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The Effect of Government Expenditures on the Economic and Institutional Dimension of Governance in European Countries

Renata Halásková

University of Ostrava, Faculty of Education, Department of Technical and Vocational Education, Czechia

Martina Halásková

VSB -Technical University of Ostrava, Faculty of Economics, Department of Public Economics, Czechia

Marek Pomp

VSB -Technical University of Ostrava, Faculty of Economics, Department of Mathematical Methods in Economics, Czechia

Abstract

The aim of the study is to examine the effect of government expenditures on institutional and economic dimensions of governance from the standpoint of selected indicators. We evaluate the effect of government expenditures on selected governance indicators (government effectiveness, regulatory quality and the control of corruption) according to two dimensions (institutional and economic dimension of governance). The research covers the period 2002-2021, applying a panel data analysis and the fixed effects method on the sample of 29 European countries. For the purposes of further examination, the European countries are divided into two groups (by GDP per capita in PPS). The results confirmed the effect of differing categories of government expenditures on the evaluated indicators of governance between European countries with higher and lower economic levels. European countries with a higher economic level manifested the strongest positive effect of government expenditures on secondary education and expenditures on police services in relation to the economic dimension of governance (government effectiveness and regulatory quality). The results of countries with a lower economic level show that the control of corruption is affected, both positively and negatively, by government expenditures on education. Government expenditures on pre-primary and primary education had the largest impact in the economic dimension of governance in relation to the reduction of government effectiveness and government expenditures on sporting and recreational services in terms of the reduction of regulatory quality. The reached findings can be beneficial to creators of public policies at all levels of public administration in the creation of concepts and strategic goals.

Keywords

Governance, Government expenditures, Economic dimension of governance, Institutional dimension of governance, Panel data analysis

JEL Classification

C23, H50, H75, H76

Introduction

Government is an organization established within a society and given the authority to provide security and welfare to its members, and in some instances to protect their liberties and promote equality of opportunity. Governance is the process by which people who work within government use the powers and authority granted to them to accomplish those goals (Burgman, 2015; Yu, 2018; Ogbeide et al., 2021). Government" and governance are interchangeably used, both denoting the exercise of authority in an organization, institution or state. Government is the name given to the entity exercising that authority. Authority can most simply define as legitimate power (Correia et al, 2020). Government represents the entirety of executive and legislative authority, judiciary and administrative agencies that run the country. Governance is actually directing and administering the affairs of the nation (Nicolaidis and Shaffer, 2005; Charbit and Michalun, 2009). In the European as well as global dimension,

Corresponding author:
Renata Halásková, University of Ostrava, Faculty of Education, Fráni Šrámka 3, 709 00 Ostrava
Email: renata.halaskova@osu.cz

the process of governance pertains to a host of countries and their economies. "*Governance includes the process by which governments are selected, monitored and replaced and the capacity of the government to effectively formulate and implement sound policies"* (World Bank, 2023).

Studying governance is important because of the role governance plays as a key determinant for growth, development, and poverty alleviation (Kauffmann et al., 2002). *The proper function of governance in terms of political, economic and administrative can* create sound development of public policies (Yu, 2018). According to the World Bank, governance comprises six dimensions (voice and accountability, political stability and the absence of violence, government effectiveness, regulatory quality, rule of law, and the control of corruption). While some governance dimensions focus on public administration, others reflect broader institutional context (Van Dooren, 2018; World Bank, 2023). Modern economies regard good governance of the public financial system as a significant factor for economic and human development (Albassam, 2020). Good governance is also a pre-condition for the assessment and management of public administration and increasing of the quality of public services (European Commission, 2022). In this connection, Noja et al. (2019, p. 1) argue that "*good governance promotes the fundamental grounds of participation and democracy in contemporary public administration, whilst institution building and the (in)effectiveness of public administration is linked to economic growth.*"

The areas currently attracting considerable interest are the measurement of the quality of services, the improvement of the living standards and the processes of governance, as well as having a transparent public administration, considering an essential condition for an effective form of governments and of the public sector **(**Noja et al., 2019; Miljenovic et al., 2020; Bonasia et al., 2022). Effective governance ensures an appropriate allocation of financial resources, and government effectiveness is then a result of a balanced budget, rational expenditures, and an elimination of wasting and duplicity (Montes et al., 2019; Amir and Gokmenoglu, 2020). In this context, by use of public expenditures, governments of individual countries are able to impact on the welfare of their citizens through the direct provision of goods and services and regulation of the economy. However, poor management of public expenditures may have uncertain impact on the economy of the individual countries, which is why the management of public expenditures can be regarded substantial and key (Bogere and Makaaru, 2016, p. 2). Public expenditure governance, should not be a one-off undertaking, but rather a continuous process. This is mainly because with time, priorities of government through public expenditure change, actors change, context changes, new processes are introduced, laws and regulations become obsolete (Bogere and Makaaru, 2016, p. 18).

Measuring governance helps in tracking progress and provides evidence for policy making i.e. sectors, governments or organisations (Bogere and Makaaru, 2016; Amir and Gokmenoglu, 2020). Then, regulatory quality is an important element of governance (Karkatsoulis et al., 2019). According to Kaufmann, Kraay and Zoido-Lobaton (2000) many of the governance indicators provide information on the broader concept of governance, their measuring and can be a useful way for resource allocation and utilisation. By contrast, Bogere and Makaaru (2016, p. 5) stat that "*while econometric models have shown strong effects in cross-country analyses, the indicators in and of themselves do not say much about the causes of institutional failures or how these failures can be corrected*."

