

## Government Size & Economic Growth: A Threshold Regression Approach in Selected Islamic Countries

<sup>1</sup>Ahmad Jafari Samimi, <sup>2</sup>Younes Nademi, <sup>3</sup>Hoda Zobeiri

<sup>1</sup>Professor of Economics & Vice president in Research Affairs Department of Economics, University of Mazandaran, Babolsar-Iran

<sup>2,3</sup>Ph.D. Student Department of Economics, University of Mazandaran, Babolsar-Iran.

---

**Abstract:** We apply a two-sector production function developed by Ram (1986) to estimate the threshold regression model for Islamic countries, regarding the effect of government size on economic growth. The ratio of final government consumption on GDP is used to find out the threshold points. Our empirical results indicate that there is a nonlinear relationship between government size and economic growth in the selected Islamic countries under consideration.

**Key words:** Government size, Economic growth, Threshold regression model

---

### INTRODUCTION

Economic growth is the most important macroeconomic variable reflecting the overall performance of a society. Among the factors that determine the economic growth, government spending is of particular interest in this paper.

The threshold government size is a point at which any rise in government spending lower than this value will have positive effects, while more than that will have negative effects on economic growth. The positive effects may be due to providing substructures, and public goods and the negative effects could be due to the crowding-out effect of government monopolistic activities.

Landau (1983), Engen and Skinner (1991), Folster and Henrekson (2001), and Dar and Amirkhalkhali (2002) found a negative relationship between government size and economic growth. They believe that expanding government size (government expenditure) has the effect of diminishing returns, and over-expanding government size will cause a crowded-out effect to private investment. In addition, government expenditure often turns into inefficient expenditure which will cause a distorted allocation of the resources as well as corruption. While expanding government expenditure, a government needs more taxes to support the expenditure, but expanding taxes will gradually have detrimental impacts on the economy.

There is another view supporting that expanding government size will promote economic growth. For instance, Ram (1986) and Kormendi and Meguire (1986) found a positive relationship between government size and economic growth. They write that expanding government size provides an insurance function to private property, and public expenditure can encourage private investment which will cause economic growth. Government expenditure provides the investment for public goods that will improve, in general, the investment environment.

Sheehey (1993), Vedder and Gallaway (1998), and Chen and Lee (2005) pointed out that the reason of inconsistency concerning the effect of government size on economic growth could be due to a non-linear relationship rather than the linear one.

Arney (1995) implements the Laffer curve to present the relationship between government size and economic growth, from which Sheehey (1993), Vedder and Gallaway (1998), and Chen and Lee (2005) empirically found the nonlinear relationship between the government size and economic growth. Vedder and Gallaway (1998) indicate that this asymmetric relationship is an "Arney curve", which considers that a small government size protect private property and provide public goods, but large government size will cause excessive investment which will create a crowded effect to private investment, overweight taxes and liability interest which will damage the economy. Chen and Lee (2005) used a threshold regression approach for testing a non-linear relationship between government size and economic growth in Taiwan. They found different

---

**Corresponding Author:** Ahmad Jafari Samimi, Professor of Economics & Vice president in Research Affairs Department of Economics, University of Mazandaran, Babolsar-Iran  
Email: jafarisa@umz.ac.ir

threshold value for different government size in Taiwan. First of all, the threshold regime is 22.839% for the “total government expenditure divided by GDP”. This indicates that there is a non-linear relationship of the Arme y curve: when the government size is smaller than the regime, economic growth is promoted under expanding government expenditure, but if the government size is larger than the regime, then the economic growth decreases. Secondly, the threshold regime is 7.302% concerning the “government investment expenditure divided by GDP”. Finally, when the variable “government consumption expenditure divided by GDP” is used as the government size, the threshold regime is 14.967%.

This paper modifies Ram (1986) two-sector production model in order to estimate the threshold government size in Islamic countries.

**Model Specification and Data Description:**

**Model Specification:**

We have used the Ram (1986) model as following:

$$\dot{Y}_t = \beta_0 + \beta_1 \left(\frac{I_t}{Y_t}\right) + \beta_2 g_{L_t} + \beta_3 g_{G_t} \left(\frac{G_t}{Y_t}\right) + e_t \tag{1}$$

Regression (1) shows that the variables which affect economic growth ( $\dot{Y}$ ) include the investment rate ( $\frac{1}{Y}$ ),

growth of labor force ( $g_G$ ), and the multiplication effects of government expenditure growth ( $g_G$ ) times

government size ( $G/Y$ ). In addition, we identify the multiplication effects through the sign of  $\beta_3$ . This indicates that the government sector has a reciprocal effect on economic growth through two ways: one is the direct contribution of the government sector and the other is the indirect effect through the non-government sector (externality effect).

