

# EDUCATION EXPENDITURES, SCHOOL ENROLLMENT - ATTAINMENT IMPACT ON ECONOMIC DEVELOPMENT: THE WESTERN BALKAN COUNTRIES



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## Abstract

This paper comprehensively examines the intricate relationship between education expenditures, school enrollment rates, and educational attainment levels on the economic development of Western Balkan countries from 2010 to 2022. By employing a quantitative methodology that encompasses Ordinary Least Squares (OLS), Fixed Effects (FE), Random Effects (RE), and the Hausman and Taylor instrumental variable approach, the study aims to uncover the dynamics that influence economic growth in this region. The findings indicate that general government education expenditures do not statistically affect GDP per capita, suggesting that merely increasing funding for education may not directly translate into economic benefits.

In contrast, the analysis highlights a concerning trend where high unemployment rates among individuals holding advanced degrees, such as PhDs and master's degrees, negatively impact GDP per capita. This underscores the importance of aligning educational outcomes with labor market needs. Additionally, the study reveals a positive correlation between per capita GDP and both school enrollment figures and overall academic achievement within the region. These insights contribute to a deeper understanding of the complex interplay between education and economic development, emphasizing the need for targeted policies that enhance educational quality and relevance to foster sustainable economic growth in the Western Balkans.

## 1. Introduction

The Western Balkans countries have common goals for a better future for the region, one of them is the integration into the EU, at the same time, the role of education is seen to have a vital role in these countries regarding the issues of quality in education that must be seen in line with the latter's impact on the economy, so the attention should be directed to producing skilled human resources (Kordić, 2010).

There are genuine studies related to education and economic growth in the countries of the Western Balkans it is emphasized that education, which is measured by the number of people with informal or primary, secondary, and higher education, has an impact on GDP per capita, here the correlation shows the correlation of higher education with GDP per capita (Erić, 2018). Another scientific work was done for the Balkan countries, where the gross national income per capita (GNIPc) and independent

years in education, macroeconomic stability, and the ability to accept information technology were taken as dependent variables, according to this model enhances that years in education and IT adaptation have a positive impact on GNIPc, while stability has no impact (Kovačević et al., 2023).

In addition to the education expenditures, the quality of education is also considered very important, these countries have experienced a series of reforms as a result of political, economic, and social changes, whereas in the higher education system, the Bologna reforms have been the most difficult for these countries (Zgaga, 2017). In a qualitative approach, it appears that many higher education institutions do not facilitate the learning of generic skills, and this is due to several factors such as poor teaching environment, lack of industry-experienced staff, and theoretical support in teaching (Okolie et al., 2020). Innovation in the framework of education is seen to have a decisive role as a determinant of competitiveness, while policies tailored to the

continuous development of the workforce are seen as opportunities for lifelong learning (Dima et al., 2018).

In the Western Balkans, HEIs do not have sufficient financial capacity to develop new curricula, so this aspect should be supported more and these countries can be helped by financial assistance from EU programs (Jusufi & Ajdarpašić, 2020). In this paper, the Western Balkans will be statistically analyzed through a quantitative approach considering the share of public expenditure on education, the number of enrolled students, educational attainment, unemployment based on the level of education, and final government expenditure on consumption. Through the research of other authors, we noticed that not only the amount of education was affecting the economic growth of a country, but also the quality of education.

According to this, we will focus only on expenses and not on reforms or educational standards, but in addition, we will mention them as an integral part of the work.

According to the main idea the hypotheses may be specified as follows:

**H1:** Education expenditures on education impact the economic growth in the Western Balkans;

**H2:** School enrollment and attainment impact the economic growth in the Western Balkans;

**H3:** Unemployment with advanced and basic education impacts the economic growth in Western Balkans.

## 2. Literature Review

Higher education in Kosovo, Albania, Montenegro, and North Macedonia has a positive impact on the growth of the country's gross domestic product, taking independent variables such as general government spending on higher education, higher education enrollment, and the total labor force, through the Hausman the Taylor IV model and the period 2000-2020 (Osmani & Jusufi, 2022). A similar work carried out for the Western Balkans through the econometric model for the period 1990-2020, according to the World Bank data, has found that education and economic growth have a positive relationship in these countries and that investments in education and improving the skills of the workforce should increase (Banda et al., 2022).