Some researches focus on comprehensive assessment of governance indicators (WGI) in terms of composite indices, e.g. European Quality of Government Index. This index measures perceptions and experiences with public sector corruption, along with the extent to which citizens believe various public sector services are impartially allocated and of good quality (Charron et al., 2022). Research conducted so far addressed aggregate indicators of governance and general government expenditures in relation to reforms of the public sector, government, economic growth or public debt (Cooray, 2009; Montes et al., 2019; Chu et al., 2020; Lazar et al., 2020; Nguyen and Luong, 2021; Feyisa et al., 2022). Other research only focuses on individual indicators of governance a pay closer attention to the impact of government expenditures on government stability and corruption in broader context (Wu, et al., 2017; Essener and Ipek, 2018; Chen and Aklikokou, 2021), examined the relationship of government expenditures and corruption (Delavallade, 2006; Guerrero and Castaneda, 2021; Nguyen and Bui, 2022) or examined government effectiveness from various angles (Arora and Chong, 2018; Amir and Gokmenoglu, 2020; Lopes et al., 2022).

By contrast, not so much attention is paid to the assessment of governance indicators according to the individual dimensions (economic, institutional, political). The authors' motivation is to partially fill the gap in research and evaluate the impact of government expenditures on the three selected indicators of governance (control of corruption, government effectiveness and regulatory quality). The selected indicators of WGI reflect key areas of governance, management of public administration and quality of public services according to two dimensions of governance (economic and institutional).

The aim of the study is to examine the effect of government expenditures by function with an emphasis on selected indicators of governance from an economic and institutional vantage point in European countries by use of panel data analysis. Selected worldwide governance indicators (WGI) - control of corruption represents the institutional dimension of governance and government effectiveness, and regulatory quality represents the economic dimension of governance, in European countries in the period 2002-2021. For the purposes of further examination, the European countries have been divided into two groups (by GDP per capita in PPS). This viewpoint has enabled us

to not only evaluate the effect of government expenditures with an emphasis on the economic and institutional dimension of governance for the evaluated countries but also to perform a comparison between the two groups of European countries (with higher and lower economic levels than the EU average).

Literature Review

The evaluation of governance with an emphasis on economic, political or institutional dimensions in international as well as European contexts is a topical issue (European Commission, 2022). Also, the trends in and the structure of general government expenditures, good governance and economic growth and their mutual relations and effects are widely discussed topics of earlier as well as more recent research (Cooray, 2009; Esener and Ipek, 2018; Chu et al., 2020; Feyisa et al. 2022). The authors agree that political, economic and institutional dimensions of governance, including total indices of good governance, have an effect on economic growth and that it is both size and quality of governance that is essential for economic growth.

Other authors have evaluated the relations between governance (using WGI indicators) and public expenditures. Bogere and Makaaru (2016, p. 3) define public expenditure governance as "*the manner in which decisions over public expenditure are made and implemented including the interaction among key actor*s". According to Bogere and Makaaru (2016, p. 5) public expenditure governance is evaluated from various views. 1) „*The assessment of public expenditure governance helps understand the manner in which public expenditure is governed in terms of the actors and how they interact. 2) Focusing on the budget processes helps in the identification of points of weakness along the public expenditure chain that require strengthening. 3) Public expenditure governance also it provides a scale for gauging and tracking changes and how changes in public expenditure governance impact on the outcomes of public expenditure".*

Some research (OECD, 2008; Merickova and Stejskal, 2014; Radulescu et al., 2015; Karkatsoulis et al., 2019; Del Monte and Pennacchio, 2020 or Nguyen and Bui, 2022) addressed the evaluation of the impact of public expenditures in the context of selected areas of public policies. Shin et al. (2020) evaluated the efficiency of public expenditures in OECD countries and Korea in selected sectors of public policies (healthcare, social care, social capital). Their findings show the existence of differing trends in public expenditures in OECD countries. Bonasia et al. (2022, p. 1) evaluated *„the long-run relationship between environmental protection expenditure and happiness in European countries and recommend governments to include environmental expenditure among possible instruments to improve domestic well-being".*

The topics addressed in a broader context are the links between the selected indicators of governance, government expenditures and other economic matters (economic growth, economic performance, national income, public debt, systems of public services). Ramesh and Vinayagathasan (2023) examined how corruption, the rule of law, accountability, and government expenditure affect government effectiveness. These authors have found the only significant positive relationship between the control of corruption and government effectiveness both in the long run and in the short run. Lazar et al. (2020) investigated that the indicator of rule of law governance had the strongest influence on taxes net of public services, both in terms of economic effect and of countries coverage. By contrast, the indicators control of corruption and regulatory quality were found significant only for lower-middle income countries and low-income countries respectively. Cuadrado-Ballesteros and Bisogno (2021) emphasise that countries that have reformed the public sector have higher management quality, higher government effectiveness and the quality of regulation, and also a higher level of the rule of law and corruption control. In relation to quality and reform in the public sector study by OECD (2008), he emphasises that a regulatory reform is not a one-off effort but a dynamic, long-term, multi-disciplinary process. „*The goal of regulatory reform is to improve national economies and enhance their ability to adapt to social, economic and technological change"* (OECD, 2008, p. 1).

Other authors Radulescu et al. (2015) examined mutual relationships between public expenditures by functions with real GDP growth and a wide range of factors, from GDP, inflation, demographic evolution in Central and Eastern European countries. Prokop et al. (2021) significantly contribute to the ongoing discussion about the significance of public financial subsidies from both national and European funds and the effects of cooperation R&D and innovation performance in Central and Eastern Europe. Linhartová (2021) verified that in EU-28 member countries public expenditure in areas producing services developing human capital really contributes to its development. Barra et al. (2019) examined the link between economic performance and public expenditures checking the quality of institutions (using WGI indicators). In the short-term perspective, a positive effect of public expenditures on national income with a lower extent for democratic countries has been found. In contrast, in the long-term perspective, a slow convergence between public expenditures and national production in non-democratic countries with low income exists. Kaya and Kaya (2020) tackle the connection between help from abroad and government expenditures. Their findings demonstrate that government expenditures show a more positive response to an increase in help from abroad in a politically stable situation, when corruption is limited, and if a government has a better regulatory authority when executing public policies. Nguyen and Luong (2021) argue that institutional quality contributes to an effect on public debt, when weak governance (in relation to government effectiveness, regulatory quality or rule of law) leads to an increased accumulation of public debt, associated with an inadequate control of corruption.

