

Does Relation between Government Consumption and Economic Growth Still Exist? Evidence from Long Run Data

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ABSTRACT

The relation between government consumption in the context of fiscal policies and economic growth was investigated in the related literature. The effect of government expenditures on economic growth and needs for government expenditures in the growth path of an economy were explained by researchers and reached various results for each country. In this study, it is aimed that interaction between government expenditures and economic growth in the Turkish economy via advanced econometric methods between years 1971 and 2019. By doing so, longer period will be considered to get more robust results. Results imply that there is a bi-directional causality between government expenditures and economic growth in the Turkish economy. This result is valid in the long run. In the shorter time frequencies, direction of causality turns into uni-directional running from government expenditures to economic growth.

ملخص

جرت دراسة العلاقة بين الاستهلاك الحكومي في سياق السياسات المالية والنمو الاقتصادي في الأدبيات ذات الصلة. حيث شرح الباحثون تأثير الإنفاق الحكومي على النمو الاقتصادي واحتياجات الإنفاق الحكومي في مسار نمو الاقتصاد، وتوصلوا إلى نتائج مختلفة لكل دولة. وتهدف هذه الدراسة إلى تحليل التفاعل بين النفقات الحكومية والنمو الاقتصادي في الاقتصاد التركي عبر أساليب الاقتصاد القياسي المتقدمة بين عامي 1971 و 2019. وبهذا، سيتم النظر في الفترة الأطول للحصول على نتائج أكثر قوة. وتشير النتائج إلى وجود علاقة سببية ثنائية الاتجاه بين النفقات الحكومية والنمو الاقتصادي في الاقتصاد التركي. وهي صالحة على المدى الطويل. وفي الترددات الزمنية الأقصر، يتحول اتجاه السببية إلى تشغيل أحادي الاتجاه من الإنفاق الحكومي إلى النمو الاقتصادي.

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ABSTRAITE

La relation entre la consommation publique dans le contexte des politiques fiscales et la croissance économique a été étudiée dans la littérature correspondante. L'effet des dépenses publiques sur la croissance économique et les besoins en matière de dépenses publiques sur le chemin de la croissance d'une économie ont été expliqués par les chercheurs et ont abouti à des résultats différents pour chaque pays. Dans cette étude, on vise l'interaction entre les dépenses gouvernementales et la croissance économique dans l'économie turque via des méthodes économétriques avancées entre les années 1971 et 2019. Ce faisant, une période plus longue sera considérée pour obtenir des résultats plus robustes. Les résultats impliquent qu'il existe une causalité bidirectionnelle entre les dépenses publiques et la croissance économique dans l'économie turque. Ce résultat est valable à long terme. Dans les fréquences temporelles plus courtes, la direction de la causalité devient unidirectionnelle, allant des dépenses publiques à la croissance économique.

Keywords: Government Expenditures, Economic Growth, Turkish Economy

JEL Classification: C22, E62, F43

1. Introduction

An economic system is a series of systems that produce and distribute economic sources under interactive control of the society's members (Lee, et al., 2019: 2). In this regard, decisions of how investments will be made, which sectors will be developed are at the end conduct the type of development of the economy. Another point related to growth, who will make the investment and expenditures? In a no-government environment, investment and consumption expenditures will be made by households and private sector. This is valid for in pure capitalist environments. In opposite, in a socialist environment, expenditures will be made by government. According to Lee et al. (2019), an economic structure of a country is determined by a variety of factors such as history, culture and therefore it is not completely possible to classify countries as a free market economy and/or planned economy.

Another discussion related to question who will make expenditure is development level of economy. In a developed economy, infrastructure needed for private sector is already completed by government in the pathway to development. That is why in developed economies, necessity of government expenditures is not high. On the other hand, in developing and less developed economies, the need for government expenditures in both investment and consumption expenditures is crucial for economic development.

