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## EVALUATING THE RELATIONSHIP BETWEEN PUBLIC EXPENDITURES AND ECONOMIC GROWTH FOR TURKEY

*Since ancient times government has always taken part in economy. Government makes expenses for its basic functions (justice, security, infrastructure etc.). However, the idea of increasing public expenditures that dominated the world after the World War II started to be discussed in 1970s. Today, governments are in the opinion of adjusting public expenditures to ensure economic growth. In this study, 3-month data covering the period 1998:01–2011:04 are examined for Turkey to determine whether or not public expenditures have any effect on economic growth. A uni-directional causality is found between GDP and public expenditures. The direction of causality is from GDP to economic growth.*

**Keywords:** public expenditures, economic growth, Granger causality test.

**JEL codes:** H21, E62, H50.

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## ОЦІНЮВАННЯ ВЗАЄМОЗВ'ЯЗКУ МІЖ БЮДЖЕТНИМИ ВИТРАТАМИ ТА ЕКОНОМІЧНИМ ЗРОСТАННЯМ (ЗА ДАНИМИ ТУРЕЧЧИНИ)

*У статті підкреслено, що в усі часи уряд завжди брав участь в економіці в тій чи іншій мірі. Уряд передбачає витрати на виконання своїх основних функцій (правосуддя, безпека, інвестиції в інфраструктуру тощо). Ідея збільшення бюджетних витрат з'явилася після Другої світової війни і почала реалізовуватися в 1970-х роках. На сьогоднішній день уряди регулюють бюджетні витрати таким чином, щоб забезпечити економічне зростання країн. Для дослідження взаємозалежності між бюджетними витратами та економічним зростанням використано дані по Туреччині, що охоплюють період з першого кварталу 1998 р. по четвертий квартал 2011 рік. Результат демонструє односпрямовану причинну залежність між ВВП, бюджетними витратами та економічним зростанням.*

**Ключові слова:** бюджетні витрати, економічне зростання, аналіз причинності за Грейнджером.

**Табл. 5. Форм. 3. Літ. 48.**

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## ОЦЕНКА ВЗАИМОСВЯЗИ МЕЖДУ БЮДЖЕТНЫМИ РАСХОДАМИ И ЭКОНОМИЧЕСКИМ РОСТОМ (ПО ДАННЫМ ТУРЦИИ)

*В статье подчеркнуто, что во все времена правительство всегда принимало участие в экономике в той или иной мере. Правительство предусматривает расходы на выполнение своих основных функций (правосудие, безопасность, инвестиции в инфраструктуру и т.д.). Идея увеличения бюджетных расходов появилась после Второй мировой войны и начала реализовываться в 1970-х годах. На сегодняшний день правительства регулируют бюджетные расходы таким образом, чтобы обеспечить экономический рост стран. Для исследования взаимозависимости между бюджетными расходами и экономическим ростом использованы данные по Турции, охватывающие период с первого квартала 1998 г. по четвертый квартал 2011 года. Результат демонстрирует однонаправленную причинную зависимость между ВВП, бюджетными расходами и экономическим ростом.*

**Ключевые слова:** бюджетные расходы, экономический рост, анализ причинности по Грейнджеру.

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**1. Introduction.** The institution called "government" became a requirement in fulfilling common needs that emerged as people adopted a sedentary life. The importance of public economy has been always a matter of debate in the literature on economics. While some economists (Keynesians, post-Keynesians) argued that government has importance in economy, others (classics, neo-classics, monetarists, supply-siders, constitutional economists) insisted that government should never intervene in economy. The role of government in economic life was first suggested by the mercantilist thought and then strengthened as Keynes emphasized it as a result of the Great Depression. Prior to the Second World War, the duties of governments were very limited. In addition to maintaining national and international security, government was supposed to make infrastructure investments. However, as the sense of social state emerged after the Second World War, government's responsibilities increased in number. The position of government is also significant depending on economic structure of countries. Public expenditures can either promote economic growth, or create negative effects on economy.

