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Government Size and Economic Growth: A Panel Data Study Comparing OECD and Non-OECD Countries

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Abstract

This study examines the non-linear relationship between government size and economic growth following Armey (1995). Generalized Method of Moments (GMM) estimation technique is applied to panel data consisting of 89 countries from 1990 to 2018. The results show substantial evidence for Armey curve across non-OECD countries. The findings suggest that a rise in government size initially enhances economic growth but later government size reduces economic growth once the government size crosses a certain threshold. However, the findings relating to the OECD countries do not support the presence of Armey curve.

Keywords: Armey curve, government size, GDP growth, panel data, OECD countries
JEL Classification: H11, H53, O47, O5

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1. Introduction

Government interventions in economic matters always attract debate and raise concerns. The Armey curve is useful illustration of the impact of government size on economic affairs. It suggests that the government involvement is necessary for economic growth up to a certain threshold. However, once that threshold is achieved, any further increase in government involvement depresses economic growth.

The empirical evidence on how changes in government size affect the size of economic pie is mixed. Kormendi and Meguire (1986) Ram (1986) establish a positive relationship between government size and economic growth. On the contrary, Dar and Amirkhalkhali (2002), Engen and Skinner (1992), Folster and Henrekson (2001) and Landau (1983) find that economic growth decreases with larger government size. Vedder and Gallaway (1998), Chen and Lee (2005) and Sheehey (1993) are few studies that find economic growth is independent of government size.

There is considerable cross-country literature that discusses other determinants of economic growth. Acemoglu, Johnson and Robinson (2005), Bjornskov (2005), Jones (1981) and Haan and Sturm (2000) are popular studies which find quality of institutions as a potential determinant of economic growth. Similarly, investment (De Long and Summers, 1990), incentives to investment (Acemoglu et al. 2005), education, health and other human capital investments (Alderman et al., 1996), population (Coale & Hoover, 1958), geography (Acemoglu et al., 2005), Culture (Rostow, 1959) and taxes (Vedder, 2001) are found to be potential determinants of economic growth.

This paper analyzes the impact of changes in government size, measured by central government expenditures (% of GDP), on economic growth, measured by GDP growth. This study is carried out following Armey (1995) where Armey curve is proposed. The Armey curve suggests that initial increase in government expansion enhances economic growth whereas the economic growth starts shrinking once the government expansion reaches a certain benchmark. Data for 89 countries from 1990 to 2018 is collected and then decomposed into OECD and non-OECD countries.

Decomposition of sample into OECD and non-OECD countries is important if we analyze the mean growth rates across sub-samples reported in Table 1. The OCED

countries enjoy 2.26 growth rates on average whereas the growth rate of non-OECDs is 4.01 on average. However, the standard deviation across the OECD countries, 2.92, is smaller when compared to non-OECD countries, 7.44. Even more interestingly, the governments are often actively involved in economic affairs across OECD countries unlike non-OECD governments. On average, the average government size throughout OECDs is 44.85 whereas it is 26.02 across non-OECD countries. The government's intervention in the economy is higher across the OECD countries compared to non-OECD countries. However, the average growth rate of the OECD countries is smaller than non-OECDs. This raises an important question. Is it the government intervention in economy which affects economic growth? If it is so, why do the average growth rates across these two sub-samples differ? To analyze it further, this paper offers separate analysis for the OECD and non-OECD countries.

For empirical purposes, OLS and GMM estimation techniques are applied. The empirical findings substantially support the theory of Armey curve across non-OECD countries. It implies that a rise in government size initially increases economic growth. But, after attaining a certain benchmark, any further intervention by the government in economic affairs leads to reduction in economic growth. Nevertheless, the findings for the OECD countries do not support presence of the Armey curve.

