

Investigation of the Relationship between Government Expenditure and Country's Economic Development in the Context of Sustainable Development

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Abstract—Arising problems of countries' public finances, social and demographic changes motivate scientific and policy debates on public spending size, structure and efficiency in order to meet the changing needs of society and business. The concept of sustainable development poses new challenges for scientists and policy-makers in the field of public finance. This paper focuses on the investigation of the relationship between government expenditure and country's economic development in the context of sustainable development. Empirical analysis focuses on the data of the European Union (except Croatia and Luxemburg) countries. The study covers 2003 – 2012 years, using annual cross-sectional data. Summarizing the research results, it can be stated that governments should pay more attention to the needs that ensure sustainable development in the long-run when formulating public expenditure policy, particularly in the field of environment protection.

Keywords—Economic development, economic growth, government expenditure, sustainable development.

I. INTRODUCTION

THE economic theory predicts that government can stimulate the economy using public finances and thus contribute to the country's economic development and increase of social welfare. However, arising problems of countries' public finances, social and demographic changes motivate scientific and policy debates on public spending size, structure and efficiency in order to meet the changing needs of society and business. In recent years, the concept of sustainable development has become particularly relevant; and it poses new challenges for scientists and policy-makers in the field of public finance. According to the concept of sustainable development, government cannot meet the needs of the present generation at the expense of future generations. One of the main objectives of public finance in the context of sustainable development concept is to maintain the sustainability of public finances and to ensure the growth of the country's economic development, providing social and environmental needs.

In recent years, a scientific literature has been paid a lot of attention on the impact of public spending on economic growth. Scientists have tried to identify the productive and unproductive public expenditure. However, summarizing the research results, it can be stated that only public investment could be considered as productive expenditure, but it could not

be unambiguous conclusions made about productivity of the other types of government expenditures in the context of economic growth. Higher economic growth ensures faster economic development of the country in the long run. Developed countries more easily absorb external economic shocks; better address challenges faced by business and society. In this context, the role of the government and public finance is very important. But it is not clear what the structure of public spending should be in order to ensure the growth of country's economic development. Therefore, the investigation of the relationship between the structure of public expenditure and the level of economic development is still relevant, taking into account the provisions of the sustainable development concept.

The aim of the paper: To assess relationship between government expenditure and country's economic development in the context of sustainable development. The research object: The relationship between government expenditure and country's economic development. The research methods: The systemic, logical and comparative analysis of scientific literature, the analysis of statistical data, descriptive statistics, hierarchical cluster analysis, correlation analysis, regression analysis.

II. IMPORTANCE OF INTERRELATION BETWEEN SUSTAINABLE DEVELOPMENT AND PUBLIC FINANCE

Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs [1]. Sustainable development includes three aspects: economic, environmental and social. According to [2], the main principles of sustainable development are: balancing different policy dimensions; long timeframes and intergenerational equity; environment preservation, limits to growth, and planetary boundaries; equal opportunities, access, and intra-generational equity; inclusion and participation; and governance for sustainable development. According to [3], sustainable development includes social and economic systems, which should support these aims: increase in the real income, the improvement in the level of education, population's health and the general quality of life. However [2] maintain that the main principle of sustainable development is balancing different policy dimensions because it comprises many aspects of sustainable development. Sustainable development is generally understood as a development that aims to balance different policy dimensions - mainly economic prosperity,

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environmental protection, and social justice [2]. In this context, governments' participation in the activities of sustainable development is crucial, because governments are able to involve sustainable development principles into different policies and finance sustainable development activities, ensuring growth of countries' economic development in the long run. Private sector cannot implement principles of sustainable development without participation of the government because implementation of these principles needs policy framework and financial resources.

