

GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH: A CROSS-COUNTRY ANALYSIS

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Abstract

This paper empirically analyses the relationship between Economic Growth measured in terms of GDP Growth and Government Expenditure, GDP and Population. It employs annual cross-section time series data of the concerned variable of 117 countries from 2001 to 2021. Random Effect model was used for the analysis. The pool-ability of data is tested by the Breusch and Pagan LM test which confirmed that Pooled OLS is not appropriate for the model. The Hausman Specification Test was then conducted for choosing between the Fixed Effect or Random Effect model. The Hausman Specification Test for the Model suggests the Random effect model is appropriate for the analysis of the data. Thus, Random effect regression is used to find the consequences of explanatory and the control variables on the dependent variable. Government Expenditure as an explanatory variable has a positive relationship with the Economic Growth, even in the case of controlling for Population and the Trade Openness. Both the control variable is depicted to have positive relationship with the Economic Growth.

Key Words: *Economic Growth, Government Expenditure, Population, Trade Openness, Random Effect*

JEL classification: C33, O47, H50

1. Introduction

Government spending or expenditure includes all government consumption, investment, and transfer payments. The acquisition by governments of goods and services for current use to directly satisfy individual or collective needs of the community is termed as Government Final Consumption Expenditure (Barro and Grilli, 1994). Government expenditure refers to the amount of money spent by a government on goods and services, such as education, healthcare, defense, infrastructure, and social welfare programs, among others, to support its citizens and fulfill its responsibilities (Musgrave, 1959).

Fundamentally, Governments outflows are government spending, and their inflows are tax revenues. If revenues exceed spending, there is a budget surplus; if revenues fall

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short of spending, there is a budget deficit. Each unit of government deficit adds to the stock of government debt. The deficit measures the year-to-year shortfall of revenues relative to spending; the debt measures the accumulation of past deficits over time. This government debt must be financed by borrowing from either citizens of one's own local or national area, or by borrowing from citizens of other areas or other nations (Gruber, 2016).

The idea of government expenditure goes back as early as the idea of government emerged. The government as the central figure responsible for the allocation of resources would do all the necessary for the welfare of the people. With the publication of the treatise "An Inquiry into the Nature and Causes of the Wealth of Nations" (Smith, 1776), the journey of systematic economic development is believed to have started in the 17th century. The idea that government spending can be a catalyst for economic growth and development has been discussed by economists and policymakers for many decades. One of the earliest examples of this idea can be traced back to the work of John Maynard Keynes in the 1930s.

Economists have always differed in their argument on whether public expenditure affects the economy positively or otherwise. The classicists are of a laissez-faire view, whereas Keynesians believe in strong government intervention. Classicists (Smith, 1776) and (Ricardo, 1817) argue that government intervention will create undue disturbances in the automatic mechanism of the market economy. A balanced budget is a way in classicists' view. If the government increases public expenditure during full employment without increasing its revenues, it will lead to inflation. In that instance, the government must fill the gap by borrowing, which should be employed in production.

However Keynes, (1936) has opposed the classical theory and suggests the dynamic role of government expenditure. He argues that government should adopt a surplus budget at the time of the Boom. But, during the depression, the government should increase its expenditure and spend more on public works to uplift economic growth.

UN, (1953) defines General Government Consumption Expenditure as the current expenditure on goods and services undertaken by general government. It comprises compensation of employees, purchases by general government from enterprises and the rest of the world less purchases from the general government of goods and services, other than surplus stores, by enterprises and households.

The Central and local level spends the government funds to cater to the needs of the people i.e. protecting and promoting citizens' social and economic welfare (Ortiz-Ospina and Roser, 2016). It is imperative to observe and analyze if the government has been expanding in favor of people and their welfare. This paper aims at analyzing the relationship between the government expenditure and the economic growth.

The phenomenon of public expenditure growth has been subject to government officials, policymakers, and researchers to find out what causes or has effects on it. The importance and magnitude of Government expenditure are of great interest in macroeconomics (Kharel and Adhikari, 2021). Government plays a vital role in responding to the situation of crises to help ease the difficulties of individuals and businesses. Economies face uncertain times quite frequently. Although the government is blamed for its inherent inefficiencies, it is the major force in rescuing the people from difficult situations by expanding through public institutions and governments are expected to deliver and maintain stability and provide an anchor of confidence in difficult times (Stark, 2009).

The British Credit crisis 1772 (Sheridan, 1960), The Great Depression of 1929–39 (Tate, 1987), The OPEC Oil Price Shock of 1973 (Issawi, 1978), The Asian Crisis of 1997 (Staff, 1998), The Financial Crisis of 2007–08 (Subrahmanyam, 2009), and Covid-19 (Hale et al., 2020) are the some of the major economic events where economies around the world faced a situation of crisis. The current war in Ukraine has also posed a number of challenges for economies around the world. The government had a minor to a major role in easing the pressure on the micro to the macro level. Along with easing out the pressures in the short-run, the government would be contributing to the economic growth as well as development in the long run.

