

# Public Social Expenditures and Economic Growth: Evidence from Selected OECD Countries

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## Abstract

There is a longstanding debate on whether the government expenditures contribute to economic growth. The endogenous growth theories, in general, predict that effective public expenditures can lead to increases in economic growth trends of countries regardless of their development stages or income levels. Starting from this prediction, this study aims to investigate the effects of governments' social expenditure proxies namely education, health and social spending on economic growth performances presented by the changes in the gross domestic product (GDP) per capita. Using the feasible generalized least squares (FGLS) estimators based on a balanced panel dataset covering 2002-2013 periods of 18 OECD countries, the study concludes that social expenditures in all three dimensions significantly contribute to the economic growth. Overall results underline that public expenditures can be productive as an investment in the case of selected OECD countries.

**Keywords:** economic growth, feasible generalized least squares, OECD countries, social expenditure

## 1. Introduction

Both economists and policymakers acknowledge economic growth as one of the most important indicators of welfare level in a country. Therefore, increasing the income level is the main concern of public policies. Studies in the related immense literature on the determinants of economic growth have commonly examined the effects of economic factors like capital and labor stocks, financial development, investment, productivity, level of production technology, trade, *etc.* (Domar, 1946; Solow, 1956; Barro, 1991; Mankiw, 1995; Barro, 2001; Bassanini and Scarpetta, 2002; Hausmann, Pritchett, and Rodrik, 2005).

Until the endogenous growth theories, the traditional neoclassic approach which underlined that the macroeconomic policies of the government is not effective on the economic growth dominated the growth literature. On the contrary, the endogenous growth models take government expenditures in health, education, social security and even in defense areas into account while modeling the growth of countries. The origins of endogenous growth models are based on the studies of Romer (1986), Lucas (1988), Barro (1990) and Rebelo (1991). Determining the economic growth as endogenous means that government can affect the economic growth rate by applying macroeconomic policies. In other words, government affects long-term growth with taxing, spending and changing the budget balance (Pevcin, 2004). However, the endogenous growth models have focused on the role of human capital as a key driver of economic growth (Stokey, 1991; Pyo, 1995) which directs the public expenditures to invest in the human capital stock.

The combination of the expenditures on human capital also matters in the endogenous growth models that there are important and direct relations between the government expenditures like education, health, social protection and social security and economic growth. Education is one of the most important factors which contributes to the sustainable economic growth and competitiveness of the countries. Therefore, it is expected that education expenditures contribute to the economic growth by increasing the efficiency and productivity levels of individuals (Afzal *et al.*, 2010).

Health expenditures have multiple contributions to economic growth in both the short-run and long-run. Healthy workers become more productive while ill workers become less productive and tend to be absent in workplace or work inefficiently. Moreover, healthy children, possible workers in the future, can affect the income trajectories of countries (Bloom and Canning, 2000; Lusting, 2006; Barro, 2013).

Another important content of public expenditures within especially the social government program is social protection expenditures consist of health, insurance, and pension payments along with social services and aids (Adema, Fron and Ladaique, 2011). However, the effects of social protection expenditures of governments on long-run economic growth are not clear with two opposite evidence. On the one hand, the benefit these programs provide can discourage people from working. Because of the decline in the amount of labor supplied in the economy, the level of output and, in some circumstances, the level of capital investment and hence growth can lower. On the other hand, social protection expenditures will make a positive contribution to the economic growth since the individuals are insured against disease and unemployment risk and therefore they become more productive and motivated to work (Arjona, Ladaique and Pearson, 2002). These two different suggestions keep the doors open to the debates about whether social protection is an expenditure or an investment.

Starting from the predictions of endogenous growth models, this study aims to empirically test the effects of governments' expenditures in social areas like education, health, and social protection which also embodies social security on economic growth for selected 18 OECD countries. The rest of the study is organized as follows: In section 2 we present growth trends and social expenditures in selected OECD countries, followed by the literature review in section 3. After model, data, and method are introduced in section 4, we report empirical results in section 5. Finally, the study concludes with some discussions of findings in the last section.

