over the period of 1998-2016. The findings supported the "Keynesian Hypothesis", which advocates a one-way causality relationship from public spending to national output. More specifically, the results of the study showed that the effect of public expenditures on economic growth was positive in the short term and negative in the long term. From an economic policy standpoint, it can be argued that policymakers can promote Turkish economic growth through expansionary fiscal policies in the short run.

Keywords: fiscal policy; public expenditures; economic growth; bounds test approach.

JEL classification: E62; H50; O40; C22.

1. INTRODUCTION

The causality relationship between public expenditures and national output is a highly debated matter among economists. Keynesian and Wagnerian approaches represent two alternative points of view related to the causality relationship between public expenditures and national income. The Keynesian view defines the causality from public expenditures to income while Wagner (1893) indicates the relationship, so that runs from national income to public expenditures. This controversy concerning with the direction of causality relationship between public expenditures and economic growth is closely related to discussions on the effectiveness of economic policy. The Keynesian school suggests the expansionary fiscal

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policies based on increasing public expenditures to enhance economic growth via augmenting the total demand. According to Wagnerian thinking, there is no room for expansionary fiscal policy based on increasing public expenditures in order to enhance economic growth since public expenditure itself depends on the level of national income. In conclusion, Wagner approach views public spending as a dependent variable that can be changed based on the level of economic growth while Keynesian approach considered public expenditure as an exogenous policy instrument for enhancing economic growth via promoting aggregate demand.

In light of the discussions mentioned above, this study aims to contribute to the existing literature by investigating the causality relationship between government expenditure and economic growth in Turkey. Besides, our study shows some differences from other similar studies, which can be determined at two points. Firstly, many studies in the literature have focused on the experience of developed countries. Few studies are analysing the experiences of developing countries. Moreover, these studies do not provide a comprehensive explanation for the case of developing countries since ignoring country-specific factors. Because these studies, in order to overcome the problem of data deficiency in the developing economies, have used panel data analysis which simultaneously examine the cases of many developing countries. This paper differs from previous studies focusing on developing countries since it examines the Turkish case, individually. Secondly, the majority of the previous studies have used the conventional cointegration techniques based on residual-based test and maximum-likelihood test proposed by Engle and Granger (1987) and Johansen and Juselius (1990), respectively. However, ARDL-bounds testing approach originally introduced by Pesaran and Shin (1999) have numerous advantages in comparison with other conventional cointegration methods. Unlike others, ARDL-bounds testing approach does not impose a restrictive assumption that all the variables under study must be integrated of the same order. Besides, this technique is found to be suitable even if the sample size is small. Taking into account these, in our study, we examine the Turkish case by using the newly introduced ARDL bounds testing approach.

The remainder of the paper is organised as follows: Section 2 reviews the primary literature about the direction of the causal relationship between public expenditure and economic growth. Section 3 continues with the description of data and methodology. Section 4 presents empirical findings. Finally, the concluding remarks and policy implications are reported in Section 5.

2. BACKGROUND

The relationship between public expenditures and economic growth has been the subject of extensive research over the past decades. Some part of these studies has especially focused on exploring the flow of causality between public expenditures and economic growth. It seems that in the literature there are two dominant views regarding the direction of causality relationship between public expenditures and economic growth. The first view advocated by so-called Wagner's law asserts that government expenditure is dependent on the extent of economic growth and thus the causality runs from economic growth to government expenditure. The second view supported by Keynesian approach argues that there is a causal flow from government expenditure to economic growth.

Wagner (1893) indicates that when evaluated in the historical process, it is observed that public expenditures tend to increase continuously depending on economic growth. Thus, Wagner suggests that the process of economic development changes some circumstances, which result in expanding the share of public spending in national income. In other words, economic development creates a drag force for public expenditures into an increase. There is a range of factors arising from the changing circumstances depending on economic growth and strengthening the causality relationship from economic growth to public expenditures. From the supply-side, it is possible to mention the increased ability of governments in collecting taxes and thus the relative ease in financing growing expenditures. From the demand side, it can be argued that the government's economic activity increases in order to meet the rising private demand for new public goods and services arising from changing factors based on economic growth. In other words, governments increase their expenditures on activities in order to meet increasing private demand based on economic growth.

