Journal of Social Science and Humanities, 1 (6): 07-12, 2018
e-ISSN: 2600 - 9056

DOI: 10.26666/rmp.jssh.2018.6.2

Government Size and Economic Growth: Empirical Study on Organization of Islamic Cooperation Countries

Jarita Duasa
Department of Economics, Faculty of Economics and Management Sciences, International Islamic University Malaysia,
Jalan Gombak, 53100 Kuala Lumpur, Malaysia.

Abstract: The issue of a correct 'government size' for economic prosperity of a nation is highly linked with the issue of optimal 'role of state'. The present study attempts to utilize more efficient econometric methods on a sample of Organisation of Islamic Cooperation (OIC) countries over a specific period of time in order to investigate relationship between government size and economic growth. It also attempts to identify optimal size of government (role of state) that maximize the economic growth of the countries by applying static and dynamic panel estimations on a widely used 'growth model' for assessing the impact of government size on economic growth. The findings indicate that small size of government contributes more on the economic growth of the countries. The results seem to be more robust by using fixed-effects model as compared to other static or even dynamic models.

Key words: *Government size, Economic growth, Panel regression, Dynamic panel GMM, OIC countries*

INTRODUCTION

The relationship between government size and economic growth has been an ongoing debate among scholars in economic development. The role of government is believed to be a catalyst in promoting rapid economic growth especially in poor countries through development of appropriate legal, administrative and economic infrastructure. However, few studies found that bigger role of government or government size might lead to lower level of economic growth due to unproductive governmental spending. The negative implications of government activity resulting from inefficiency, excessive taxation, corruption and rent-seeking behavior are found to be obvious in less developed countries. This is with the assumption that the government has been recognized in the industrialized world where a well-developed infrastructure have already been in place for long period of time. A study by Hansson and Henrekson [1] found that government transfers, consumption and total outlays have negative effects, while educational expenditure has a positive effect, and government investment has no effect on private productivity growth. Even Barro [2] predicts that the unproductive governmental spending will lower the growth rate of GDP, while the effect of productive government expenditure on the growth rate of GDP is ambiguous, depending on how the government behaves and on whether the expenditure ratio is too little or too much. 'Wagner [3] law' which postulates that government spending is income elastic and that the ratio of government spending to income tends to grow with economic development is heavily refer to productive government spending such as education, infrastructure and laws which are the important factors for economic growth. Akitoby et. al [4] suggested that the Wagner's law may hold for developed countries, but less likely so for developing countries. The ambiguity of results over the impact of government size on GDP growth prevailed in most of previous studies was owing to their differences in the specification of econometric models too. Besides, it was due to different measurement of government size and sample data selection. On methodology, Granger causality tests method was used by Halicioglu [5] on Turkish data and the study found neither co-integrated nor causal relationship between per capita GDP and government spending shares. In contrast, a study by Abu-Bader and Abu-Quar [6] found evidence on Granger causality running from national income to government expenditure and thus support for Wagner's law. The issue of a correct 'government size' for economic prosperity of a nation, which is highly linked with the issue of optimal 'role of state' is not given much attention in previous literature. Only a few

Corresponding Author: Jarita Duasa, Department of Economics, Faculty of Economics and Management Sciences, Jalan Gombak, 53100 Kuala Lumpur, Malaysia; Tel:+603-61964626; Email: jarita@iium.edu.my

studies have tested for the influence of government size and economic growth assuming that an inverted-U relationship exists between the scale of government and growth. Examples of those studies are by Ram [7] and Dar and AmirKhalkhali [8]. According to Kahf [9], the involvement of government in the market is not occasional or temporary. The government should be co-existed in the market together with other economic units on permanent and stable basis and it acts as a planner, supervisor, producer as well as consumer. Having said the importance of government is to ensure the efficiency and provide provisions which cannot be accommodated by the market system, its expansion or contraction of role is never allowed to contract beyond the limits established in the Islamic law. Thus, it is expected that there is an optimal size of government which could be adopted by OIC countries to maximize the welfare of the nation, in particular, to maximize the standard of living. This paper contributes to the literature from three aspects. One, the focus, of study is on the group of OIC countries in which previous literature hardly analyzed these countries on the issue of government size and economic growth. Two, the study is utilizing more efficient econometric methods on panel data which consist of a sample of OIC countries over a specific period of time. It is more efficient than those solely based on time-series data for they may perform poorly in small samples. Three, it attempts to identify optimal size of government (role of state) that maximize the economic growth of the countries, that is, the possibility that inverted-U shape existence between growth and government size.