The necessity level of government expenditures is investigated by several researchers in the literature. But the findings of these researches are some confusing. Initial reason of confusion is direction of causality. There four different explanation about the interaction between government expenditures and economic growth: uni-directional causality running from government expenditures to economic growth, uni-directional causality running from economic growth to government expenditures, bi-directional causality and neutrality. Another reason of confusion is about the type of country investigated. The initial studies focus on developed economies. But the results of these studies might be invalid for developing countries because of level of capital formation in the economy. Last reason is the time period examined. Initial studies take shorter periods into account, while latest studies have opportunity to test over fifty years for developed economies, especially.

In the light of explanations above, this study aims to investigate the Turkish economy empirically in the longer time periods, different from existing studies. By doing so, it will be possible to eliminate one of the confusions related to period. The longest time series possible for the Turkish economy is employed, 1971 – 2019. Moreover, the advanced causality methods are used to test the direction of causality and/or existence of it from different point of views.

In the second section, theoretical background about the interaction between variables is presented. The third section summarizes national and international literature. In the fourth section, empirical tests implemented, and results are described. In the conclusion section, findings are interpreted and compared with existing literature.

2. Literature Review

The relation between government expenditures and economic growth is one of the debates which is investigated in last decades. It is possible to conclude that there are two arguments in the literature explaining the interaction between them. One of them Wagner's law and other is Keynes's law. According to Wagner (1983), increasing expansion of public and particularly state activities is an outcome of economic growth. Therefore economic growth is Granger cause of increasing government expenditures and the direction of causality from economic growth to government expenditures. According to Wagner, there are three reasons to explain increasing government expenditure. These are, a) greater complexity of legal relationship, b) greater demand for education and public services, c) state neutralization of private monopolies and in some cases creation of state monopolization (Jean – Garcia, 2018: 14).

The Keynesian view implies that government spending accelerates economic growth. Because of this reason, government expenditure is regarded as an exogenous force that increase output (Loizides and Vamvoukas, 2005: 126). Because government expenditures are effective on private sector's decisions. An increase in government expenditures encourage private investment, which will translate to higher output growth (Nyasha and Odhiambo, 2019: 82).

Especially after World War II, Keynes's law was popular among developing economies to converge developed economies. The government of these economies aimed to grow the economy in accordance with the growth of government expenditure through multiplier effect (Wang et al., 2016: 42). Robinson's (1977) findings support this view. Larger government size promotes economic growth by reducing dependence in especially developing countries. Also developed economies between 1945 and 1965 presumed the necessity of expanding public spending and increasing relative size of government to achieve economic and social goals (Diamond, 1989: 1 – 2).

Besides the direction of causality is highly debated in the literature. Effect of government expenditures on economic growth is another debate to

discuss in the literature. Is that positive or negative. According to Keynes's view, positive effect on economy occurs when government expenditures increase. By the beginning of 1970's, efficiency of overly high level of government expenditures on economic growth was queried empirically by researchers such as Landau (1986). According to this view, government expenditures can affect economy positively or negatively according to sub-components of government expenditures. If government expenditures focus on capital expenditures and/or expenditures on infrastructure, it would affect economic growth positively. If it focuses on current expenditures, it will affect economy negatively. Moreover, overly high level of government expenditures induce increase in tax, and it would affect private sector negatively. In the literature, it is called as crowding out hypothesis, means that existence of government crowds out private sector.

In the light of theoretical explanations above, empirical literature is inconclusive in determination of the direction of causality and efficiency of government expenditures on economy, although there is a vast literature. One of the initial studies belongs to Barro. Barro (1990) implies positive effect of government expenditures on production by extending endogenous growth model. At the end of study, he finds out that government expenditures made for services increase savings and economic growth in the short run, but in the longer period growth performance reduces growth performance. Another study of Barro (1991) investigates factors affecting economic growth between years 1960 and 1985 for ninety-eight countries. According to analysis results, there is a positive correlation between growth rate of real gross domestic product per capita and initial human capital level and negative correlation between initial level of gross domestic product per capita real gross domestic product per capita. Also Barro (1991) reveals that economic growth is related to share of government's consumption expenditures negatively, but it is positively related to government's investment expenditures.