There are many factors affecting the expansion of total demand after an increase in economic growth. For example, Wagner Law asserts that since public goods are located in a group of goods with a high degree of income elasticity, the economic growth results in an expansion of private demand for public goods and services related to health, communication and transportation. Therefore, governments have to increase public activities and thus expenditure to meet these increasing demands for public goods and services. Besides, the state is undertaking new tasks that do not exist before and thus arise due to economic growth. Musgrave (1988) indicated that as nations are industrialised, the share of the public sector in the national economy grows continually. Economic growth caused industrialisation increases the administrative and security duties of the state and thus caused a rise in public expenditures. Mann (1980) took attention to economic development resulting in population growth and rapid urbanisation. Increasing concentration of population in the cities increased needs for legal and socio-economic regulations provided by state and thus administrative and social functions of the state. Cooray (2009) also submitted that technological progress that is an underlying dynamic of economic growth creates a lot of new goods and services of which requires public provision since these types of services require a large amount of capital that not afford by the private sector to produce.

As can be seen from the above a wide variety of socio-economic factors in the framework of Wagner's Law have been indicated as the reasons for the unidirectional causality from economic growth to public expenditures. Looking at the literature, there are also many studies empirically indicated that the causality runs from national income to government expenditure in line with the Wagner's law. Pahlavani et al. (2011) examined the causal relationship between the size of the government and economic growth in Iran from 1960 to 2008. Granger causality test based on the Error Correction Model (ECM) and Toda and Yamamoto approach showed that a unidirectional causal flows from economic growth to size of government. Magazzino (2012) explored the relationship among the rate of economic growth and government expenditure in the case of Italy during the period 1960-2008. A cointegration analysis revealed that there is a long run relationship between government expenditures and economic growth. The results of the Granger-causality test also showed there is unidirectional relationship from economic growth and government expenditures. Thus empirical results in Italy indicated evidence in favour of Wagner's Law. Antonis et al. (2013) analysed the causal relationship between income and government

spending in the Greek economy for the historical period between 1833 and 1938. Employing the ARDL model it was indicated a long run causal effect is running from economic performance towards the public size giving support to Wagner's Law in Greece. Thus, it has been determined that state activities are a systemic element of economic development.

On the contrary to theoretical and empirical arguments of Wagner's Law, the Keynesian hypothesis postulates that the causality relationship runs from public expenditures to national income. Keynesian view primarily focuses on the components of aggregate demand to explain the changes in the national income. Aggregate demand consists of consumption, investments, public expenditures and net exports and has a positive impact on economic growth. Keynes explain how national output changes in response to a change in components of aggregate demand in the framework of multiplier mechanism. This approach advocates increasing aggregate demand in order to promote economic growth permanently. That means public expenditure as an essential component of aggregate demand is a significant determinant of national income. An increase in the volume of public expenditures promoting aggregate demand augments national output through provoking multiplier mechanism. Thus, public expenditure is a critical factor which could be utilised as a policy instrument to promote economic growth. Accordingly, the Keynesian approach suggests the expansionary fiscal policies based on increasing public expenditures to enhance economic activity. In other words, focusing on the demand side as a fundamental dynamic of the economy, Keynes argues that total demand must be promoted through public spending to raise the level of economic growth. Therefore, it is clear that the increase in public spending in Keynesian thinking is seen as a cause and not a consequence of economic growth.

In line with Keynesian view, there are many studies in the literature empirically proved the causality relationship from public expenditures to economic growth. Dogan and Tang (2006) investigated the causality relation between government expenditure and national income in South East Asian countries for the period covering 1960-2002. The Granger causality tests indicated that the direction of causality runs from government expenditures to national income in the Philippines. Thus, it is indicated that government expenditures have played an essential role in the economic growth in the Philippines. Ighodaro and Oriakhi (2010) examined the causality relationship between government expenditures and economic growth in Nigeria over the period 1961-2007. Estimation results of Johansen Cointegration and Granger causality tests indicated that the Keynesian hypothesis was validated. It is recommended that policy makers in Nigeria can increase total expenditures to propel economic growth. Ebaidalla (2013) determined the direction of causality between government spending and national income in Sudan for the period 1970-2008. The results of Granger causality test and Error Correction Model indicated the direction of causality running from government spending to national income, both in the short and long-run. Thus, the results imply that public spending is a crucial exogenous factor for stimulating national income.

