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Original Article

Optimal Public Expenditure in Developing Countries

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Abstract: Many researchers believe that government expenditure promotes economic growth at the first development stage. However, as public expenditure becomes too large, countries will suffer a huge tax burden and tax distortions. This suggests there is an optimal public expenditure at which the economic growth rate is the highest. However, the optimal point would differ across countries because of differences in economic structure. In this present paper, the optimal public expenditure in developing countries is analyzed. Based on descriptive statistics and regression analysis of 30 developing countries in the period 2004-2013, the findings of this paper are threefold: (i) public expenditure increases along with the development level of countries; (ii) optimal public expenditure is at 19.375% of GDP; (iii) economic growth has a positive relationship with both investment and the labor force, and a negative relationship with urbanization.

Keywords: Public expenditure, economic growth, developing countries.

1. Introduction

Public spending plays a special role in developing the economy, society, defense and security of a country. Governments use public expenditure for providing basic public goods and services (infrastructure, health care, education and national defense). According to the IMF (2014), government size (measured by government expenditure or tax revenue) in most countries tends to increase in the long run, and primarily arose for social security, education and health care [1]. In developed economies, government spending surpassed nominal GDP growth from the 1960s to the mid-1980s. Particularly, public expenditure accounted for more than 40% of the GDP overall and over 50% of the GDP in developed countries.

Many researchers believe that government expenditure promotes production to achieve a high economic growth rate at the first development stage. However, as public expenditure becomes too large, countries will suffer a huge tax burden and tax distortions. In other words, governments must increase tax revenue to finance budget expenditure, reducing private investment and working motivation. As a result, this will cause negative impacts on

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economic growth. These findings are supported by highly persuasive theories which combine the two directions into a unique inverted U-shaped relationship [2]. Accordingly, in the early stage of development, public expenditure increases along with total output. This is due to an increase in government expenditure leading to a higher marginal productivity of capital. However, to some extent (called the optimal public expenditure), the effects will occur in the opposite direction. According to this hypothesis, countries with a small public expenditure scale (being on the upward side of the inverted U shape) cannot achieve a maximum growth rate because of a lack of infrastructure. Therefore, improving infrastructure by expanding government expenditure is necessary. Countries with large public expenditures (being on the downward side of the inverted U-shaped figure) will see decelerating economic growth in terms of public expenditure expansion.

However, if there is a unique U-shaped relationship between government size and growth in all countries, then the optimal size of public expenditure will be equal in every country. This is an absurdity because each country has its own characteristics, requiring a different optimal level of public expenditure. This can be illustrated in Figure 1 where the L curve represents the relationship between government size and growth in less developed countries; the M curve is for middle developed countries; and the H curve is for highly developed countries.

Studies on factors contributing to economic developments are of great importance. This is because economic growth can be understood as a major driving force in the wellbeing of many individuals. It is worth mentioning Solow's neoclassical theories of economic growth. In the model, economic development comes from more *labor, capital, ideas and new technology.* Many economists believe that an increase in the economic growth rate links with smaller government consumption, longer life expectancy, higher levels of investment, higher levels of schooling, a lower fertility rate, and a more open market.

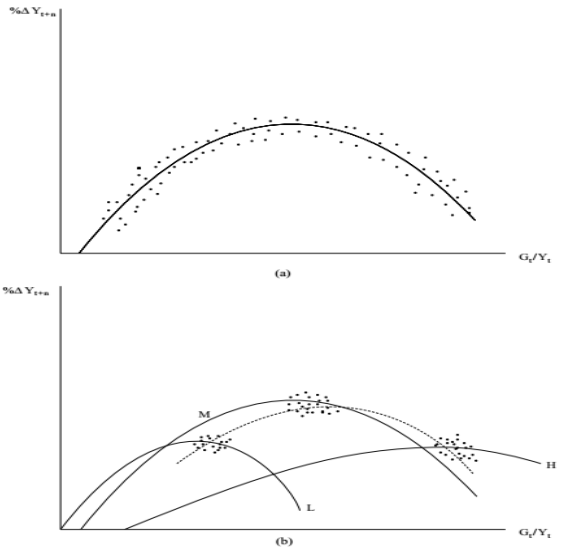

Figure 1. The relationship between public expenditure and economic growth.