Devarajan et al. (1996) investigate fourty three countries in the context of Keynes's law. Authors empirically analyze twenty years between 1970 and 1990 via panel data method and take education expenditures, health

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expenditures, transportation and communication expenditures made by government. According to analysis results, an increase in current expenditures affects growth positively. On the other hand, there is a negative relation between investment expenditures and economic growth.

Agénor and Neanidis (2011) analyze optimal distribution of government expenditures between health, education, and infrastructure in the context of endogenous growth approach. The authors put private sector capital stock, government infrastructure services and human capital variables into model and analyze them in the context of overlapping generations model. According to analysis results, expenditures made to improve health and education technologies are important to grow for an economy. Especially, an increase in health expenditures increases consumption level and in the long run, it transforms to wealth.

Al – Faris (2002) tests the relation between variables in the context of Gulf Cooperation Council. The period between 1970 and 1997 is investigated via Johansen co-integration and Granger causality test methods and employ gross domestic product per capita, ratio of government expenditures to gross domestic product, current expenditure per capita and capital expenditure per capita. According to analysis results, Wagner law is valid in the related countries, so increasing economic growth raises government expenditures.

Vu Le and Surukuga (2005) analyze the effects of foreign direct investment and government expenditures on economic growth for a hundred and five developing and developed economies between years 1970 and 2001. They employ constant effect panel regression analysis and panel Threshold regression analysis. Results obtained imply that foreign direct investment and government's investment expenditures and private investments affect economic growth positively. Also, governments' expenditures out of investment are negatively effective on economic growth.

Bose et al. (2007) investigate the relation between government expenditures and economic growth between years 1970 and 1990 in selected countries by employing panel data methods. Authors take budget

constraints and variables not included in the model into account. At the end of model analysis, while there is a positive correlation between share of investment expenditures of government in gross domestic product and economic growth, current consumption expenditures have no effect on economic growth. Moreover, education expenditures and all expenditures made on education are effective on economic growth positively.

Srinivasan (2013) analyzes Indian economy and investigates the relation between years 1973 and 2012. Srinivasan employs co-integration analysis and vector error correction analysis methods. According to results, there is a uni-directional causality running from economic growth to government expenditures in both short and long run.

There have been many studies investigating the subject for the Turkish economy. One of them belongs to Ulutürk (2001). The author investigates possible effect of government expenditures on economic growth via ordinary least squares method. Ulutürk employs growth rate of gross domestic product, ratio of public and private investments to gross domestic product, employment level, total consolidated budget and annual growth rate of government expenditures. The education and social security expenditures are positively, and health expenditures are negatively effective on economic growth. Lastly, infrastructure investments do not affect economic growth.

Kar and Taban (2003) also analyze the effect of government expenditures on economic growth between years 1971 and 2000. Ratios of government expenditures, education expenditures, social security expenditures, infrastructure expenditures to gross domestic product are the variables put into model. According to results obtained from Kremers, Ericsson and Dolado co-integration analysis, education and social security expenditures are effective on economic growth.

Arisoy (2005) investigates the validity of Wagner's law and Keynes's law in the Turkish economy in 1950 – 2003 period by testing the relation between government expenditures and economic growth. Data belonging to real GDP, real government expenditures, real current government expenditures, real government investment expenditures, real transfer

expenditures and real total government expenditures are investigated via co-integration analysis method. At the end of study, Arısoy reveals that findings support Wagner's law. So current expenditures, investment expenditures and transfer expenditures are affected by economic growth performance of the Turkish economy in the long run.

Bagdigen and Çetintaş (2004) test the long run relation in the Turkish economy between years 1965 and 2000. Final consumption expenditures of government, total government expenditures, GDP and total population variables are used in Granger causality analysis. According to results, there is no causation linkage between variables.