According to [1], an economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances which damage industrial production. Therefore, financing sustainable development and keeping sustainable public finance at the same time is complicated problem for policy makers. The implementation of sustainable development concept is very complicated in practice, because it is very difficult to combine principles of sustainable development concept with goals of those who can implement this concept, because usually activities associated with sustainable development do not generate profit in the short run. For example, [3] analyzed EU countries public spending on sustainable development sphere (study covers 2005 – 2012 years). Reference [3] made

conclusion that general government spending in support of sustainable development was not reduced and grew on average more rapidly than the total public expenditure even in the time of crisis; and it caused the growth of general government deficit and debt. This contravenes the principle that government should ensure sustainable level of the government debt and do not create imbalances; and it shows difficulty to implement the concept in practice.

III. THEORETICAL AND EMPIRICAL ASPECTS OF THE RELATIONSHIP BETWEEN GOVERNMENT EXPENDITURE AND ECONOMIC DEVELOPMENT

Governments may promote economic growth and development through productive expenditure. According to [4], government's activities can directly and indirectly increase the total production volume through interaction with a private sector. The scientific literature maintains that changes within public expenditure and taxes affect economic development.

In recent years, a lot of attention has been paid on investigation of link between the relationship between government expenditure and country's economic growth or development. The review of recent empirical research results is presented in Table I.

TABLE I
EMPIRICAL RESEARCH RESULTS ON THE RELATIONSHIP BETWEEN GOVERNMENT EXPENDITURE AND ECONOMIC DEVELOPMENT

Authors	Research sample	Research method	The main conclusions
[5]	23 OECD countries, 1970 – 2006	Panel data technique of pooled mean group (PMG) estimation	There is structural positive correlation between public spending and per-capita GDP which is consistent with the so-called Wagner's law
[6]	7 transition economies of the South Eastern Europe, 1995 – 2005	OLS and GLS techniques	Government spending on capital formation has positive and significant effect on economic growth
[7]	14 developing countries, 1970 – 2005	OLS and dynamic GMM techniques for panel data	Public expenditures in productive and "core" sectors, which consist of a combination of current and capital spending on infrastructure, health, education, and other economic sectors that are critical for development, can have a significant joint impact on growth (GDP per capita growth).
[8]	Nigeria, 1970 – 2008	OLS technique	There is a positive relationship between GDP and recurrent and capital expenditure
[9]	Nigeria, 1970 – 2009	VECM technique	Increased government activity and the corresponding increase in government expenditure is an inevitable result of economic growth. This indicates that changes in national income can cause changes in government expenditure and government size
[10]	10 Central and East European countries, 2002 – 2012	OLS technique	GDP/capita is positively correlated with public order and safety expenditures as well as with economic affairs, whereas national defense and general public services are negatively correlated
[11]	156 countries, 1980 – 2010	GMM estimator for linear dynamic panel data	Government size as a percentage of GDP has a quadratic (inverted U-shaped) effect on the growth rate of the Human Development Index (HDI). This effect is especially pronounced in developed and high income countries. Composition of public expenditure affects development, with the share of five subcomponents exhibiting non-linear relationships with HDI growth

Summarizing the research results it can be stated that it is still unclear what the impact of different types of government expenditure on economic development is. Also it is unclear how many governments spend on activities of sustainable development; and what differences between high and lower development countries are. Further research is needed in order to evaluate these issues.

IV. RESEARCH METHODOLOGY

Empirical analysis focuses on the data of the European Union (EU) (except Croatia and Luxemburg) countries. The

study covers 2003 – 2012 years. The cross-sectional data are used. Arithmetic average is used for calculation of averages. All indicators are collected from [12]. Description of all indicators used in this research is presented in Table II.

This study focuses on the relationship between government expenditure and country's economic development. Following statistical methods are used: hierarchical cluster analysis, descriptive statistics, correlation analysis (Spearman's rho correlation), and regression analysis. Microsoft Excel and IBM SPSS Statistics 17.0 software packages are used.

