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Optimal Size of Government in Turkey

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ABSTRACT: This paper examines the relationship between a size of the government and the economic growth and estimates the optimal size of the government for Turkey by using two different specifications. We find that the optimal size of the central government varies from 8.8 (15.4) to 9.1 (17) percent of GDP for 1950-2012 (1970-2012) period, depending on the specification. The optimal size of the central government expenditures excluding the interest payments is 14.4 percent of GDP. The actual rates have been well above the estimated optimal ones for a long time. The results of our quadratic specification also suggest that Armey curve is valid for Turkey during the period examined. We find that the estimated optimal sizes of the government from different specifications are consistent with each other, but there is a substantial variation in the size when different time periods are used. This shows that Armey curve is sensitive to change in the time periods. Our results clearly point out that the Turkish government should cut its expenditures in order to have a growth maximizing size.

Keywords: optimal government size; government size and growth; Turkey
JEL Classifications: E62; H10; H50; O40

1. Introduction

The relationship between the economic growth and the size of the government has been one of the most important and popular topics in economics for a long time. There is no doubt that this relationship has very important policy implications. No one can convincingly argue that the size of the government does not matter for policy making or social welfare.

Although the exact relation between the government size and economic growth is not clear cut, we can safely say that a certain amount of government expenditure is necessary for the economic growth and general public order. For example without a government that protects property rights, establishes the rule of law or defends national borders, the economy can not function or operate well. But this does not mean that every increase in government expenditures will have necessarily positive effects regardless of the government size. As argued by many studies, such as Barro (1990), Gwartney et al. (1998), Vedder and Gallaway (1998), after some point, increases in government size can have negative effects on the growth. Gwartney et al. (1998) discuss the possible reasons to explain why an increase in the government size after a certain level may be harmful for the growth. So if a government aims at increasing the growth rate, it should keep its size at the optimal point. But what is the optimal size or point? The optimal size, as expected, varies among countries. In another words, there is no unique optimal size fits for all countries.

Like many other countries, the size of the government has changed over time in Turkey. For example the share of the central government expenditure in GDP is 10.3, 16.3, and 24.8 percent in 1950, 1980 and 2012, respectively.[1] We think that it is important to study whether the actual government size is close to the optimal one and see the optimal size is sensitive to the change in the sample period used or not.

The present study examines the relation between the economic growth and the government size to estimate the optimal size of the central government total expenditures for 1950-2012 and 1970-2012 periods and the central government total expenditures excluding interest payments (non-interest

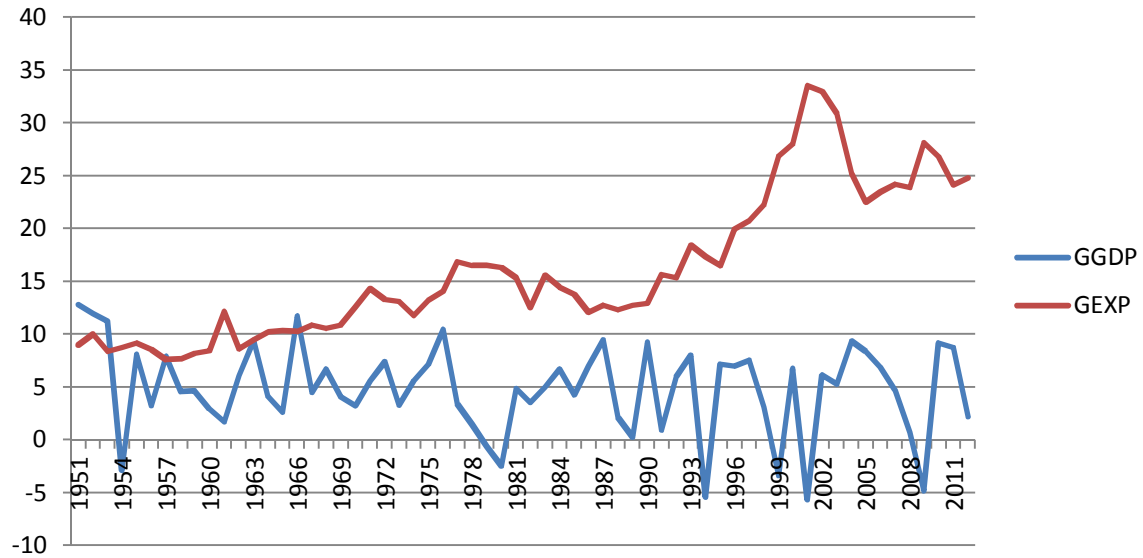
[1] As a result of an important change in the government budget system in Turkey, the consolidated government budget series terminated and the central government budget series started in 2006. Therefore the central government expenditures refer to the consolidated government expenditures before 2006 in the present study.

