The impact of health capital on economic growth in the Balkan countries

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Abstract

This study estimates the impact of health capital on economic growth in 10 Balkan countries over the 2000-2019 period. We used panel autoregressive distributed lag (ARDL) of a pooled mean group (PMG) to examine this relationship. Our results revealed that economic growth responds to short-term and long-term health capital changes. Estimation results indicate a positive relationship between health capital and the economic growth of Balkan countries. According to the results, increased health expenditure stimulates higher economic growth and development. The findings imply the need to formulate policies that assign higher priority to the healthcare sector, which would help sustain future economic growth in Balkan countries.

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Introduction

As a key aspect of economic development, healthcare has been a subject of increasing interest amongst academics and policymakers. Recently, countries worldwide have recorded increased health spending, reflecting the intention of economic development and improving life quality (Wang, 2011). The importance of health has been particularly accentuated in endogenous growth models (Romer, 1986; Lucas, 1988; Romer, 1999) as a healthier population implies higher productivity which leads to higher income per capita (Piabuo et al., 2017). Investing in health, considered capital, increases the productivity of all production factors, leading to overall economic growth and prosperity (Atilgan et al., 2017).

The relationship between health capital (measured by health expenditure and healthcare indicators) and economic growth has always intrigued scholars, to a greater or lesser degree. Different results are obtained depending on the applied methodology, the period, and countries or groups of countries analysed; thus, there is no unanimous opinion on the relationship between these variables. On the one hand, there are studies claiming that an increase in health capital does not accelerate economic growth (e.g., Kar et al., 2003; Yumuşak et al., 2009; Ashraff et al., 2009; Cervellati et al., 2011), while on the other hand there are studies confirming the role of health capital, as the most significant component of human capital in stimulating economic growth (e.g., Huang et al., 2008; Arısoy et al., 2010; Atilgan et al., 2017; Isreal Akingba et al., 2018; Piabuo et al., 2017).

The relationship between health capital and economic growth is crucial for developing countries like Balkan countries. These countries show large differences in economic development; however, they share some common characteristics, including similar health systems. Health systems in most Balkan countries are characterized by mandatory national health insurance, while most healthcare institutions are publicly owned (Dankó et al., 2014). During communism, health systems were based on universal health coverage, which proved difficult to preserve; thus, many countries tried to rationalize publicly funded health services through patient cost-sharing or decreasing the scope of basic benefits (Konatar et al., 2021). However, while major improvements in European health systems occurred during the last 30 years, most countries of the Balkan region are lagging, with health sectors operating dysfunctionally (Levett & Kyriopoulos, 2006). In absolute terms, health expenditures per capita in all countries showed significant growth, comparing 2000 and 2019 (the highest average health spending per capita was recorded in Greece in the amount of 2235 purchasing power parity dollars, while the lowest was recorded in Albania amounting to 475 purchasing power parity dollars). Nevertheless, the average share of total health expenditures in GDP for the analysed countries (7.1%) is much lower than in developed countries of the European Union (10%).

From a policy perspective, it is very important to understand the relationship between health capital and economic growth in developing countries, particularly the Balkan countries. This is because these countries need implementation policies that would increase health expenditure as an important precondition for a healthier and more productive population to improve economic growth (Atilgan et al., 2017).

The main objective of this study is to determine the impact of health capital on economic growth in 10 Balkan countries. We used panel autoregressive distributed lag (ARDL) of a pooled mean group (PMG) to examine this relationship. To our best knowledge, this may be the first study of this kind to empirically investigate the impact of health capital on economic growth in this set of countries. Additionally,

our study captures long- and short-run dynamics of health capital and economic growth.

The paper was structured as follows: after the introductory notes, we presented the applied methodology and data used. The next section presents the empirical results and discussion, while the conclusions drawn are offered in the final, fourth section of the paper.

Methodology and Data

Our basic regression framework builds upon a simple neo-classical growth model to estimate the impact of health capital on economic growth in Balkan countries. Based on Mankiw et al. (1992), the economic growth model is specified as

$$Y_{it} = f\,(H_{it,}C_{it}, L_{it})Y_{it} = f\,(H_{it,}C_{it}, L_{it}) \quad (1)$$

Where Y is economic growth measured by GDP per capita, H is the level of health capital measured by health expenditure per capita, K is the stock of physical capital measured by gross fixed capital formation, and L represents labor measured by the total labour force in a country.