Fetai et al. (2017) highlight the lack of impact of education on economic growth in Western Balkan countries, and this has been measured by the impact of higher education enrollment on economic growth, revealing a negative impact between these variables. Literacy rate and gross enrollment ratio in higher education have a positive correlation with GDP, while a negative correlation between the primary school dropout rate and the

dependent variable, these countries show the potential to influence development stable (Krstić et al., 2015).

Another analysis made with the countries of the Balkans and Albania showed that government investments in higher education favorably impact the economic growth of these countries and show long-term success in their economic development (Nikolli & Shima, 2023). In a Granger causality analysis, it was found that higher education has an impact on the gross domestic product in the countries of the Western Balkans (Landika et al., 2023). Furthermore, a study of the period 1998-2006 for several Balkan countries with panel data, which deals with the total number of persons enrolled in tertiary education, emphasizes that the latter affects the gross domestic product (Karagoz et al., 2008). On the other hand, education has no impact on economic growth in the Western Balkans, thus considering it a non-important factor in economic growth in these countries from 1995-2016 (Kaleci, 2018).

In addition to the quantitative part, the quality of education in institutions positively impacts economic growth in 33 European countries, including 5 Western Balkan countries from 1996-2016 (Kostić et al., 2019). The Western Balkans do not invest as much in education as the most developed countries, being considered as countries that invest below the EU average, while the most educated young people and the most qualified workers of these countries are imported from the most developed countries so the cost is borne by the country of origin (Solilová & Vránová, 2022). The quality of institutions is seen to have a statistical significance with the GDP per capita during the period 2008-2022, for the countries of the Western Balkans, among the independent variables included were the efficiency of the government, the quality of regulation, and the rule of law as the most important variables (Babajić et al., 2024).

Correlation analyses point out that there is a high correlation between the level of education and gross domestic product per capita in the countries of the Western Balkans, where this level is very important for the level of development, but there is an inverse relationship between the level of formal the level of education and economic development in these countries (Erić, 2018). In these countries there is a high level of youth unemployment, which is a consequence of the incompatibility of educational institutions and economic demands, these countries should focus on modern educational reforms to face the main problem of long-term youth unemployment (Radović-Marković, 2015). Another analysis of Bosnia-Herzegovina, Serbia, and Macedonia, points out that these countries have low spending on research and development, as well as slow industry-university

cooperation, this analysis refers to the 2013-2014 report (Gjorgjievska, 2014).

In 2007, in an analysis of the countries of the Western Balkans, several characteristics of the countries' educational systems were highlighted, so Montenegro and Serbia were highlighted as having suffered from a lack of investment, the education system in Kosovo must be rebuilt. Croatia turns out to be more funded than other countries in terms of the education system where the salary of teachers is estimated to be the lowest and this leads to the demoralization of the staff, from these countries Croatia and Macedonia enter the first group of reforms. Kosovo and Albania enter the second group of privatization reformers (Bartlett, 2007). The countries of the progressive Balkans face educational challenges. This is due to the centralization of educational management and other reasons related to the lack of academic or scientific activities. This paper is based on research from the University of Pristina, where the importance of academic freedom with an improvement this year is highlighted as a very important factor in improving the quality of education (Qorraj et al., 2022).

If we analyze the results of the PISA test in 2015, for Kosovo, North Macedonia, Serbia, and Montenegro, the results are not good, and the educational or cognitive results are below the

average of peers with countries with equal income and in some cases with low-income countries (WBG, 2019). In the application of the Bologna reforms, Croatia has been analyzed as the best performer, while for the level of public investment in higher education, Macedonia and Serbia compared to Croatia show higher levels, while the countries of the Western Balkans are considered to have no capacity effective government, analysis that belongs to the higher level of education (Dolenec et al., 2014).

### 3. Methodology

The methodology employed in this study, which spans the period from 2010 to 2022, utilizes Ordinary Least Squares (OLS) regression, Fixed Effects (FE) and Random Effects (RE) models, along with the Hausman test to determine the appropriate model specification, and the Hausman and Taylor instrumental variable approach to address potential endogeneity, with all data generated and analyzed using STATA to facilitate statistical analyses and hypothesis testing.

The methodology section includes the use of econometric models, tests, and formulas to determine which approach provides the most insightful results, based on the current nature of the data and the specific research topic.