expenditures) for 1980-2012 period in Turkey. Although Altunç and Aydın (2011) also examine the optimal government size for Turkey, the present study differs in many respects, like using a longer time period, estimating the optimal size for the non-interest expenditures, adding the openness of the economy to the specification, showing how a change in the sample periods affect the optimal size, also estimating a different model developed by Schully (1994). We have a brief look at the growth rate of GDP and the government expenditure in Turkey in section 2. We review the literature in section 3, specify the empirical strategy in section 4, estimate and discuss the empirical results in section 5, and conclude in section 6.

2. A Biref Look at the Growth Rates of GDP and the Government Expenditures in Turkey

The growth rate of GDP and the central government expenditures (% of GDP) over the period 1950-2012 can be seen at Figure 1.

Figure 1. Growth Rate of GDP and Central Government Expenditure (% of GDP)



It seems that the government expenditures, in general, are very stable and relatively low in 1950s and 1960s. There is an increase after 1970s, especially 1990. The rise in the interest payments on the government debt has a role in this increase, but the non-interest government expenditures have substantially increased as well. Although government expenditures are relatively high in 1990s and 2000s, with some exceptions, the growth rates of GDP display a more volatile pattern in those periods compared to 1950s and 1960s. Another important point is the government expenditures rate is low in 1950s and 1960s, but the growth rates in those years are well above the mean experienced during the entire period. Put it differently, in 1950s and 1960s, the mean of government size is lower and the mean of the GDP growth are higher compared to the means of the full sample.

3. Literature Review

Since the main focus of the present study is to estimate the optimal size of government for Turkey, we review the studies focus on the optimal size of government. In an endogenous growth model, Barro (1990) shows that an increase in taxes and government spending can have the opposite effects on the growth rate. Barro (1990) suggests that when the government is big (small) the negative (positive) effect dominates and argues that at the optimal point the marginal product of government services is equal to unity. Karras (1996) develops a model, using the latter point in Barro (1990), to estimate the optimal size of government and examine whether the government service is productive or not. Karras (1996) finds that the optimal government size (as a share of the government consumption expenditures in GDP) is 23 (+-2) percent for average country but varies from 14 (± 4) percent to 33

(+-6) percent for average OECD and South American country, respectively. [2] Karras (1997) using data for 1950-1990 period for 20 European countries, find that optimal government size is 16 (± 3) percent and argues that government services are productive. Aly and Strazicich (2000), following Barro (1990) and Karras (1996, 1997), examine the optimal size of government in 5 Gulf countries of Middle East over the period 1970-1992. They find that, in general, the government services are productive and the optimal government size including (excluding) Kuwait is 9 (12) percent and conclude that the size of the governments is greater than the optimal ones. AbuAl-Faul and Rafiq (2007), using the data for 1975-1996 period for Jordan, find that optimal size of the government is 10.4 percent on average and conclude that the government services are overprovided.