DATA AND METHODOLOGY

The present study uses annual data on OIC countries (45 countries) from 2009 through 2013 (refer to Table 1). The countries selected are those which have at least data of one year. We constructed a panel database with information along three dimensions: the GDP per capita growth, general government final expenditure as % of GDP (proxy for government size, GS), and control variables, such as, ratio of investment to GDP (K) and size of labor force as percentage of total population (L). Data are sourced from SESTRIC and World Bank. Following is the equation to be estimated:

$$lnGDP_{i,t} = \alpha_{0,i} + \alpha_1 lnGS_{i,t} + \alpha_2 lnGS_{i,t}^2 + \alpha_3 lnK_{i,t} + \alpha_4 lnL_{i,t} + \varepsilon_{i,t} \quad (1)$$

where GDP is the GDP per capita growth, GS is general government final consumption expenditure (% of GDP), K is Gross fixed capital formation (in US$) and L is labour force participation rate, total (% of total population ages 15-64).

Table 1. Selected OIC Countries in Study

No.	Country	No.	Country	No.	Country
1	Afghanistan	16	Guyana	31	Oman
2	Albania	17	Indonesia	32	Pakistan
3	Algeria	18	Iraq	33	Qatar
4	Azerbaijan	19	Jordon	34	Saudi Arabia
5	Bahrain	20	Kazakhstan	35	Senegal
6	Bangladesh	21	Kuwait	36	Sierra Leone
7	Benin	22	Kyrgyz Rep.	37	Sudan
8	Brunei	23	Lebanon	38	Tajikistan
9	Burkina Faso	24	Malaysia	39	Togo
10	Cameroon	25	Mali	40	Tunisia
11	Chad	26	Mauritania	41	Turkey
12	Comoros	27	Morocco	42	Turkmenistan
13	Egypt	28	Mozambique	43	Uganda
14	Gambia	29	Niger	44	United Arab Emirates (UAE)
15	Guinea	30	Nigeria	45	Uzbekistan

All variables are transformed into natural logarithm to smoothen the data and to solve the preliminary problems of the data such as outliers and non-stationarity. The above equation is initially estimated using Pooled Ordinary Least Squared (Pooled OLS) which threats the data as for a single entity with the assumption that data are homogeneous. Then, further test is conducted to decide which method is suitable for the data, either Pooled OLS or Panel OLS. The decision is based on the result from Bruesh Pagan LM test. If the null hypothesis, that data is homogeneous, is rejected, Panel OLS is adopted. Both Fixed effect (FE) and Random effect (RE) models are applied if Panel OLS is suitable for the data. Besides, the study applies the Dynamic Panel Generalized Moment Method (GMM) to obtain robust results. This model is dynamic in the sense that it includes lag of dependent variable as an independent variable and there are instrumental variables included in the model to capture the problem of endogeneity. The Dynamic panel GMM is also chosen since cross-section data is bigger than time-series data (N>T). Dynamic panel GMM that used in this study is conducted for both step 1, when data are homogeneous, and step 2, when data are heterogeneous. It is also conducted using first generation and second generation GMM. The former is not giving flexibility of chosen instrumental variables which are exogenous while the latter is giving more flexibility to select the exogenous instrumental variables. The models are tested for auto-correlation problem and over identifying restrictions. Autocorrelation existence test is conducted

using Arellano-Bond test and over identifying restrictions is tested using Hansen test. In order to identify the optimal government size that maximizes the economic growth, the focus is on the coefficients of α_1 and α_2. If both coefficients are significant and have positive and negative signs, respectively, we could identify the 'optimal' government size that contributes to maximum level of economic growth from the sample data.

RESULTS AND ANALYSIS

The present section analyzes the results from regression of panel data using static and dynamic panel data estimations. The regression is conducted based on equation (1).