This study included annual data from 2000 to 2019 for 10 Balkan countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, North Macedonia, Montenegro, Romania, Serbia, and Turkey). Data for health expenditure per capita (expressed in 2018 purchasing power parity dollars) was collected from the World Health Organization (National Health Accounts, NHA). Data for GDP per capita (expressed in 2018 purchasing power parity dollars), gross fixed capital formation (expressed as a percentage of GDP), and total labour force were collected from the World Development Indicators (WDI) of the World Bank. All variables except for gross fixed capital formation were transformed into their natural logarithmic forms for modeling purposes.

To determine the relationship between economic growth and health capital, we used a panel autoregressive distributed lag model (ARDL), which distinguishes between short- and long-term dynamics. Additionally, this method does not restrict variables of interest to be integrated in the same order. To provide consistent estimates of the parameters' averages despite the possible presence of endogeneity, it is possible to use pooled mean group (PMG) and mean group (MG) techniques. The PMG restricts long-run equilibrium to be homogenous across countries while allowing heterogeneity for the short-run relationship. On the other hand, the MG estimator allows for heterogeneity in the short-run and long-run relationship (Pesaran et al., 1999). In this study, we used the PMG estimator since, in a relatively small cross-section of data (10 countries), the PMG is less sensitive to the existence of outliers (Pesaran et al., 1999).

The panel form of ARDL (p, q_1,..., q3), proposed by Pesaran et al. (1999), is presented as:

$$lnY_{i,t} = \sum_{j=1}^{p} \lambda_{ij}\ lnH_{i,t-j} + \sum_{j=0}^{q} \delta'_{ij}\, X_{i,t-j} + \mu_i + \varepsilon_{i.t}\,, \quad (2)$$

where i=1,2,..., ten stands for the country; t=1,2,..., 20 for the period; lnY_{it} for the dependent variable, which represents the natural logarithm of GDP per capita; *X* for the vector of explanatory variables (lnH_{it}, which represents the natural logarithm of health expenditure per capita; c_{it} which presents the gross fixed capital formation as

a share in GDP and lnl_{it} representing natural logarithm of the total labor force); μ_i standing for fixed effects and $\varepsilon_{i,t}$ as the disturbing component.
In a panel error correction (EC) representation, equation (2) is formulated as follows:

$$\Delta lnY_{i,t} = \phi_i\left(lnY_{i,t-1} - \theta_i' X_{i,t}\right) + \sum_{j=1}^{p-1} \lambda_{ij}^{*} \Delta lnY_{i,t-1} + \sum_{j=0}^{q-1} \delta'^{*}_{ij} \Delta X_{i,t-1} + \mu_i + \varepsilon_{i.t}. \quad (3)$$

where θ_i' measures the long-run impact of the explanatory variables on economic growth and $\phi_i$represents the error-correction mechanism impact which estimates the speed of adjustment for any deviation from the long-run relationship. The remaining parameters (λ_{ij}^{*} and δ'^{*}_{ij}) represent the individual short-run coefficient of the lagged dependent and independent variables.

Empirical Results and Discussion

Before conducting the empirical analysis, it is important to check if the data exhibits cross-sectional dependence using the Pesaran test for cross-sectional dependence (Pesaran, 2004). If cross-sectional dependence is confirmed, second-generation techniques should be used in the consecutive analysis. The test outcomes are shown in Table 1. Results revealed the presence of cross-sectional dependence in all variables, as the null hypothesis of cross-sectional independence was rejected in all cases.

Table 1
Pesaran test for cross-sectional dependence

Variable	CD test	p-value
lnY	28.237***	0.000
lnH	24.828***	0.000
c	7.675***	0.000
lnl	2.339**	0.019

Note: *** and ** indicate the rejection of the null hypothesis of cross-sectional independence (CD test) at a 1% and 5 % significance level, respectively.
Source: Authors' calculation

In the next stage, the stationarity tests were carried out to check the order of data integration and to ensure that no variable is integrated of order two or more. Considering the cross-sectional dependence, we used the second-generation panel test for stationarity: cross-sectionally augmented Dickey-Fuller (CADF) panel unit root test. The results of the CADF test are shown in Table 2 for levels and first differences. According to the test results, all variables are integrated in the order of 1.

Table 2
Stationarity tests

Variable	CADF		Order of integration
	Level	Difference	
lnY	-2.39	-2.9***	1
lnH	-1.53	-3.32***	1
c	-0.88	-2.37**	1
lnI	-1.623	-3.16***	1

Note: *** and ** indicate significance at 1% and 5 %, respectively.
Source: Authors' calculation

The unit root test is followed by Westerlund (2007) panel cointegration test to check the long-run equilibrium relationship between variables of interest. The null hypothesis of no cointegration was rejected at a 1 % significance level for all statistics except for G_a (Table 3), confirming the long-run equilibrium between economic growth, health capital, physical capital, and labour force.