## 2. Growth Trends and Social Expenditures in OECD Countries

The recent turning point in global growth trends was the 2008-2009 crisis initially started in the finance sector of the United States and then spread to the real sector. This crisis not only affected the United States but also affected the whole world economy fast with striking decreases of growth rates as shown in Table 1 presenting the OECD countries case. As the crisis deepened, the importance of social protection and social security programs well-understood and increased.

It is seen from the Table 1 that the countries especially Czech Republic, Estonia, and Turkey, recorded high growth rates before the crisis. Sharp declines in 2008 and 2009 in selected OECD countries reveal how deep and pervasive the recession was. Moreover, during the post-crisis period, most of the countries seem to be having problems in catching the same growth performances of the pre-crisis periods.

Table 1. Percentage changes in gross domestic products (expenditure approach), 2002-2015

Countries	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>Austria</i>	1.7	.8	2.7	2.1	3.4	3.6	1.5	-3.8	1.9	2.8	.7	.1	.6	1.0
<i>Belgium</i>	1.8	.8	3.6	2.1	2.5	3.4	.7	-2.3	2.7	1.8	.1	-.1	1.7	1.5
<i>Canada</i>	3.0	1.8	3.1	3.2	2.6	2.1	1.0	-2.9	3.1	3.1	1.7	2.2	2.5	1.1
<i>Czech Republic</i>	1.6	3.6	4.9	6.4	6.9	5.5	2.7	-4.8	2.3	2.0	-.8	-.5	2.7	4.5
<i>Denmark</i>	.5	.4	2.7	2.3	3.9	.9	-.5	-4.9	1.9	1.3	.2	.9	1.7	1.6
<i>Estonia</i>	6.1	7.4	6.3	9.4	1.3	7.7	-5.4	-14.7	2.3	7.6	4.3	1.4	2.8	1.4
<i>Finland</i>	1.7	2.0	3.9	2.8	4.1	5.2	.7	-8.3	3.0	2.6	-1.4	-.8	-.7	.2
<i>France</i>	1.1	.8	2.8	1.6	2.4	2.4	.2	-2.9	2.0	2.1	.2	.6	.6	1.3
<i>Germany</i>	.0	-.7	1.2	.7	3.7	3.3	1.1	-5.6	4.1	3.7	.5	.5	1.6	1.7
<i>Italy</i>	.2	.2	1.6	.9	2.0	1.5	-1.1	-5.5	1.7	.6	-2.8	-1.7	.1	.7
<i>Netherlands</i>	.1	.3	2.0	2.2	3.5	3.7	1.7	-3.8	1.4	1.7	-1.1	-.2	1.4	2.0
<i>Norway</i>	1.4	.9	4.0	2.6	2.4	2.9	.4	-1.6	.6	1.0	2.7	1.0	1.9	1.6
<i>Portugal</i>	.8	-.9	1.8	.8	1.6	2.5	.2	-3.0	1.9	-1.8	-4.0	-1.1	.9	1.6
<i>Spain</i>	2.9	3.2	3.2	3.7	4.2	3.8	1.1	-3.6	.0	-1.0	-2.9	-1.7	1.4	3.2
<i>Sweden</i>	2.1	2.4	4.3	2.8	4.7	3.4	-.6	-5.2	6.0	2.7	-.3	1.2	2.6	4.1
<i>Turkey</i>	6.2	5.3	9.4	8.4	6.9	4.7	.7	-4.8	9.2	8.8	2.1	4.2	2.9	4.0
<i>United Kingdom</i>	2.4	3.5	2.5	3.0	2.5	2.6	-.6	-4.3	1.9	1.5	1.3	1.9	3.1	2.2
<i>United States</i>	1.8	2.8	3.8	3.3	2.7	1.8	-.3	-2.8	2.5	1.6	2.2	1.7	2.4	2.6
<i>European Union (28)</i>	1.3	1.4	2.5	2.1	3.3	3.0	.4	-4.4	2.1	1.7	-.5	.2	1.5	2.2
<i>European Union (15)</i>	1.2	1.2	2.4	1.9	3.1	2.8	.2	-4.4	2.1	1.5	-.6	.1	1.5	2.1
<i>OECD-Total</i>	1.7	2.1	3.3	2.8	3.1	2.7	.2	-3.5	3.0	1.9	1.3	1.3	1.9	2.2

Source: OECD (2016).