Research conducted more recently (e.g. Berkovich, 2016; Tajaddini and Gholipour 2018; Chen and Aklikokou,

2021; Lendvorský et al., 2021; Nguyen and Bui, 2022) analysed mutual relations of public expenditures and classified the impact of public expenditures on corruption, including the effect of other factors, such as economic growth, public debt, quality of public services or total factor productivity. Nguyen and Bui (2022) state that government expenditure and corruption control have a negative impact on economic growth in developing economies. Berkovich (2016) states that countries with an increased rate of government corruption show a higher ratio of public expenditures on education associated with less effective education results, i.e. that policies focus on the support of the quality of public services leads to its deterioration. Wu et al. (2017) examined the proportions selected expenditures (of administrative service investment development expenditures, and safeguard governance expenditures) on total factor productivity which have a single corruption threshold. The authors arrived at the conclusion that an increased corruption rate might lead to a decrease in total factor productivity. Other authors (Del Monte and Pennacchio, 2020) found that corruption increased public debt and that this effect is independent of the size of government expenditure of OECD countries.

In this study, three research questions are verified in two groups of European countries (with economic levels above and below the EU average). In order to examine the impact of the selected categories of government expenditures, representative areas affecting selected WGI indicators are taken into account in a broader context. Also, source for the research questions are findings and conclusions from selected empirical studies on this topic.

RQ1: Do government expenditures on education and government expenditures on general services primarily affect corruption control?

RQ2: Do government expenditures on education and government expenditures on public consumption services of the state affect the economic dimension of governance (in the case of government effectiveness)?

RQ3: Do government expenditures in services sectors (education, recreation and sport, transport, general services) primarily affect the economic dimension of governance (in the case of regulatory quality)?

Research Methodology

Data

For the analysis, we use data from two available databases (Eurostat and World Bank) in the years 2002-2021. The data used from the Eurostat database include Government finance statistics – Annual government finance statistics – General government expenditures by function COFOG (Eurostat, 2023). The classification COFOG (the Classification of the Functions of Government) has three levels of detail: Divisions, Groups, and Classes. The divisions could be seen as broad objectives of government, while the groups and classes detail the means by which these broad objectives are achieved. According to the COFOG classification, selected categories of general government expenditures (ten groups) are selected, which correspond to the breakdown according to the COFOG second level (Eurostat, 2019; Eurostat, 2023). The original intention was to work with a larger number of indicators (government expenditure), but some categories of government expenditure were constant in a number of countries throughout the monitored period, so they were excluded from our analysis.

Selected indicators Worldwide Governance Indicators (WGI) were then chosen from the World Bank database. The Worldwide Governance Indicators project reports aggregate and individual governance indicators for over 200 countries and territories over the period 1996–2021, for six dimensions of governance (World Bank, 2023). In our analysis, we monitor only three sub-indicators of the WGI (Control of corruption, Government effectiveness, Regulatory quality), (World Bank, 2023). The chosen governance indicators: Government Effectiveness (GE) and Regulatory quality (RQ) represent the economic dimension of governance (the capacity of the government to effectively formulate and implement sound policies). Control of Corruption (CC) represents institutional dimensions of governance (the respect of citizens and the state for the institutions that govern economic and social interactions among them (Kaufmann and Kraay, 2008).

The datasets (of World Bank and from the database Eurostat) has been acquired by the R packages WDI (Arel-Bundock, 2018) and Eurostat (Lahti et al., 2017). Based on the available data (for the set of 29 European countries), a 20-year period was chosen for the purposes of the analysis, which is adequately long and also reflects the development of public expenditure and dynamic changes in the individual countries, including the selected Worldwide Governance Indicators. The data used is documented in more detail in Table 1.

The selected set comprises 29 European countries (27 EU countries, Iceland, and Norway). For the purposes of a more detailed examination, the European countries have been divided and evaluated (with respect to their economic levels according to GDP per capita (in PPS EU27 2020) into:

1) *European countries with a lower economic level than the EU average*: Bulgaria, Czech Republic, Estonia, Greece, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Malta, Hungary, Poland, Portugal, Romania, Slovenia, Slovakia;

2) *European countries with a higher economic level than the EU average*: Austria, Belgium, Denmark, Germany, Ireland, France, Luxembourg, Netherlands, Finland, Sweden, Iceland, Norway.

Table 1. Used Indicators.

Indicators (variables)		Abbreviation	Unit	Source
Independent variables	General government expenditures on executive and legislative organs, financial and fiscal affairs, external affairs	GEELF	Percentage of GDP	Eurostat
	General government expenditures on general services	GEGS	Percentage of GDP	Eurostat
	General government expenditures on police services	GEPS	Percentage of GDP	Eurostat
	General government expenditures on transport	GETS	Percentage of GDP	Eurostat
	General government expenditures on housing development	GEHD	Percentage of GDP	Eurostat
	General government expenditures on recreational and sporting services	GERSS	Percentage of GDP	Eurostat
	General government expenditures on cultural services	GECS	Percentage of GDP	Eurostat
	General government expenditures on pre-primary and primary education	GEPE	Percentage of GDP	Eurostat
	General government expenditures on secondary education	GESE	Percentage of GDP	Eurostat
	General government expenditures on tertiary education	GETE	Percentage of GDP	Eurostat
Dependent variables	Control of corruption	CC	Index (-2.5 – 2.5)	World Bank
	Government effectiveness	GE	Index (-2.5 – 2.5)	World Bank
	Regulatory quality	RQ	Index (-2.5 – 2.5)	World Bank

Source: Authors according to Eurostat (2023); World Bank (2023)

Correlations between the selected variables (government expenditures by selected function and selected indicators of governance – WGI) are provided in Tables 2a and 2b.

Table 2a. Intercorrelations of Variables.