Table 1: Summary statistics of variables used in this study

	Non-OECD Countries					OECD Countries				
	Observations	Mean	Standard Deviation	Minimum	Maximum	Observations	Mean	Standard Deviation	Minimum	Maximum
GDP Growth	1,968	4.01	7.44	-64.04	123.13	420	2.26	2.92	-9.13	25.55
Government Expenditures	1,697	26.02	11.21	3.78	182.17	393	44.85	7.92	26.31	68.36
Military Expenditures	1,830	2.55	2.13	.0003	29.72	420	1.87	.95	.34	5.27
Trade	1,926	68.14	36.07	.02	311.35	419	76.80	40.25	19.73	221.15
Inflation Rate	1,968	44.56	441.33	-27.04	15444.38	420	4.64	13.27	-5.01	143.69
Population Growth	2,071	1.78	1.45	-10.95	7.91	420	.66	.51	-1.85	2.89
Dependency Ratio	2,044	69.76	20.44	28.35	119.13	420	50.68	4.09	43.93	67.78

Research and Development	572	.75	.90	.014	4.42	291	1.81	.77	.36	3.91
Foreign Direct Investment	1,704	-28.6	11.74	-23.2	45.50	377	32.9	4.44	-2.13	66.77
Inequality	897	46.53	5.68	24.92	62.85	359	38.61	4.07	29.30	50.75

2. Literature Review

The role of government in economic affairs is indispensable. Implementation of rule of law is one of the most important jobs of any government. It is, in fact, due to presence of the government that contracts are obeyed and acted upon. The savers and investors derive confidence when the rule of law is ensured by the government. If the governments do not ensure rule of law, every economic agent is perpetually dreadful of getting his resources and properties confiscated unlawfully. The government ensures property rights of public. Furthermore, the faith on money as means of transactions is only possible after governments guarantee it.

Enforcement of property rights, business freedom, investment freedom, labor freedom, financial freedom and rule of law are essential to economic growth. It is, therefore, imperative to have government because without it the economy does not function efficiently. Ram (1986) and Kormendi and Meguire (1986) support government intervention because it raises the size of pie – economic growth.

On the contrary, governments are also criticized for discouraging economic growth. Landau (1983), Engen and Skinner (1992), Folster and Henrekson (2001) and Dar and Amirkhalkhali (2002) are studies which find considerable evidence of negative relation between government intervention and economic growth. According to these studies, governments are often involved in rent seeking behavior. For example, governments may unduly and unlawfully favor their relatives, friends and close associates. Furthermore, it is also criticized for discouraging economic growth through corrupt practices and under the table money. Heavy taxation and inefficiency are also potential reasons why minimum government intervention in economic affairs is desirable.

Armey (1995) proposed Armey curve which establishes a non-linear inverted U-shaped relationship between government size and economic growth. According to Armey

(1995), initially the government intervention enhances economic growth by establishing property rights, creating incentives for saving-investment, ensuring law and order and facilitating ease of doing business. However, excessive government intervention in the economy results in lower economic growth because governments may involve in rent seeking behavior.

Applying GMM technique and using data from 1995 to 2011, Connolly and Li (2016) examined Armey curve across OECD countries. According to their results, government consumption and investment do not affect economic growth. However, public social spending is found to reduce economic growth.

The literature examining the presence of Armey curve has progressed and reasonably developed. Vedder and Gallaway (1998) confirm the presence of Armey curve using a panel data set for the US, Canada, Britain, Italy, Denmark and Sweden. According to this study the government intervention, in the form of enforcing property rights, improving the law and order situation, reducing and controlling the transaction costs, providing environment for ease of doing business and attracting investment, leads to higher economic growth. Nevertheless, further expansion in government size, beyond a certain threshold, results in hampering economic growth.

Another study, Tanzi and Zee (1997), confirms the presence of the Armey curve. This study states that public finance instruments, tax and expenditures and overall budgetary policies may influence economic growth. These financial instruments are helpful in ensuring fairer income distribution across public, perpetuating economic stability and promoting economic efficiency.

Simultaneous model was developed by Grossman (1987) for assessing non-linearity between the size of government and economic growth. The results are consistent with the Armey curve. Cashin (1995) finds that the public transfer and public investment leads to higher economic growth. But, the economic growth is negatively affected by taxation for its distortionary effects.