It is seen that, before the 1990s, government had a great importance in economy in many countries. In fact, government owned industrial enterprises. However, publicly owned companies made a loss because of not keeping up with advanced technology, employing more people than they needed for political reasons, not improving productivity etc. As a result, in many countries, state owned enterprises were privatized. Today, public expenditures include current expenditures such as personnel salaries, expenditures made for investments in infrastructure such as highways, bridges, communication networks, and transfer expenditures such as retirement pensions, widow's pensions, unemployment pays, student loans, agricultural supports etc. Personnel salaries (current expenditures) constitute the major part of public expenditures. It is followed by transfer expenditures.

According to Wagner, public expenditures are not the cause but the result of the increase in national income. However, Keynes states that any increase in public expenditures leads to an increase in national income. The aim of this article is to test whether these provisions are effective for Turkey. Using the Granger causality test, the relationship between public expenditures and economic growth is examined for Turkey.

**2. Theoretical Framework.** In general, the concept of public expenditures is defined as the total of the components forming the cost of all works government does in order to perform the functions it has (Aksoy, 1998: 91).

The term "public expenditures" is defined differently by many economists and schools. According to the classical school philosopher Adam Smith, the public has 3 duties: maintaining national security, securing justice and making public investments in the fields where it is not possible for the private sector to enter (Uzay, 2002: 152).

Just like classical economists, neoclassical economists suggest that state intervention in economic life disturbs the equilibrium of macroeconomics (Altay and Altin, 2008: 268). In the neoclassical models, where economic growth is exogenously determined by the change in technological progress, public expenditures do not affect economic growth. In addition, in this approach, it is not possible for government policies to affect economic growth. It is seen that public policies do not play any role in determining the rate of long-term economic growth (Kar and Taban, 2003:

148). Neoclassical economists evaluate the form of public expenditure finance and argue that an increase in the number of public activities in economy creates a crowding-out effect on private investments (Cural et al., 2012: 74).

In fiscal policy, monetarists assert that pure fiscal expansion can affect national income in the short term without monetary accommodation. On the other hand, they state that in the long term public expenditures replace or crowd out some components of private expenditures. Consequently real income remains unchanged. Monetarists point out the disadvantages if government is actively used in eliminating instabilities in macroeconomics with expenditures and ensuring growth in the long term. The most significant approach used by the monetarism for demonstrating the inefficiency of public expenditures in economic stability and equilibrium is the crowding-out effect (Bakirtas, 2004). For monetarists, public expenditures which are financed by taxes and bond supply without any change in money supply do not lead to any increase in total expenditures but result in contraction in private sector expenditures. Based on the assumption that the interest elasticity of investments is high and the interest elasticity of money demand is low, monetarists economists suggest that the crowding-out effect caused by the increase in public expenditures is strong. For monetarists, public expenditures which are financed by taxes and bond supply without any change in money supply do not lead to any increase in total expenditures but result in contraction in private sector expenditures. Any increase in interest rates is a disincentive for private sector investments. For this reason, private sector lowers its production level. If real economy crowds the private sector out, it either neutralizes or minimizes the effect of an expected increase in public expenditures and national income (Yavuz, 2001).

The Great Depression shook the foundations of the classical school of economic thought, which argues that the economy will always be at full employment level and be free from permanent unemployment. During that period, Keynes claimed that the government was capable of overcoming economic depressions by means of basic policies. He emphasized that the economy would get rid of underemployment if the government intervened in the economy through some policies (Yildirim et al., 2011: 143–144).

German economist Wagner puts forth the nature of the relationship between public expenditures and economic growth. Wagner's Law expresses that, as per capita income rises, the public sector grows more than per capita income. In other words, Wagner's Law means that the income elasticity of public expenditures demand is higher than 1. According to Wagner, public expenditures are not the cause but the result of the increase in national income (Tan et al., 2010: 26). In Wagner's Law, public expenditures are considered to be an endogenous variable. In addition, the direction of causality is from economic growth to public expenditures. However, Keynes' Law accepts public expenditures to be the exogenous variable. Any increase in public expenditures leads to an increase in national income and consequently the direction of causality is from public expenditures to growth (Arisoy, 2005).