Source: Mueller, 2004 [3].

In this paper, finding factors affecting the growth of countries and the optimal public expenditure in developing countries are the two main focuses. The findings are: (i) public expenditure increases along with the development level of countries; (ii) optimal public expenditure is at 19.375% of GDP; (iii) economic growth has a positive relationship with both investment and the labor force, and a negative relationship with urbanization.

The remainder of this paper is structured as follows: Section 2 provides a literature review with two subsections: An overview of studies on the relationship between public expenditure and economic growth and an overview of studies on the factors affecting economic growth. Section 3 presents the methodology and data used in the paper. Section 4 provides interpretations of the findings. Section 5 is the conclusion.

2. Literature review

2.1. Overview of studies on the relationship between public expenditure and economic growth

So far, there have been a large number of experimental studies which not only verify the inverted U-shaped relationship between public expenditure and economic growth but also indicate the optimal point in developing countries. Optimal public expenditure is not the same across either countries or studies. For example, Pevcin (2004) analyzed developing countries in Europe during the period 1950-1996 [4]. The results show a positive relationship between public expenditure and economic growth. However, this is just an early stage of the inverted U-shaped curve, followed by threats from income redistribution and tax distortions in the latter stage. The suggested optimal public expenditure is from 36% to 42% of GDP (this is quite high compared to the other studies, as you will see below).

Aly and Strazicich (2000) [5] analyzed the data of five Gulf countries in the Middle East between 1970 and 1992, including: Bahrain, Kuwait, Oman, Saudi Arabia, and the United Arab Emirates. In the 1970s when oil prices soared, the size of the governments in these countries increased dramatically. A few years later - in the 1980s, when oil prices peaked and suddenly reduced, their oil revenues dropped significantly, leading to a reduction in government expenditure. The authors showed that the average size of public expenditure was 21% in Bahrain, 18% in Kuwait, 29% in Oman, 17% in Saudi Arabia, and 22% in the United Arab Emirates. The average public expenditure for the five countries was approximately 22% of GDP, which was almost double the optimal level (12% of GDP).

Abounoori and Nademi (2010) [6] studied Iranian data for the period 1959-2005. By using threshold regression analysis, the authors found the threshold values for total public expenditure, consumption expenditure and investment expenditure is 34.7%, 23.6% and 8%, respectively. The authors argued that Iran is a developing country with a high dependence on oil and poor management mechanism. Corruption causes public expenditures to be too large. The authors suggested that Iran should narrow down public spending to promote sustainable economic growth. Recently, İyidoğan and Turan (2017) [7] analyzed Turkey in the period 1998-2015. The authors showed a non-linear relationship between GDP growth and total public expenditure, consumption expenditure and investment expenditure. The optimal thresholds are 16.5%, 12.6 % and 3.9% of GDP respectively. The studies also pointed out that the current expenditures are over the optimum.

Onchari (2013) [8] aimed to investigate the effects of public expenditure on the economic growth of Kenya. The data was collected in an 11-year period from 2002 to 2012 and was analysed using OLS regression and descriptive analysis. The necessary conclusion of the research is that public expenditure as measured by the percentage change in public expenditure for capital formation has a strong positive impact on Kenya's development. From the result, Onchari proposed that Kenya's government should encourage private investments to boost the economy. The study also found that private investment positively correlates with economic growth. The remaining variables including population growth, net ODA, net exports have a negative influence on Kenya's economic growth.