	GECS	GEGS	GEHD	GEPS	GERSS	GEPE
GEELF	-0.06018	-0.241	-0.02834	0.4964	-0.1874	-0.2272
GECS		-0.2104	0.07838	-0.05104	0.562	0.3793
GEGS			-0.3553	-0.1795	0.1518	0.04453
GEHD				0.01993	0.01984	-0.01645
GEPS					-0.08477	-0.2091
GERSS						0.4646
GEPE						
GESE						
GETE						
GETS						
CC						
GE						

Source: Authors

Table 2b. Intercorrelations of Variables.

	GESE	GETE	GETS	CC	GE	RQ
GEELF	0.05903	-0.2031	0.09621	-0.4649	-0.4022	-0.3506
GECS	0.1624	0.3464	0.2892	0.1065	0.1108	0.07396
GEGS	0.1865	0.1493	-0.1927	0.2817	0.293	0.2198
GEHD	-0.08221	-0.03214	0.1721	0.02978	-0.006582	0.05595
GEPS	-0.1017	-0.1902	0.133	**-0.7008**	**-0.6958**	**-0.6674**
GERSS	0.2202	0.3111	0.1427	0.35	0.3022	0.176
GEPE	-0.2073	0.413	0.01897	0.4895	0.425	0.3092
GESE		0.09469	-0.2111	0.1975	0.2521	0.1737
GETE			-0.01018	0.3259	0.2869	0.2511
GETS				-0.2394	-0.2322	-0.1971
CC					**0.9435**	**0.8828**
GE						**0.8701**

Source: Authors

Used Methods

A panel data analysis is used for the purposes of the analysis of the relation between general government expenditures and selected indicators of governance (WGI) with an emphasis on the economic and institutional dimensions of governance. Panel data is “a dataset in which the behavior of each individual or entity (in this case a country) is observed at multiple points in time. Using panel data accounts for variables that change over time, but not across entities” (Princeton University Library, 2023). Three models have been selected for the analysis (each model for 29 European countries and separately for countries with higher and lower economic levels than the EU average according to GDP per capita in PPS). The data has a characteristic of a balanced panel where the cross-sections are countries with $n = 29$ individuals and $T = 20$ time periods. We have $k = 10$ independent variables.

According to (Baltagi, 2021) it is used the F-test to test the consistence of the pooled OLS model

$$Y_{it} = \alpha + \beta_1 X_{it} + \cdots + \beta_k X_{kit} + u_{it}, \tag{1}$$

againist the panel regression fixed effect model

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \cdots + \beta_k X_{kit} + u_{it} \tag{2}$$

which has different intercepts for all cross-section units, where

Y_{it} are the dependent variables,
X_{jit} are the independent variables,
α is the common intercept,
α_i are the individual intercepts,
β_j are the parametric coefficents,
u_{it} are the error terms,
and $i = 1,2,\dots,n;,\ t = 1,2,\dots,T,\ j = 1,2,\dots,k.$

In all our models the p-value of the F-test was extremely low; thus the panel model was better, then the pooled linear regression model.

As the individuals (the European countries) are not obtained arbitrarily or randomly, the random effect panel regression model should not be applied. To test the consistency of the random effect model, we performed the Hausman test (Baltagi, 2021). Except for the model 2 for the countries with lower economic level all the models have the p-value of Hausman test below 0.05, thus the fixed effect panel regression models can be used in all models. The fixed effects method “utilises panel data to control for (omitted) variables that differ across individuals or entities (in this case European countries), but are constant over time. When using fixed effect (FE), we assume that characteristics of an individual may impact or bias the predictor or outcome variables, and we need to control for this. This is the rationale behind the assumption of the correlation between an entity’s error term and predictor

variables. FE removes the effect of those time-invariant characteristics, and therefore we can assess the net effect of the predictors on the outcome variable. In fixed effects models, the slope coefficient of the population regression line is the same for all individuals or entities (European countries), but the intercept of the population regression line varies across individuals/entities (countries)" (Gujarati, et al., 2017; Stokes and Watson, 2019; Princeton University Library, 2023). All computation of the panel regression were carried on R-package plm (Croissant and Millo, 2008).

Results

In this section, the results of the panel data analysis are presented. We evaluate the effect of the selected government expenditures on indicators of the economic and institutional dimensions of governance (Control of corruption, Government Effectiveness and Regulatory Quality) in the years 2002-2021. Results are presented for 29 European countries; and further for 17 European countries with a lower economic level and 12 European countries with a higher economic level than the EU average.

The Effect of Government Expenditures on Institutional Dimension of Governance in European Countries in Years 2002-2021

First, we examine the effect of government expenditures on the institutional dimension of governance (represented by the WGI indicator – control of corruption) in European countries in the years 2002-2021. Table 3 documents the influence of examined government expenditures on Control of corruption (CC) in the years 2002-2021 for 29 European countries (CC-M1 model), for European countries with a lower economic level than the EU average (CC-M2 model) and European countries with a higher economic level (model CC-M3).

Table 3. The Effect of Government Expenditures on Control of Corruption (CC) in Years 2002-2021.

Variables	CC-M1 All countries	CC-M2 Countries with a lower economic level	CC-M3 Countries with a higher economic level
GEELF	-0.009	-0.004	-0.059
	(0.02)	(0.024)	(0.045)
GECS	-0.037	-0.194	0.202*
	(0.069)	(0.11)	(0.081)
GEGS	0.007	0.142***	-0.108***
	(0.027)	(0.041)	(0.032)
GEHD	0.013	0.019	-0.031
	(0.053)	(0.083)	(0.065)
GEPS	-0.055	-0.008	-0.304
	(0.071)	(0.083)	(0.164)
GERSS	-0.099	-0.047	0.208
	(0.079)	(0.106)	(0.135)
GEPE	0.169***	0.241***	-0.018
	(0.034)	(0.043)	(0.063)
GESE	-0.089*	-0.136**	0.144
	(0.036)	(0.044)	(0.079)
GETE	-0.155**	-0.277***	0.008
	(0.055)	(0.076)	(0.079)
GETS	0.019	0.012	0.05*
	(0.012)	(0.015)	(0.022)