**3. Literature Review.** Davoodi and Zou (1998) found a negative relationship between economic growth and fiscal administrations in developing countries. Lin (1994), Hsieh and Lai (1994), Devarajan et al. (1996), Sinha (1998), Uluturk (2001) and Nketiah-Amponsah (2009) proved that public expenditures are effective on eco-

economic growth. Ram (1986), Dandan (2011) and Altunc (2011) reached a positive relationship between total public expenditures and economic growth. Yamak and Kucukkale (1997), Ansari et al. (1997), Loizides and Vamvoukas (2005), Bose et al. (2007), Uysal and Mucuk (2009), Gul and Yavuz (2011), Nasiru (2012) and Yuksel and Songur (2011) suggested a causality relationship from total public expenditures to economic growth while Taban (2010) puts forth a bidirectional causality relationship. Karikari (1995) emphasized that public expenditures have a negative effect on economic growth. However, Alexiou (2009) and Cetinkaya and Sahin (2009) underlined that for Turkey public expenditures positively affect production. Cavusoglu (2005) showed that in Turkey there is a weak relationship between public sector activities and economic development. Glaeser et al. (1996), Bagdigen and Cetintas (2003), Basar et al. (2009) and Bagdigen and Beser (2009) indicated that there is no direct relationship between economic growth and public expenditures. Kolluri et al. (2000), Al-Faris (2002) found that national income is a predictive factor of the expanding role of government as postulated by Wagner. Saad and Kalakech (2009), Mudaki and Masaviru (2012) found government spending on education have a positive effect on economic growth but Nurudeen and Usman (2010) showed a negative effect on it.

**4. Analysis of Public Expenditures in Turkey.** Today, the countries' level of development is measured by per capita income. Consequently, the gross domestic product (GDP) of a country is significant in this sense. According to the World Bank in Turkey, this ratio increased compared to the years before: in 2007 – 24.5%, in 2008 – 22.8, in 2009 it reached 27.3%.

Besides, the countries' level of development is measured according not only to per capita national income but also to the share of social service expenditures in the budget. In this context, consolidated budget expenditures can be divided into two different classes: administrative-functional and economic. In the administrative-functional class, budget allocations are grouped into 14 categories. However, in the economic class, they are divided into 3 categories; namely, current, investment and transfer expenditures. Current expenditures are classified as personnel expenditures and other current expenditures. In that item, public personnel payments made by government have the biggest share. Other current expenditures include the payments which are made for consumable goods and services such as electricity, gas, water, gasoline, postal service etc. In the event such expenditures are not made at an adequate level, production quality may deteriorate, which may contribute to the factors that hinder economic development in the long term. Investment expenditures cover the purchase of machinery, equipment and vehicles as well as building, installation and repair costs. Investment expenditures, which increase production and positively affect productivity, allows better use of resources. Increasing the productivity of production factors, such expenditures are made for durable goods. This expenditure item is of great importance for the development of a country. Transfer expenditures, on the other hand, encompass subsidies, internal and external debt interest payments, payments to state-owned enterprises (for nationalization and building purchase costs) and tax returns. Without doubt, debt payments are the most significant component of this item (Bahar and Tas, 2004: 3–4). Table 1 demonstrates the distribution (%) of the consolidated budget revenues and expenditures in Turkey.