In conclusion, looking at the international literature about the relationship between public expenditures and economic growth, some studies indicate the validity of Wagner's Law while others confirm the Keynesian Hypothesis. Similarly, the results of the studies examining the relationship between public expenditures and economic growth in the case of Turkey are inconclusive to advocate the unidirectional causality only. Concerning the studies supporting the Wagner's law, Arisoy (2005) examined the nexus between public spending and economic growth during the period 1950-2003 in Turkey. The results of Johansen Cointegration and Granger causality test showed the existence of causality

relationship from economic growth to public spending. Altunc (2011) investigated the link between public expenditures and economic growth in the Turkish economy over the period of 1960-2009. The estimation results of ARDL model support Wagner's Law for the causality relationship between economic growth and public spending. Concerning macroeconomic policies, this finding implies that the use of public expenditures as a means of fiscal policy will not affect real variables in Turkey. Bayrakdar *et al.* (2015) explored the direction of the relationship between public expenditures and growth for the Turkish economy. Unidirectional causality from economic growth to public expenditures has been found using Hatemi-J Cointegration and Granger causality tests. Thus, it has been precisely determined the validity of Wagner's Law in the case of Turkey.

In contrast to the findings advocated Wagner's Law, some studies relating to Turkey investigated the causality relationship from public spending to economic growth in accordance with Keynesian Hypothesis. Uysal and Mucuk (2009) analysed the impact of public spending on economic growth in Turkey for the period 1980-2006. As a result of the Johansen-Juselius cointegration test, a long-run relationship was found between the variables. On the other hand, in the analysis carried out in Error Correction Model, it is determined that there is a one-way relationship from public expenditures to economic growth in the short term. Thus, findings have shown that public expenditures can be used as an effective policy instrument for the realisation of the growth objectives in Turkey. Gul and Yavuz (2011) examined the relationship between public spending and economic growth during the period from 1963 to 2008 for the Turkish economy. Estimation results of Johansen Cointegration and Granger causality tests showed that the direction of the relationship runs from government expenditures to economic growth which indicates the validity of the Keynesian Hypothesis. Thus, this finding also implied that public spending could be used as an effective tool in realising the goal of economic growth. Tulumce and Yayla (2017) focused on the relationship between government expenditures and economic growth for the period of 1988-2016. By using VAR technique and Granger causality test, it was illustrated that in terms of economic classification; government expenditures have a positive impact on economic growth. Thus, empirical findings showed that Keynesian theory to be valid in the case of economic classification of public expenditures in Turkey.

It seems that studies focused on Turkey cannot reach a common implication concerning with the validities of Keynesian view and Wagner Law. The first reason for this is that the results of the research may differ according to the econometric method used in the studies. Secondly, whether or not the implementation of an active expansionary fiscal policy in the periods of research may affect the results of the study. Accordingly, in the periods when an active expansionary fiscal policy is applied, the direction of causality mostly operates from public spending to economic growth. In order to test this phenomenon in our study, like Tulumce and Yayla (2017), the review period has been limited to the last decades, when the expansionary fiscal policies are used extensively, rather than addressing a large period including very old historical data.

3. DATA AND METHODOLOGY

This paper investigates the nexus between public expenditures and economic growth for the Turkish economy over the period of 1998 and 2016 on a quarterly basis. Over the last two decades, Turkey has experienced high real per capita income accompanied by

expansionary fiscal policies (Yavuz and Ergen, 2017, p. 50). It is, therefore, a good research topic to test the validity of Wagner and Keynesian Hypothesis by using fresh data of the Turkish economy. However, few studies focused on the Turkish economy which has witnessed a significant increase in economic performance and government expenditure over the last two decades. This study distinguishes itself from the past studies as it covers the new era in which Turkey have experienced an admirable growth performance and a massive increase in government expenditure.

On the other hand, our study offers some significant policy implications concerning with the role of government expenditures on Turkey's growth performance in the new era. Thus, the examination of the validity of Keynesian or Wagner views gives also crucial implications for the fact that public expenditures can be used as a policy tool in order to stimulate economic growth in future. In other words, the significance of our study arises from the identification of the effectiveness of future fiscal policies implemented by policymakers in Turkey.