Altunç (2011) investigates the relation between economic growth and total and sub-components of government expenditures in the Turkish economy between years 1960 and 2009. ARDL bounds test, vector autoregressive analysis, Granger causality analysis and block externality Wald test methods are employed. Results obtained from analysis imply that both of the laws are valid in the Turkish economy. Because there is a bi-directional causality between economic growth and government expenditures.

Gül and Yavuz (2011) analyze the relation for 1963 – 2008 period in Turkey. Annual data belonging to current expenditures, government expenditures, investment expenditures, transfer expenditures and economic growth variables are tested by Johansen co-integration and Granger causality tests. Results indicate that government expenditures totally affect economic growth positively and also current, investment and transfer expenditures affect economic growth positively.

Telek and Telek (2016) investigate possible effects of government expenditures on the economic growth. Authors employ quarterly data belonging to 1998 – 2015 period. According to results, there is a uni-directional causality running from government expenditures to economic growth.

One of the latest studies belongs to Zabun (2020). Data belonging to 1999 – 2017 period are used to test relation via Johansen co-integration test and

Granger causality test. According to results, Wagner's law is valid in the Turkish economy. Moreover, Keynes model is valid for investments.

As can be seen in the literature, the results are inconclusive about which law is valid for the Turkish economy and for the countries in different part of the world. Although empirical researches are made for Turkey, they do not employ the same data and variables. Also, methods employed have different robustness scores. To obtain more robust results in this study, the longest period available for the Turkish economy is employed.

3. Data and Methodology

In this study, the relation between government expenditures¹ (Billion United States Dollar, GOV, hereafter) and gross domestic product per capita² (Billion United States Dollar, GDPPC, hereafter) is investigated via annual times series belonging to 1971 – 2019 by employing causality methods. Data belonging to each variable are obtained from the database of World Bank. In the first step, we convert series into logarithmic form to prevent heteroscedasticity.

Table 1: Descriptive Statistics

		Max	Min			Jarque-Bera
In GDPPC	In GOV	Skewness	Kurtosis			(Probability)

¹ According to World Bank Definition "General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security but excludes government military expenditures that are part of government capital formation. Data are in current U.S. dollars."

² According to World Bank Definition "GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars."

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			9.442	6.120		
lnGDPPC	1	-			-0.069	1.954 2.268 (0.321)
			25.62	21.34		
lnGOV	0.994	1			-0.016	1.742 3.231 (0.198)

According to correlation analysis, there is a strong and positive correlation between government expenditures and economic growth. Tale distribution of each variable is skewed to left and flattened. According to Jarque – Bera test null hypothesis which implies normal distribution for each variable is accepted. Parameters β_0 , β_1 and β_2 represent constant term, lagged values of independent term and lagged values of trend variable, respectively. Thus the unit root test model is as follows;

$$Y_t = \beta_0 + \beta_1 Y_{t-p} + \beta_2 Trend_{t-p} + \varepsilon_t \quad (1)$$

There are three different alternatives in the model. In the context of assumption that independent variable X_t is constant, regression is on origin in the first model. Second is the model including constant term and last one is the model with constant term and trend variable. If parameter β_1 equals to β_1 , it implies effect of one-unit shock. Thus, the null hypothesis $\beta_1 = 1$, means there is a unit root in the series (Pantula et al., 1994).