Although many articles investigated the optimal government expenditure in developing countries, the findings are still in debate. In line with the previous studies (such as Barro, 1990 [2], among others), this present paper applies a quadratic regression model to estimate the optimal point, controlling 4 variables: labor force, domestic investment, high-tech exports, and urbanization. Other researchers may consider more variables, but these variables are representative for the development level of countries. They are important and significant in economic and statistical meaning, at least in this present paper.

2.2. Overview of studies on the factors affecting economic growth

From a historical perspective, factors that foster economic growth have always been one of the most discussed topics in economics. Upreti (2015) [9] indicated that a high volume of exports, plentiful natural resources, longer life expectancy, and higher investment rates have positive effects on the growth of GDP per capita in developing countries. Data used were cross sections for each year which were collected for the years 2010, 2005, 2000, and 1995 for 76 developing countries based on their GDP per capita level in 2010. The paper also shows that factors affecting developed countries' growth tend to be true for developing countries.

Chinnakum et al. (2013) [10] aimed to determine factors affecting economic output in developed countries. This paper used panel data of 22 countries from 1996 to 2008 to examine the causes of economic development. Based on the resulting sample selection model, the first finding is the variables influencing whether a country is a developed country. Particularly, a high GNI per capita, a high exports-to-imports ratio, a high degree of political and economic freedom will lead countries to be considered as developed countries. Secondly, based on the estimation of coefficients of the economic equation, the paper concluded that an increase in the money supply, the labor supply, tourism expenditure, and average life expectancy will lead to a rise in the economic output of a developed country.

Kira (2013) [11] showed the analysis of factors having impacts on the GDP of developing countries. A representative country is Tazania in which the Keynes model was adopted to be directly estimated from 1970 to 2011. The source of data was time series. The dependent variable is GDP, and the independent variables are investment, consumption, and balance of payments. In conclusion, the paper indicates that developing countries' GDP is mainly explained by consumption and exports. This means that developing countries need to stimulate investment to increase their development.

Machado et al. (2015) [12] analyzed the relationship between economic growth and economic variables. Results suggest that an undervalued exchange rate, high exports and high investment are negatively associated with growth. There were three steps to find the results: (1) identifying number of thresholds with the Likelihood-Ratio test; (2) identifying regimes independent variable; (3) estimation of OLS regression considering the independent variables and the different regimes. The conclusion is evident that emphasizes the importance of investment, the degree of political and economic freedom and trade openness to economic growth.

Ram (1986) [13] examined the contribution of government size to economic growth in seventy developed and underdeveloped countries where inputs include labor, capital and technology. The study is characterized by some typical features. First, the estimated model provided the overall effects of government size on economic growth by using cross-section and time-series data. Second, the paper enabled answers for two questions (a) whether the (externality) effects of government size is positive or not (b) whether input productivity is lower or higher in comparison to the non-government sector. The summary of Ram's result is that (i) the impact of government size on growth is positive in almost all cases (ii) the externality effects of government size is generally positive (iii) productivity in the government sector was higher compared with the private sector, at least during the 1960s.

In our research, based on Ram's theoretical model, the series of variables including public expenditure, labor, investment and technology are independent variables. The dependent variable is annual GDP growth rate. The data, methodology and results will be given in more detail in Section 3 and Section 4.

3. Methodology and data

This paper constructs a quadratic regression equation to show an inverted U-shape

relationship between government expenditure and economic growth. According to the theoretical model of Ram (1986) [13], government expenditure can alter private production where the inputs consist of labor, capital and technology. Taking all variables into account, this paper has an additional factor representing country urbanization which is an important aspect of the national development level. Thus, the regression equation is expressed as below:

$$gdp_{it} = \hat{\beta}_0 + \hat{\beta}_1 expense_{it} + \hat{\beta}_2 expense_{it}^{\ 2} + \hat{\beta}_3 labourg_{it} + \hat{\beta}_4 invest_{it} + \hat{\beta}_5 hightech_{it} + \hat{\beta}_6 urban_{it} + \alpha_i + \varepsilon_{it}$$

Where the variables are defined in Table 1. This paper uses panel data analysis including a fixed-effect model (FEM) and a random effect model (REM) to control individual characteristics (via country-specific intercept).