In our study, adjusted for calendar and seasonal effects, we compiled the data for public expenditures and real Gross Domestic Product (GDP) growth rate from the National Accounts database of Turkish Statistical Office (TURKSTAT). As a component of GDP by expenditure approach, government final consumption expenditures are utilised as a proxy for public expenditures at constant prices of 1998 in local currency. Economic growth is gauged by the annual percentage change of GDP corresponding to the same period of the previous year at constant prices of 1998 in local currency as well.

We embark upon our empirical investigation concerning the nexus between public expenditures and economic growth by examining the direction of causality between public expenditures and economic growth by performing Granger (1969) causality test, and the relevant results are displayed in Table no. 1. The null hypotheses are tested against their alternatives, and the results indicate the presence of unidirectional causality that runs from public expenditures (LGOV) to economic growth (GR) by rejecting the null hypothesis of "LGOV does not Granger cause of GR" since the relevant F-statistics is significant at 10 %. Thus, the results of the Granger causality test lead us to carry out the bounds test concerning our baseline specification in which economic growth is involved as a dependent variable. Hence, the presence of unidirectional causality channelizes us to consider the following linear specification.

$$GR_t = \beta_0 + \beta_1 LGOV_t + \varepsilon_t \tag{1}$$

where GR_t represents the real GDP growth rate, $LGOV_t$ represents the natural logarithm of government final consumption expenditures, and ε_t denotes the disturbance term that is independently and identically distributed with which zero mean and constant variance.

Table no. 1 – Granger causality test

Null Hypothesis	F-statistics (p-value)
GR does not Granger cause of LGOV	1.957 (0.149)
LGOV does not Granger cause of GR	2.649 (0.078)***

Notes: *** denotes the significance level at 10 %.

Source: authors' estimations

In light of the baseline specification, the long-run relationship between public expenditures and economic growth would be examined by ARDL bounds testing approach to cointegration. Developed by Pesaran *et al.* (2001), this technique is superior to its counterparts in some aspects. First, this technique could be applied whether the variables are integrated at the same order and different order. Second, compared to its counterparts such as Engle and Granger (1987), Johansen (1988), Johansen and Juselius (1990) it works more efficient under small samples. Finally, Banerjee and Newman (1993) suggest that the dynamic error correction model through a simple linear transformation might hinder losing information over long periods. In the context of the ARDL approach, the error correction model integrates the short-run dynamics with the long-run equilibrium without losing information on the latter (Shahbaz *et al.*, 2016, p. 724).

We elaborate the ARDL bounds test approach through the baseline specification in three steps. First, the existence of a cointegration relationship among the variables is examined by constructing the following unrestricted error correction model (UECM) within the context of baseline specification

$$\Delta GR_t = \beta_0 + \beta_1 T + \sum_{i=0}^{n} \beta_{2i} \Delta LGOV_{t-i} + \beta_3 LGOV_{t-1} + u_t \qquad (2)$$

where n denotes the lag length, Δ denotes the difference operator at first order, subscripts t-i and t-1 denotes the lag orders respectively. In this equation, drift parameter is represented by β_0, time trend is represented by T, β_1, β_{2i} and β_3 represent the coefficients to be estimated, and finally, u_t denotes the conventional white-noise disturbance term with the standard normal distribution. In order to select the optimal lag length for appropriate ARDL model, Akaike Information Criterion (AIC) is used in which nonexistence of serial correlation and heteroskedasticity problems are ensured. Cointegration relationship between the variables is tested by constructing the null hypothesis of no cointegration among the variables against the alternative. In this context, F-test is conducted, and Pesaran *et al.* (2001) offer lower and upper bounds to compare whether calculated F-statistics is higher or lower than the upper bound. If the calculated F-statistics exceed the upper bound, then it is decided that cointegration between the variables do exist while the calculated F-statistics fall below the lower bound then the decision is against the existence of cointegration i.e. no long-run relationship exists between the variables in consideration.