Schully (1994) suggests an empirical model, used by some studies like Husnain (2011), to find the optimal or growth maximizing rate of taxes (or government expenditures). Schully (1994), for the US over the period 1929-1989, finds that optimal size of the government (tax rate) is between 21.5 and 22.9 percent of Gross National Product. Schully (2008), estimates that the growth maximizing tax rates is 19.3 percent for the US data over the period 1960-1990. Heerden and Schoeman (2008), using data from 1960 to 2006 for South Africa, find that optimal tax rate is 21.94 percent. Chobanov and Mladenova (2009) estimate the optimal size of government to be around 25 percent in 28 member countries of OECD for 1970-2007 period. Husnain (2011), using data from 1975 to 2008 for Pakistan, reports that the optimal size of the government spending is 21.48 percent. He argues that this rate is not much different from the actual rate and suggests that it would be better to enhance the efficiency of the government rather than making large fiscal adjustments.

In recent years, many studies strongly argue and present evidence that the relationship between the government size and economic growth may be nonlinear or quadratic. In an important and widely cited paper in the literature, Vedder and Gallaway (1998) specify a useful quadratic approach, based on the idea suggested by Armey (1995), has been used in many subsequent studies. According to this approach when government expenditure exceeds the optimal point, its effect on the growth will be negative or detrimental. This is illustrated as an inverted U shaped relationship, frequently called Armey curve referring to Armey (1995) in the literature. Vedder and Gallaway (1998) find that Armey curve peaks when the federal government spending is 17.45 percent for the US during 1947-1997 period. They estimate the optimal size for different federal expenditure categories and find that Armey curve is also valid for the state and local governments. They report that the optimal government spending for Canada, Denmark, Italy, Sweden and United Kingdom to be 21.37, 26.14, 22.23, 19.43 and 20.97 percent respectively and argue that Armey curve is detected and the optimal rates are smaller than the actual ones. Pevcin (2005), using data for 12 European countries, calculates that the optimal size of the general government is 36.56, 40.3 and 42.12 percent. Pevcin (2005) also suggests the optimal size of the government to be 37.09, 42.90, 38.98, 45.96, 38.45, 42.28, 44.86 and 41.91 percent for Italy, France, Finland, Sweden, Germany, Ireland, Netherlands and Belgium respectively and concludes that the actual rates in those countries, except for Ireland, are greater than the optimal rates. Chobanov and Mladenova (2009), for 81 countries over the period 1961-2005, estimate the optimal government consumption rate to be 10.8 percent. Forte and Magazzino (2010), using different empirical specifications including the quadratic one and data for EU countries from 1970 to 2009, estimate the optimal size of government for EU countries and individually for 12 EU countries, also point out that the significant differences among countries exist and the actual rates are greater than the estimated optimal ones. Mutaşcu and Miloş (2011), using data for 1999-2008 period and non-linear regressions, examine the optimal size of the government in the 15 old and 12 new members of European Union. They find that the optimal government size is 30.42 percent for old member countries, while it is 27.46 for the new members and conclude that the actual rates are significantly greater than the optimal ones. A few studies focus on single countries. Mavrov (2007) studies the relation of government spending and economic growth in Bulgaria over the period 1990-2004 and estimates that the optimal size of the government is 21.42 percent. Altunç and Aydın (2011), using Turkish data for 1975-2010, conclude that Armey curve is valid for the government total, current and transfer expenditures but not for the investment expenditures. They find that the optimal government total expenditures, current expenditures and transfer expenditures are 15.8, 6.18 and 10.83 percent respectively. Altunc and Aydın (2013), using data for the period 1995-2011, find that optimal levels of

[2] Unless stated otherwise, all estimated optimal sizes expressed as a share of GDP.

government total expenditures are 25.21, 20.44, 22.45 percent for Turkey, Romania and Bulgaria respectively and conclude that the optimal levels are above the actual ones in 2011. Herath (2012), for Sri Lankan data from 1959 to 2009, calculates that the optimal amount of government expenditures is around 27 percent and argues that Armey curve is a reality for developing countries as well as developed ones. Facchini and Melki (2013), using French data over the period 1896-2008 and time series methods, indicate that the efficient government spending is around 30 percent.