Pooled OLS, Fixed Effects and Random Effects

Table 2 presents the results from panel data estimations using Pooled OLS, Fixed-effect and Random-effects models. In specific, the regression includes the squared of lnGS in order to capture the possible estimation of optimal government size from the data in study. Equation (1) from the table shows that both lnGS and $LnGS^2$ and not significant though the signs of both coefficients are as expected. The only variable contributes to the economic growth of OIC countries is the size of labor force. However, the coefficient is negative in sign. This is not surprise because based on OIC Economic Outlook report of 2015, the average labor force participation rate in OIC member countries stood at 59.8% in 2014, which is the lowest rate as compared to 63.5% in the world, 65.6% in non-OIC developing countries and 60.3% in developed countries. In case of labor force participation rate for the male population, OIC member countries recorded a rate of 78% compared to 76.7% in the world, 78.5% in non-OIC developing countries and 67.7% in developed countries. Although, OIC member countries registered globally comparable performance in terms of total and male labor force participation rates, their performance in case of female labor force participation rate remained significantly lower. Female labor force participation rate in OIC member countries was recorded at 41.2% in 2014, which is significantly lower than the world average of 50.3%, the average of 52.6% in non-OIC developing countries and the average of 53.2% in developed countries. The report also stated that OIC countries recorded significantly higher average unemployment rates compared to the world, developed and non-OIC developing countries during the period 2000- 2008. During this period, total unemployment rate in OIC countries changed between 7.8% and 9.1%. After the global financial crisis, as of 2014, OIC countries attained a rate of 7.6%, while developed countries managed to lower the rate to 7.4%, which is lower than the rate in OIC countries [10].

Table 2 Static Panel Data Estimations: Inclusion of $lnGS^2$

Variable	Dependent Variable: ln(GDP per capita)		
	(1)	(2)	(3)
constant	4.68*** (6.87)	-23.15** (-1.99)	4.75*** (5.44)
ln(general government final consumption expenditure)	0.18 (0.32)	0.51 (0.34)	0.19 (0.28)
ln(general government final consumption expenditure)_square	-0.71 (-0.53)	-2.58 (-0.70)	-0.86 (-0.51)
ln(ratio of investment to GDP)	-0.009 (-0.94)	0.03 (0.40)	-0.007 (-0.55)
ln(size of labour force)	-0.29** (-2.51)	6.39*** (2.28)	-0.29** (-1.98)
Number of observations	163	163	163
Adjusted R^2	0.02	0.0147	0.0437
Type of model	Pool	Fixed	Random
Breush & Pagan LM test	Chi-sq stat. = 13.48 (p-value=0.0001)		
Hausman test	Chi-sq stat. = 16.89 (p-value=0.002)		

Notes: 1. t-statistic in parentheses for pool and fixed-effects regressions and z-statistic in parentheses for random-effects regression .
2. The type of model either fixed or random-effects is based on Hausman test.
3. *** significant at 1% level, ** significant at 5% level, * significant at 10% level.

Further test is conducted to determine the suitability of the model used via panel data. Breush and Pagan LM test is conducted and as shown in the table, the Chi-square statistic rejects the null hypothesis that Pooled OLS should be used assuming homogeneous data. This result implies that the data are better to be analyzed using panel regression, either fixed effects (FE) or random effects (RE) models. Hausman test is used to determine the selection between FE and RE models. The Hausman test statistic in similar table suggests FE model to be used since the statistic is significant and rejecting the null hypothesis that RE is efficient. Equation (2) and (3) in Table 2 display both results from FE and RE estimations. Similar as in equation (1) of Pooled OLS, the focus variables of government size and squared of government size in FE model (equation 2) are not significant. Interestingly, variable of labor now is with expected sign (positive) and extremely significant. RE estimation in equation (3) produces almost similar results as in Pooled OLS estimation.

Since it is expected that *there is no inverted U-shaped relationship* between lnGS and lnGDP per capita, as the coefficients of both variables are not significant, the study attempts to analyze again the data using similar models but without the inclusion of variable $lnGS^2$. The results are displayed on Table 3. At this stage of analysis, the Pooled OLS again is conducted and the results displayed on column equation (1) of Table 3. The results show that government size negatively affects economic growth with 5% level of significance, which implies that the smaller government size better contributes to larger economic growth among the OIC nations. However, similar as in previous model, labor contributes negatively to economic growth with 5% level of significance.

Table 3 Static Panel Data Estimations: No Inclusion of $lnGS^2$

Variable	Dependent Variable: ln(GDP per capita)		
	(1)	(2)	(3)
constant	4.75*** (7.13)	-23.58** (-2.04)	4.83*** (5.69)
ln(general government final consumption expenditure)	-0.11** (-1.97)	-0.52*** (-2.65)	-0.15** (-2.10)
ln(ratio of investment to GDP)	-0.008 (-0.90)	0.04 (0.48)	-0.006 (-0.52)
ln(size of labour force)	-0.29 (-2.51)**	6.52** (2.33)	-0.29** (-2.01)
Number of observations	163	163	163
Adjusted R^2	0.027	0.015	0.042
Type of model	Pool	Fixed	Random
Breush & Pagan LM test	Chi-sq stat. = 13.52 (p-value=0.0001)		
Hausman test	Chi-sq stat. = 16.65 (p-value=0.0008)		

Notes: 1. t-statistic in parentheses for pool and fixed-effects regressions and z-statistic in parentheses for random-effects regression .
2. The type of model either fixed or random-effects is based on Hausman test.
3. *** significant at 1% level, ** significant at 5% level, * significant at 10% level.