The remaining part of the paper is organized in the following manner. Various existing literature on the Impact of Government Expenditure on the GDP is discussed in the second section of the paper. The third section describes the data and variables used in the study. Model specification and methodology are explained in the fourth section. The fifth section includes the findings and results of the study. Finally, the sixth and last section concludes the paper with recommendations.

2. Review of Literature

Numerous studies have been carried out in the field of public expenditure. This chapter includes a review of the related studies and their essence concerning the relationship between government expenditure and economic growth. Some of them conform to the view that there exists positive causality between government expenditure and economic growth while some do not agree with the idea. And some suggest that there is a negative relationship between the variables concerned.

Landau, (1985) suggests that government consumption and investment expenditure helped cause the slowdown of economic growth of the developing countries. The study by Fan and Rao, (2003) finds mixed results while analyzing the performance of government expenditure in the developing countries. LE and TRAN, (2021) show that level of expenditure between education expenditure and GDP growth in Vietnam has

a positive relationship and influences each other. In Nepal, there was a short-run as well as the long-run relationship between Public Expenditure and Economic growth (Chaudhary and Acharya, 2018).

Bağdigen and Çetintaş, (2003) by examining the validity of Wagner's Law for the Turkish case found no co-integration between GDP and public expenditure, meaning that there is no long-run relationship between public expenditure and GDP in the Turkish case. Wang et al., (2022) finds that Government expenditure negatively affects Economic growth by analyzing the Panel data in South Africa's context. Likewise, Nyasha and Odhiambo, (2019) concludes that the impact of government expenditure on economic growth was not definite. Similarly, Popescu and (Maxim), (2021) finds that although there is double causality in the short run, the results do not indicate the existence of long-term co-integration vectors.

Rasaily and Paudel, (2019) revealed that there exists a long-run relationship exists between government expenditure and economic growth in Nepal. Kunwar, (2019) also finds a significant relationship between the variables. The authors also found the short-run relationship between the variables in Nepal. Another study suggest that both current and capital expenditure should be utilized simultaneously for the growth of the economy in Nepal (Shrestha, 2009), concluding the potential of achieving optimum growth in the case of Nepal with government expenditure. However, Sharma, (2012) observes that there exists a negative relationship between the government expenditure in Nepal.

Lee et al., (2019) observe the difference in the economic system and its impact on the relationship between economic growth and government expenditure by looking at the case of China and Korea. China, being a socialist economic system, maintains a higher level of government intervention. The author suggests being more cautious about government spending.

Arvin et al., (2021) studied the interactions between institutional quality, government expenditure, tax revenue, and economic growth in low-income countries (LICs) and lower-middle-income countries (LMICs) from 2005–to 2019. The findings imply that there are strong inter-relationships between institutional quality, government expenditure, tax revenue, and economic growth in the short run for LMICs. In the long run, the results reveal that there is a strong causal relationship between institutional quality and economic growth for the LICs, the LMICs, and also in the pooled sample.

Intending to analyze and estimate the impact of government spending volatility on economic growth, tests the data for the period of 1970 to 2018 (Algaed, 2022). The result suggests the negative impact of government spending volatility on real GDP growth.

Reviewing all the many pieces of literature, the gap on the part of an analysis of more number of countries was felt. Past literature included Country-wise, Cross-country regression analysis. Also, the pieces of literature on the developed, and developing countries' stance on the relationship between government expenditure and economic growth were reviewed. But it was felt that there was a need to analyze the relationship by taking into account more countries for more number of years of data available.

3. Methodology

The paper studies the relationship across the four different variables; namely, GDP Growth, Government Expenditure, Trade openness and the Population. The data are sourced from the World Bank for the duration from 2001 to 2021. The data were log-transformed for the purpose of the analysis. STATA 17.0 was used for the data analysis. The list of countries selected for the analysis is attached in *Appendix A*.

The Summary Statistics of observations, mean, and standard deviation, minimum, maximum explains the synopsis about the distribution, variability and central tendency of the variables.

Table 1: The result of descriptive statistics and correlation matrix

	GDP Growth	Government Expenditure	Population	Trade openness
Descriptive Statistics				
Obs	1849	1849	1849	1849
Mean	0.556	0.527	7.067	1.88
Std. Dev.	0.35	0.467	0.74	0.248
Min	-1.623	-1.957	4.748	0.163
Max	1.504	2.752	9.148	2.646
Correlation Matrix				
GDP Growth	1			
Government Expenditure	0.268	1		
Population	-0.005	0.034	1	
Trade openness	0.06	-0.103	-0.516	1
Source: Author's own Computation using STATA 17.0				

This paper aims to explore the causality between the Economic Growth with Government Expenditure, controlling for the Population and the Trade openness. Economic Growth measured in terms of GDP Growth is the dependent variable explained by Government expenditure. Population and the Trade openness is employed

as the control variables. Aiming for the objective, it has employed the following functional model based on the different Panel data literature. The specified model is as follows:

$$\text{GDPG} = f(\text{GFCE}, \text{POP}, \text{TO}) \dots\dots\dots (1)$$

Where, GDPG = GDP growth (annual %), GFCE = General government final consumption expenditure (annual % growth), POP = Population TO = Trade Openness.