Note: Coefficients of models of CC (FE – fixed effect model, asterisks describe significance of the Hausman test, std.err. in parentheses, asterisks describe statistical significance *** 0.1%, ** 1%, * 5%)
Source: Authors' calculations

From the results (Table 3), we can state that for 29 European countries (model CC-M1), government expenditures on pre-primary and primary education (GEPE) have a statistically significant positive effect on control of corruption (CC) at the level of 0.1%. While government expenditures on secondary education (GESE) and tertiary education (GETE) have a statistically significant negative effect in the case of control of corruption (CC), namely GESE at the level of 5% and GETE at the level of 1%. This confirms the fact that an increase in the volume of government

expenditure (GESE, GETE) by 1% has an effect on the reduction of CC (while GESE reduces the level of corruption by 0.089 and GETE by 0.155). Conversely, a 1% increase in government expenditures on pre-primary and primary education (GEPE) tends to increase CC by 0.169.

In countries with a lower economic level than the EU average (see Table 3, CC-M2 model), government expenditures (GEPE) and government expenditures on general services (GEGS) are statistically significant at the 0.1% level with a positive effect on CC. This means that an increase in government expenditure (GEPE) by 1% will increase the level of corruption by 0.241, and an increase in government expenditure (GEGS) affects the growth of corruption by 0.142. On the contrary, government expenditures on secondary education (GESE) are statistically significant at the level of 1% and government expenditures on tertiary education (GETE) at the level of 0.1%, when they have a negative effect on CC. This that an increase in government expenditures (GESE and GETE) by 1% affects the reduction of corruption control by 0.136 in the case of GESE and the reduction of CC by 0.277 in the case of GETE.

In European countries with a higher economic level than the EU average (model CC-M3), government expenditures on general services (GEGS) are statistically significant at the level of 0.1%, but with a negative effect. This means that an increase in GEGS by 1% reduces the level of corruption by 0.108. Government expenditures on cultural services (GECS), expenditures on transport (GETS) have a statistically significant positive effect at the level of 5% in the case of CC. This confirms that an increase in government expenditures by 1% increases the level of corruption in the case of GECS by 0.202 and in the case of GETS it affects an increase in CC by 0.05.

The results show that European countries with a lower economic level (CC-M2) and countries with a higher economic level (model CC-M3) differ in the opposite effect of government expenditures on general services (GEGS) in the case of CC. The effect of government expenditures according to individual levels of education (GEPE, GESE and GETE) on CC is so high in countries with a lower economic level that it is also reflected in the model of all 29 European countries. At the same time, based on the results (Table 3), we can state that for the four investigated categories of government expenditure GEELF, GEHD, GEPS and GERSS (in all models of European countries CC-M1, CC-M2, CC-M3) a statistically significant influence on CC was not demonstrated.

The Effect of Government Expenditures on the Economic Dimension of Governance in European Countries in the Years 2002-2021

In the years 2002-2021 in European countries, we examine the effect of selected categories of government expenditures on the economic dimension of governance (represented by WGI indicators - Government Effectiveness and Regulatory Quality). First, we focus on the influence of government expenditures on Government Effectiveness (GE), which is one of the indicators of the economic dimension of governance. Table 4 shows the results of the influence of government expenditures on government effectiveness for 29 European countries (GE-M1), for European countries with a lower economic level (GE-M2) and European countries with a higher economic level (GE-M3).

The results (Table 4) for *29 European countries* (GE-MI model) show that only government expenditures on executive and legislative bodies, financial and fiscal affairs, and external affairs (GEELF) have a statistically significant positive effect at the level of 1% on government effectiveness (GE). On the contrary, government expenditures on secondary education (GESE), on tertiary education (GETE) and government expenditures on police services (GEPS) have a statistically significant negative effect on government effectiveness (GESE at the level of 1%, GETE, GEPS at the level of 5%). This means that an increase in the volume of government expenditures (GEELF) by 1% increases government effectiveness by 0.053. On the contrary, an increase in allocated government expenditures (GESE, GETE, GEPS) by 1% has an effect on the reduction of government effectiveness (GESE reduction by 0.093; GETE reduction by 0.124 and GEPS reduction by 0.176).

In countries with a lower economic level (GE-M2 model), government expenditures on cultural services (GECS) are statistically significant at the 1% level with a positive effect on GE. This confirms that an increase in GECS by 1% has an effect on an increase in government effectiveness by 0.118. Conversely, government expenditures (GEPE, GESE) have a statistically significant negative effect on government effectiveness (GE) (GESE at the level of 5%, GEPE at the level of 0.1%). In European countries with a lower economic level, the fact is again confirmed that an increase in the volume of government expenditure on education (GEPE, GESE) by 1% has an effect on the reduction of government effectiveness (GEPE reduction by 0.208; GESE reduction by 0.169), see Table 4.

In countries with a higher economic level (GE-M3 model), government expenditures (GEELF and GESE) in the case of government effectiveness are statistically significant at the level of 0.1% with a positive effect. This means that an increase in the volume of these government expenditures by 1% has an effect on the increase in government effectiveness (in the case of GEELF by 0.185 and GESE by 0.447). On the contrary, government expenditures on general services (GEGS) and on pre-primary and primary education (GEPE) are statistically significant at the 5% level with a negative influence in the case of government effectiveness. This means that in countries with a higher economic level, an increase in the volume of government spending (GEGS, GEPE) by 1% will be reflected in a decrease in government effectiveness (in the case of GEGS, a reduction of GE by 0.075, in the case of GEPE, a reduction of GE by 0.169).

Table 4. The Effect of Government Expenditures on Government Effectiveness in Years 2002-2021.