Again, selection of model is done based on the Breush and Pagan LM test and the result of the test suggests that panel estimations should be used either using FE or RE models. Hausman test statistic suggests the use of *FE model* since the null hypothesis that RE is efficient is rejected. Equation (2) from Table 3 is our focus estimation in which it could be seen that coefficient of government size variable is highly significant and negative which indicates that small size of government contributes more on the economic growth of the countries. Besides, labor is also found to be an important factor contributes to economic growth and positively contributes to growth as expected in theories. As of RE estimations in equation (3), the results are almost similar as in Pooled OLS estimation of equation (1). Thus, without inclusion of squared variable term in the regression, the results seem to be more robust by the use of FE model.

Dynamic Panel GMM

Further analysis is conducted to look at possibility of better results using dynamic panel GMM as mentioned in the methodology section. Table 4 displays the results based on the regression which *not* includes the squared government size ($lnGS^2$) as prior regressions found that the variable is not significantly contributing to the growth, in which it implies there is no non-linearity of variables within the data. In Table 4, five equations are estimated using dynamic panel GMM of first generation and second generation.

Table 4 Results of Dynamic Panel GMM Estimations: No Inclusion of $lnGS^2$

Variable	Dependent Variable: ln(GDP per capita)		
	(1) *One step* (1st generation)	(2) *Two step* (1st generation)	(3) *One step* diff. GMM (2nd generation)
constant	-1.60 (-0.05)	14.07 (0.69)	
ln(GDP per capita)$_{t-1}$	-0.097 (-0.27)	0.09 (0.37)	-0.02 (-0.12)
ln(general government final consumption expenditure)	-0.21 (-0.94)	-0.24 (-1.31)	-0.98 (-0.93)
ln(ratio of investment to GDP)	0.08 (0.82)	0.02 (0.30)	-0.10 (-0.35)
ln(size of labour force)	0.89 (0.11)	-2.64 (-0.53)	-1.05 (-0.12)
Sargan test stat.(p-value)		2.98 (0.225)	5.47 (0.485)
Arellano-Bond test of order 1 (p-value)			-2.54 (0.011)
No. of observation	77	77	77
No. of group	40	40	40

Table 4 Results of Dynamic Panel GMM Estimations: No Inclusion of $lnGS^2$……*continue*

Variable	Dependent Variable: ln(GDP per capita)	
	(4) *Two step* diff. GMM (2nd generation)	(5) *One step* System GMM (2nd generation)
constant		4.52*** (2.79)
ln(GDP per capita)$_{t-1}$	0.08 (0.43)	-0.14 (-1.05)
ln(general government final consumption expenditure)	-0.63 (-0.65)	-0.09 (-0.57)
ln(ratio of investment to GDP)	-0.005 (-0.02)	0.002 (0.17)
ln(size of labour force)	-4.76 (-0.56)	-0.20 (-0.76)
Sargan test stat.(p-value)	5.47 (0.485)	16.61 (0.165)
Arellano-Bond test of order 1 (p-value)	-2.00 (0.045)	-2.45 (0.014)
No. of observation	77	119
No. of group	40	42

Notes: 1. z-statistic in parentheses
2. *** significant at 1% level, ** significant at 5% level, * significant at 10% level

As mentioned earlier in methodology section, the former is not giving flexibility of chosen instrumental variables which are exogenous while the latter is giving more flexibility to select the exogenous instrumental variables. Both methods also applied for the assumption of homogeneous data (step 1) and heterogeneous data (step 2). It is expected that lag of dependent variable is significant with positive sign. Unfortunately, in all five equations, the lag dependent variables are insignificant with mixed sign. Other independent variables are also insignificantly contributes to economic growth though the results of Sargan test in all equations suggest that over identifying restriction are valid. Nonetheless, the results of Arellano-Bond test for AR(1) in first difference in equation (3), (4) and (5) indicate the existence of autocorrelation in all equations.