**Table 1. Ratio of Consolidated Budget Revenues and Expenditures in Turkey**

Years	2005	2006	2007	2008	2009	2010(•)
EXPENDITURES	100.0	100.0	100.0	100.0	100.0	100.0
Primary Expenditures	70.8	73.8	75.9	77.4	79.9	83.1
Current	31.2	33.6	33.4	33.8	33.0	34.1
Personnel	25.5	25.8	25.7	25.9	25.1	25.9
Other Current	5.7	7.8	7.7	7.9	7.9	8.2
Investment	5.9	6.6	6.3	7.6	7.1	9.0
Transfer	62.9	59.8	60.3	58.6	59.9	57.0
Interest Payments	29.2	26.2	24.1	22.6	20.1	16.9
Domestic Interest Payments	25.1	22.4	20.9	20.0	17.7	14.7
Foreign Interest Payments	4.1	3.8	3.2	2.6	2.4	2.1
Transfer to State-Owned Enterprises	0.9	2.6	1.3	1.7	2.1	2.7
Tax Returns	6.6	6.6	7.8	7.7	6.8	6.5
Social Security	14.9	14.1	16.5	15.7	19.9	19.2
Other Transfers	11.3	10.3	10.7	10.9	11.0	11.8
REVENUES	100.0	100.0	100.0	100.0	100.0	100.0
General Budget	98.5	97.1	97.1	96.9	96.8	96.7
Tax Revenues	79.0	79.0	80.1	79.9	79.8	82.2
Taxes on Income	21.6	20.5	22.5	23.3	24.5	22.1
Wealth Taxes	1.6	1.7	1.8	1.8	2.0	2.0
Goods and Service Taxes	42.7	42.4	42.4	40.7	41.5	43.9
Foreign Trade Taxes	13.0	14.5	13.5	14.0	11.9	14.3
Tax-Free Revenues	18.2	16.8	16.0	15.3	14.5	12.3
Special Revenues and Funds	1.3	1.3	1.0	1.7	2.5	2.2
Supplementary Budget (*)	1.5	2.9	2.9	3.1	3.2	3.3

Source: State Planning Organization (DPT), [www.dpt.gov.tr](http://www.dpt.gov.tr) (17.07.2012),

(\*) Total of Special Budget and Regulatory and Supervisory Authority Revenues after 2006,

(•) temporary.

As seen in Table 1, in the budget expenditures between 2009 and 2010, social security (19.9–19.2%) and domestic interest payments (17.7–14.7%) have the biggest shares in transfer expenditures (59.9–57.0%). On the other hand, in terms of revenues, taxes have the highest ratio (79.8–82.2%).

The statistics of the social expenditures made by the public sector in Turkey is given in Table 2.

**Table 2. Public Sector Social Expenditure Statistics**

Years	2006	2007	2008	2009
(Ratio to GDP) (%)				
Education	3.10	3.14	3.02	3.28
Health	3.97	3.97	3.91	3.92
Social Protection	7.20	7.29	7.02	7.42
Total	14.27	14.39	13.94	14.62

Source: State Planning Organization (DPT), [ekutup.dpt.gov.tr](http://ekutup.dpt.gov.tr) (12.07.2012)

In Table 2, according to the public sector social expenditure statistics, health expenditures (3.92%) are higher than education expenditures (3.28%) in 2009. However, social protection expenditures (7.42%) are more than health and education expenditures in 2009. In other words, it is possible to say that, compared to other types of expenditures, transfer expenditures are higher.

**5. Variables, Methodology and Prediction Results.** In this study, the 3-month data covering the period of 1998:01–2011:04 were used. The variables of public expendi-

tures and GDP (with the fixed prices of 1998 by the method of expenditures) were obtained from the website of the Central Bank of Turkey. Seasonal effects were purified using Trame-Seats method. Natural logarithms were taken for both variables. As a method in the prediction of the model created, the Granger causality test was implemented with the help of Eviews 7.0. The following equation was used to determine whether or not a long-term relationship existed between public expenditures and economic growth.

$$\Delta \ln(PE_t) = \beta_0 + \beta_1 \Delta \ln(GDP_t) + \varepsilon_1 \quad (1)$$

In the model predicted PE means public expenditures, GDP means gross domestic product,  $\Delta$  means error,  $\beta$  means the parameters in the model.

In case of a relationship between public expenditures and economic growth, for the purpose of testing the direction of this relationship, the Granger causality test was conducted. The Granger causality test is performed with the help of the following equations (Granger, 1969: 424–438):

$$Y_t = \sum_{i=1}^m \alpha_i Y_{t-i} + \sum_{j=1}^m \beta_j X_{t-j} + u_{1t}, \quad (2)$$

$$X_t = \sum_{i=1}^m \lambda_i Y_{t-i} + \sum_{j=1}^m \delta_j Y_{t-j} + u_{2t} \quad (3)$$

In these equations,  $m$  indicates the length of delay.  $u_{1t}$  and  $u_{2t}$  error terms are accepted to be independent from each other.