Variables	GE-M1- All countries	GE-M2 - Countries with a lower economic level	GE-M3 - Countries with a higher economic level
GEELF	0.053 **	0.025	0.185 ***
	(0.02)	(0.021)	(0.05)
GECS	0.089	0.118 **	0.153
	(0.067)	(0.099)	(0.088)
GEGS	-0.011	0.098	-0.075 *
	(0.026)	(0.037)	(0.035)
GEHD	0.083	-0.123	-0.021
	(0.052)	(0.075)	(0.072)
GEPS	-0.176 *	-0.029	-0.334
	(0.069)	(0.075)	(0.179)
GERSS	-0.072	0.046	0.259
	(0.077)	(0.096)	(0.147)
GEPE	0.027	-0.208 ***	-0.169 *
	(0.033)	(0.038)	(0.069)
GESE	-0.093 **	-0.169 *	0.447 ***
	(0.035)	(0.04)	(0.087)
GETE	-0.124 *	-0.018	-0.135
	(0.054)	(0.068)	(0.086)
GETS	-0.004	0.025	-0.021
	(0.012)	(0.014)	(0.024)

Note: Coefficients of models of GE, (FE – fixed effect model, asterisks describe significance of the Hausman test, std.err. in parentheses, asterisks describe statistical significance *** 0.1%, ** 1%, * 5%)
Source: Authors calculations

European countries with a lower economic level (GE-M2) and countries with a higher economic level (GE-M3 model) differ, not only according to selected categories of government expenditures that affect GE, but also in the opposite effect of government expenditures on secondary education (GESE) in the case of GE. Based on the results (table 4), we can also state that for the evaluated government expenditures GEHD, GERSS and GETS (in all models of European countries GE-M1, GE-M2, GE-M3) no statistically significant influence was demonstrated in the case of GE.

Furthermore, we examine the effect of selected categories of government expenditures on Regulatory Quality (RQ) in the years 2002-2021. Regulatory Quality (RQ) represents the second indicator of the economic dimension of governance. The results are presented for three country models - for all surveyed countries, i.e. 29 European countries (RQ-M1) and for 17 European countries with a lower economic level (RQ-M2) and for 12 European countries with a higher economic level (RQ-M3). Table 5 documents the results in more detail.

The results for *29 European countries* (model RQ-M1) show that government expenditures on general services (GEGS), government expenditures on pre-primary and primary education (GEPE) and government expenditures on transport (GETS) have a statistically significant positive effect on Regulatory Quality (RQ) at the level of 0.1%. Government expenditures on recreational and sporting services (GERSS) and government expenditures on secondary education (GESE) have a statistically significant negative effect on Regulatory Quality (RQ) at the level of 0.1%. This means that a 1% increase in government expenditures of GEGS, GEPE and GEPE has the effect of increasing RQ by 0.089 in the case of GEGS, increasing RQ by 0.145 in the case of GEPE and 0.049 in the case of GETS. On the contrary, an increase in government spending (GERSS and GESE) by 1% tends to reduce RQ (at the same time, GERSS affects the reduction of RQ by 0.262 and GESE by 0.172).

For countries with a lower economic level than the EU average (RQ-M2 model), the same categories of government expenditures are statistically significant as for the 29 European countries in the case of RQ. Government expenditures (GEGS, GEPE) are statistically significant in the case of regulatory quality with a positive effect at the level of 0.1% and government expenditures (GETS) at the level of 1%. Conversely, government expenditures (GERSS, GESE) in the case of regulatory quality are statistically significant, but with a negative effect at the level of 1%. At the same time, the effect of government expenditures (GEPE, GESE, GEGS, GERSS and GETS) on RQ

is so high in countries with a lower economic level (RQ-M2) that it is also reflected in the model of all 29 European countries (RQ-M1). Table 5 shows the results in more detail.

Table 5. The Effect of government expenditures on Regulatory Quality in years 2002-2021.

Variables	RQ- M1 All Countries	RQ-M2 Countries with a lower economic level	RQ-M3 Countries with a higher economic level
GEELF	0.016	0	0.027
	(0.017)	(0.021)	(0.044)
GECS	-0.028	0.044	-0.118
	(0.059)	(0.095)	(0.078)
GEGS	0.089 ***	0.128 ***	0.044
	(0.023)	(0.035)	(0.031)
GEHD	0.043	-0.016	-0.034
	(0.046)	(0.072)	(0.063)
GEPS	-0.018	-0.065	0.392 *
	(0.061)	(0.072)	(0.158)
GERSS	-0.262 ***	-0.356 ***	0.109
	(0.068)	(0.092)	(0.13)
GEPE	0.145 ***	0.148 ***	0.009
	(0.029)	(0.037)	(0.061)
GESE	-0.172 ***	-0.174 ***	-0.082
	(0.031)	(0.038)	(0.076)
GETE	0.018	0.055	-0.12
	(0.048)	(0.066)	(0.076)
GETS	0.049 ***	0.035 **	0.059 **
	(0.011)	(0.013)	(0.021)

Note: Coefficients of models of RQ, (FE – fixed effect model, asterisks describe significance of the Hausman test, std.err. in parentheses, asterisks describe statistical significance *** 0.1%, ** 1%, * 5%).
Source: Authors calculations

In European countries with a higher economic level than the EU average (model RQ-M3), government expenditures on police services (GEPS) and government expenditures on transport (GETS) have a statistically significant positive effect in the case of Regulatory quality (RQ). Meanwhile, GEPS are statistically significant at the 5% level and GETS at the 1% level. This means that an increase in government expenditures (GEPS, GETS) by 1% in countries with a higher economic level has an effect on increasing RQ (in the case of GEPS, an increase of 0.392 and GETS has an effect on increasing RQ by 0.059).

European countries with a lower economic level and countries with a higher economic level differ more significantly according to the effect of government expenditures on services that affect RQ. On the contrary, in the case of RQ, no statistically significant influence was demonstrated for the four categories of investigated government expenditures GEELF, GECS, GEHD and GETE (in all models of European countries RQ-M1, RQ-M2, RQ-M3).