As seen in Table 2, even the growth rates decreased in the post-crises period, the shares of public social expenditures in GDP has increased which is seen consistent with the argument suggesting that countries need to spend and invest more in social programs to ease and relieve the negative outcomes of the market failures resulted in crises.

Table 2. Public social expenditures, aggregated, percentages of gross domestic products, 2002-2015

Years	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Countries</b>														
<i>Austria</i>	25.9	26.5	26.3	25.9	25.7	25.1	25.6	27.5	27.6	26.8	27.2	27.6	27.9	28.0
<i>Belgium</i>	24.4	25.5	25.3	25.3	25.2	24.9	26.3	28.6	28.3	28.7	29.0	29.3	29.2	29.2
<i>Canada</i>	16.2	16.3	16.3	16.1	16.3	16.2	16.3	18.1	17.6	17.1	17.1	16.9	16.8	17.2
<i>Czech Republic</i>	18.7	18.8	18.0	18.1	17.8	17.6	17.8	20.2	19.8	19.8	20.0	20.3	19.9	19.5
<i>Denmark</i>	24.8	25.3	25.1	25.2	25.0	25.0	25.4	28.3	28.9	28.9	28.9	29.0	29.0	28.8
<i>Estonia</i>	12.8	12.9	13.4	13.0	12.6	12.6	15.4	19.6	18.3	16.3	15.9	15.9	16.0	17.0
<i>Finland</i>	23.2	23.8	24.0	23.9	23.8	22.9	23.3	26.9	27.4	27.1	28.4	29.5	30.2	30.6
<i>France</i>	28.2	28.6	28.7	28.7	28.1	28.0	28.2	30.5	30.7	30.5	31.0	31.5	31.9	31.7
<i>Germany</i>	26.1	26.6	26.0	26.3	25.0	24.1	24.2	26.7	25.9	24.7	24.6	24.8	24.9	25.0
<i>Italy</i>	23.3	23.6	23.9	24.1	24.2	24.7	25.6	27.7	27.6	27.3	28.1	28.6	29.0	28.9
<i>Netherlands</i>	19.2	20.0	19.9	20.5	20.2	19.9	19.6	21.6	22.1	22.0	22.5	22.9	22.7	22.3
<i>Norway</i>	22.7	23.7	22.3	20.7	19.5	19.6	19.2	22.3	21.9	21.4	21.3	21.8	22.4	23.9
<i>Portugal</i>	20.3	21.4	21.7	22.3	22.1	21.8	22.2	24.6	24.5	24.4	24.5	25.5	24.5	24.1
<i>Spain</i>	19.3	19.9	20.1	20.4	20.4	20.8	22.2	25.4	25.8	26.3	26.1	26.3	26.1	25.4
<i>Sweden</i>	27.6	28.2	27.7	27.4	26.6	25.5	25.6	27.7	26.3	25.8	26.7	27.4	27.1	26.7
<i>Turkey</i>	9.0	10.0	10.4	10.3	10.3	11.1	11.6	13.5	12.8	12.5	13.0	13.4	13.5	--
<i>United Kingdom</i>	18.6	19.0	19.5	19.4	19.2	19.5	20.9	23.0	22.8	22.4	22.5	21.9	21.6	21.5
<i>United States</i>	15.7	15.9	15.8	15.6	15.7	15.8	16.5	18.6	19.3	19.1	18.8	18.8	18.8	19.0
<i>OECD - Total</i>	18.7	19.0	18.8	18.8	18.5	18.3	19.0	21.2	21.1	20.7	21.0	21.1	21.1	21.0

*Notes:* Aggregated public social expenditures comprise of main social policy areas like old age, survivors, incapacity-related benefits, health, family, active labor market programs, unemployment, housing, and other social policy areas. All these benefits can be both cash and non-cash (benefits-in-kind). See Adema *et al.*, (2011) for more details on the methodology and analytical explanations.

*Source:* OECD (2016).

### 3. Literature Review

There are many empirical studies investigating the relationships between the public expenditure combinations and economic growth in both developing and developed countries. Even the immense interests in the current literature on the relationship, the conclusions for the impacts of social expenditures on the growth is not that clear. This ambiguity seems to be caused by differences in the methods, samples, and time spans in the studies. Some selected studies with different findings are reviewed and summarized in Table 3.