Prior to the Granger causality test, in order to ensure the prediction results are accurate and reliable, it should be determined whether or not the variables are stable. Predictions made with stable variables give better results. The ADF unit root test results for the variables are demonstrated in Table 3.

**Table 3. Unit Root Tests**

Variables Number of Data: Data Period	t and p values for ADF	Test Result (*)	Fixes, Trend	Inherent Correlation Delay
LPE 54; 1998Q3-2011Q4	-3.158 p=0.028	There is no Unit Root	Fixed	1
$\Delta$ LPE 54; 1998Q3-2011Q4	-9.747 p=0.000	There is no Unit Root	Fixed	0
LGDP 51; 1999Q2-2011Q4	-2.475 p=0.338	Unit Root	Fixed and Trend	1
$\Delta$ LGDP 50; 1999Q3-2011Q4	-5.898 p=0.000	There is no Unit Root	Fixed	0

\*As a result of the ADF test, if p-value is higher than 0.05, there is a unit root.

Otherwise, there is no unit root. Critical values are cited from MacKinnon (1996).

As seen in Table 3, according to the ADF test results, public expenditures series is determined to be stable at the significance level of 5%. However, GDP is stable only after the first difference is taken.

During the period in question, financial crises were experienced both in the Turkish economy and in the world. These crises may have led to structural breaks in the series. For this reason, the existence of structural breaks in the series was analyzed by the unit root test, which was developed by Zivot and Andrews (1992). The unit root

test takes structural break into account. Zivot and Andrews (1992) developed 3 different unit root tests with the intent of finding the break in the series (Barisik and Cevik, 2008):

$$y_t = \mu^A + \theta^A DU_t(\lambda) + \beta^A t + \alpha^A y_{t-1} + \sum_{j=1}^k c_j^A \Delta y_{t-j} + e_t \quad (\text{Model A})$$

$$y_t = \mu^B + \beta^B t + \gamma^B DT_t^*(\lambda) + \alpha^B y_{t-1} + \sum_{j=1}^k c_j^B \Delta y_{t-j} + e_t \quad (\text{Model B})$$

$$y_t = \mu^C + \theta^C DU_t(\lambda) + \beta^C t + \gamma^C DT_t^*(\lambda) + \alpha^C y_{t-1} + \sum_{j=1}^k c_j^C \Delta y_{t-j} + e_t \quad (\text{Model C})$$

Here,  $T\lambda$  is the probable break year. In Model A, if  $T\lambda < t$ ,  $DU_t(\lambda) = 1$ . In other cases, it is the puppet variable with zero value. Similarly, in Model B, if  $t > T\lambda$  then  $DT_t^*(\lambda) = 1 - T\lambda$ . In other cases, it indicates the puppet variable with zero value. Model A analyzes the break at stable while Model B analyzes the break at trend. However, Model C analyzes the break at stable and at trend. In the application of the test, each year during the period of observation is considered to be a probable break year; puppet variables are created; t-statistics of  $\alpha$  coefficient is acquired. After this process is implemented for the entire observation period, the year for which t-statistics of  $\alpha$  coefficient is obtained at minimum level is determined to be the probable break year. The t-statistics obtained is compared to the critical values created by Zivot and Andrews. If t statistics is smaller than critical values by absolute value, null hypothesis (the series include a unit root) is accepted. If t-statistics is bigger than critical values by absolute value, the null hypothesis is rejected. The alternate hypothesis, which indicates that the series is stable with structural break, is accepted.

According to the results in Table 4, when the test statistics calculated is smaller than critical values as absolute value, the null hypothesis "the series is stable around the structural break" is not rejected<sup>2</sup>. According to the results in both Tables 3 and 4, the GDP series does not include a unit root and becomes stable when the first difference taken.