Data is downloaded from the World Bank website. To obtain a well-balanced data sheet, 300 observations of 30 countries over 10 years from 2004 to 2013 are conducted. Missing data is the main difficulty in having more observations.

Table 1. Variable definition

Variable	Definition	Expected sign of coefficient
gdp	Annual GDP growth rate (%)	
expense	Total public expenditure	+
expense^2	expense squared	-
labourg	Annual Growth rate of labor force (%)	+
invest	Annual growth rate of total domestic investment (%)	+
hightech	The proportion of high-tech products in total exports (%)	+
urban	Urban population growth (%)	-

In the model, the annual GDP growth rate *(gdp)* is a dependent variable. The remaining variables are explanatory variables:

Public expenditure

As mentioned in Section 1 and Section 2, there are many studies with a focus on the effects of public expenditure on economic growth. The first to mention is Keynes's renowned work, which explains the Great Depression and proposes new solutions. Briefly, he suggested that an increase in public expenditure could bring a positive effect on economic growth. However, many researchers believe that government expenditure has a positive relationship with economic growth only if it is below the optimal point. As public expenditure becomes too large, countries suffer from a tax burden, which eventually causes negative impacts on economic growth. The ideas are supported by theories which show a unique inverted U-shape relationship. This paper is also constructed with the aim to show the inverted U-shape relationship between government expenditure and economic growth. Therefore, the *expense* variable is expected to have a positive sign. Meanwhile, the *expense*^{2} variable is expected to have a negative sign.

Labor force

Labor is a major source of production and an indispensable part in economic activities. Enhancing human capital can lead to the effective application of technology, which in turn increases production efficiency. In developing countries, economic growth is greatly contributed to by the size of the labor force. Therefore, the *labor g* variable which measures the annual growth rate of the labor force (%) is predicted to have a positive relationship with economic growth. This is highly supported by neoclassical growth theory. The theory is that economic growth can be accomplished by three necessary driving forces: Labor, capital and technology.

Investment

The explanatory variable *invest* is measured by the annual growth rate of total domestic investment. Investment can generate

employment opportunities as it opens up construction work, expanding production size. Anderson (1990) [14] showed that investment is of great importance in a country's growth if it is used effectively to boost the output. The Solow Economic Growth model suggests that a sustained increase in capital investment leads to a rise in economic growth in the short term. Hence, the *invest* variable is predicted to have a positive sign.

Technology

Technological change allows the same amount of labor and capital to produce higher productivity, which means the production process is more efficient. The contribution of technology to a country's growth has been captured by persuasive studies. Solow (1956) [15] indicated technology is an exogenous variable in his growth model. Romer (1986) [16] showed that technical progress is the major driver for economic growth. In this paper, technology which is signed as *hightech* is measured by the proportion of high-tech products in total exports (%) and is expected to have positive effects on economic growth.

Urbanization

Urban which is defined as urban population growth (%) is likely to have a negative relationship with the economic growth rate. Potts (2012) [17] defined urbanization as "the demographic process whereby an increasing share of the national population lives within urban settlements". Urbanization impacts on growth through two channels. The first channel is the difference between rural and urban productivity. The second channel is the more rapid productivity change in cities. In early stages of development, a large number of people who live in rural areas move to cities to seek employment opportunities, which greatly affects growth. Therefore, Fay and Opal (2000) [18] found that more urbanisation is positively associated with high GDP per capita featured by a low economic growth rate (as suggested by the theory of economic growth convergence).