Verification of Research Questions

From the results of our research, we verify in two groups of European countries (with a higher and lower economic level than the EU average) the impact of selected categories of government expenditure on the institutional and economic dimension of governance (represented by indicators of WGI – Control of Corruption, Government Effectiveness, Regulatory Quality) in years 2002-2021.

We verify the impact of selected categories of government expenditure on the institutional dimension of governance (represented by the indicator Control of corruption) with the research question ***(****RQ1): Do government expenditures on education and government expenditures on general services primarily affect corruption control?* In European countries with lower and higher economic levels, the institutional dimension of governance represented by corruption control is influenced by government expenditure on general services, while the influence of this expenditure is larger in countries with a lower economic level. In the group of European countries with a lower economic level, the analysis of government expenditure showed that government expenditures on education specifically have the greatest influence on corruption control (expenditure on tertiary education and expenditure on

pre-primary and primary education). In European countries with a higher economic level, government expenditure on cultural services has the greatest influence on corruption control, and government expenditure on transport has the least influence. On the contrary, in the case of corruption control, government expenditure on education did not have a significant effect in this group of countries (see table 3). We can therefore state that in European countries with a lower economic level, government expenditure on individual levels of education, as well as government expenditure on general services, has an effect on corruption control. In countries with a higher economic level, only the influence of government expenditure on general services was evident. On the basis of these findings, the verification of the research question (RQ1) can be confirmed in more than half of the surveyed countries. Therefore, we can answer the research question in the affirmative (YES).

We verify the influence of selected categories of government spending on the economic dimension of governance (represented by the indicators Government Effectiveness and Regulatory quality) with research questions RQ2 and RQ3. In connection with the research question (RQ2), we want to verify whether *"government expenditures on education and government expenditures on public consumption services of the state affect the economic dimension of governance (in the case of government effectiveness)?"* We evaluate government expenditures at individual levels of education, which include government expenditures on pre-primary and primary education, expenditures on secondary education, expenditures on tertiary education. And expenditures on public consumption services of the state, which include government expenditures on executive and legislative bodies, government expenditures on general services, government expenditures on police services. From the results in European countries with higher and lower economic levels, it follows that government expenditures on pre-primary and primary education and expenditures on secondary education have the greatest impact on the economic dimension of governance (represented by Government effectiveness). In countries with a higher economic level, the influence of expenditures according to public consumption services of the state was also evident. At the same time, government expenditures on executive and legislative bodies have a greater influence on government effectiveness, whereas government expenditures on general services have a smaller influence. In countries with a lower economic level, in the case of government effectiveness, government expenditures on cultural services have a positive effect, but the effect of expenditures on public consumption services of the state did not manifest itself (see table 4). From the results achieved, we can state that in European countries with higher and lower economic levels, government effectiveness is mainly affected by government expenditures on pre-primary, primary and secondary education. In the group of European countries with a higher economic level, the influence of two categories of expenditure on public consumption services of the state was also manifested. Based on these findings, the answer to the research question was confirmed only for 12 European countries with a higher economic level. Therefore, we answer the research question (RQ2) in the negative (NO).

With the research question (RQ3), we verify whether ***"****government expenditures in services sectors (education, recreation and sport, transport, general services) primarily affect the economic dimension of governance (in the case of regulatory quality)?"* From the analysis of public expenditures on the economic dimension of governance represented by regulatory quality, a significant influence of four categories of government expenditures (expenditures on general services, expenditures on recreational and sporting services, expenditure on secondary education, expenditures on transport) were manifested in European countries with a lower economic level. At the same time, government expenditures on recreational and sporting services and further expenditures on secondary education and expenditures on general services have the greatest impact on regulatory quality. Conversely, in the group of European countries with a higher economic level, government expenditures on police services have the greatest influence on regulatory quality and government expenditures on transport have a smaller influence (see table 5). In connection with the verification of the research question (RQ3), the influence of selected categories of government expenditure on Regulatory quality was confirmed in European countries with a lower and higher economic level. However, these are different categories of government expenditures for both groups of European countries. Therefore, the answer to the research question (RQ3) is negative (NO).

Discussion

Science should contribute directly to policy decisions, but there are significant gaps between what scientists provide and what policy-makers can use (Burgman, 2015). Some authors (Robichau and Lynn 2009; Tosun et al., 2016; Correia et al. 2020) agree that different relationships between public and private actors exist, and that the forms of co-governance can also change over time. The degree of cooperation and competition mostly depends on the existing regulatory arrangements, the congruence of goals of the different actor groups, and the institutionalization of industrial relations. In this connection, it may be said that opportunities exist for designing governance mechanisms that will better support the development and persistence of the personal relationships that underpin the most effective delivery of science for policy.

According to Bogere and Makaaru (2016); Montes et al. (2019) or Amir and Gokmenoglu (2020) effective governance then ensures also an appropriate allocation of financial resources. Government expenditures shape good public administration, but the improvement of dimensions of good governance also has a significant impact on government expenditures. Noja et al. (2021) have found the significant mutual links between the management of government expenditures and economic development. Cooray (2009, p. 416) indicate that *"there is also evidence*

of an interaction between government expenditure and governance, which suggests that countries with good governance make more effective use of public expenditure and/or that increased public expenditure leads to improved governance". As also other authors show (e.g. Khan and Murova 2015; Meričková et al., 2017; Shin et al., 2020; Moretti et al., 2021), the share of total public expenditures on gross domestic product (GDP) is a significant indicator of the size of governance across countries. The division of government expenditures (by level and function) can render the information about the extent to which key government activities are decentralised to sub-national governments. Similarly, Khan and Murova (2015) confirm in this regard that public expenditures account for a considerable part of domestic production with direct impact on public policy and public services, such as education, healthcare, public safety, transport and social care.