There are contrasting effects of private and public sector on economic growth. To analyze this, Ram (1986) conducts a study using two-sector model production function. The findings significantly support the hypothesis of the Armey curve. Similarly, different time

spans may potentially affect economic growth differently. For example, Lin (1994) breaks the time into two periods - short-run and medium-run - using single and simultaneous equation for both less developed and developed economies. Medium term is defined as 25 years whereas anything shorter than this is considered to be short term. The results suggest that the government intervention seems to affect economic growth positively in the short term. However, in the medium term, economic growth is negatively affected with government intervention in the economy.

3. Data and Method

To examine the presence of the Armey curve across OECD and non-OECD countries, the data is collected following Islam (1995) and Lee and Gordon (2005). To do so, this paper assesses the effect of changes in government size, measured by central government expenditures as a share of GDP, on economic growth, measured by GDP growth. The sample ranges from 1990 to 2018 consisting of 89 countries. The sample is then decomposed into OECD and non-OECDs. There are control variables which may potentially affect economic growth. These are military expenditures (% of GDP), trade (% of GDP), foreign direct investment, population growth rate, dependency ratio, inflation rate, research and development and income inequality.

GDP growth rate (at PPP constant $2011), measuring economic growth, is collected from World Development Indicators. On average the GDP growth rate of non-OECD countries exceeds growth rate of the OECD countries as indicated by the mean values, 40.1 for non-OECD countries and 2.26 for the OECD countries. However, the standard deviation values show that divergence from the mean across non-OECD countries is higher than the OECD countries.

Data for central government expenditures as a fraction of GDP is collected from World Economic Outlook. This variable, central government expenditures is used as a proxy for measuring government size following Jin and Zou (2002). The mean value for non-OECD countries is 26.02 whereas for the OECD countries it is 44.85. These mean values imply that he government intervention is more than 60% higher in the OECD countries as compared to

non-OECD countries. Similarly, the standard deviation across the OECD sample is larger than non-OECD sample.

As the world's interdependency increased so did the impact of trade on economic growth. Trade is measured by sum of exports and imports as a fraction of GDP. Frankel and Romer (1999) find that a rise in trade leads to higher economic growth.

Population growth attracts both opponents and proponents regarding its impact on economic growth. The supporters argue for the aggregate demand side whereas opponents discuss the supply side issues. Temple (1999) finds population as an important determinant of economic growth. Consequently, population growth rate is added as a control variable.

Human capital and economic development are closely linked to each other. Investment in human capital paves the way for innovation and change of technology. Mankiw, Romer and Weil (1992) find that an increase in human capital leads to higher economic growth. Research and development expenditures (% of GDP), measuring human capital, is added as a control variable following Mankiw et al. (1992).

According to the literature of Economics, inflation is an important determinant of economic growth. Following Lee and Gordon (2005), who find negative association between these two variables, inflation rate as a control variable is added.

In this day and age, military's role is significant. To maintain the military muscle for defense, a considerable fraction of budget is allocated for defense. Deger and Smith (1983) find that higher spending on military results in lower economic growth because these are non-productive spending. Following them, military expenditure as a fraction of GDP is included as a control variable in the regression.

Foreign direct investment (FDI) is crucial in the process of technology transfer from one country to the other. Borensztein, De Gregorio, and Lee (1998) find that the contribution of foreign direct investment to economic growth outweighs the contribution of domestic investment. Thus, it is included as a control variable.

There are different arguments about the dependency ratio in the literature of economics. Few studies find that a rise in the dependency ratio leads to higher economic growth. However, there is ample literature that finds negative correlation between dependency ratio and economic growth. Following Kelley and Schmidt (1996), dependency

ratio (sum of population aging between 0-14 and population aging 65+ as a fraction of population aging from 14-65) is included as a control variable in the model specification.

Inequality can be detrimental for economic growth as it may give rise to many socio-political movements across the country. In addition, it may also result in strikes, disincentive to labor, crime, political turmoil and even terrorism. For example, Persson and Tabellini (1994) find that a rise in inequality affects economic growth negatively. Therefore, income inequality is included as a control variable.

World Development Indicators is used as a source for data collection of control variables including military expenditures (% of GDP), trade (% of GDP), foreign direct investment, population growth rate, dependency ratio, inflation rate, research and development, GDP growth per capita and income inequality.