Table 3. Selected studies with different findings in the literature

<i>Author(s) (Year)</i>	<i>Country Sample</i>	<i>Period</i>	<i>Variables</i>	<i>Method</i>	<i>Findings</i>
Landau (1983)	104 (developing and	1961-1976	GDP per capita; public expenditures; total education	Comparative country analysis based on the	Negative relationship between the growth rate of GDP per capita and the share of

	developed countries)		investments	traditional methods	government consumption expenditures
Baum and Lin (1993)	58 (developing and developed countries)	1975-1985	GDP per capita; education, defense, and welfare expenditures; population	Panel data analysis	Education and defense expenditures have positive effects while welfare expenditures have negative but insignificant effect on growth
Barro (1991)	98 (developing and developed countries)	1960-1985	Growth (in the real GDP per capita); human capital (school-enrollment rates); initial (1960) level of real GDP per capita.	Panel data analysis	The growth rate is positively related to initial human capital and negatively related to the initial level of real GDP per capita. Growth is inversely related to the government consumption, but insignificantly related to the public investment.
Devarajan, Swaroop and Zou (1996)	43 (developing countries)	1970-1990	GDP growth; public expenditures in education, health defense, transportation, and communication	Panel data analysis and OLS	Education and defense expenditures have negative effects while health, transportation, and communication expenditures have contributions on the growth.
Kelly (1997)	73 (developing and developed countries)	1970-1989	GDP per capita; public investment and expenditures in defense, education, health, social security, transportation, and communication	Panel data analysis	Public investment and social expenditures contribute to the growth. Crowding - out and rent - seeking concerns seem to be overstated in the literature.
Folster and Henrekson (2001)	23 (developed OECD countries)	1970-1995	GDP per capita; human capital; labor force growth rate; investment rate; total taxes as share of GDP	Panel data analysis, some complementary tests	There is a strong negative relationship between social expenditures and economic growth.
Baldacci, Cui, Clements, and Gupta (2004)	120 (developing countries)	1975-2000	Real GDP per capita; social spending in education, health; population	Panel data analysis	Both education and health spending have positive direct impacts on the economic growth.
Dreger and Reimers (2005)	21 OECD countries	1975-2001	GDP per capita; Indices for health expenditures	Panel data analysis	Long-term positive relationship between health expenditures and economic growth.
Beraldo, Montolio and Turati (2009)	19 OECD countries	1971-1998	GDP per capita; public and private health expenditures; public and private education	Panel data analysis	Health and education expenditure contribute to the growth. The impact of health is stronger than education. Public

		expenditures		expenditures contribute to the GDP growth more than private expenditures.	
Alam, Sultana and Butt (2010)	10 Asian countries	1970-2005	GDP; education health and social security/welfare expenditures	Panel data analysis	Social expenditures increase efficiency and therefore, affect growth positively.
Afonso and Alegre (2011)	15 European Union countries	1971-2006	Growth (GDP per capita); total factor productivity; labor productivity; education, health, and social expenditures	Panel data analysis	Public expenditures induce distortions in the private factors allocation. Public investment enhances economic growth by boosting private investment (crowding-in effect)
Carter, Craigwell and Lowe (2013)	Barbados (a small open economy case)	1976-2011	GDP per capita; health, education, and social security expenditures	Dynamic OLS, unrestricted error correction model	Total government spending lessens growth rates, particularly in the short-run. Health and social security have little influences. Education expenditures have a negative impact on growth, both in the long and short runs.
Khan and Bashar (2015)	Australia and New Zealand	1980-2012	GDP per capita; education, health, social welfare expenditures; budget deficit	Time series analysis (cointegration and error correction, causality)	Social expenditures promote economic growth in both countries. One way causality running from economic growth to health and social expenditures in Australia. One-way causality runs from education expenditure to growth in New Zealand

Both individual country-specific and country-aggregated studies in the huge literature generally conclude that the effects of government expenditures, presented by several measurements, on the growth that is commonly proxied by GDP per capita, vary over time and over countries. These unclear conclusions implicitly indicate that the conditions of contribution are country-specific. In this context, our study aims to contribute to the literature using a new dataset and different methods as outlined in the following section 4.