4. Results

Analysing the data, Table 2 shows the results corresponding to different regression equations. Hausman's test suggests that the FEM model (column 2) is more appropriate than the REM model (column 1). In addition, the problem of heteroskedasticity, cross correlation and autocorrelation are effectively corrected (by using Diskoll and Karray technique) to produce more accurate results shown in the final column. The key findings are summarized below:

Table 2. Results of quadratic regression equations

	gdp (REM)	gdp (FEM)	gdp (FEM*)
$expense$	0. 392*	0. 589+	0. 589**
	(2. 03)	(1. 8)	(3. 59)
$expense^2$	-0. 0101*	-0. 0152*	-0. 0152**
	(-2. 57)	(-2. 57)	(-3. 55)
$labourg$	0. 192	0. 128	0. 128*
	(1. 57)	(0. 87)	(2. 75)
$invest$	0. 194***	0. 234***	0. 234***
	(5. 43)	(4. 54)	(4. 31)
$hightech$	0. 0107	0. 0244	0. 0244
	(0. 56)	(0. 6)	(0. 9)
$urban$	-0. 014	-0. 361**	-0. 361**

_cons	(-0. 85) -2. 752	(-2. 99) 12. 46+	(-3. 58) 12. 46+
	(-1. 27)	(1. 88)	(1. 82)
N	300	300	300

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001
Statistic t values in the parentheses.
Source: Author.

The result interpretations are as follows:

Firstly, the regression coefficients corresponding to government expenditure (*expense* and $expense^2$) meet the expectation in terms of the sign (i. e. , $\hat{\beta}_1 > 0$ and $\hat{\beta}_2 < 0$) and are statistically significant, at 99%. This indicates that there is an optimal scale of public expenditure at 19.375% of GDP. This finding is quite similar to that of some previous studies on developing countries. For example, the optimal expenditure is 21% of GDP in Bahrain, 18% in Kuwait, 17% in Saudi Arabia and 22% in the United Arab Emirates [5]. The optimal level of public spending suggests that the economic growth rate would be higher for countries with spending levels close to optimal spending levels (see Table 3 for more details).

Secondly, the growth rate of the labor force is proportional to the GDP growth rate. For every 1% increase in the workforce, GDP increases by 0.128 percentage point at the confidence level of 95%. Akpan and Abang (2013) also show similar effects in the case of Nigeria.

Thirdly, the growth rate of investment is positively associated with the GDP growth rate. For every 1% increase in investment capital, GDP is likely to increase by 0.234 percentage points, at a 99.99% confidence level. The recent research by Asimakopoulos and Karavias (2015) also shows the positive correlation between these two factors.

Fourthly, the share of exported high-tech products does not have a statistically significant impact on GDP growth. This does not imply a less important role of technology in economic growth. But it suggests that the growth rate of developing countries is weakly associated with high-tech exports

Finally, urbanization is counter-productive. In other words, every 1% increase in the urban population makes the GDP decreased by 0.361 percentage points at a confidence level of 99%.

In conclusion, the paper once again emphasizes the importance of public expenditure in the development of the whole economy. In addition, the independent variables mostly meet sign expectations and the optimal public expenditure is 19.375% of GDP. Specifically, government expenditure, the growth rate of the labor force and the growth rate of investment have led to growth and development in developing countries. By contrast, exported high-tech products fail to have a positive correlation to the economic growth of developing countries. These findings could be a suggestion for policymakers to boost economic growth in developing countries. One of the examples is that governments should alter expenditure and consider optimal expenditure to reach the expected level of development.

Figure 2 shows the scatter plots of public expenditure and economic growth by country group; the black line in the middle corresponds to the optimal public expenditure of 19.375% of GDP as a result of the regression model:

In terms of the size of public expenditure, observations which belong to the lower-middle -income group are almost entirely under the horizontal line. It means that most of these observations are under the optimal level. The public expenditure size increases gradually along with the income level. More specifically, there are 76 out of 97 observations of the upper-middle income group located above the optimum. Meanwhile there is only one out of

58 observations in the lower-middle income group. The difference between the two groups may stem from the pressure of regulating the economy and ensuring social standards, leading to difficulty in controlling government size in upper-middle income countries. Indicators and standards for security, social security, welfare, etc. in the rich countries are higher than that in the poor countries. Hence, it seems to be a trade off between economic growth and social security in many upper-middle-income countries.