Table 2: ADF (1981) and PP (1988) Unit Root Test Results

	<i>Variables</i>	<i>ADF</i>	<i>PP</i>	<i>ADF</i>	<i>PP</i>	
<i>Level</i>	<i>Constant</i>	lnGOV	-1.545 (0)	1.430	-4.933	-4.976
			[0.502]	(3)	(0)	(3)
				[0.559]	[0.00]	[0.00]
				***	***	***
<i>Level</i>	lnGDPPC	-2.078 (0)	-2.002	-6.591	-6.602	
		(3)	(3)	(0)	(2)	
			[0.254]	[0.284]	[0.00]	[0.00]
					***	***
<i>Level</i>	<i>Constant +Trend</i>	lnGOV	-2.612 (1)	-2.431	-4.967	-5.026
			(4)	(4)	(0)	(3)
			[0.276]	[0.359]	[0.00]	[0.00]
					***	***
<i>Level</i>	lnGDPPC	-2.322 (0)	-2.651	-6.770	-6.779	
		(3)	(3)	(0)	(2)	
			[0.414]	[0.260]		

[0.00] [0.00]
*** ***

Not: ***, ** and * values show stationarity of series in significance level 1%, 5% and 10%, respectively.

According to Dickey-Fuller (1981) and Phillips-Perron (1988) unit root test results, series belonging to both variables contain unit root in level. On the other hand, they become stationary when the first difference is considered.

In the second step, Rolling Windows test based on corrected likelihood ratio (LR) developed by Balçılar et al. (2010) is implemented. In LR Granger causality test based on bootstrap, vector autoregression model with two variables and lag value p is as follows. ($t=1, 2, \dots, T$)

$$y_t = \Phi_0 + \Phi_1 y_{t-1} + \dots + \Phi_p y_{t-p} + \varepsilon_t \quad (2)$$

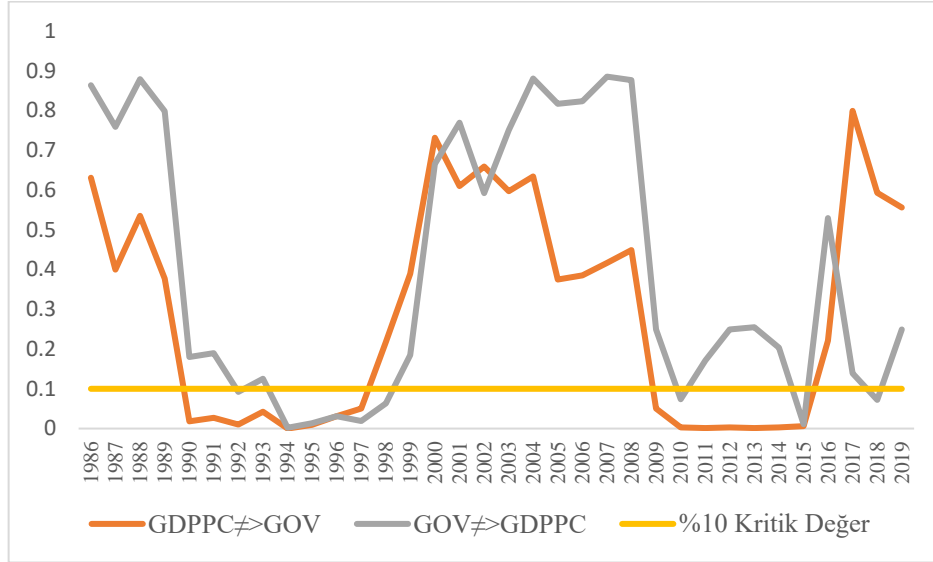
$\varepsilon_t = (\varepsilon_1, \varepsilon_2) \square iid(0, \sigma^2)$ error term is distributed independently. The matrix of the model is $y_t = [y_{1t}, y_{2t}]_{2 \times 1}$. Hence, it is possible to write the vector autoregression model with p lagged as follows;

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} \phi_{10} \\ \phi_{20} \end{bmatrix} + \begin{bmatrix} \phi_{11}(L) & \phi_{12}(L) \\ \phi_{21}(L) & \phi_{22}(L) \end{bmatrix} \begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (3)$$

While $\phi_{ij}(L) = \sum_{k=1}^p \phi_{ij,k} L^k$, $i, j=1, 2$ and lag operator is $L^k x_t = x_{t-k}$. The null hypothesis is $\phi_{12,i} = 0$ and implies y_{2t} is not Granger cause of y_{1t} .