Some studies examine the relation between the government size and economic growth by modifying the model suggested by Ram (1986) into a threshold regression model, such as Chen and Lee (2005), Abounoori and Nademi (2010) and Vaziri et all (2011). Chen and Lee (2005), examining the presence of Armey curve in Taiwan and using data for 1979:1-2003:3 period, estimate that the threshold levels for the government total, consumption and investment expenditures are 22.84, 14.97 and 7.30 percent respectively and suggest that Armey curve holds. Abounoori and Nademi (2010), for Iran over the period 1959-2006, find that the threshold levels of the government total, consumption and investment expenditures are 34.7, 23.6 and 8 percent. They conclude that a nonlinear relationship between the government size and economic growth exists in Iran. Vaziri et al. (2011), using data from 1960 to 2007 for Pakistan and Iran, detect a nonlinear relationship between government expenditure and economic growth and conclude that Armey curve is valid.

4. Empirical Strategy and Specification

We estimate the growth maximizing or optimal size of government for Turkey, based on the models suggested by Schully (1994) and by Vedder and Gallaway (1998). The empirical specification developed by Schully (1994), based on Cobb Douglas production function, and relates the government to the output as follows:

$$O=A(G/O)^{B}(1-TAX)^{C} \qquad (1)$$

where O stands for total output, which is proxied by Gross Domestic Product (GDP), A for total factor productivity, G for government expenditures, TAX for the tax rate, which can be measured by the share of government expenditures in output (G/O), 1-TAX shows the fraction of the output taken private economic agents after paying the tax. In logarithmic form:

$$LO= LA + B\ L(G/O) + C\ L(1-TAX) \qquad (2)$$

where L stands for natural logarithm. This model assumes that government budget is balanced: G=TAX*O. Therefore, TAX can replace the G/O in the equation (2):

$$LO= LA + B\ LTAX + C\ L(1-TAX) \qquad (3)$$

Growth maximizing tax or expenditure rate is calculated with the formula: TAX*=B/(B+C). The model, developed by Vedder and Gallaway (1998), includes the linear and squared terms for the government expenditures, the unemployment rate and a time trend as independent variables. In this model, the linear term is expected to capture positive effects of government size, while the squared term can show the negative ones. Facchini and Melki (2013) and Herath (2012) employ also the openness of the economy as a control variable. Based on those studies, we will use the following specification:

$$GGDP=\beta_0 + \beta_1 GEXP+ \beta_2 GEXP^2 + \beta_3 OPEN+ \beta_4 UN+\varepsilon \qquad (4)$$

where GGDP stands for growth rate of real GDP, GEXP for government expenditures (% of nominal GDP), OPEN for openness of the economy measured by the sum of exports and imports (% of the nominal GDP), UN for unemployment rate, ε is the error term[3]. As mentioned before, the coefficient on GEXP shows the positive effects of government expenditures on the rate of economic growth, while the one on the squared term reflects the negative effects. Therefore we can expect that the linear term has a positive sign, whereas the squared term has a negative one. Optimal or growth maximizing government size is estimated with the following formula GEXP*: $-\beta_1/2\ \beta_2$.

One can naturally wonder how or what extent the optimal rate of the government size is sensitive to the change in the sample period. Because there is no reason to assume that this rate is the same or stable over time. Therefore we estimate the equations (3) and (4) for 1950-2012 and 1970-2012 periods separately. This may be also regarded as a sensitivity analysis. Also in Turkey, especially since 1990s, the interest payments on the government debt have had a significant share in the budget.

[3] Like Chobanov (2007), it is possible to use the change in GDP in natural logarithm instead of the growth rate of GDP. Our results, as expected, do not change much.