To support our results, it may be said that other authors have arrived at similar conclusions in examining the relationship of government expenditures and corruption rate. Jajkowicz and Drobiszová (2015, p. 1259) came to the conclusion in their research using the example of 21 OECD countries that worsening corruption rate distorts the structure of public expenditures in favour of defense and general public services, while the share of expenditures on education, health, recreation and culture declines. Same authors, Jajkowicz and Drobiszova (2015**,** p. 1258**)** also argue that „*the governments of individual countries should try to consistently fight the corruption and concentrate on government spending allocation into the area of education and health instead of the area of defense and other sectors less significant for economic growth and development".* Delavallade (2006, p. 222) points out the fact that corruption influences government expenditure allocation,"*is negative for education, health and social protection and positive is for the share of spending allocated to public services and order, defense, fuel and energy, and culture. The coefficient on the level of corruption is not significant in the regressions of housing and other economic activities (sector which gathers agriculture, transport and communication".*

The findings some authors (Tajaddini and Gholipour, 2018; Guerrero and Castaneda, 2021; Nguyen and Bui, 2022) show that the less countries are developed, the more difficult it is to find a combination of policies that leads to a decrease in corruption. Their findings also show that a higher level of corruption control leads to reduction in luxury spending. Some research (Nguyen and Bui, 2022, p. 1) argue that "*government expenditure and corruption control have a negative impact on economic growth and that the interaction between government expenditure and corruption control can reduce the level of the negative impact of these factors on economic growth".* Similarly, Esener and Ipek (2018) point out that variables of public expenditures, corruption and population growth cause some significant declining effects on economic growth. By contrast, Guerrero and Castaneda (2021, p. 139) state that as a result of reduced corruption rate, government have a tendency to *"navigate when changing the total budget size and the relative expenditure towards the rule of law*".

Many findings render strong evidence that government effectiveness has a considerable effect on financial development. Similarly, to our research, other research also corroborate the existence of the relation between government effectiveness a public expenditure in European as well as other countries (Voghouei and Jamali, 2018; Montes et al., 2019; Amir and Gokmenoglu, 2020; Ramasamy, 2020; Ramesh and Vinayagathasan, 2023). We can state in most cases, according to Ramesh and Vinayagathasan (2023), that government expenditure (but also control of corruption, rule of law and accountability) tend to have a positive impact on government effectiveness. Their results show that government expenditure affect the government's effectiveness negatively in the long run and positively in the short run. Based on findings by Albassam (2020), we can state that it is challenging for governments to transform public spending into successful public programs and address the ability of public allocations to reach government's objectives (e.g. enhancing economic growth). In connection with findings by Voghouei and Jamali (2018), however, it can be said that government effectiveness responds positively to changes in expenditures on information technologies, be it in the government or the society as a whole. Based on the findings of other research (Montes, et al., 2019; Amir and Gokmenoglu, 2020), we may propose some recommendations to enhance financial development. In particular, this includes fiscal transparency, which is important to improve government effectiveness and government spending efficiency. Another suggestion can be, according to Amir and Gokmenoglu (2020, p. 445) "*enhancing social cohesion through education on the use of tax contributions, revising budget procedures to ensure efficient spending of resources, to improve institutional quality or reducing corruptive pursuits and of modifying the rule of law."*

In connection with our results and results of other studies (OECD, 2008; Fereidouni et al., 2015; Karkatsoulis et al., 2019; Mehmood et al., 2021, Nguyen and Tran Pham, 2023), we can confirm the connection between regulatory quality and performance with respect to the structure of the allocated public expenditures. On the basis of experience from abroad (e.g. Mehmood et al., 2021), it can be stated that weak institutional quality at the state level presents a considerable danger in signalling the existence of an unfavourable economic situation which increases public debt. By contrast, better performance of institutional quality at the state level may lead to improved transparency of the financial market, hence reduction in the public debt. Following the findings by Nguyen and Tran Pham (2023), we can agree with the statement that an increase in public spending and budget imbalance contributes to the expansion of dark economy, and with a higher budget imbalance level than the effects of public spending, dark economy will intensify. In line with our results, other authors also confirm the existence of the effect of general government expenditures on sporting services on regulatory quality. According to Fereidouni et al. (2015,

p. 1005), we may say that "*numerous national sports resources are allocated to ineffective areas due to high levels of sponsorship behaviour between political elites and mismanagement of sports funds."*

Conclusion

Modern economies regard good governance of the public financial system as a substantial factor for economic growth. Therefore, the assessment of public expenditure governance helps to better understand the manner in which public expenditure is governed and how it interacts. Based on the analysis performed, we have arrived at the following conclusions. In all groups of countries: i) 29 European countries, ii) countries with a lower economic level, iii) countries with a higher economic level (compared to the average EU level), a different influence of the structure of the analysed categories of government expenditures on governance in the economic and institutional dimensions manifested. The analysis of all 29 European countries confirmed that control of corruption (institutional dimension of governance) is mainly affected by government expenditure according to the levels of education (pre-primary and primary, secondary, tertiary education), whereas the economic dimension of governance (government effectiveness and regulatory quality) is both positively and negatively affected by the majority of the evaluated government expenditure. The results between European countries with higher and lower economic levels confirmed the influence of different categories of government spending, which influence the evaluated governance indicators. In European countries with a higher economic level, in the economic dimension of governance, the influence of government expenditure on secondary education in the case of government effectiveness and the influence of government expenditure on police services in the case of regulatory quality demonstrated positively. On the institutional dimension of governance (on control of corruption), government expenditure on cultural and general services had the greatest influence. In European countries with a lower economic level, on the other hand, the results showed that control of corruption is mainly negatively affected by government expenditure on tertiary education. In the economic dimension of governance, the greatest influence of government expenditure on pre-primary and primary education was manifested in connection with the reduction of government effectiveness and the influence of government expenditure on sporting and recreational services on the reduction of regulatory quality. The achieved findings opened other research topics for the authors. The topic of future research can be, among other topics, a more detailed evaluation of different effects of selected categories of public expenditure in European countries in relation to governance indicators in the economic and institutional dimensions. Another research topic can be the evaluation of the efficiency of public expenditure in the political dimension of governance.

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