The Role of Human Capital On Economic Development in Europe & Central Asia

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Abstract

This article explores the relationship between human capital and economic development in the Europe & Central Asia region, which consists of 23 diverse countries. The article uses the Human Capital Index (HCI) as a measure of human capital, which reflects the health, education, and skills of a population. The article reviews the theoretical and empirical literature on human capital theory, which suggests that education enhances the earnings and productivity of workers and generates positive externalities for society. The article also employs a vector autoregression (VAR) model to estimate the impact of human capital on four economic indicators: education level (ET), per capita income growth rate (PG), literacy rate (LR), and greenhouse gas emissions (GEE). The article finds that human capital has a positive and significant effect on itself and a negative and significant effect on PG and LR, but no significant effect on GEE. The article concludes that human capital is an important factor for economic development, but its effects vary depending on the indicator and the context. The article recommends that policy makers adopt a comprehensive and context-specific approach to invest in human capital and enhance its outcomes.

Keywords: Human capital, Economic development, Europe & Central Asia region
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Background

The 23 nations that make up Europe and Central Asia span the economic spectrum from advanced to developing. According to the Human Capital Index (HCI), which takes into account a population's health, education, and skills, the area has made great strides in human capital development. A child born in the region today has a 74% chance of reaching his or her full potential, as reported by the World Bank in its HCI 2020 report1. This is second highest among all areas and above the worldwide average of 0.56. (Andrews et al., 2019).

Human capital is the stock of skills and productive knowledge embodied in people. It is one of the most important factors that influence economic growth and development, as it affects the productivity, innovation, and competitiveness of a country. Human capital can be enhanced by investing in education, health, training, and other activities that improve the abilities and well-being of individuals and society (Widarni & Bawono, 2021; Rusminingsih, Askar,Mutia, Fitria, Wahyudi, 2023).

Adam Smith, among other early economists, understood the value of an educated and skilled workforce to a nation's economy, giving rise to the notion of human capital. However, the human capital theory and the estimation of the returns to education and experience were not developed

until the latter half of the twentieth century, thanks in large part to the work of Schultz (1961), Becker (1964), and Mincer (1974) (Psacharopoulos & Patrinos, 2018).

According to the human capital theory, education increases the earnings and productivity of workers by enhancing their skills and knowledge. Moreover, education also generates positive externalities, such as spillover effects, social cohesion, and civic participation. Therefore, investing in human capital is not only beneficial for individuals but also for society as a whole (Montiel et al., 2021; Irawan, Sasongko, Mukhlis, Yanto, & Wulandari, 2022).

Human capital has been shown to contribute to economic growth in several empirical studies. Human capital, as assessed by levels of schooling and standardised test scores, has been shown to have a beneficial impact on economic growth at the international level (Barro, 1998; Priyanto, Widarni, & Bawono, 2022). Human capital, as measured by secondary school enrolment and literacy rates, has a beneficial effect on both the level and the growth rate of per capita income, as shown by Benhabib and Spiegel (1994) (Siddiqui & Rehman, 2017; Sasongko, Nehruddin, Musriyatun, Siswanto, 2023).

However, human capital is not only a matter of quantity but also of quality. The quality of human capital depends on various factors, such as the quality of education, health, nutrition, environment, institutions, and culture. These factors affect not only the cognitive abilities but also the non-cognitive abilities of individuals, such as motivation, creativity, resilience, and social skills. These abilities are essential for adapting to changing economic conditions and for fostering innovation and entrepreneurship (Erlyn et al., 2022).

Therefore, human capital development requires a holistic approach that considers both the supply and the demand sides of the labor market. On the supply side, policies should aim at providing universal access to quality education and health services, as well as promoting lifelong learning and skill upgrading. On the demand side, policies should aim at creating an enabling environment for innovation and job creation, as well as ensuring decent work conditions and social protection (Global Strategy on Human Resources for Health: Workforce 2030, n.d.).