If the long-run relationship or cointegration between the variables exists, then short-run dynamics would be investigated by estimating the following error-correction representation of our baseline specification.

$$\Delta GR_t = \beta_0 + \beta_1 T + \sum_{i=1}^{m} \beta_{2i} \Delta GR_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta LGOV_{t-i} + \beta_4 EC_{t-1} + u_t \qquad (3)$$

In this equation, Δ denotes the difference operator at first order; EC_{t-1} denotes the first-order lagged error-correction term that is derived by the estimation of the long-run equation, n is the corresponding lag lengths, subscript t-i denotes the lag orders respectively. Likewise, the long-run equation, estimation of short-run error correction model is performed

including drift parameter β_0 and time trend T. Finally, β_{2i}, β_{3i} and β_4 are the coefficients to be estimated and u_t denotes the white-noise disturbance term with which above mentioned properties. In addition to the estimation of long-run and short-run parameters, we check for the stability of those parameters by performing the cumulative sum (CUSUM) test.

4. RESULTS

Consistent with the above-defined equations, the summary of descriptive statistics regarding the economic growth is shown in raw values while for public expenditures it is shown by the natural logarithmic form in Table no. 2. The mean of public expenditures is overwhelmingly larger than economic growth while with regard to the volatility of series standard deviation of series are computed, and the results indicate that the series of public expenditures displays lower variance to the extent which computed the value of standard deviation is extremely low. It should also be noted that both variables are typically distributed since Jarque-Bera normality test statistics for both variables are not statistically significant.

Table no. 2 – Descriptive statistics

	GR_t	$LGOV_t$
Number of Observations	74	74
Mean	3.90	14.73
Maximum	12.60	15.26
Minimum	-14.20	14.36
Standard Deviation	5.31	0.23
Skewness	-1.06	0.34
Kurtosis	4.33	1.95
Jarque-Bera (probability)	3.53(0.17)	1.10 (0.57)

Source: authors' estimations

The starting point is to determine the order of integration of each variable. We performed the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) unit root tests that are developed by Dickey and Fuller (1981) and Phillips and Perron (1988), respectively. After determining the order of integration of the variables through unit root tests, the next step is to determine the direction of causality relationship between variables using Granger causality test proposed by Granger (1969). Finally, pioneered by Pesaran *et al.* (2001), the long and short run dynamic interaction between variables is revealed by employing the ARDL model.

In the first step, ADF and PP type unit root tests performed and the findings are displayed in Table no. 3. The results of both types of unit root tests ensure that economic growth (GRt) variable is integrated either at I(0) or I(1) while public expenditures variable (LGOVt) is integrated only at I(1). The results of both tests indicate that either assuming trend or without trend, LGOVt is not stationary by which relevant test statistics yield that null hypothesis of non-stationary cannot be rejected at any significance level. However, after the first-differencing LGOVt becomes stationary as the corresponding test statistics indicate the rejection of the null hypothesis of non-stationary at 1 % significance level. It should also be noted that GRt is stationary either at the level or at first-differenced form as by which rejecting the null hypotheses for both tests as the relevant test statistics imply the

presence of significance at 1 %. These results let us employ the ARDL model for further investigation of the nexus between public expenditures and economic growth.

Table no. 3 – Unit root tests

Variables	ADF Test	ADF Test (Trend)	PP Test	PP Test (Trend)	Decision
GR_t	-6.455[0.00]*	-6.435[0.00]*	-6.463[0.00]*	-6.443[0.00]*	I(0)
$LGOV_t$	1.902[0.99]	-2.198[0.48]	0.768[0.99]	-1.793[0.69]	I(1)
ΔGR_t	-8.948[0.00]*	-8.888[0.00]*	-19.347[0.00]*	-19.271[0.00]*	I(0)
$\Delta LGOV_t$	-11.070[0.00]*	-8.626[0.00]*	-11.165[0.00]*	-12.658[0.00]*	I(0)

Notes: * denotes the significance level at 1 %. AIC is used for selecting optimal lag length and maximum lag length for each test is selected as 12. For each test, p-values are shown in brackets. Δ denotes the first difference of relevant variables.
Source: authors' estimations