In the next section, the analysis is offered applying Ordinary Least Squares (OLS) and Generalized Method of Moments (GMM) estimation techniques. To start with, OLS is a useful estimation technique. However, GMM is a better estimator for a dynamic panel data. The data sample may contain endogeneity of the lagged dependent variables – when there is correlation between explanatory variables and the error term used in the model. Furthermore, GMM also controls for omitted variable bias and unobserved panel heterogeneity. For example, there are time invariant and country specific factors across the sample. Therefore, it is important to apply GMM estimation as robustness check which also improves reliability of results.

4. Estimation Results and Discussion

Table 2 reports estimation results for 74 non-OECD countries. According to estimated coefficients, there is strong support for non-linear relationship between government size and economic growth. The linear coefficient is positive whereas the quadratic (non-linear) coefficient is negative. Both are statistically significant at 1%. These estimated coefficients confirm the presence of the Armey curve across non-OECD countries substantiating Armey Curve (1995). Government's involvement initially promotes economic growth. But after reaching a certain benchmark, any further intervention from the government causes lower economic growth.

From column 2 to column 9, the presence of Armey curve is examined using different control variables. Throughout Table 2, there is substantial evidence for the Armey curve. The results suggest that the government intervention in non-OECD countries initially increases economic growth. However, once the government intervention crosses a certain threshold, any further interference by the government depresses economic growth. The findings may imply that the non-OECD countries are on the "wrong side" of the Armey curve.

Column 9 is of utmost importance as it includes all control variables. A rise in military expenditures leads to lower economic growth. The finding supports Deger and Smith (1983). In addition, an increase in trade (% of GDP) is found to encourage economic growth as suggested by Frankel and Romer (1999). Except these two control variables, none is statistically significant.

Table 2: Results of estimation for non-OECD countries using fixed effects model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Expenditures	.0939	.1431	.1653	.1708	.1657	.1667	.3948	.3422	.8165
	(.046)**	(.056)***	(.0574)***	(.056)***	(.0567)***	(.0569)***	(.1487)***	(.1533)**	(.2848)***
Expenditures Square	-.0010	-.0019	-.0022	-.0022	-.0022	-.0022	-.0063	-.0057	-.0135
	(.0003)***	(.0004)***	(.0004)***	(.0004)***	(.0004)***	(.0004)***	(.0021)***	(.0022)***	(.0040)***
Military Exp	-1.65	-1.63	-1.53	-1.49	-1.40	-1.35	-1.35	-1.30	-1.39
	(.229)***	(.229)***	(.264)***	(.396)***	(..512)***	(.482)***	(.514)***	(.532)***	(.543)***
Trade		-.5169	-.4703	-.5689	-.5195	-.5239	-.7684	-.7009	-.7183
		(.165)***	(.1813)***	(.1795)***	(.1816)***	(.1826)***	(.2719)***	(.2856)**	(.3918)*
Inflation			.0314	.0298	.0306	.0303	.0313	.0319	.0206
			(.0095)***	(.0094)***	(.0094)***	(.0095)***	(.0115)***	(.0115)***	(.0160)
Population				-.0225	-.0224	-.0225	-.0232	-.0235	-.0188
				(.0035)***	(.0035)***	(.0035)***	(.0189)	(.0198)	(.0296)
Dependency					.3575	.3541	-1.40	-1.14	-.6528
					(.2045	(.2065)*	(.4968)***	(.5149)**	(.7052)
R&D Exp						.0119	-.0430	-.0774	-.1082
						(.0292)	(.0422)	(.0478)	(.0901)
FDI							-.0011	.1184	1.39
							(.9011)	(.9262)	(1.31)
Inequality								5.58	4.92
								(7.80)	(1.51)
N	1679	1598	1544	1544	1544	1539	546	525	314

Notes: Dependent Variable is GDP growth (at PPP constant $2011). OLS estimations are run for 74 Non-OECD Countries using time and year fixed effects. *, **, *** represent statistical significance at 10%, 5% and 1%. Values in parenthesis show robust standard errors.

Table 3 reports empirical results for OECD countries. The U-shaped relationship between government size and economic growth, across OECD countries, challenges the hypothesis of the Armey curve. The government intervention initially decreases economic growth. Nevertheless, later government intervention enhances economic growth.