This share exceeds 5 or 6 percent of GDP in some years. So we will also estimate the equation (4) by the using central government expenditures excluding interest payments (NIGEXP), instead of total expenditures (GEXP) for 1980-2012 period. We estimate the equations by using Ordinary Least Squares (OLS) and also calculate the optimal size of the government for each regression we carry out.

5. Empirical Results and Analysis

Data on the central government expenditures come from Turkish Ministry of Finance, GDP from Turkish Ministry of Development and Turkish Statistical Institute, the openness of the economy from Turkish Statistical Institute (2013), unemployment rates for 1950 to 1979, 1980 to 2010, 2011 to 2012 from Bulutay (1995), from Turkish Ministry of Development and Turkish Statistical Institute (2013) respectively. We first report the results of unit root tests, then the estimations of the equations (3) and (4), and finally calculate and discuss the optimal size of the government for Turkey.

5.1 Unit root tests

Before estimating the equations, we examine whether our variables are stationary or not by using Augmented Dickey Fuller tests. The results of unit root tests are summarized in Table 1.

Table 1. ADF Tests

Variables	1950-2012		1970-2012		1980-2012	
	Level	First dif.	Level	First dif.	Level	First dif.
GEXP	-2.535479	-7.434905*	-1.849904	-5.539474*		
$GEXP^2$	-2.874684	-6.268166*	-2.591438	-4.972507		
GGDP	-8.116391*	-8.776115*	-6.411583*	-7.070822*	-6.166877*	-6.488264*
OPEN	-1.738230	-7.112545*	-2.271729	-6.037731*	-2.074491	-5.360795*
L(GDP)	-3.485526**	-8.161686*	-3.313428***	-6.439743*		
L(TAX)	-3.240591***	-9.497450*	-1.931294	-6.52380*		
L(1-TAX)	-2.467027	-7.059636*	-1.861410	-5.345758*		
NIGEXP					-3.180742	-4.044111**
$NIGEXP^2$					-2.826025	-4.440225*
UNEM	-2.348294	-6.789893*	-2.650971	-5.533580*	-2.713445	-4.675354*

Notes: *,*,*** show 0.01, 0.05 and 0.10 significance levels, respectively. Schwarz Information Criteria is used for the lag specification.

GEXP, $GEXP^2$, OPENNESS, UNEM, L(1-TAX), NIGEXP and $NIGEXP^2$ have unit roots in levels. GGDP does not have unit roots in levels and first differences at 0.01 significance level. L(TAX), measured as government expenditures in GDP (O/GDP), and L(GDP) don't have unit roots at 0.10 and 0.05 levels during the entire sample, but for the subsample, 1970-2012, L(TAX) and LGDP have unit roots at 0.05 level. Elliott-Rothenberg-Stock and NG Perron tests also indicate that L(GDP) and L(TAX) have unit roots. Since the first differences of all variables, other than NIGEXP, don't have unit roots at 0.01 level, we use the first differences except for GGDP.

5.2. Estimation results

The estimations of the equation (3) for 1950-2012 and 1970-2012 periods are reported in Table 2. Following Husnain (2011) we use the current or contemporaneous values of the independent variables.

The coefficient on the $\Delta L(1\text{-}TAX)$ is statistically important while the one on $\Delta L(TAX)$ is not for 1950-2012 period. Both coefficients on the independent variables are statistically significant for 1970-2012 period. F tests show the null hypothesis, which is the coefficients on the independent variables are equal to zero, is rejected at 0.01 level. Diagnostic tests don't indicate any problem with the estimation results. We also perform CUSUM-squares and Ramsey RESET tests to see if there is a structural instability or not. We find that there is no evidence for instability in our results at 0.05 level.

We estimate the equation (4) for the central government expenditures for 1950-2012 and with and without a squared term for 1972-2012 periods and for the primary expenditures from 1980 to 2012. The results are reported in Table 3.