To sum up, the analysis using dynamic panel GMM does not improve the robustness of the model developed earlier using static panel estimation of FE and RE. In other words, the robust results from the regression is only the results from FE model without the inclusion of $lnGS^2$, ie. equation (2) from Table 3. From the results, it could be inferred that in a case of OIC countries, a small government could potentially be more efficient resulting from fewer policy-induced distortions, the greater discipline of market forces which fosters efficiency of resource use, and the absence of crowding-out effects that weaken the incentives to create new capital which embodies new technologies [11]. Nevertheless, positive labor contribution to economic growth seems to be very important among OIC countries. It is believed that this is due to nature of most OIC countries which are labor-intensive countries. Having said that labor and small size of government are the main contributors of growth, the role of government in the labor market seems very crucial. This includes the involvement of government in increasing human capital for the countries. The results also indicate the important of private sector role to promote growth in most OIC countries. A larger government size is likely to be detrimental to efficiency and growth because of inefficient governmental operation, regulatory process imposes excessive burdens and costs on the economic system and many fiscal and monetary policies tend to distort economic incentives and lower productivity of the system [12].

CONCLUSION

The importance of government is to ensure the efficiency and provide provisions which cannot be accommodated by the market system. However, its expansion or contraction of role is never allowed to contract beyond the limits established in law. Therefore, the size of government must be suitable for the development of the country. The critical role of governments for economic growth has also been gaining increasing attention in the past half century. While many studies widely confirmed the institutional role of government in economic growth, the evidence from causal relationship is less conclusive. Different model specifications and sample data were contributed to the uncertainty of results in these studies. Studies which attempted to test the inverted-U relationship between government size and economic growth to determine optimal government size were also very rare, particularly studies on OIC countries.

The present study attempts to utilize more efficient econometric methods on a sample of OIC countries over a specific period of time in order to investigate relationship between government size and economic growth. It also attempts to identify optimal size of government that maximizes the economic growth of the countries by applying static and dynamic panel estimation. The findings indicate that small size of

government contributes more on the economic growth of the countries. Besides, labor is also found to be an important factor contributes to economic growth and positively contributes to growth as expected in theories. The results seem to be more robust by using fixed-effects model as compared to other static or even dynamic models, such as difference GMM or system GMM of one step or two step. However, the study is unable to identify any optimal size of government for economic growth even with the attempt to include non-linear variable in the model. Overall, our findings suggest that a smaller government size affects economic growth via productive government expenditure on growth rate and efficiency of resource used and efficiency of the public sector among the OIC countries.

REFERENCES

[1] Hansson, P. and Henrekson, M. 1994. A New Framework for Testing The Effect of Government Spending on Growth and Productivity. Public Choice 81, 381–401.

[2] Barro, R. 1990. Government spending in a simple model of endogenous growth. Journal of Political Economy 98, S103–S125

[3] Wagner, A. 1958. Three Extracts on Public Finance. In *Classics in the theory of public finance*, edited by R. A. Musgrave, & A. T. Peacock, 1–15. New York: MacMillan, 1958 (extracts from *Finanzwissenschaft*, Part I, Third Edition, Leipzig, 1883, pp. 4–16, 69–76).

[4] Akitoby, B., Clements, B., Gupta, S., and Inchauste, G. 2006. Public Spending, Voracity, and Wagner's Law in Developing Countries. European Journal of Political Economy 22, 908–924.

[5] Halicio˘glu, F. 2003. Testing Wagner's Law for Turkey, 1960–2000. Review of Middle East Economics and Finance 1(2), 129–140.

[6] Abu-Bader, S., and Abu-Quar, A. 2003. Government Expenditures, Military Spending and Economic Growth: Causality Evidence from Egypt, Israel and Syria. Journal of Policy Modeling 25, 567–583.

[7] Ram, R. 1986. Government Size and Economic Growth: A New Framework and Some Evidence from Cross-section and Time-series Data. American Economic Review 76, 191–203.

[8] Dar, A. A., and AmirKhalkhali, S. 2002. Government Size, Factor Accumulation, and Economic Growth: Evidence from OECD Countries. Journal of Policy Modeling 24, 679–692.

[9] Kahf, M. 1992. Financing The Public Sector in An Islamic Perspectives. In *Resource Mobilization and Investment in an Islamic Economic Framework*, edited by Sattar, Z., 55-174. Herndon, VA: International Institute of Islamic Thought.

[10] SESRIC (2015), OIC Economic Outlook 2015. Retrieved on 11 October 2018

[11] Dar, A. A., and AmirKhalkhali, S. 2002. Government Size, Factor Accumulation, and Economic Growth: Evidence from OECD Countries. Journal of Policy Modeling 24, 679–692.

[12] Ram, R. 1986. Government Size and Economic Growth: A New Framework and Some Evidence from Cross-section and Time-series Data. American Economic Review 76, 191–203