Before unveiling the cointegration relationship between the variables, optimal lag order for appropriate ARDL model is selected by Akaike Information Criterion (AIC) since it has superior predicting properties in small sample sizes (Shahbaz *et al.*, 2016, p. 728). According to Figure no. 1, optimal lag order for ARDL cointegration test is selected to be ARDL (1, 2) at which minimum value of AIC without having serial correlation corresponds to -1.29 over 20 models.
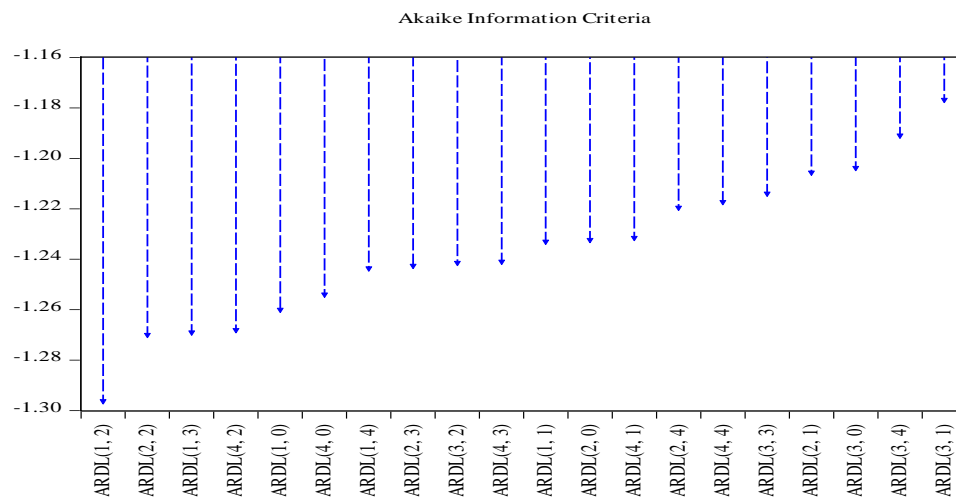

Figure no. 1 – Optimal Lag Order Selection

Based on Equation 1, cointegration or long-run relationship is examined by employing the bounds test. The estimation results of the ARDL (1, 2) model and bounds test are reported in Table no. 3. With unrestricted constant and trend, the results of the bounds test yield the existence of cointegration relationship between variables due to calculated F-statistics exceeds the upper bound or at 1 % significance level discernibly.

The long-run estimation results of ARDL (1,2) are also exhibited in the middle part of Table no. 4, and the corresponding results reveal that one period lag of economic growth is positively associated with the dependent variable since the corresponding coefficient is positive and statistically significant. However, public expenditures are negatively related

with the first difference of economic growth so that the coefficient of the second lag of public expenditures is negative and statistically significant even though its current and first-lagged coefficients are positive but insignificant statistically. The value of the second lag of public expenditures is -1.44 which in turn circumvents its current and first-lagged values as magnitude. Besides, in order to examine the ultimate long-run effect of public expenditures on economic growth, we estimated the long-run coefficient of public expenditures based on ARDL (1, 2) model. The result attests the presence of a negative relationship between public expenditures and economic growth in the long-run. More specifically, 1 % rise in public expenditures causes to deplete economic growth by 0.96 % in the long-run.

Finally, below part of Table no. 4 is devoted to diagnostic check of the estimation of ARDL (1, 2) model. The result of the Breusch-Godfrey (BG) test yields that residuals are not serially correlated in subsequent periods. The White test indicates the non-existence of the heteroskedasticity problem since the residuals are not correlated with the independent variables. Jarque-Bera (JB) normality test shows that residuals are normally distributed while the test statistics of the Ramsey test regarding the specification of functional form points out that our model is correctly specified.