Table 2. Estimation Results of the Equation (3)

Dependent variable: ΔLGDP		
Variables	**Coefficients**	
	1950-2012	**1970-2012**
Constant	0.048292*	0.042324*
	(0.004741)	(0.005380)
ΔLTAX	0.110551	0.328761**
	(0.083628)	(0.125766)
ΔL(1-TAX)	1.138699*	1.810840*
	(0.395954)	(0.482431)
R^2	0.199724	0.319737
F	7.362264	9.400379
DW	1.960071	2.075585
Jarque-Bera	2.086930	3.593053
BG S.C. LM Test (F)	0.372687	0.810097

Notes: *,*,*** show 0.01, 0.05 and 0.10 significance levels, respectively. Standard errors are in the parentheses. Δ is the first difference operator. BG SC LM is Breusch-Godfrey Serial Correlation LM test.

Table 3. Estimation Results of the Equation (4)

Dependent Variable: ΔGGDP				
Variables	**Coefficients**			
	1950-2012	**1970-2012**	**1970-2012**	**1980-2012**
Constant	5.209707*	4.496741*	4.794842*	5.150383*
	(0.524277)	(0.615273)	(0.651225)	(0.781274)
ΔGEXP	0.555489	1.837484***	-0.598714***	
	(0.741899)	(0.953178)	(0.305857)	
$\Delta GEXP^2$	-3.039515***	-5.393890**		
	(1.696054)	(2.014404)		
ΔNIGEXP				3.732830***
				(2.103420)
$\Delta NIGEXP^2$				-12.95659***
				(7.236086)
ΔOPEN	-0.200109	-0.077958	-0.180418	-0.400107
	(0.228421)	(0.234249)	(0.248712)	(0.286342)
ΔUN	-0.789420	-0.868437	-1.198606	-1.917170**
	(0.704371)	(0.687961)	(0.728393)	(0.842431)
R^2	0.232284	0.352156	0.229921	0.382382
F test	4.311556	5.164028	3.881375	4.179090
DW	1.844730	1.960319	1.890489	2.326399
Jarque-Bera	0.710645	2.971441	1.662135	1.158837
BG SC LM (F)	0.464852	0.678377	0.808375	0.388671

Notes:*,*,*** show 0.01, 0.05 and 0.10 significance levels, respectively. Standard errors are in the parentheses. Δ is the first difference operator. BG SC LM is Breusch-Godfrey Serial Correlation LM test.

As can be seen from Table 3, the coefficients on squared term are minus, as expected, and also statistically significant. The coefficient on linear term is statistically insignificant for the entire sample, but it is significant for the subsample. The results indicate that Armey curve is valid for Turkey in the period examined. Our control variables, the openness of the economy and the unemployment rate are statistically insignificant. The unemployment rate has the expected sign whereas the openness has the opposite sign.

Since the government expenditures substantially increase after 1970, like Vedder and Gallaway (1998) we also estimate the equation (4) for the period 1970-2012 without the squared term. As expected, the coefficient is on the linear term for government expenditures is minus and

statistically important. This suggests that after 1970, the government expenditures have a negative impact on the growth.

We estimate the equation (4) for the 1980-2012 period by using the government expenditures excluding interest payments (NIGEXP) instead of the total ones (GEXP). Both of the coefficients on the linear and the squared terms have the expected signs and are statistically significant at 0.05 level. This means that Armey curve is also valid for the primary expenditures. The coefficient on the unemployment rate has the expected negative sign and is statistically important at 0.05 level. Our other control variable, the openness of the economy, is insignificant and has a negative sign again.

Overall F statistics are significant. Our results indicate that the residuals have a normal distribution and are not serially correlated. Also CUSUM of squares and Ramsey RESET tests show that there is no instability in our estimates at 0.05 level.

5.3. The optimal size of the government

By using the formulas mentioned above and regression results, we can calculate the optimal size of the government expenditure as a percent of GDP. The estimated optimal sizes are shown in Table 4[4].