Table 3: Results of estimation for OECD countries using fixed effects model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Expenditures	-.6012***	-.6045***	-.5292***	-.5266***	-.5074***	-.5116***	-1.039***	-1.258***	-1.117***
	(.1731)	(.1742)	(.1712)	(.1723)	(.1791)	(.1724)	(.2818)	(.2972)	(.2911)
Expenditures	0.0041**	0.0041**	0.0034*	0.0032*	0.0031*	-0.513***	-1.031***	-1.259***	-1.118***
Square	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.1737)	(0.2817)	(0.2963)	(0.2970)
Military Exp		0.0764	-0.0631	0.4382	0.4588	0.0032*	0.0071**	0.0095***	0.0091***
		(0.4652)	(0.4653)	(0.5170)	(0.5186)	(0.0018)	(0.0030)	(0.0032)	(0.0031)
Trade			0.0383***	0.0402***	0.0420***	0.4862	2.1606***	2.7276***	1.8612***
			(0.0120)	(0.0119)	(0.0123)	(0.5228)	(0.7312)	(0.7601)	(0.6420)
Inflation				-.0657**	-.0699**	0.0427***	0.0582***	0.0790***	0.0332*
				(0.0302)	(0.0310)	(0.0124)	(0.0159)	(0.0186)	(0.0190)
Population					0.1776	-.0662**	-0.0694*	-0.0750*	-0.0650
					(0.2891)	(0.0321)	(0.0410)	(0.0429)	(0.0426)
Dependency						-0.0270	0.0031	-0.1257	-0.1273
						(0.0607)	(0.0893)	(0.0994)	(0.0802)
R&D Exp							-.4445**	-.3485**	-1.2766
							(0.7294)	(0.9215)	(0.8444)
FDI								5.1269**	-1.594**
								(2.6294)	(2.2731)
Inequality									0.5060***
									(0.1261)
N	393	393	392	392	392	392	282	258	230

Notes: Dependent Variable is GDP growth (at PPP constant $2011). OLS estimations are run for 15 OECD Countries using time and year fixed effects. *, **, *** represent statistical significance at 10%, 5% and 1%. Values in parenthesis show robust standard errors.

There is strong possibility of endogeneity among explanatory variables. For example, GDP growth, military expenditures, trade, inflation rate, expenditures on research and development, foreign direct investment and inequality may also be affected by economic growth. General Method of Moments (GMM), following Arellano and Bond (1991), is applied to deal with endogeneity problem.

The panel data is often confronted with time invariant and country specific factors. Whether to apply random or fixed effects model, Hausman test is run. As the null hypothesis is not accepted, fixed effects model is applied to control for such heterogeneous factors.

Table 4 and Table 5 are replicated for non-OECD and OECD countries while applying GMM method. Quite interestingly, the findings are consistent with Table 2 and Table 3. According to results reported in Table 4, there is substantial evidence for the Armey curve across non-OECD countries. On the contrary, a U-shaped relationship is found between government size and economic growth across the OECD countries.

Table 4: Results of estimation for non-OECD countries using GMM method

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Expenditures	1.96***	0.83**	4.83**	8.02***	6.06*	5.31**	1.10*	4.77**	5.28***
	(.75)	(.49)	(2.73)	(2.90)	(4.70)	(2.83)	(1.05)	(2.24)	(1.94)
Expenditures	-0.005***	-0.02*	-0.02**	-0.82***	-0.62	-0.73*	-0.76**	-0.91**	-0.78***
Square	(0.007)	(0.01)	(0.01)	(0.24)	(0.40)	(0.45)	(0.36)	(0.40)	(0.30)
Military Exp		2.79***	4.36*	7.33**	6.16	5.67**	8.43*	-3.56*	-7.4**
		(0.92)	(3.06)	(3.52)	(7.79)	(2.41)	(5.17)	(2.2)	(3.71)
Trade			-1.66	-2.81*	-2.03*	-1.73	2.67**	-3.96**	4.17***
			(1.52)	(1.80)	(1.26)	(1.89)	(1.15)	(1.97)	(0.91)
Inflation				0.06	0.05	0.46*	0.81	-1.36	-0.15
				(0.79)	(0.36)	(0.27)	(0.53)	(1.33)	(1.22)
Population					-0.54	-0.88*	1.70**	-0.95*	-0.49**
					(0.84)	(0.52)	(0.79)	(0.67)	(0.27)
Dependency						0.04	-0.09	0.24*	-0.03*
						(0.34)	(2.27)	(2.72)	(0.20)
R&D Exp							-2.15*	-1.82	1.83*
							(1.2)	(2.09)	(1.02)
FDI								-5.19	6.84***
								(3.2)	(2.9)