Table no. 4 – ARDL (1, 2) cointegration test and long-run estimation results

Depended variable : ΔGR_t		Optimal lag length (1, 2)				
Critical values for F-statistics		**1 % Level**		**5 % Level**		**10 % Level**
k	F-statistics	I(0) I(1)		I(0) I(1)		I(0) I(1)
1	23.287*	9.325 10.325		6.880 7.675		5.765 6.470
Variable	**Coefficient**		**Standard Error**		**t-statistics**	
Constant	10.7172		5.9522		1.8005***	
Trend	0.0081		0.0045		1.7934***	
GR_{t-1}	0.2268		0.1094		2.0719**	
$LGOV_t$	0.1701		0.5384		0.3160	
$LGOV_{t-1}$	0.5312		0.6338		0.8381	
$LGOV_{t-2}$	-1.4480		0.5675		-2.5515**	
Long-Run Coefficient Estimate						
Variable	**Coefficient**	**Standard Error**	**t-statistics**			
$LGOV_t$	-0.9656	0.5149	-1.8752**			
Diagnostic tests			**Statistics**			
R^2			0.15			
Adjusted R^2			0.09			
SE of Regression			0.1213			
Akaike Information Criterion			-1.3007			
Schwarz Criterion			-1.1109			
F-Statistics			2.459(0.041)**			
JB Normality test			2.940(0.229)			
BG Autocorrelation test			0.216(0.897)			
White Heteroskedasticity test			19.824(0.171)			
Ramsey RESET test			1.045(0.310)			

Notes: For critical values regarding the bounds test see Pesaran *et al.* (2001), Table CI (v) on p. 300 and k denote the number of explanatory variables. **,*** denotes the significance levels at 5 % and 10 % respectively. Regarding the diagnostic tests, probability values of test statistics are displayed in parenthesis. Δ denotes the first difference of variables in consideration.

Source: authors' estimations

Based on the ECM, the short-run dynamics between public expenditures and economic growth is examined by performing ARDL (1, 2) model and the relevant results are reported in Table no. 5. The coefficients of current and one lagged first differences of public expenditures are 0.29 and 1.44 respectively which indicate that 1 % increase in current and one period lagged first differences of public expenditures cause to raise economic growth almost by 0.3 % and 1.45 % respectively. Alongside the Keynesian hypothesis, the findings indicate that there is a positive nexus between public expenditures and economic growth in the short-run. The sign of lagged error correction term (ECt-1) is negative as it is expected with the value of -0.77. This means that changes in exogenous variables cause economic growth to converge its long-run path and the shocks that come to economic growth dwindle at speed by 77 %, which also firmly ensures the presence of long-run relationship among the variables.

Below segment of Table no. 5 reports the results of diagnostic test statistics and the results to indicate that there is neither serial correlation nor heteroskedasticity problems exist by which accepting the corresponding null hypotheses since each test statistics are not significant statistically. The result of the Jarque-Bera (JB) test reveals that residuals are normally distributed while Ramsey's RESET test statistics prove that the model is correctly specified.

Table no. 5 – Short-run error correction model estimation results

Depended variable : ΔGR_t			
Variable	**Coefficient**	**Standard Error**	**t-statistics**
Constant	1.8251	0.2642	6.9073*
Trend	0.0013	0.0002	5.8144*
$\Delta LGOV_t$	0.2935	0.1429	2.0537**
$\Delta LGOV_{t-1}$	1.4480	0.5493	2.6356**
EC_{t-1}	-0.7731	0.1124	-6.8761*
Diagnostic tests		**Statistics**	
R^2		0.43	
Adjusted R^2		0.39	
SE of Regression		0.1204	
Akaike Information Criterion		-1.3284	
Schwarz Criterion		-1.1703	
F-Statistics		12.738(0.000)*	
JB Normality test		0.771(0.701)	
BG Autocorrelation test		0.238(0.887)	
White Heteroskedasticity test		4.739(0.577)	
Ramsey RESET test		0.246(0.621)	

Notes: *, ** denotes the significance levels at 1 % and 5 % respectively. Regarding the diagnostic tests, probability values of test statistics are displayed in parenthesis. Δ denotes the first difference of variables in consideration.
Source: authors' estimation

Besides the diagnostic tests that confirm the overall validity of long-run and short-run models over our ARDL model, we also perform the cumulative sum of recursive residuals (CUSUM) test that is proposed by to gauge the stability of long-run and short-run models or our ARDL model in general. In Figure no. 2, the dashed red lines represent the critical boundaries at 5 % significance level and the blue line represents the plot of CUSUM test which oscillates between the critical boundaries which in turn attests that either long-run or