#### 4. Model, Data, and Method

The theoretical model of the study associates a relationship between economic growth and governments' education, health, and social expenditures in selected 18 OECD countries as shown in equation 1.

$$Y = f(EDU, HEALTH, SOCIAL) \quad (1)$$

Where,  $Y$  is GDP per capita (constant 2005 USD),  $EDU$  is total public expenditures on education as a percentage of GDP,  $HEALTH$  is total public expenditure on health as a percentage of GDP and  $SOCIAL$  is the total public expenditures on social protection as the percentage of GDP. Social protection expenditure comprises cash benefits, direct in-kind provision of goods and services, and tax breaks by governments with social purposes (Adema *et al.*, 2011; OECD, 2016). Expressing the variables in natural logarithms ( $\ln$ ), the regression model in a panel structure is specified as in the equation 2.

$$\ln Y_{it} = \beta_0 + \beta_1 \ln EDU_{it} + \beta_2 \ln HEALTH_{it} + \beta_3 \ln SOCIAL_{it} + \varepsilon_{it} \quad (2)$$

$(i = 1, \dots, 11; t = 2002, \dots, 2013)$

In equation 2, all the variables are the same as previously defined and  $i$  and  $t$  stand for the cross-section units (countries) and temporal units (years), respectively, while  $\beta_0$  is a country-specific intercept. The stochastic error term,  $\varepsilon_{it}$ , comprises the influences of all other factors not included in the model. Finally,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are the elasticities to be estimated.

The study is based on annual dataset covering a period from 2002 to 2013 of 18 OECD countries including Austria, Belgium, Canada, Czech Republic, Germany, Denmark, Spain, Estonia, Finland, France, United Kingdom, Italy the Netherlands, Norway, Portugal, Sweden, the Unites States, and Turkey. The data of GDP per capita, total public expenditures on education and health are taken from the World Bank's World Development Indicator (WB-WDI, 2016) and expenditure on social protection is those of OECD (2016) and Eurostat (2016).

We followed the panel data analysis methodology as follows: First we checked cross-sectional dependence (CSD) using several tests like Pesaran's CD test, Friedman's test and Frees' test. Then, we controlled time series characteristics for heteroskedasticity, and autocorrelation through modified Wald test and Wooldridge test respectively. Finally, we estimate the coefficients using the feasible generalized least squares (FGLS) estimator.

### 5. Empirical Results

We checked time series characteristics for heteroskedasticity and autocorrelation problems using Pesaran, Friedman and Frees tests. Test statistics are presented in Table 4. Results indicate that there is a cross-sectional dependency between variables in all three tests.

Table 4. Cross-sectional dependence tests

<i>Tests</i>	<i>Statistics</i>	<i>Probability (p) values</i>
Pesaran's test	18.701	.000
Friedman's test	96.855	.000
Frees' test	5.201	Critical values from Q distribution are: .214 (for .10) .284 (for .05) .425 (for .01)

Moreover, unreported statistics reveal that there are both heteroskedasticity and autocorrelation in the series. Therefore, we rearrange the calculations in FGLS procedure considering the case where cross-sectional dependency, heteroskedasticity and autocorrelation exist. The results of FGLS estimation are presented in Table 5.

Table 5. The results of FGLS estimation

<i>Independent variables</i>	<i>Coefficients</i>	<i>Standard errors</i>	<i>Probability (p) values</i>
<i>EDU</i>	.065	.002	.000
<i>HEALTH</i>	.052	.001	.000
<i>SOCIAL</i>	.024	.001	.000
<i>CONSTANT</i>	9.024	.040	.000

The coefficients reported in the Table 5 reveal that the effects of education, health and social protection expenditures on the economic growth are significantly positive. Education (.065) expenditures spent by the governments are found most contributing to the growth followed by the health (.052) and social protection (.024) expenditures. Again, high constant emphasizes the fact that a wide array of factors determines growth, besides government spending.

## 6. Conclusion

There is a longstanding debate with no consensus on whether government expansion through public policies helps or hinders economic growth. Consistently, the empirical studies in the related literature conclude with unclear findings. Neoclassical growth theories predict a convergence between the growth paths of developing and developed countries. Since such convergence was not observed in the real world with a few exceptions from East Asia, the neoclassical growth model has been questioned by especially endogenous growth theories that highlight the importance of human capital. The endogenous growth theories, in general, predict that effective public expenditures can lead to increases in economic growth trends of countries regardless of their development stages or income levels.