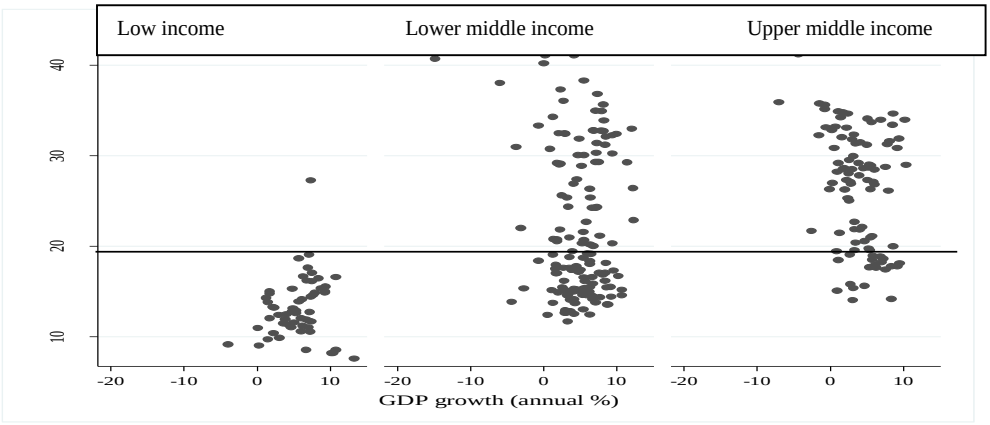

Figure 2. Public expenditures and economic growth by income group (2004-2013).
Source: Author.

Table 3. Public expenditure in developing countries, 2011-2014 (unit: % of GDP)

Country	**2011**		**2012**		**2013**		**2014**	
Madagascar	9.701	[L]	9.911	[L]	10.401	[L]	10.7	[L]
Malawi	18.229	[L]	17.277	[L]	18.907	[L]	20.47	[L]
Burkina Faso	12.415	[L]	14.537	[L]	13.89	[L]	14.63	[L]
Cambodia	11.051	[L]	10.585	[L]	11.691	[L]	12.4	[L]
Kyrgyz Republic	21.744	[L]	22.919	[L]	21.376	[LM]	21	[LM]
Uganda	15.577	[L]	11.94	[L]	11.511	[L]	12.18	[L]
Tanzania	16.557	[L]	17.618	[L]	18.72	[L]	17.6	[L]
Sierra leone	13.07	[L]	13.236	[L]	10.365	[L]	11.77	[L]
Nepal	15.898	[L]	15.933	[L]	14.594	[L]	15.44	[L]
Cote d'Ivoire	13.875	[LM]	15.2	[LM]	13.578	[LM]	13.16	[LM]
Bhutan	21.859	[LM]	20.436	[LM]	20.142	[LM]	18.17	[LM]
Georgia	24.346	[LM]	25.381	[LM]	24.381	[LM]	25.66	[LM]
Honduras	22.504	[LM]	23.499	[LM]	23.894	[LM]	24.54	[LM]
Indonesia	15.025	[LM]	15.613	[LM]	15.375	[LM]	15.91	[LM]
Moldova	32.817	[LM]	33.301	[LM]	32.263	[LM]	34.59	[LM]
Nicaragua	15.004	[LM]	15.365	[LM]	15.241	[LM]	15.55	[LM]
Pakistan	17.614	[LM]	18.799	[LM]	17.827	[LM]	18.01	[LM]