Table 4. Zivot-Andrews Break Tests

Variable	Test Statistics		
	Model A	Model B	Model C
LGDP	-3.267 (1)	-2.593 (1)	-3.332 (1)
Year of Break	2008Q2	2007Q1	2008Q4
1% Critical Value	-5.43	-4.93	-5.57
5% Critical Value	-4.80	-4.42	-5.08

$H_0$  hypothesis indicates no causality relationship. \* Meaningful with 10% margin of error.

Due to the fact that the degree of integration is different in both variables, it is not possible to examine the long-term relationship between the variables. For this reason, causality relationship between the variables was analyzed by means of the test developed by Toda and Yamamoto (1995). Since the variables used in the prediction are 3-month data, the length of delay was taken as 4 and the optimal length of delay

<sup>2</sup> The public expenditures series is found to be stable according to the ADF unit root test. For this reason, the Zivot-Andrews test was not conducted on this variable.

was determined to be 2 according to Schwarz's data criteria. When the highest degree of integration for the variables was determined to be 1 as a result of the unit root test, the equation system 3 (2 + 1) was predicted using the delayed apparently unrelated regression model. On the other hand, the causality relationship between the variables was found by employing the Wald restriction test for the first two delayed value. Table 5 gives the predicted results of the causality test.

**Table 5. Granger Causality Test Result between Public Expenditures and Economic Growth**

Null Hypothesis	$\chi^2$ Statistics	Degree of Freedom	p-value	Decision with 10% Significance Level
$\Delta$ LGDGP is not the Granger cause of LPE	5.013	2	0.081*	H <sub>0</sub> Rejected
LPE is not the Granger cause of $\Delta$ LGDGP	0.393	2	0.821	H <sub>0</sub> Accepted

H<sub>0</sub> hypothesis indicates no causality relationship.

"\*" shows that the null hypothesis is rejected at the significance level of 10%.

As seen in Table 5, during the period reviewed, public expenditures made are not the Granger cause of GDP while GDP is the Granger cause of public expenditures. According to these results, there is a unidirectional causality relationship between GDP and public expenditures. The direction of causality is from GDP to public expenditures.

**6. Conclusion.** In macroeconomic models, economy is accepted to consist of 4 sectors: household sector, business sector, government sector and foreign trade sector. The government sector covers all state institutions and organizations in economy. The government not only purchases goods and services but also makes expenses. Even in the economic thought which argues that the government has to more or less take part in economy, government makes some basic expenses (education, health, security, infrastructure etc.). Money is used in the payment of public expenditures. Public expenditures have a number of different classifications. In Turkey, the analytic budget classification has been used since 2004. It is a budget system classifying public expenditures in to administrative, functional and economic for measuring public expenditures. The analytic budget classification is an important step towards financial transparency, which allows for evaluating government's budgetary policies better and using resources in a more efficient way. Even though different economic classifications exist, generally accepted economic classifications include real expenditures, transfer expenditures, current expenditures and investment expenditures.

Public expenditures have both positive and negative effects on economic growth. The government has to implement some policies in order to increase the number of investments in the country. It has to provide infrastructure services, ensure political stability and improve national security, grant promotions to some sectors for development. The negative side of public expenditures is seen in meeting public finance with domestic borrowing. Shrinkage in private sector fund supply and increase in interest rates may lead to a decrease in the number of private sector investments. Besides, the public sector adapts itself to market conditions more slowly. For this reason, it takes the public sector longer to obtain new information and catch up with the changing technology. The production factor productivity in the public sector is different from the production factor productivity in the private sector. According to the generally



accepted opinion, factor productivity is lower in the public sector. The public sector is relatively bigger. As a result, resources are used in non-productive areas and economic growth is negatively affected.

In this study, 3-month data covering the period of 1998:01–2011:04 are used to determine whether or not public expenditures have any effect on economic growth. According to the result obtained, during that period in Turkey public expenditures did not affect economic growth while economic growth affected public expenditures, which supports Wagner's opinion. As emphasized by Wagner, public expenditures are not the reason but the result of economic growth.

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