**Table 1.** Variables, countries, and sources

Countries	Variables	Abbreviations	Sources
Albania	GDP per capita_lag Government expenditure on education % GDP School enrollment primary (%gross)	gdp_lag gov_exp_prmy	World Bank Indicators (open data)
Bosnia and Herzegovina	Unemployment with advanced education (% of total labor force with advanced education) Educational attainment doctoral 25+ (%) cumulative Educational attainment masters 25+ (%) cumulative	sch_enroll_prmy	World Bank Indicators (open data)
Croatia	Final consumption expenditure (constant 2015 US\$) General government final consumption expenditure (constant 2015 US\$)	unmpl_adva_educ	World Bank
Kosovo	GDP per capita (dependent)	educ_attain_doc	World Bank, Statistics Agency of Kosova, IMF
Montenegro		educ_attain_mast	World Bank
North Macedonia		final_cons_exp	World Bank, Regional Cooperation Council
Serbia		gov_fin_exp	World Bank

In this study, various statistical methods were employed using Stata software to analyze the data effectively. Here's a brief overview of the key econometric models and methods used:

#### 3.1. Ordinary Least Square (OLS)

The method of least squares is a basic method of regression analysis, moreover, it is the first analysis in the regression section, but it is also considered the simplest according to (Gujarati,

2003). According to the same author, the main formula of this method is:

$$y_i = \beta_1 + \beta_2 X_{2it} + u_i \quad (1)$$

### 3.2. Fixed Effects

Methods to measure unobserved effects of panel data, using a transformation to remove  $a_i$  the unobserved effect before estimation (Gujarati, 2003; Wooldridge, 2018).

$$y_{it} = \beta_1 + \beta_2 X_{it} + u_{it} \quad (2)$$

### 3.3. Random Effects

The common effect is appropriate when the unobserved effect is uncorrelated with all explanatory variables (Wooldridge, 2018).

### 3.4. Hausman and Taylor (IV) Model

$$y_{it} = X'_{it} \beta + Z'_{it} \gamma + u_i + \varepsilon_{it} \quad (3)$$

### 3.5. Hausman test

It is used to define whether the fixed or random effects are more appropriate to the model. Based on the models considered for least squares analysis up to Hausman and Taylor, the implemented model will be the latter. Although to choose between fixed and random effects we used the Hausman test and this test recommends fixed effects as the most appropriate, we consider the Hausman and Taylor (IV) model more appropriate for the nature of the study, in addition, because the model tries to deal with the endogeneity problem.

**Table 2.** Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
gdppercapita_lag	98	7473.509	3699.777	2981.2	21459.8
gdppercapita	97	7457.893	3683.902	2981.2	21459.8
gov_exp_prmy	98	4.1084210	.4274783	2.7	5.2
sch_enroll_prmy	72	97.56944	6.897287	82	114
unmpl_adva_educ	90	13.7976	5.030415	3.584	24.814
educ_attain_doc	98	.3016949	.1222567	0	.7
educ_attain_mast	98	5.161017	4.186577	.6	15.1
final_cons_exp	98	1.85e+10	1.51e+10	3.75e+09	5.28e+10
gov_fin_exp	98	3.90e+09	3.96e+09	7.14e+08	1.39e+10

The section on statistics descriptively analyzes the variables considered in the paper, specifying the mean, standard deviation, minimum, and maximum. During the analyses, a total of seven independent variables, whereas GDP per capita was considered the dependent variable for all analyses.

## 4. Empirical Findings

According to the results of the Hausman and Taylor (IV) model, *gdppercapita\_lag* has no impact on growth, nor does government expenditure on primary education have any impact on economic growth. The variables school enrollment in

primary education, doctorate attainment, and final consumption expenditure have a positive impact on the gross domestic product per capita of Western Balkan countries. On the other hand, unemployment with advanced education and master's education level have a negative impact on economic growth. Here it is observed that the general government expenditures in percentage have no impact on the economic growth of the analyzed countries.