TABLE II
DESCRIPTION OF INDICATORS

Indicator	Description
Economic development	GDP per capita in Purchasing Power Standards (PPS) at current prices (GDP per capita (in PPS))
Government size	Annual total general government expenditure divided by GDP (Government expenditure, % GDP)
Government investment size	Annual total general government investment (gross fixed capital formation) divided by annual total general government expenditure (Government investment, %) (author's calculations)
Government expenditure	General government expenditure by function according to COFOG classification. Expenditure on: general public services; defense; public order and safety; economic affairs; environment protection; housing and community amenities; health; recreation, culture and religion; education. Measured as a share of annual total general government expenditure (author's calculations)

Stages of Empirical Analysis:

Stage 1. Calculation of indicators. The indicators of government investment size and government expenditure are calculated. Then averages of all countries' indicators are calculated using arithmetic average.

Stage 2. Classification of the EU countries using cluster analysis: grouping variable – GDP per capita (in PPS). Analysis of descriptive statistics is performed in clusters and all countries' sample.

Stage 3. Investigation of the relationship between government expenditure and country's economic development is performed. Analysis of Spearman's correlations between indicators is performed in clusters and all countries' sample. Analysis of regression results (dependent variable – GDP per capita (in PPS)) is performed in all countries' sample.

V. EMPIRICAL RESULTS

The descriptive statistics of the data (see Table III) shows that there are large differences between the EU countries economic development and other indicators. The high dispersion of the data, especially of the economic development

and government size, shows the need to classify countries in smaller groups.

TABLE III
DESCRIPTIVE STATISTICS OF THE EU COUNTRIES' DATA

Indicator	N	MIN	MAX	Mean
GDP per capita (in PPS)	26	9740.0	32300.0	21761.5
Government expenditure, % GDP	26	37.1	54.9	45.4
Government investment, %	23	2.2	14.0	7.5
General public services	26	8.3	25.3	13.9
Defense	26	1.1	5.8	3.1
Public order and safety	26	2.0	7.2	4.3
Economic affairs	26	5.8	18.2	10.9
Environment protection	26	0.6	3.6	1.7
Housing and community amenities	26	0.6	5.9	2.0
Health	26	7.2	17.0	13.6
Recreation, culture and religion	26	1.1	5.5	2.7
Education	26	8.2	17.1	12.2
Social protection	26	24.4	44.2	35.6

The cluster analysis was used in order to better assess the relationship between government expenditure and country's economic development. Two clusters were obtained using hierarchical cluster analysis (see Table IV). The first cluster is characterized as high economic development cluster where GDP per capita (in PPS) ratio is significantly higher than in the case of the second cluster. The second cluster is described as lower economic development cluster.

The cluster analysis shows that government sector is larger in the case of the first cluster, but size of government investment (share of total government expenditure) is significantly lower than that in the case of the second cluster. High economic development countries spend larger share of their total expenditure on social protection, health, but they spend less on economic affairs, public order and safety.

TABLE IV
DESCRIPTIVE STATISTICS OF THE CLUSTERS

Cluster	1 st cluster				2 nd cluster			
	N	MIN	MAX	Mean	N	MIN	MAX	Mean
Countries	Finland, United Kingdom, Belgium, Germany, Denmark, Sweden, Austria, Netherlands, Ireland, Spain, Italy, France				Czech Republic, Portugal, Malta, Greece, Slovenia, Cyprus, Bulgaria, Romania, Estonia, Hungary, Slovakia, Latvia, Poland, Lithuania			
Indicator	N	MIN	MAX	Mean	N	MIN	MAX	Mean
GDP per capita (in PPS)	12	23970.0	32300.0	28092.5	14	9740.0	22290.0	16335.0
Government expenditure, % GDP	12	41.8	54.9	49.1	14	37.1	50.1	42.3
Government investment, %	10	2.2	8.7	5.2	13	5.8	14.0	9.3
General public services	12	9.8	17.7	13.1	14	8.3	25.3	14.6
Defense	12	1.1	5.4	2.7	14	1.8	5.8	3.5
Public order and safety	12	2.0	5.5	3.5	14	3.4	7.2	4.9
Economic affairs	12	5.8	16.2	9.6	14	8.5	18.2	12.1
Environment protection	12	0.6	3.6	1.6	14	0.7	3.6	1.8
Housing and community amenities	12	0.7	3.6	1.7	14	0.6	5.9	2.3
Health	12	13.1	17.0	14.8	14	7.2	16.9	12.6
Recreation, culture and religion	12	1.7	3.7	2.4	14	1.1	5.5	2.9
Education	12	9.1	13.6	11.5	14	8.2	17.1	12.7
Social protection	12	32.4	44.2	38.9	14	24.4	37.9	32.7