Regression (1) is a traditional linear economic growth model, but we alter the linear model into the two regime TAR model of Hansen (1996, 2000). The model can be shown as follows:

$$\begin{cases} \dot{Y}_t = \delta_{10} + \delta_{11} \left(\frac{I_t}{Y_t}\right) + \delta_{12} g_{L_t} + \delta_{13} g_{G_t} \left(\frac{G_t}{Y_t}\right) + e_t & \text{if } q_t \leq \gamma \\ \dot{Y}_t = \delta_{20} + \delta_{21} \left(\frac{I_t}{Y_t}\right) + \delta_{22} g_{L_t} + \delta_{23} g_{G_t} \left(\frac{G_t}{Y_t}\right) + e_t & \text{if } q_t > \gamma \end{cases} \tag{2}$$

Or as one nonlinear regression such as:

$$\begin{aligned} \dot{Y}_t = & \left( \delta_{10} + \delta_{11} \left(\frac{I_t}{Y_t}\right) + \delta_{12} g_{L_t} + \delta_{13} g_{G_t} \left(\frac{G_t}{Y_t}\right) \right) I[q_t \leq \gamma] \\ & + \left( \delta_{20} + \delta_{21} \left(\frac{I_t}{Y_t}\right) + \delta_{22} g_{L_t} + \delta_{23} g_{G_t} \left(\frac{G_t}{Y_t}\right) \right) I[q_t > \gamma] + e_t \end{aligned} \tag{3}$$

The threshold value  $\gamma$  can be found by estimating the regression (3) through finding the minimum Error Sum of Squared in a re-order threshold variable. The threshold variable can be set by the exogenous variables out of the theoretical model. For example, in this paper we set government size as the threshold variable.

**Data Description:**

We have used the WDI 2008 annual data Islamic countries for 1980-2007 periods. The variables are: Total Labor Force (L), Gross Capital Formation (K), General Government Final Expenditure (G), GDP and GDP Annual Growth.

**Empirical Results:**

This paper uses Hansen (1996, 2000) threshold regression model to study whether a non-linear Arme y curve exists in Islamic countries.

**Table 1:** The Threshold and Linear Regression

countries	Threshold value	The impact of ( $g_G$ )(GS) on economic growth in two regimes of <i>Government size</i>			
		$\leq$ threshold	p-value	$>$ threshold	p-value
Iran	0.246	63.57	0.00	-101.3	0.00
Pakistan	0.119	158.16	0.006	-131.27	0.047
Turkey	0.1396	55.43	0.07	-88.24	0.35
Egypt	0.1653	40.88	0.11	-179.06	0.001
Algeria	0.1654	67.25	0.009	-127.84	0.0003
Indonesia	0.07	727.88	0.004	-791.33	0.002
Oman	0.2611	239.56	0.00	-149.84	0.065
Jordan	0.2609	105.15	0.00	10.17	0.89

As table 1 shows, while “General Government Final Expenditure over GDP” is the threshold variable, there is a nonlinear relationship between Government size and Economic growth in Islamic countries. In particular, since the government size is small (the threshold value is less than the threshold value) in two-regime model, government size and economic growth have a significantly positive relationship, but when the government size is large (the threshold value is larger than the threshold value), government size and economic growth have a significantly negative relationship. But in turkey and Jordan, government size has not a significantly impact on economic growth in large government size.

**Conclusion:**

Following the non-linear theory of Armeý (1995) and Vedder and Gallaway (1998), we have tested the presence of a non-linear Armeý curve relationship between government size and economic growth in Islamic countries. Doing so, we have modified the Ram (1986) two-sector production model into a threshold regression model. The empirical results using the ratio of “General Government Final Expenditure on GDP” as the threshold variable indicate that threshold effect exist between government size and economic growth in Islamic countries.

**REFERENCES**

Armeý, R., 1995. *the Freedom Revolution*, Washington DC: Rognery Publishing Co.

Dar, A. & S. Amirkhalkhali, 2002. “Government size, factor accumulation, and economic growth: evidence from OECD countries”, *Journal of policy modeling*, 24: 679-692.

Engen, E. & J. Skinner, 1991. Fiscal policy and economic growth. In paper presented at NBER conference on taxation.

Folster, S. & M. Henrekson, 2001. Growth effects of Government Expenditure and Taxation in rich countries. *European Economic Review*, 45(8): 1501-1520.

Gwartney, J., R. Lawson, & R. Holcombe, 1998. The size and functions of government and economic growth. Joint Economic Committee.

Hsieh, E. & K. Lai, 1994. Government spending and Economic growth; The G-7 experience. *Applied Economics*, 26: 535-542.

Kormendi, R.C. & P. Meguire, 1986. Government Dept, Government spending, and private sector behavior; Reply. *American Economic Review*, 76(1): 191-203.

Landau, D., 1983. “Government expenditure and economic growth; A cross-country study”, *Southern Economic Journal*, 49(3): 783-792.

Lin, S., 1994. “Government spending and economic growth”, *Applied Economics*, 26(1): 83-94.

Ram, R., 1996. “Government size and economic growth; A new framework and some evidence from cross section and time-series data”, *American Economic Review*, 76(1): 191-203.

Sheehey, E., 1993. “The effect of government size on economic growth”, *Eastern Economic Journal*, 19(3): 321-328.

Sheng Tung Chen, & Chien Chiang Lee, 2005. “Government size and economic growth in Taiwan: A threshold regression approach”, *Journal of Policy Modeling*, 27: 1051-1066.

Vedder, R.K. & L.E. Gallaway, 1998. Government size and Economic growth, paper prepared for the Joint Economic Committee of the US Congress, pp: 1-15.