Inequality									2.01*
									(1.11)
N	1539	1430	1380	1378	1378	1372	376	367	180

Notes: Dependent Variable is GDP growth (at PPP constant $2011). Specifications using GMM method are run for 74 Non-OECD Countries using time and year fixed effects. *, **, *** represent statistical significance at 10%, 5% and 1%. Values in parenthesis show robust standard

Table 5: Results of estimation for OECD countries using GMM method

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Expenditures	-8.28***	-9.85**	-6.16***	-6.87***	-6.44***	-6.51***	-10.24***	-5.87***	-13.2***
	(2.97)	(4.38)	(24.72)	(2.06)	(2.13)	(2.07)	(3.16)	(2.26)	(4.88)
Expenditures	0.08***	0.09***	0.08***	0.16***	0.09***	0.06***	0.09***	0.07**	0.12***
Square	(0.03)	(0.03)	(0.03)	(0.6)	(0.38)	(0.02)	(0.01)	(0.03)	(0.04)
Military Exp		8.23**	-1.32	12.98*	-5.90	-5.67	7.82	3.63	16.19**
		(4.49)	(4.22)	(7.57)	(6.20)	(6.26)	(5.18)	(7.42)	(7.31)
Trade			1.69**	1.42**	1.79*	1.77	-2.96***	-1.24**	0.84***
			(0.71)	(0.60)	(1.11)	(1.23)	(1.47)	(0.61)	(0.33)
Inflation				-1.13	1.11	1.09	-1.86	-1.15	1.79
				(13.84)	(6.64)	(7.32)	(7.86)	(2.47)	(8.04)
Population					2.66*	2.65*	4.67**	6.88***	5.97**
					(2.16)	(2.07)	(2.78)	(2.57)	(2.97)
Dependency						-0.01*	-0.32*	-0.15	0.13*
						(0.31)	(0.89)	(0.22)	(0.07)
R&D Exp							0.12	-7.38	62.09
							(64.32)	(34.81)	(171.22)
FDI								6.46***	-3.84***
								(1.61)	(1.45)
Inequality									-5.44**
									(2.72)
N	363	363	362	362	362	362	242	218	176

Notes: Dependent Variable is GDP growth (at PPP constant $2011). Specifications using GMM method are run for 15 OECD Countries using time and year fixed effects. *, **, *** represent statistical significance at 10%, 5% and 1%. Values in parenthesis show robust standard errors.

In a nutshell, hypothesis of Armey curve is supported across non-OECD countries. The plausible reasoning is that these countries may be more involved in corrupt practices and rent-seeking behavior. Furthermore, the governments in non-OECD countries are lesser efficient than in the OECD countries. Lastly, the enforcement of rule of law is often weaker across non-OECD countries. Given these plausible reasons, government expansions in economic affairs cause lower economic growth.

5. Conclusion

This paper examines the impact of government size on economic growth following the Armey curve. The results provide considerable evidence for presence of the Armey curve across non-OECD countries. The findings suggest that the economic growth increases at lower levels of government intervention. However, the size of economic pie (GDP growth) reduces at higher levels of government interference in economic affairs. The possible rationale for an inverted U-shaped relationship is that the non-OECD countries may be on the "wrong side" of the Armey curve. It is, therefore, recommended that government across non-OECD countries should intervene in economic affairs only when it is necessary since larger government size leads to lower economic growth.

References

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. In P. Aghion & S.N. Durlauf (Eds.), *Handbook of Economic Growth*, Volume 1A (pp.385-472). Amsterdam: North Holland.