Figure 1: Balçılar et al. (2010) Rolling Window Regression Causality Test Results

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In Graph 1, direction of causality is presented. In the graph, period is placed in X-axis and probability ratio is placed in Y-axis. The null hypothesis in causality analysis developed by Balcilar et al. (2010) claims absence of causality and alternative hypothesis claims validity of causality between variables. Prob values are used to decide validity. If the prob value calculated is smaller than 10% (0,1) critical value, alternative hypothesis which implies the validity of causation linkage is accepted. In the light of investigation, there is a causality running from gross domestic product per capita to government expenditures between years 1990 and 1997 and between years 2009 – 2015. On the other hand, uni-directional causality runs from government expenditures to economic growth in 1992, from 1994 to 1998, 2010, 2015 and 2018.

According to results, in 1992, 1994 – 1998, 2010 and 2015 periods, there is a bi-directional causality. Moreover, there is a uni – directional causality running from gross domestic product per capita to government expenditures in crisis times.

In frequency domain causality test developed by Breitung and Candelon (2006), z_t denotes a vector with two dimensions in a determined vector autoregression model $z_t = [x_t, y_t]'$

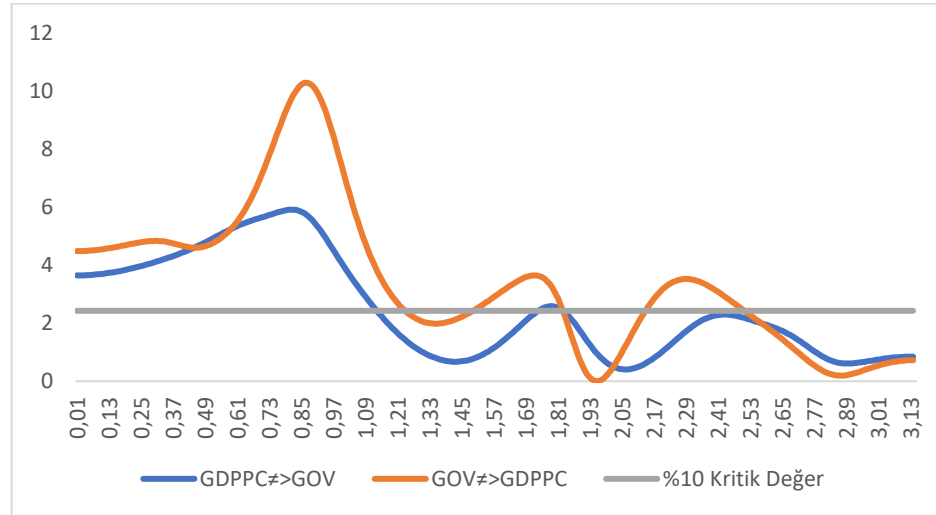
$$\Theta(L)z_t = \varepsilon_t \quad (4)$$

In the model, $\Theta(L) = I - \Theta_1 L - \dots - \Theta_p L^p$ and lag length id $L^k z_t = z_{t-1}$. Granger causality hypothesis in different time frequencies is as follows.

$$M_{y \rightarrow x} = \log \left[\frac{2\pi f_x(\omega)}{|\psi_{11}(e^{-i\omega})|^2} \right] = \left[1 + \frac{|\psi_{12}(e^{-i\omega})|^2}{|\psi_{11}(e^{-i\omega})|^2} \right] \quad (5)$$

$|\psi_{12}(e^{-i\omega})|^2 = 0$ states that there is no Granger causality running from Y to X in frequency ω . The most important advantage of frequency domain causality test is to give opportunity to test validity of causality in different time periods (Şengül, 2020: 270).