Paraguay	17.596	[LM]	21.244	[LM]	19.282	[LM]	19.23	[UM]
Philippines	14.129	[LM]	14.186	[LM]	13.793	[LM]	13.39	[LM]
Samoa	25.873	[LM]	24.83	[LM]	26.095	[LM]	28.39	[LM]
Solomon Islands	30.001	[LM]	29.243	[LM]	37.012	[LM]	34.83	[LM]
Sri lanka	16.166	[LM]	15.512	[LM]	14.668	[LM]	14.65	[LM]
Ukraine	38.272	[LM]	41.07	[LM]	40.199	[LM]	43.54	[LM]
West Bank and Gaza	8.421	[LM]	7.214	[LM]	7.56	[LM]	8.188	[LM]
Angola	28.637	[UM]	26.034	[UM]	30.874	[UM]	32.15	[UM]
Azerbaijan	18.478	[UM]	22.493	[UM]	21.097	[UM]	22.12	[UM]
Belarus	26.313	[UM]	28.521	[UM]	29.194	[UM]	28.39	[UM]
Brazil	29.205	[UM]	28.62	[UM]	28.518	[UM]	29.98	[UM]
Jamaica	34.784	[UM]	33.118	[UM]	30.825	[UM]	29.12	[UM]
Jordan	28.03	[UM]	29.525	[UM]	26.912	[UM]	28.27	[UM]
Kazakhstan	15.207	[UM]	15.796	[UM]	14.609	[UM]	15.31	[UM]
Colombia	24.191	[UM]	25.118	[UM]	28.158	[UM]	32.5	[UM]
Costa Rica	25.679	[UM]	26.368	[UM]	27.218	[UM]	26.81	[UM]
Malaysia	19.735	[UM]	20.98	[UM]	20.602	[UM]	19.68	[UM]
Mauritius	21.82	[UM]	20.394	[UM]	21.862	[UM]	21.49	[UM]
Romania	34.911	[UM]	33.191	[UM]	31.392	[UM]	31.84	[UM]
South Africa	32.32	[UM]	33.081	[UM]	34.658	[UM]	33.76	[UM]
Turkey	33.311	[UM]	33.592	[UM]	34.628	[UM]	34.96	[UM]
Dominica	24.259	[UM]	24.106	[UM]	25.662	[UM]	24.38	[UM]

Source: World Bank Data.

5. Conclusion

To explore optimal levels of public expenditure for developing countries, this paper has different approaches compared to previous studies. Firstly, to gain practical implications, the study analyzes developing countries featured by limited infrastructure and economic growth. Secondly, the research is continuously based on Ram's model (1986) to provide the estimation, adding new control variables including urban population growth rates and the proportion of exported high-tech products. Furthermore, the application of fixed-effects regression (FEM) also allows the author to control the individual characteristics that do not change over time in each country (through the intercept coefficients for each nation). As a result, it is possible to make an overall assessment of the net impact of some other factors on economic growth.

Based on descriptive statistics and regression estimates for developing countries in the period 2004-2013, this paper found that the optimal public expenditure scale is 19.375% of GDP. This result is quite similar to some previous studies. For example, Karras (1997) [19], in a sample of 20 European countries, realized that the optimal level of government spending was 16% of GDP; and Altunc and AydÕn (2013) [20] found the optimal threshold within the range of 11-25% of GDP. Besides, this paper also found a positive effect of investment and labor force on growth, whereas urbanization has a negative effect. Statistical

analysis illustrated that government size has been expanding over time along with the development level of countries. It seems like over-threshold public expenditure offers more opportunities for economic growth, although it is not a long-term solution to a thriving economy. As argued by many researchers, the inefficient monitoring of public expenditure leads to low growth rates.

It is also worth noting the factors affecting developing countries' economic growth in our model besides government expenditure. The growth rate of the labor force and the growth rate of domestic investment positively affect developing countries' development. Labor has always significantly contributed to economic growth and is always seen as a huge advantage in developing countries because of the large labor pool and low labor costs. However, the 21st century has been an era of technological advance which could replace a shortage of labor. Therefore, skilled labor has been required and governments in developing countries should focus on educating more skilled labor.