Starting from this prediction, this study aims to investigate the effects of governments' social expenditures proxies like education, health and social protection on economic growth presented by the changes in gross domestic product per capita using a balanced panel dataset covering 2002-2013 periods of 18 OECD countries. Taking cross-sectional dependency, heteroskedasticity and autocorrelation into consideration, the study followed the feasible generalized least squares estimation procedure within the panel data framework.

Findings reveal that the effects of education, health and social protection expenditures on the economic growth are significantly positive. Education (.065) expenditures spent by the governments are found most contributing to the growth which followed by the health (.052) and social protection (.024) expenditures. Again, high constant emphasizes the fact that a wide array of factors determines growth, besides government spending. Supporting the predictions of endogenous growth theories in terms of the importance of human capital, overall results suggest that governments not only can eliminate the results of market failures by social spending directly but also, they can increase the welfare promoting the economic growth from various channels in the case of selected OECD countries.

## References

- Adema, W., Fron, P., & Ladaique, M. (2011). Is the European welfare state really more expensive? Indicators on social spending, 1980-2012; and a manual to the OECD social expenditure database. *OECD Social, Employment and Migration Working Papers*, 124. <http://dx.doi.org/10.1787/5kg2d2d4pbf0-en>
- Afonso, A., & Juan, A. (2011). Economic growth and budgetary components: A panel assessment for the EU. *Empirical Economics*, 41(3), 703-723. <http://dx.doi.org/10.1007/s00181-010-0400-9>
- Afzal, M., Farooq, M.S., Ahmad, H.K., Begum, I., & Quddus, M.A. (2010). Relationship between school education and economic growth in Pakistan: ARDL bounds testing approach to cointegration. *Pakistan Economic and Social Review*, 48(1), 39-60.
- Alam, S., Sultana, A., & Butt, M.S. (2010). Does social expenditures promote economic growth? A multivariate panel cointegration analysis for Asian countries. *European Journal of Social Sciences*, 14(1), 44-54.
- Arjona, R., Ladaique, M., & Pearson, M. (2002). Social protection and growth, *OECD Economic Studies*, 35(2), 7-45. [http://dx.doi.org/10.1787/eco\\_studies-v2002-art8-en](http://dx.doi.org/10.1787/eco_studies-v2002-art8-en)
- Baldacci, E., Clements, B., Gupta, S., & Cui, Q. (2004). Social spending, human capital and growth in developing countries: Implications for achieving the MDGs. *IMF Working Papers*, WP/04/217, 1-40. <http://dx.doi.org/10.5089/9781451875140.001>
- Barro, R.J. (1990). Government spending in a simple model of endogenous growth. *The Journal of Political Economy*, 98(5), 103-125. <http://dx.doi.org/10.3386/w2588>
- Barro, R.J. (1991). Economic growth in a cross section of countries. *The Quarterly Journal of Economics*, 106(2), 407-443. <http://dx.doi.org/10.2307/2937943>
- Barro, R.J. (2001). Human capital and growth. *The American Economic Review*, 91(2), 12-17. <http://dx.doi.org/10.1257/aer.91.2.12>
- Barro, R.J. (2013). Education and economic growth. *Annals of Economics and Finance*, 14(2), 301-328.
- Barro, R.J. (2013). Health and economic growth. *Annals of Economics and Finance*, 14(2), 329-366.
- Bassanini, A., & Scarpetta, S. (2002). Does human capital matter for growth in OECD countries? A pooled mean-group approach. *OECD Economics Department Working Papers*, 282. <http://dx.doi.org/10.1787/424300244276>
- Baum, D.N., & Lin, S. (1993). The differential effects on economic growth of government expenditures on education, welfare, and defense. *Journal of Economic Development*, 18(1), 175-185.