Figure 2: Breitung and Candelon (2006) Frequency Domain Causality Test Results



In the graph 2, F test statistics are placed in y – axis and frequency values between 0 – 3,14 are placed in X – axis. The null hypothesis of the test

claims there is no causality, alternative hypothesis claims there is a causation linkage. In the decision phase, if F test statistics is bigger than 10% critical value, 2.427 in the F table, alternative hypothesis claiming existence of causality is accepted. Also, if frequency interval is between 0.01 and 0.99, it means long run causality, if it is between 1.00 and 1.99, it means medium term causality and lastly, if it is between 2.00 and 3.14, it means short run causality.

According to results presented in graph 2, there is bi-directional causality between gross domestic product per capita and government expenditures in the long run. That means both Wagner's and Keynes's law are valid in the long run. On the other hand, results show that uni-directional causality running from government expenditures to gross domestic product per capita occurs in the medium and short time frequencies.

4. Conclusion

Theoretically, the relation between government expenditures and economic growth is explained via two approach. First one is Wagner's law and implies that economic growth increases government expenditures due to increasing demand for public services, demand for education, increasing complexity of legal relations and neutralization of private monopolization via government. On the other hand, Keynes's law implies that increasing government expenditures promote economic growth via multiplier effect of government expenditures.

The relation between government expenditures and economic growth is highly debated in the literature. The reason why it is popular among researchers is that it is important to determine how government expenditures are effective on economy. By doing so, expenditure policies will be designed according to most effective way of growth.

In this study, the relation is analyzed in the Turkish economy for a longer time period and the possible relation is analyzed for different time frequencies and also analyzed to get exact dates of causation linkage. By doing so, it is aimed to get more robust results. In this regard, two different causality analysis methods were performed. One of them is Balcilar et al. (2011) and the other one is frequency domain causality method developed by Breitung and Candelon (2006).

Results reveal that there is a bi-directional causality between variables, and it occurs in the long run. This result is expectable due to lagged effect of government expenditures, especially investment expenditures, on economic activities. Although lag length is shorter than monetary policy, it takes some time to appear itself on the economy. It is conducted that after a while an effect would appear and economy would accelerate. On the other hand, economic growth would increase wealth level of households and that would increase demand for public services. So, government expenditures would expand.

Moreover, results imply that uni-directional causality from economic growth to government expenditures appears from 2009 to 2015. This result supports Wagner's law. More importantly, the period includes post – crisis period where central banks increase the volume of money all over the world. So, expanding liquidity increases wealth and demand for leisure and consumption of public services. At the end government expenditures would increase in the context of expanding needs of households and firms.

In the light of all explanations above, it is clear that economic growth and government expenditures encourage each other in the Turkish economy. While growing economic structure asks for more government, increasing governmental activities will dominate economic growth and the process will continue. This would emerge in the long run. The exception is the period between years 2009 – 2015. The expanding monetary policies raise wealth and the need for leisure. It is possible to conclude that implementation of monetary policy via different ways can help to economic growth via increasing demand for public services and wealth increase.

References

- Agénor, P. R., & Neanidis, K. C. (2011). The allocation of public expenditure and economic growth. *The Manchester School*, 79(4), 899-931.
- Al-Faris, & A. F. (2002). Public expenditure and economic growth in the Gulf Cooperation Council countries. *Applied economics*, 34(9), 1187-1193.
- Altunç, Ö. F. (2011). Kamu harcamaları ve ekonomik büyüme ilişkisi: Türkiye'ye ilişkin ampirik kanıtlar. *Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 18(2), 145-157.
- Arısoy, A. & G. İ. (2005). Wagner ve Keynes hipotezleri çerçevesinde Türkiye'de kamu harcamaları ve ekonomik büyüme ilişkisi. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 14(2), 63-80.
- Bagdigen, M., & Cetintas, H. (2004). Causality between public expenditure and economic growth: The Turkish case. *Journal of Economic and Social research*, 6(1), 53-72.
- Balcilar, M., Ozdemir, Z. A., & Arslanturk, Y. (2010). Economic growth and energy consumption causal nexus viewed through a bootstrap rolling window. *Energy Economics*, 32(6), 1398-1410.
- Barro, Robert J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy* 98(S5): 103-125. doi:10.1086/261726
- Barro, R. J. (1991). Economic growth in a cross section of countries. *The quarterly journal of economics*, 106(2), 407-443.
- Bose, N., Haque, M. E., & Osborn, D. R. (2007). Public expenditure and economic growth: A disaggregated analysis for developing countries. *The Manchester School*, 75(5), 533-556.
- Breitung, J., & Candelon, B. (2006). Testing for short-and long-run causality: A frequency-domain approach. *Journal of econometrics*, 132(2), 363-378.