Table 3
Westerlund cointegration test

Statistics	Value	z-value	p-value
G_t	-2.099***	-3.414	0.000
G_a	-4.668	-0.602	0.274
P_t	-6.774***	-4.421	0.000
P_a	-4.519***	-3.815	0.000

Note: *** indicates statistical significance at the level of 1%.
Source: Authors' calculation

Results of panel ARDL (1,1,1,1) were estimated through the PMG estimator. The number of lags was selected according to Akaike Information Criteria (AIC) and the Schwarz Bayesian Criteria (SBC). As seen from Table 4, the coefficient of error correction term (ECT), which shows the speed of adjustment to long-run equilibrium after a short-run shock, is negative, significant, and less than one, which confirms the results of the cointegration test regarding the long-run relationship between variables. According to the results, approximately 15.2 % of the disequilibrium from the previous year's short-run shocks converges back to the long-run equilibrium in the current year.

Long-run and short-run findings suggest that investing in health capital positively affects economic growth, implying that economic growth and health expenditures are moving in the same direction. These results are in line with the majority of studies claiming that health capital is one of the key determinants of economic growth and development (Huang et al., 2008; Arısoy et al., 2010; Atilgan et al., 2017; Isreal Akingba et al., 2018; Piabuo et al., 2017). Estimation results confirm the hypothesis that an increase in health care expenditure effectively enhances the economic growth of a country in the long run (Wang, 2011), which is a matter of the utmost importance for developing countries of the Balkans. It can be concluded that health spending is not a consumer good but rather an investing good; thus, an increase in this kind of spending would lead to an increase in the economy's overall output.

Table 4
Results for PMG estimator

Variable	Long-term estimates	Short-term estimates
lnH	0.987***	
	(0.023)	
c	0.014***	
	(0.003)	
lnI	0.286**	
	(0.160)	
ECT (-1)		-0.152***
		(0.051)
Δ lnH		0.295***
		(0.059)
Δ c		0.008***
		(0.002)
Δ lnI		-2.971
		(2.183)
Constant		-0.299**
		(0.122)
Observations (N)		190
Log-likelihood		455.257

Note: *** and ** indicate significance at 1% and 5 %, respectively. The value in parenthesis represents the standard error.
Source: Authors' calculation

The investment ratio measured as gross fixed capital formation relative to GDP has a positive and statistically significant impact on economic growth both in the long and short-term which is in line with many studies (e.g., De Long et al., 1991; Easterly and Rebelo, 1993; Lach, 2010). Even though there are opinions suggesting that increasing fixed capital could be costly and hamper economic growth (Lach, 2010), it is not the case in this region, where fixed capital has not yet reached its growth-maximizing level. Hence, increased fixed capital investment is required for Balkan countries to achieve sustainable economic growth. Additionally, an increase in the labor force has a positive and statistically significant impact on economic growth only in the long run. In contrast, in the short run, it proved insignificant, suggesting the need for longer periods for these improvements to show effect. Results indicate that an increased qualified labour force can stimulate economic growth, which other studies prove (Duval et al., 2010; Piabuo et al., 2017). Thus growth in the labor force can be perceived as one of the key determinants of the nation's potential rate of economic expansion in the Balkan region.

Conclusion

This paper analyzes the relationship between health capital and economic growth in 10 Balkan countries. To achieve our objective, we used a panel ARDL (1,1,1,1) estimated through the PMG estimator.

The cointegration test confirmed a long-run relationship between health capital and economic growth, with 15.2 % of the disequilibrium from the previous year's short-run shocks converging to the long-run equilibrium in the current year. Investing in health capital positively affects economic growth in the long and short run, implying that economic growth and health expenditures are moving in the same direction, which is in line with the majority of studies. According to this study's results,

health expenditure is a fundamental determinant of Balkan countries' economic growth, and increasing expenditure on health leads to higher growth rates.

The results obtained have significant policy implications. The Health economy has crucial importance in national policy for developing countries. The Balkan countries share similar economic and social heritage, including similar health systems. Despite major reforms, they are still lagging behind developed Western European countries. Thus, it is necessary to formulate policies that assign higher priority to the healthcare sector. Such policies would increase health spending, an important precondition of a productive population that stimulates growth and development. As investing in healthcare creates wealth, these countries must allocate more national output towards healthcare.

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