The spearman's correlation analysis was performed in order to better assess relationship between government expenditure and country's economic development in the case of all sample and clusters (see Table V). Results show that there is negative relationship between economic development and these government expenditures: government investment,

expenditure on public order and safety, economic affairs, defense. Positive relationship is found between economic development and these government expenditures: expenditure on social protection and health. Results show that higher countries' economic development is associated with larger government size.

TABLE V
RESULTS OF SPEARMAN'S CORRELATIONS BETWEEN ECONOMIC DEVELOPMENT AND GOVERNMENT EXPENDITURE

	Government expenditure, % GDP	Government investment, %	General public services	Defense	Public order and safety	Economic affairs	Environment protection	Housing and community amenities	Health	Recreation, culture and religion	Education	Social protection
All sample												
Coeff.	0.650**	-0.735**	0.019	-0.398*	-0.690**	-0.427*	-0.206	-0.291	0.495*	-0.283	-0.098	0.543**
Sig.	0.000	0.000	0.927	0.044	0.000	0.030	0.312	0.149	0.010	0.161	0.633	0.004
N	26	23	26	26	26	26	26	26	26	26	26	26
1 st cluster												
Coeff.	0.014	-0.188	-0.028	-0.399	-0.308	0.287	0.000	-0.245	0.378	-0.021	0.308	-0.175
Sig.	0.966	0.603	0.931	0.199	0.331	0.366	1.000	0.443	0.226	0.948	0.331	0.587
N	12	10	12	12	12	12	12	12	12	12	12	12
2 nd cluster												
Coeff.	0.613*	-0.643*	0.459	0.051	-0.591*	-0.596*	-0.213	-0.341	0.240	-0.051	0.077	0.002
Sig.	0.020	0.018	0.098	0.864	0.026	0.025	0.464	0.233	0.409	0.864	0.794	0.994
N	14	13	14	14	14	14	14	14	14	14	14	14

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Results of the first cluster's correlation analysis show that there is no any link between economic development and government expenditure in the case of high economic development's countries. Results of the second cluster's correlation analysis show that the higher economic development has positive relationship with the size of government. There is negative link between economic development and these government expenditures: expenditure on public order and safety, economic affairs and government investment in the case of lower economic development's countries.

Regression analysis was performed only in the case of all countries' sample (see Table VI).

TABLE VI
RESULTS OF REGRESSION ANALYSIS

Regression	(1)		(2)	
	B	Beta	B	Beta
Constant	33571.69 (0.000)		38040.59	
Government investment, %	-1655.70 (0.000)	-0.763	-1097.824 (0.009)	-0.506
Public order and safety			-1999.089 (0.039)	-0.385
p (ANOVA)	0.000		0.000	
R Square	0.581		0.664	
Adjusted R Square	0.562		0.630	
Std Error of the Estimate	4535.528		4165.956	
Durbin-Watson	1.68		1.68	

Notes: Dependent variable: GDP per capita (in PPS).

Stepwise method (criteria: Probability-of-F-to-enter $\leq 0,050$, Probability-of-F-to-remove $\geq 0,100$)

Results show that the major difference between high and lower development countries is government investment share

in total government expenditure. This phenomenon may be explained by the fact that infrastructure is lower developed in the lower economic development countries; therefore governments allocate more funds to improve infrastructure in these countries. But, on the other hand, non-existence of private – public partnership, high level of bureaucracy, corruption or bad quality of governance may be the reasons of high level of government investment. This view can be supported with findings of [13], [14].