The functional form explains that GDP Growth is dependent on or influenced by Government expenditure.

The econometric model is presented as follows:

$$\text{GDPG}_{it} = \alpha_0 + \beta_1 \text{GFCE}_{it} + \beta_2 \text{POP}_{it} + \beta_3 \text{TO}_{it} + \mu_{it} \dots\dots\dots (2)$$

Where, α_0 = intercept ($\alpha_0 > 0$), β_1 is the coefficient of General government final consumption expenditure, β_2 is the coefficient of Population, β_3 is the coefficient of Trade Openness μ_{it} is the error term. t = Year ranging from 2001 to 2021.

Description of the Variables

The detail of the entire variables used in the formulation of equation (1) and (2) and other associated variables in the study are presented in the below:

Table 2: Variable Details

Variable	Variable Details
GDPG	GDP growth (annual %)
GFCE	General government final consumption expenditure (annual % growth)
POP	Population
TO	Trade Openness

The data were analyzed with the help of Stata. Breusch-Pagan Lagrange multiplier (LM) test (Breusch and Pagan, 1980) was used to choose between the Random effects model and OLS model. Hausman Specification Test (Hausman, 1978) was employed to select between the fixed effect model or random effect model.

The pool-ability test confirms if the cross-sectional unit in the panel has the same intercept or a different intercept. Provided that the data set includes countries of diverse characteristics. As a result, they should have different slopes. After employing the Breusch and Pagan Lagrangian multiplier test to test the pool ability of data, it was confirmed that the Panel data was not Pool-able. So, Pooled OLS is not appropriate for the model.

The result of the Breusch and Pagan Lagrange Multiplier test is in ***Appendix B***.

Since the result indicates that Prob > chibar2 = 0.0000 and we conclude that the Pooled OLS model is not appropriate.

To choose among the fixed effect model and random effect model, the Hausman Specification test was conducted. The Hausman Specification Test for our Model suggests that the random effect model is appropriate for our data.

The result obtained for the Hausman Specification test is in the *Appendix C*.

4. Results and Discussion

The paper employs the Random Effect model to assess the relationship between the Economic Growth and the explanatory and the control variables in the selected countries. The model investigates the association between the GDP Growth, Government Expenditure, Population and the Trade openness. GDP Growth was taken as the dependent variable and Government Expenditure was taken as the independent variable while Population and Trade openness was controlled for. The regression result in the Table 3 shows that the GDP Growth is positively related to Government expenditure.

Table 3: Pooled OLS, Fixed Effect and Random Effect Models

Models & VARIABLES	Pooled OLS		Fixed Effect		Random Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
GFCE	0.201*** (0.017)	0.208*** (0.017)	0.207*** (0.016)	0.214*** (0.017)	0.205*** (0.016)	0.212*** (0.016)
POP		0.020 (0.012)		0.017 (0.012)		0.017 (0.012)
TO		0.157*** (0.037)		0.140*** (0.036)		0.143*** (0.036)
Constant	0.450*** (0.012)	0.010 (0.138)	0.447*** (0.011)	0.056 (0.133)	0.432*** (0.026)	0.035 (0.135)
Observations	1,849	1,849	1,849	1,849	1,849	1,849
R-squared	0.072	0.081	0.079	0.087	0.079	0.087

Note: Standard errors are in parentheses.

*, **, *** indicate significance at the 10, 5 and 1 percent levels, respectively.

Government Expenditure is found to have positive relationship with Economic Growth. As shown in Columns (1), (3) and (5), Government Expenditure had a negative effect on Economic Growth for all 3 models. Columns (2), (4), and (6) show the regression result after introducing the control variables (i.e. Population and the Trade Openness). Based on the results, the conclusion did not change after the control variables being introduced.

This analysis starts from a parsimonious model that considers only one variable and gradually considers additional control variables. The result conforms the hypothesized expected positive signs, even after controlling for control variables.

The control variable Trade openness in (2), (4) and (6) have high level of significance with the Economic Growth. However, Population doesn't have significance with the Economic growth. Both of the control variables have positive relationship with Economic growth.