**Table 3.** Econometric models

Variables	(Model 1) OLS	(Model 2) FE	(Model 3) RE	(Model 4) Hausman-Taylor (IV)
gdp_lag				0.0588306 (0.175)
gov_exp_prmy	118.8509 (0.764)	110.2596 (0.722)	118.8509 (0.763)	113.1373 (0.711)
sch_enroll_prmy	92.45868*** (0.001)	35.50452 (0.269)	92.45868*** (0.000)	62.31838* (0.081)
unmpl_adva_educ	-206.8348*** (0.000)	-61.86963* (0.076)	-206.8348*** (0.000)	-82.23893** (0.015)
educ_attain_doc	4370.27*** (0.001)	2430.05** (0.017)	4370.27*** (0.000)	3109.879*** (0.003)
educ_attain_mast	-119.355*** (0.007)	-42.21605 (0.272)	-119.355*** (0.005)	-79.21456* (0.064)
final_cons_exp	-4.24e-07*** (0.000)	6.63e-07*** (0.000)	-4.24e-07*** (0.000)	5.30e-07*** (0.001)
gov_fin_exp	2.04e-06*** (0.000)	-1.01e-06 (0.107)	2.04e-06*** (0.000)	-6.78-07 (0.261)
_cons	-101.9567 (0.974)	-5210.961 (0.167)	-101.9567 (0.974)	-6604.902 (0.323)
R-squared	0.9262	0.6843	0.9262	
Observations	69	69	69	68
Countries	7	7	7	7

**Note:** Results are significant in 1% (\*\*\*), 5% (\*\*), and 10%(\*). Dependent variable is GDP per capita for each country.

Furthermore, the Hausman test recommends the fixed effects as more appropriate for the model.

**Table 4.** The Hausman test

Hausman test		
Prob>chi	0.0000	Fixed Effects
Chi2	73.48	

The Hausman-Taylor (IV) model basic econometric formula:

$$y_{it} = X'_{it} \beta + Z_{iy} + u_i + \eta_{it} \quad (4)$$

Adapted in the current findings as follows:

$$y_{it} = c + (gdppercapita_{it-1}) + \beta_1(gov\_exp\_prmy_{it}) + \beta_2(sch\_enroll\_prmy_{it}) - \beta_3(unmpl\_adva\_educ_{it}) + \beta_4(educ\_attain\_doc_{it}) - \beta_5(educ\_attain\_mast_{it}) + \beta_6(final\_cons\_exp_{it}) - \beta_7(gov\_fin\_exp_{it}) + u_{it}$$

where:

$y_{it}$ : represents the dependent variable or  $gdppercapita$ ;

$c$ : is the constant;

$\beta_1$  to  $\beta_7$ : represents the parameters and,

$u_{it}$ : is the random error.

According to the results of the Hausman and Taylor (IV) model,  $gdppercapita\_lag$  has no impact on growth, nor does government expenditure on primary education have any impact on economic

growth. The variables of school enrollment in primary education, doctorate attainment, and final consumption expenditure have a positive impact on the gross domestic product per capita of Western Balkan countries. On the other hand, unemployment with advanced education and master's education level have a negative impact on economic growth. Here it is observed that the general government expenditures in percentage have no impact on the economic growth of the analyzed countries.

**Table 5.** Hypotheses significance

Hypotheses	Method	Significance
H1: Education expenditures on education impact the economic growth in the Western Balkans;	Hausman-Taylor (IV)	Accepts the null
H2: School enrollment and attainment impact the economic growth in the Western Balkans;	Hausman-Taylor (IV)	Rejects the null
H3: Unemployment with advanced and basic education impacts the economic growth in Western Balkans.	Hausman-Taylor (IV)	Rejects the null

## 5. Conclusion

The paper emphasizes the importance of government spending, student registration, and school attainment in the economic growth of the countries of the Western Balkans. These variables have not been treated before in any paper. According to the results, we find that government public spending in these countries has no impact on economic growth, on the other hand, school enrollment and school attainment have a positive impact on the economic growth of countries. The unemployment of individuals with master's and doctorate degrees was found to have a negative impact on the economic growth of countries. This paper is in line with the findings of many authors who emphasized a lack of impact of public spending on education in these countries with economic growth (Fetai et al., 2017; Kaleci, 2018). Most scientific works that have analyzed education and economic growth have taken into consideration variables related to school enrollment or the level of education and economic growth, variables that have been found to have a positive impact on the economic growth of these countries (Krstić et al., 2015; Osmani & Jusufi, 2022; Banda et al., 2022; Landika et al., 2023).

Based on these findings, the limitation of this work is considered to be the small number of observations, while future works should be based on a wider database using data from every country in the Western Balkans, from the premises of the bases of reporting data of municipalities. for the primary and secondary level, while for the higher level from the ministries of education of these countries. If the reporting of public money management in these countries is delayed or incomplete, then the policy making will

be incorrect, or even the budget proposal for the following years. Therefore, countries should pay high attention to the correct management of public money and its reporting, because then the authors of the papers will draw more accurate results related to this issue.

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