VI. CONCLUSION

Summarizing the research results it can be concluded that the implementation of sustainable development concept is very complicated in practice, first of all, due to limited financial resources. Therefore it should be more attention paid to the private – public partnership financing sustainable development activities, because profits from these activities usually are generated only in the long run.

The empirical results show that high economic development countries have high government expenditure to GDP ratio, but the share of public sector investment is relatively small in the public expenditure structure. Share of public expenditure on public order and safety, and economy in the public expenditure structure is smaller, but share of total expenditure on health and social protection is larger compared with lower economic development countries.

According to the research results and the concept of sustainable development, it can be concluded that governments should pay more attention to the needs which ensure sustainable development in the long term. Currently, the governments spend a relatively small share of their

financial resources on environmental protection, but this area is identified as one of the most important in the concept of sustainable development. The major share of public spending is expenditures on social protection and health, but the problem of spending efficiency is still relevant, especially taking into account demographic change and public finance problems.

REFERENCES

- [1] J. M. Harris, "Basic principles of sustainable development," Global Development and Environment Institute, Working Paper no. 00-04, 2000.
- [2] U. Pisano, A. Martinuzzi, and B. Bruckner, "The financial sector and sustainable development: logics, principles and actors," European Sustainable Development Network (ESDN), Quarterly Report no. 27, December 2012.
- [3] T. Uryszek, "Public finance crisis and sustainable development financing – evidence from EU economies," *Copernican Journal of Finance & Accounting*, vol. 3, no. 1, pp. 161-173, 2014.
- [4] L. Sineviciene, and A. Vasiliauskaite, "Fiscal policy interaction with private investment: the case of the Baltic States," *Inzinerine Ekonomika-Engineering Economics*, vol. 23, no. 3, pp. 233-241, 2012.
- [5] S. Lamartina, and A. Zaghini, "Increasing public expenditures: Wagner's law in OECD countries," CFS Working Paper, no. 2008/13, 2008.
- [6] C. Alexiou, "Government spending and economic growth: econometric evidence from the South Eastern Europe," *Journal of Economic and Social Research*, vol. 11, no. 1, pp. 1-16, 2009.
- [7] N. Bayraktar, and B. Moreno-Dodson, "How can public spending help you grow? An empirical analysis for developing countries," Policy Research Working Paper 5367, The World Bank, July 2010.
- [8] M. Taiwo, and T. Abayomi, "Government expenditure and economic development: empirical evidence from Nigeria," *European Journal of Business and Management*, vol. 3, no.9, pp. 18-28, 2011.
- [9] M. A. Oyinlola, and O. Akinnibosun, "Public expenditure and economic growth nexus: Further evidence from Nigeria," *Journal of Economics and International Finance*, vol. 5, no. 4, pp. 146-154, July 2013.
- [10] M. S. Dincă, and G. Dincă, "The impact of government expenditures upon economic growth in post-communist countries," *Scientific Annals of the „Alexandru Ioan Cuza” University of Iași Economic Sciences*, vol. 60, no. 1, pp. 83-92, 2013.
- [11] S. Martins, and F. J. Veiga, "Government size, composition of public expenditure, and economic development," *International Tax and Public Finance*, vol. 21, no. 4, pp 578-597, August 2014.
- [12] European Commission, Eurostat database, 2014.
- [13] K. Blackburn, N. Bose, and M. E. Haque, "public expenditures, bureaucratic corruption and economic development," *The Manchester School*, vol. 79, no. 3, pp. 405-428, June 2011.
- [14] A. S. Rajkumar, and V. Swaroop, "Public spending and outcomes: Does governance matter?," *Journal of Development Economics*, vol. 86, pp. 96-111, 2008.