5. Conclusions

The paper intends to examine the consequences of Government Expenditure on the Economic Growth. For the said purpose, the unbalanced panel data of 117 countries since 2001 to 2021 was employed. The empirical results have been estimated using Pooled OLS, Fixed Effect and Random Effect Model. Moreover, control variables GDP and Population were introduced for strengthening the causal conclusion.

The empirical result conform the expected positive association to Government Expenditure to the Economic Growth. In all the models (Pooled OLS, Fixed Effect and Random Effect) employed for regression, with and without control variables, there is a positive effect on the Economic Growth explained by the Government Expenditure.

The result implies that when there is increase in the Government Spending, the GDP Growth increases. Using this result, we conform with the earlier proposition supposed in the paper that with increase in the Government Expenditure, there is increase in the GDP Growth because Government Expenditure leads to increase in the aggregate demand of the goods and services as well as the stimulating the productivity, innovation and competitiveness. It was also hypothesized that Government Expenditure by indirectly promoting investment helps to increase the GDP. So, with the Government Expenditure increasing, there is increase in the GDP Growth.

The econometric model (2), (4) and (6) controls for Population and Trade Openness to further enhance the presence of causality of Government Expenditure in the Economic Growth. However, the introduction of the control variables did not change the conclusion in all 3 models employed. The relationship between the control

variable Population suggests that when the Population increases, the Economic Growth increases. Demographic change directly alters the size of the labor force, consumption and savings patterns and labor productivity, having an important impact on real economic variables. The population plays a demand side role in an economy, it is evident that when the demand increases, the GDP also increases.

Another control variable Trade openness depicted positive association with Economic Growth, meaning that when participation in international trade increases, the Economic growth also increases. The increased access to larger markets can also lead to greater specialization and efficiency. This specialization and efficiency can lead to lower production costs and higher productivity, which can contribute to GDP Growth.

Thus, the findings of the paper correspond to the basic macroeconomic foundations of the economic theories which establishes the relationship between the Government Spending and the Economic Growth. Based on the results, it can be concluded that the impact of government spending is positive and significant on economic growth measured in terms of GDP Growth. The economies today are more globalized and are subject to frequent uncertainty with challenges and unforeseen threats all the time. History shows that events have happened and spiraled out of control of individuals, and businesses (Bernanke et al., 2020). Although, Governments and their programs are criticized for their inefficiency (Rothbard, 2002), Governments have been the ultimate insurance for the economies. Governments have always been there in the difficult times to make sure that the pressure is released from individuals and businesses when in difficult moments. The government has always been the last resort for all individuals and businesses, playing a vital role of ultimate insurance (Saez and Zucman, 2020).

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Appendices

Appendix A: List of Countries

Albania	Brazil	Cyprus	Greenland	Kazakhstan	Mauritius	Pakistan	Sierra Leone	Uganda
Algeria	Brunei Darussalam	Czechia	Guatemala	Kenya	Mexico	Panama	Singapore	Ukraine
Argentina	Bulgaria	Denmark	Haiti	Korea, Rep.	Moldova	Paraguay	Slovak Republic	United Kingdom
Armenia	Burundi	Dominican Republic	Honduras	Kyrgyz Republic	Morocco	Peru	Slovenia	United States
Australia	Cambodia	Ecuador	Hong Kong SAR, China	Latvia	Mozambique	Philippines	South Africa	Vietnam
Austria	Cameroon	Egypt, Arab Rep.	Hungary	Lebanon	Namibia	Poland	Spain	
Bangladesh	Canada	El Salvador	Iceland	Lithuania	Netherlands	Portugal	Sudan	
Belgium	Chile	Estonia	India	Luxembourg	New Zealand	Romania	Sweden	
Belize	Colombia	Eswatini	Indonesia	Macao SAR, China	Nicaragua	Russian Federation	Switzerland	
Benin	Comoros	Finland	Ireland	Madagascar	Niger	Rwanda	Tanzania	
Bhutan	Congo, Dem. Rep.	France	Israel	Malaysia	Nigeria	Saudi Arabia	Thailand	
Bolivia	Costa Rica	Gabon	Italy	Mali	North Macedonia	Senegal	Timor- Leste	
Bosnia and Herzegovina	Croatia	Germany	Japan	Malta	Norway	Serbia	Tunisia	
Botswana	Cuba	Ghana	Jordan	Mauritania	Oman	Seychelles	Turkiye	

Appendix B: Breusch and Pagan Lagrangian multiplier test for random effects

GDPG [Year,t] = Xb + u[Year] + e[Year,t] Estimated results:		
	Var	SD = sqrt(Var)
GDPG	0.1223498	0.3497854
ε	0.1036929	0.3220138
u	0.0102613	0.1012979
Test: Var(u) = 0 <div style="text-align: right;"> chibar2(01) = 401.92 Prob > chibar2 = 0.0000 </div>		

Appendix C: Hausman (1978) specification test

Coef.	
Chi-square test value	-.637
P-value	1