Human capital development is especially relevant in the context of globalization, digitalization, and environmental challenges. These phenomena pose new opportunities and threats for economic development and require new skills and competencies for workers and citizens. For example, globalization increases trade and integration but also competition and inequality; digitalization enhances productivity and connectivity but also automation and polarization; environmental challenges require sustainability and adaptation but also mitigation and cooperation (Hecklau et al., 2016).

Human capital development should be in sync with the United Nations' sustainable development goals (SDGs), which were approved in 2015, in order to meet these difficulties and capitalise on their opportunities. By setting a deadline of 2030, the SDGs give a comprehensive plan for attaining equitable and sustainable growth. Quality education (SDG 4), excellent health and well-being (SDG 3), decent employment and economic growth (SDG 8), and decreased disparities (SDG 10) are the four goals most closely connected to human capital. These objectives support one another and are interdependent (Purcell et al., 2019).

Research Method

We proxied Population Growth, Literacy Rate, with Government Expenditure on Education variable. For the Employers in total. We use secondary data from the world bank. Our research period is from 2000 to 2020. We use the following equation:

$$ET_t = \beta_0 + \beta_1 PG_t + \beta_2 LR_t + \beta_3 GEE_t + e_t \quad \text{eql 1}$$

$PG_t = \beta_0 + \beta_1 ET_t + \beta_2 LR_t + \beta_3 GEE_t + e_t$ eql 2
$LR_t = \beta_0 + \beta_1 ET_t + \beta_2 PG_t + \beta_3 GEE_t + e_t$ eql 3
$GEE_t = \beta_0 + \beta_1 ET_t + \beta_2 PG_t + \beta_3 LR_t + e_t$ eql 4

Description:
ET : Employers in total
PG : Population growth
LR : Literacy rate
GEE : Government expenditure on education
β : the magnitude of the effect of causality
e = Error term
t = Time period
eql: equation

Table 1. Variable Description

Variable	Explanation	Data type	Source
Employers in total	Employers are individuals who, either on their own or in partnership with others, perform work properly classified as "self-employment jobs" (i.e., work in which payment is directly tied to the profits made from the sale of goods or provision of services) and who have continuously engaged one or more individuals to perform work properly classified as "employee."	Percent	World Bank
Population growth	The annual growth rate of the population in year t is the percentage increase in the population from the middle of Year t-1 to the middle of Year t represented as an exponential. All people living in a given area are included in the population count regardless of their	Percent	World Bank

	immigration status or citizenship status, as this is the de facto definition of population.		
Literacy rate	Literacy among adults is measured by the proportion of those aged 15 and up who can read and write clearly enough to comprehend a brief, generic statement about everyday life.	Percent	World Bank
Government expenditure on education	Spending on education by the government as a whole (including current and capital expenditures as well as transfers) is reported as a percentage of GDP. It includes government spending that was paid for by foreign aid. The term "general government" is commonly used to encompass all levels of administration.	Percent	World Bank

Result and Discussion

Table 2. Root Test Results

Variabel	Unit Root	Statistics for the Augmented Dickey Fuller	Probability	Description
Employers in total (ET)	Level	0.069551	0.9547	Tidak Stationary
	First Different	-3.313842	0.0287	Stationary
Population growth (PG)	Level	-1.932038	0.3120	Tidak Stationary
	First Different	-3.218987	0.0347	Stationary
	Level	-2.026763	0.2739	Tidak Stationary

Literacy rate (LR)	First Different	-3.328879	0.0279	Stationary
Government expenditure on education (GEE)	Level	-3.673395	0.0133	Stationary
	First Different	-2.545919	0.1219	Tidak Stationary

*the limit value used at the significance level of 0.05

Based on the findings shown on Table 2. The fact that ET, PG, LR and GEE stationary data are not at the same level, so that the first differencing is put into action. The results of the first differencing show that the data is stationary with a probability value < 0.05. After knowing the stationarity of the data held, then testing is carried out to calculate the best lag duration to utilize. The method used determining the optimal lag duration LogL, LR, FPE and AIC. The smaller the value of LogL, LR, FPE, AIC, the lag is the most optimum lag. The outcomes of the test are shown on the next table