Increasing urban population negatively influences economic growth. This result implies that there is a large number of migrants moving from rural areas to urban areas in developing countries in general. The positive role of immigrants is indispensable. Specifically, out-of-urban labor has become a human resource in the diversified labor force in the cities. Moreover, those laborers potentially contribute to the reduction of pressure of labor in rural areas, generating income, and contributing to social stability. However, the problem is that the movement of rural labor has become too large, which is out of the city's management and supply. As a result, this causes social problems as well as a negative impact on economic growth.

Last but not least, a limitation of this study is that many observations have been discarded because of missing data. Someones may recommend a technique for missing data imputation to deal with this problem. Of course, this is in our agenda for future studies.

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References

[1] IMF, "Public expenditure reform: Making difficult choices", chapter 2, 2014.

[2] R.J. Barro, Government spending in a simple model of endogeneous growth, Journal of political economy 98 (5, Part 2) (1990) S103-S125.

[3] D.C. Mueller, Public choice: an introduction, In The encyclopedia of public choice, Springer, Boston, MA, 2004, pp. 32-48.

[4] P. Pevcin, Does optimal size of government spending exist? University of Ljubljana. 10 (2004) 101-135.

[5] H. Aly, M. Strazicich, "Is Government Size Optimal in the Gulf Countries of the Middle East? An empirical investigation", International Review of Applied Economics 4 (2000) 475-483.

[6] E. Abounoori, Y. Nademi, Government Size Threshold and Economic Growth in Iran (No. 259600001). EcoMod.

[7] P.V. İyidoğan, T. Turan, Government Size and Economic Growth in Turkey: A Threshold Regression Analysis, Prague Economic Papers 26 (2) (2017) 142-154.

[8] H.O. Onchari, The relationship between public expenditure and economic growth in Kenya, University of Nairobi, 2013.

[9] P. Upreti, Factors Affecting Economic Growth in Developing Countries, Major Themes in Economics, 2015.

[10] W. Chinnakum et al, Factors affecting economic output in developed countries: A copula approach to sample selection with panel data, International Journal of Approximate Reasoning, 2013.

[11] A.R. Kira, The Factors Affecting Gross Domestic Product (GDP) in Developing Countries: The Case of Tanzania, European Journal of Business and Management 5 (2013) 2222-1905.

[12] M. Machado et al, "Economic Development and Economic Variables: An analysis of Emergent Countries", Social Science Research Network, 2015.

[13] R. Ram, Government size and economic growth: A new framework and some evidence from cross-section and time-series data, The American Economic Review 76 (1) (1986) 191-203.

[14] D. Anderson, "Investment and Economic Growth", World Development, 1990, pp. 1057-1079.

[15] R.M. Solow, "A Contribution to the Theory of Economic Growth", The Quarterly Journal of Economics 70 (1956) 65-94.

[16] P. Romer, "Increasing Returns and Long-Run Growth", Journal of Political Economy 94 (1986) 1002-1037.

[17] D. Potts, "Challenging the Myths of Urban Dynamics in Sub-Saharan Africa: The Evidence from Nigeria". World Development, 2012, pp. 1382-1393.

[18] M. Fay, O. Charlotte, "Urbanization without growth: A not-so-uncommon phenomenon", Policy Research Working Paper, no. 2412: The World Bank, 2000.

[19] G. Karras, On the optimal government size in Europe: theory and empirical evidence, The Manchester School 65 (3) (1997) 280-294.

[20] O.F. Altunc, C. AydÕn, "The Relationship between Optimal Size of Government and Economic Growth: Empirical Evidence from Turkey, Romania and Bulgaria", Procedia-Social and Behavioral Sciences 92 (2013) 66-75.