- Devarajan, S., Swaroop, V., & Zou, H. F. (1996). The composition of public expenditure and economic growth. *Journal of monetary economics*, 37(2), 313-344.
- Diamond, J. (1989). Government expenditure and economic growth: An empirical investigation. IMF Working Paper, no. WP/89/45.
- Dickey, David & Wayne Fuller. (1981). Likelihood Ratio Statistics For Autoregressive Time Series With A Unit Root. *Econometrica*, 49, ss:1057-72.
- Gül, E., & Yavuz, H. (2011). Türkiye’de kamu harcamaları ile ekonomik büyüme arasındaki nedensellik ilişkisi: 1963-2008 dönemi. *Maliye Dergisi*, 160, 72-85.
- Jean – Garcia, M. (2018). Wagner’s law: A Revision and a new empirical estimation. *Review of Public Economics*, 224, 13 – 35.
- Kar, M. & Taban, S. (2003). Kamu Harcama Çeşitlerinin Ekonomik Büyüme Üzerine Etkiler, *Ankara Üniversitesi SBF Dergisi*, Cilt: 58 (3) 146-169.
- Landau, D. L. (1986). Government expenditure and economic growth in less developed countries: An empirical study for 1960-80. *Economic Development and Cultural Change (Chicago)*, Vol. 35 (October 1986), pp. 35-75.
- Loizides, J. & Vamvoukas, G. (2005). Government expenditure and economic growth: Evidence from trivariate causality analysis. *Journal of Applied Economics*, 8(1), 125 – 152.
- Pantula, S. G., Gonzalez-Farias, G., & Fuller, W. A. (1994). A comparison of unit-root test criteria. *Journal of Business & Economic Statistics*, 12(4), 449-459.
- Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335-346.
- Robinson, R. (1977). Dependence, Government Revenue, and Economic Growth, 1955-1970. *Studies in Comparative International Development (New Brunswick, New Jersey)*, Vol. XII (No. 2, 1977), pp. 3-28.

- Srinivasan, P. (2013), Causality between Public Expenditure and Economic Growth: The Indian Case, *International Journal of Economics and Management*, Vol. 7(2): 335 – 347.
- Şengül, O. (2020). Finansal baskı ve ekonomik büyüme: Türkiye Örneği. *The Journal of Social Sciences*. 47. 265-273.
- Telek, C., & Telek, A. (2016). Kamu harcamaları ve ekonomik büyüme ilişkisinin wagner ve keynes hipotezi çerçevesinde incelenmesi. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 12(12), 628-642.
- Ulutürk, S. (2001). Kamu harcamalarının ekonomik büyüme üzerine etkisi. *Akdeniz Üniversitesi BF Dergisi*, 1(1), 2001.
- Vu Le, M., & Suruga, T. (2005). Foreign direct investment, public expenditure and economic growth: the empirical evidence for the period 1970–2001. *Applied economics letters*, 12(1), 45-49.
- Wagner (1893). *Grundlegung der Politischen Okonomie*, 3rd ed., Leipzig, C. F. Winter.
- Zabun, F. (2020). Kamu harcamaları ve ekonomik büyüme arasındaki nedensellik ilişkisinin ekonometrik analizi; Türkiye örneği. *R&S-Research Studies Anatolia Journal*, 3(4), 287-305.