Table 4. Optimal size of the government

Equations	Optimal size of the government		
	1950-2012	1970-2012	1980-2012*
(3)	8.8	15.4	
(4)	9.1	17	14.4

Note: * only for the non-interest government expenditures (NIGEXP).

The optimal size of the government for 1970-2012 period is very close to that of Altunç and Aydın (2011), which is 15.8 percent and in line with many studies. The optimal size for the central government expenditures is surprisingly small in 1950-2012 period. The means of the government expenditures are about 16 and 19 percent for 1950-2012 and 1970-2012 periods in Turkey. The central government total and non-interest expenditures are about 24.8 and 22 percent of GDP in 2012. Since 1993, except for 1995, the central government expenditures have been always over 17 percent of GDP. In a similar way, for a long time, the central government non-interest expenditures have exceeded 14.4 percent. Our estimates clearly show that the size of the government has been well above the optimal one. Since many studies find that actual size of government is larger than the optimal one, our results are consistent with those findings.

The optimal size of the government, estimated from two different specifications, is totally consistent with each other. But there is a substantial variation in the optimal rates when different time periods are used. The optimal size for 1970-2012 period is almost twice the optimal size for 1950-2012 period. The size of the government is very low in 1950s and 1960s respectively, while the mean growth rates of GDP in 1950s and 1960s are well above the mean of the entire sample. Especially after 1970, there is a strong increase in the government expenditure rate, but no similar or accompanying increase in the growth rate of GDP.

We can conclude that the Turkish government should largely cut its expenditures in order to have a growth maximizing size. But it is a well known fact that, other than maximizing the growth, governments have other functions or goals. In Turkey, the central government expenditure (as a share of the GDP) has jumped from 12.9 percent in 1990 to 24.8 percent in 2012. As for the general government total expenditure, it has remarkably increased from 25.6 percent in 1999 to 37.5 percent in 2012.[5]

6. Conclusion

We examine the relationship between the economic growth and government expenditures and estimate the optimal size of the government for Turkey by using two empirical specifications. Since we don't have enough data for the general government expenditures, we estimate the optimal size for only the central government.

[4] For 1960-2010 period, the optimal government size is 11.6 and 13.4 percent.

[5] The data for the general government expenditure is taken from Turkish Ministry of Development.

The results of our first specification show that the optimal size of government is 8.80 and 15.4 percent of GDP for 1950-2012 and 1970-2012 periods. Our second specification suggests that the optimal size is 9.1 and 17 percent of GDP in the same periods. We also estimate the optimal size of the central government non-interest expenditures to be around 14.4 percent of GDP. The actual rates have been well above the optimal ones for a long time. Actually the size of the general government in Turkey seems larger than the estimated optimal government sizes by many studies in the literature. Our quadratic specification indicates that Armey curve is valid for both the central government total and non-interest expenditures in Turkey during the period examined.

We would like to point out that the optimal size, estimated from the two different specifications, is consistent with each other. But it seems that there is a significant variation in the optimal size when there is a change in the sample period. We think that this point is important and also shows that Armey curve can change in a significant way over time.

As for policy proposal, our empirical findings clearly indicate that Turkish government should decrease its expenditures by a good amount to have an optimal or growth maximizing size. It can be argued that the government should cut its unproductive and transfer expenditures first. But there may be a trade off between the economic efficiency or rationality and distributional policies. We think that the decisions on the size and mix of government expenditures should be made with a clear understanding about what their possible effects would be on the overall economy and social welfare. If the government finds cutting its expenditure wrong, difficult or politically unattractive, it should try to enhance its efficiency. Finally we think that if the observed increase in the government expenditure continues in Turkey, its negative effects on the growth might be stronger and more detrimental.

References

Abounoori, E., Nademi, Y. (2010) *Government size threshold and economic growth in Iran.* International Journal of Business and Development Studies, 2(1), 95-108.