- Beraldo, S., Montolio, D., & Turati, G. (2009). Healthy, educated and wealthy: A primer on the impact of public and private welfare expenditures on economic growth. *The Journal of Socio-Economics*, 38(1), 946-956. <http://dx.doi.org/10.1016/j.socec.2009.06.013>
- Bloom, D.E., & Canning, D. (2000). The health and wealth of nations. *Science New Series*, 287(5456), 1207-1209. <http://dx.doi.org/10.1126/science.287.5456.1207>
- Carter, J., Craigwell, R., & Lowe, S. (2013). Government expenditure and economic growth in a small open economy: A disaggregated approach. *CBB Working Papers*, WP/13/15. Retrieved from [http://www.ccmf-uwi.org/files/publications/conference/2013/3\\_1-Carter\\_Craigwell\\_Lowe-p.pdf](http://www.ccmf-uwi.org/files/publications/conference/2013/3_1-Carter_Craigwell_Lowe-p.pdf)
- Devarajan, S., Swaroop, V., & Zou, H. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, 37(2), 313-344. [http://dx.doi.org/10.1016/S0304-3932\(96\)90039-2](http://dx.doi.org/10.1016/S0304-3932(96)90039-2)
- Domar, E. (1946). Capital expansion, rate of growth, and employment. *Econometrica*, 14(1), 137-47. <http://dx.doi.org/10.2307/1905364>
- Dreger, C., & Reimers, H.E. (2005). Health care expenditures in OECD countries: A panel unit root and cointegration analysis. *IZA Discussion Papers*, 1469, 1-20. Retrieved from <http://ftp.iza.org/dp1469.pdf>
- Eurostat. (2016). Retrieved from <http://ec.europa.eu/eurostat/data/database>
- Folster, S., & Henrekson, M. (2001). Growth effects of government expenditure and taxation in rich countries. *European Economic Review*, 45(8), 1501-1520.
- Hausmann, R., Pritchett, L., & Rodrik, D. (2005). Growth accelerations. *Journal of Economic Growth*, 10(4), 303-329. <http://dx.doi.org/10.1007/s10887-005-4712-0>
- Kelly, T. (1997). Public expenditures and growth. *The Journal of Development Studies*, 34(1), 60-84. <http://dx.doi.org/10.1080/00220389708422503>
- Khan, H., & Bashar, O. (2015). Social expenditure and economic growth: evidence from Australia and New Zealand using cointegration and causality tests. *The Journal of Developing Areas*, 49(4), 285-300. <http://dx.doi.org/10.1353/jda.2015.0137>
- Landau, D. (1983). Government expenditure and economic growth: A cross-country study. *Southern Economic Journal*, 49(3), 783-792. <http://dx.doi.org/10.2307/1058716>
- Lucas, R.E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3-42. [http://dx.doi.org/10.1016/0304-3932\(88\)90168-7](http://dx.doi.org/10.1016/0304-3932(88)90168-7)
- Lustig, N. (2006). Investing in health for economic development: The case of Mexico. *UNU-WIDER Research Papers*, 2006/30. Retrieved from <http://www.wider.unu.edu/sites/default/files/rp2006-30.pdf>
- Mankiw, N.G. (1995). The growth of nations. *Brookings Papers on Economic Activity*, 1995(1), 275-326. <http://dx.doi.org/10.2307/2534576>
- OECD. (2016). OECD statistics. Retrieved from <http://stats.oecd.org/>
- Pevcin, P. (2004). Does optimal size of government spending exist?. Retrieved from <http://soc.kuleuven.be/io/egpa/fin/paper/slov2004/pevcin.pdf>
- Pyo, H.K. (1995). A time-series test of the endogenous growth model with human capital. Retrieved from <http://www.nber.org/chapters/c8551.pdf>
- Rebelo, S.T. (1991). Long-run policy analysis and long-run growth. *Journal of Political Economy*, 99(3), 500-521. <http://dx.doi.org/10.3386/w3325>
- Romer, P.M. (1986). Increasing returns and long run growth. *Journal of Political Economy*, 94(5), 1002-1037. <http://dx.doi.org/10.1086/261420>
- Solow, R.M. (1956). Contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65-94. <http://dx.doi.org/10.2307/1884513>
- Stokey, N.L. (1991). Human capital, product quality and growth. *Quarterly Journal of Economics*, 106(2), 587-616. <http://dx.doi.org/10.3386/w3413>
- WB-WDI. (2016). The World Bank, World Data Bank, World Development Indicators. Retrieved from <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>