Alderman, H., Behrman, J. R., Ross, D. R., & Sabot, R. (1996). The returns to endogenous human capital in Pakistan's rural wage labour market. *Oxford Bulletin of Economics and Statistics, 58*(1), 29-55.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277-297.

Armey, R. (1995). *The freedom revolution.* Washington, DC: Rogney Publishing Co.

Bjørnskov, C. (2005). Does political ideology affect economic growth? *Public Choice, 123*(1-2), 133-146.

Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of international Economics*, *45*(1), 115-135.

Cashin, P. (1995). Government spending, taxes, and economic growth. *Staff Papers*, *42*(2), 237-269.

Chen, S. T., & Lee, C. C. (2005). Government size and economic growth in Taiwan: A threshold regression approach. *Journal of Policy Modeling*, *27*(9), 1051-1066.

Coale, A. J., & Hoover, E. M. (1958). *Population growth and economic development in low-income countries: A case study of Indias prospects*. New Jersey: Princeton University Press.

Connolly, M., & Li, C. (2016). Government spending and economic growth in the OECD countries. *Journal of Economic Policy Reform*, *19*(4), 386-395.

Dar, A. A., & AmirKhalkhali, S. (2002). Government size, factor accumulation, and economic growth: evidence from OECD countries. *Journal of Policy Modeling, 24*(7), 679-692.

De Long, J. B., & Summers, L. H. (1990). Equipment investment and economic growth. *Quarterly Journal of Economics, 106*(2), 445-502.

Deger, S., & Smith, R. (1983). Military expenditure and growth in less developed countries. *Journal of Conflict Resolution*, *27*(2), 335-353.

Engen, E. M., & Skinner, J. (1992). *Fiscal policy and economic growth* (NBER Working Paper No. 4223). Cambridge, MA: National Bureau of Economic Research.

Folster, S., & Henrekson, M. (2001). Growth effects of government expenditure and taxation in rich countries. *European Economic Review, 45*(8), 1501-1520.

Frankel, J.A., & Romer, D.H. (1999). Does trade cause growth? American Economic Review, *89*(3), 379-399.

Grossman, P. J. (1987). The optimal size of government. *Public Choice*, *53*(2), 131-147.

Haan, J., & Sturm, J.-E. (2000). On the relationship between economic freedom and economic growth. *European Journal of Political Economy, 16*(2), 215-241.

Islam, N. (1995). Growth empirics: a panel data approach. *The Quarterly Journal of Economics*, *110*(4), 1127-1170.

Jin, J., & Zou, H. F. (2002). How does fiscal decentralization affect aggregate, national, and subnational government size? *Journal of Urban Economics*, *52*(2), 270-293.

Jones, E. (1981). *The European miracle: environments, economies and geopolitics in the history of Europe and Asia*. New York: Cambridge University Press.

Kelley, A. C., & Schmidt, R. M. (1996). Saving, dependency and development. *Journal of Population Economics*, *9*(4), 365-386.

Kormendi, R. C., & Meguire, P. (1986). Government debt, government spending, and private sector behavior: reply. *The American Economic Review, 76*(5), 1180-1187.

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

Lee, Y., & Gordon, R. H. (2005). Tax structure and economic growth. *Journal of Public Economics, 89*(5), 1027-1043.

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

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics, 107*(2), 407-437.

Persson, T., & Tabellini, G. (1994). Is inequality harmful for growth? *The American Economic Review*, *84*(1), 600-621.

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.

Rostow, W. W. (1959). The stages of economic growth. *The Economic History Review, 12*(1), 1-16.

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

Tanzi, V., & Zee, H. H. (1997). Fiscal policy and long-run growth. *Staff Papers*, *44*(2), 179-209.

Temple, J. (1999). The new growth evidence. *Journal of Economic Literature*, *37*(1), 112-156.

Vedder, R. (2001). *Taxes and Economic Growth*. Wiscousin: Taxpayers Network, Inc.

Vedder, R. K., & Gallaway, L. E. (1998). *Government size and economic growth*. Washington, DC: Joint Economic Committee.