AbuAL-Faul, B., Rafiq, R.B. (2007), *On the optimality of government size in developing countries: The case of Jordan.* International Journal of Business Research, 7(5), 226-230.

Altunç, Ö.F., Aydın C. (2011) *An Empirical Analysis on the Relationship between Public Sector Size and Economic Growth in Turkey.* Ekonomik Yaklaşım, 23(82), 79-98, (Turkish).

Altunc, O.F., Aydın C. (2013) *The relationship between optimal size of government and economic growth:Empricial evidence from Turkey, Romania and Bulgaria*. Procedia-Social and Behavioral Sciences, 92, 66-75.

Aly, H., Strazicich, M. (2000) *Is the government size optimal in the Gulf Countries of Middle East? An Empirical Investigation.* International Review of Applied Economics,14(4), 475-483.

Armey, D. (1995), The Freedom Revolution, Washington, Regnery Publishing.

Barro, R.J. (1990) *Government spending in a simple model of endogeneous growth.* Journal of Political Economy, 98(5), 103-125.

Bulutay, T. (1995), *Employment, unemployment, and wages in Turkey*, ILO, Ankara.

Chen, S.T., Lee, C.C. (2005), *Government size and economic growth in Taiwan: A threshold regression approach*, Journal of Policy Modeling, 27, 1051-1066.

Chobanov, D., Mladenova, A. (2009), *What is the optimum size of government?* Institute for Market Economics, Bulgaria.

Facchini, F., Melki, M. (2013), *Efficient government size: France in the 20th century.* European Journal of Political Economy, 31, 1-14.

Forte, F., Magazzino, C. (2010), *Optimal size of government and economic growth in EU-27*. CREI Working Paper, no. 4/2010.

Gwartney, J., Lawson, R., Holcombe, R. (1998) *The size and functions of government and economic growth.* Prepared for the Joint Economic Committee, Washington.

Heerden Y.V., Schoeman, N.J. (2008) *Finding the optimum level of taxes in South Africa: A balanced budget approach.* University of Pretoria, Department of Economics Working Paper Series, 2008-28.

Herath, S. (2012), *Size of government and economic growth: A nonlinear analysis*. Economic Annals, LVII(194), 7-30.

Husnain, M.I. (2011) *Is the size of government pptimal in Pakistan?*Journal of Economics and Economic Education Research, 12(2), 41-49.

Karras, G. (1997), *On the optimal government size in Europe:Theory and empirical evidence.* The Manchester School, LXV(3), 280-294

Karras, G. (1996), *The optimal government size further international evidence on the productivity of government services.*Economic Inquiry, XXXIV, 193-203.

Mavrov, H. (2007), *The size of government expenditure and the rate of economic growth in Bulgaria.* Economic Alternatives, 1, 53-63.

Mutaşcu, M., Miloş, M. (2009), *Optimal size of government spending. The case of European Union member states.* Annales Universitatis Apulensis Series Oeconomica, 11(1), 447-456.

Pevcin, P. (2005), *Government and Economic Performance.* Enterprise in Transition: International Conference Proceedings, 1291-1300. Sixth International Conference on Enterprise in Transition.

Ram, R. (1986), *Government size and economic growth: A new framework and some evidence from cross-section and time series data.* The American Economic Review, 76(1), 191-203.

Schully, G.W. (1994), *What is the optimal size of government in the Unites States?* NCPA Policy Report No. 188.

Schully, G.W. (2008), *Optimal taxation, economic growth and income inequality in the United States.* NCPA Policy Report No. 316.

Vaziri, H., Nademi, Y., Paghe, A., Nademi, A. (2011), *Does Armey Curve exist in Pakistan and Iran economies?* Journal of Applied Sciences Research, 7(5), 562-565.

Vedder, R. K., Gallaway, L.E. (1998), *Government size and economic growth.* Prepared for the Joint Economic Committee, Washington.

Turkish Statistical Institute (2013), *Statistical Indicators 1923-2012*. Publication number 4132, Ankara.