short-run parameters that are obtained from ARDL model follows a stable pattern and public expenditures affect economic growth in Turkey.
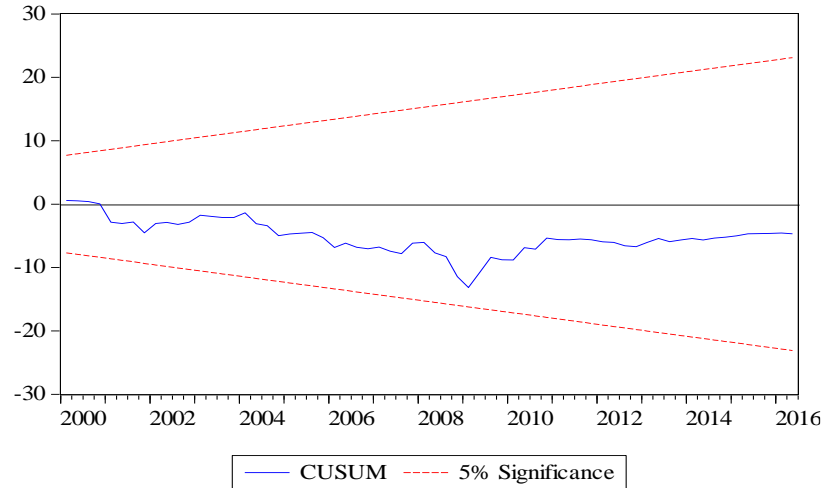

Figure no. 2 – Stability of Short-Run and Long-Run Parameters

In summary, empirical results concerning the Granger causality test and ARDL model are generally in line with the Keynesian hypothesis. The result of the Granger causality test indicates the presence of a unidirectional relationship that runs from public expenditures to economic growth. Thus, estimation results of causality test support the Keynesian proposition while do reject the Wagner's law. The results of our study are consistent with the findings of Dogan and Tang (2006), and Ighodaro and Oriakhi (2010) focused on the cases of South East Asia and Nigeria, respectively. Our finding also is consistent with the results of studies like Gul and Yavuz (2011) and Tulumce and Yayla (2017) focusing on the Turkish economy by using different econometric methodologies. Thus, the results of our study in line with other studies indicated above provide support for the validity of the Keynesian proposition that public expenditure is an exogenous factor and essential policy instrument for increasing of national income. These findings probably arise from the fact that policymakers have used government expenditure as an active policy tool in order to stimulate the economy over the last two decades in Turkey. Thus, the reason why Wagner Law is not valid in Turkey can be explained by active expansionary fiscal policy implemented during the last decades in Turkey.

Our empirical analysis is also extended by using ARDL model in order to examine the effect of public expenditures on economic growth in the short and long run. Estimation results of the ARDL model showed that the effect of public expenditures on economic growth is positive in the short run but negative in the long run. The significance of this result related to policymakers in Turkey arises from that government spending is one of the vital policy tools to promote economic growth in the short run but not in the long run.

5. CONCLUSION

The direction of the causality relationship between public expenditures and economic growth is one of the most controversial issues of the literature, which also causes great disagreements in the design process of economic policies. There are two approaches to this subject that are opposite each other and called "Wagner's Law" and "Keynesian Hypothesis" in the literature. Wagner Law views public spending as a dependent variable that can be changed based on the level of economic growth. Thus, public expenditures are not an exogenous policy instrument in order to promote because the increase in public spending is seen as a consequence and not a cause of economic growth. Contrarily, the Keynesian approach considers public expenditures as an exogenous policy instrument for enhancing economic growth through promoting aggregate demand in the framework of the multiplier mechanism.

In order to provide new evidence, this study aims to test the validity of Wagner Law and Keynesian Hypothesis by using quarterly data related to aggregate public expenditures and economic growth over a period between 1998 and 2016 in Turkey. The results of Granger causality test reveal the presence of unidirectional causal relationship running from public expenditures to economic growth giving support to Keynesian Hypothesis. For further investigation, the analysis is extended by employing the ARDL model to examine the short-run dynamics and the long-run (cointegration) relationship between public expenditures and economic growth. The estimation results of the ARDL model reveal that public expenditures affect economic growth positively in the short run but negatively in the long run. This means that, in the framework of the multiplier mechanism, the government expenditures can yield positive externalities and linkages for the Turkish economy only in the short term. From the policy standpoint these findings indicate that the Keynesian proposition of increasing government spending as a policy instrument to enhance economic growth is only supported in Turkey for the short term. In other words, government expenditure is a crucial exogenous factor for stimulating short-run economic growth in Turkey.

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