Table 3. Maximum Lag Test

Lag	LogL	LR	FPE	AIC
0	44.96505	NA	1.96e-07	-4.096505
1	119.4812	111.7742*	5.87e-10*	-9.948117*

Table 3. Shows the optimum lag testing of the VAR model using the LogL, LR, FPE and AIC criteria. Based on these results, it is known that the optimum model is found in Lag 1 because the LogL, LR, FPE and AIC values in Lag 1 are the smallest compared to the previous Lag.

Table 4. Cointegration Test

Hypothesized at Most	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability
None	0.689744	23.40718	27.58434	0.1568
1	0.478217	13.01007	21.13162	0.4513
2	0.285678	6.728425	14.26460	0.5217
3	0.055671	1.145604	3.841466	0.2845

* Max-eigenvalue test indicates no cointegration at the 0.05 level

The cointegration test results are shown in table 4 above explain that all probability value is above 0.05. It means all the probabilities are not significant. Analysis of VAR for identify connection among the researched variables studied that one variable have influence other variables in short term. The coefficients on the VAR analysis can be used to determine the influence between variables. If the coefficient value is less than the t-statistic value, then there is an influence relationship between these variables.

Table 5. VECM Estimation Results

	D(ET)	D(PG)	D(LR)	D(GEE)
D(ET(-1))	0.447595	-1.005010	0.525534	2.048498

	(0.35260)	(0.63067)	(0.60158)	(1.36572)
	[1.26940]	[-1.59355]	[0.87358]	[1.49994]
D(PG(-1))	0.279672	0.932977	-0.091930	0.940999
	(0.16176)	(0.28933)	(0.27598)	(0.62654)
	[1.72893]	[3.22466]	[-0.33310]	[1.50190]
D(LR(-1))	-0.194609	-0.478177	1.112224	1.537795
	(0.19300)	(0.34520)	(0.32928)	(0.74753)
	[-1.00835]	[-1.38522]	[3.37778]	[2.05717]
D(GEE(-1))	0.042293	0.032834	0.105152	-0.163852
	(0.09359)	(0.16740)	(0.15968)	(0.36251)
	[0.45189]	[0.19614]	[0.65851]	[-0.45199]
C	10.44205	11.04911	-3.404875	-37.95744
	(5.23625)	(9.36562)	(8.93365)	(20.2813)
	[1.99419]	[1.17975]	[-0.38113]	[-1.87155]

Considering what the VAR analysis revealed, could be said that relationship between ET and ET has a positive significant impact because the coefficient value's at 0.447595, this value less than the 1.26940 t-statistic's value. Significant correlation exists between ET and PG, meaning that the two variables related to each other because the coefficient value is at -1.005010 less than the -1.59355 t-statistic value. The significant correlation also found exists between ET and LR, because the coefficient value is at 0.525534 less than the 0.87358 t-value statistic. The unsignificant association between ET and GEE was spotted, we found that the coefficient value is at 2.048498 more than the 1.49994 t-value statistic.

Conclusion

The positive significant impact between ET and ET, because the coefficient value is positive (0.447595) and smaller than the t-statistic value (1.26940). This means that as ET increases, ET also increases, and this effect is statistically significant. The text also concludes that there is a significant correlation between ET and PG, and between ET and LR, because the coefficient values are negative (-1.005010 and 0.525534) and smaller than the t-statistic values (-1.59355 and 0.87358). This means that as ET increases, PG and LR decrease, and these effects are statistically significant. However, the text concludes that there is no significant association between ET and GEE, because the coefficient value is positive (2.048498) and larger than the t-statistic value (1.49994). This means that there is no clear relationship between these two variables, or that the relationship is too weak to be detected by the VAR analysis.

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