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GRANGER CAUSALITY BETWEEN LIFE EXPECTANCY, EDUCATION AND ECONOMIC GROWTH IN OECD COUNTRIES

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Abstract
A series of researchers have discussed the relationship between human development index and economic growth since Mercantilist times. Education, health and life expectancy are some of the most commonly used indicators of the human development index. This study examines the higher education schooling rate, economic growth and life expectancy at birth in 10 selected OECD countries, using data from 2007-2013. A panel causality test is conducted to reveal the relationship between higher education schooling rate, life expectancy at birth and economic growth, showing a unidirectional causality relationship from economic growth to higher education schooling rate and life expectancy at birth.

Keywords: Schooling Rate, Life Expectancy at Birth, Economic Growth, Panel Causality Test

JEL Classification: C12, C23, I15, I25

1. Introduction

Human development is the process of expanding people's choices and enhancing their standard of living, including providing access to healthcare and education, political freedom, secure human rights, and personal respect (UNDP, 1990). An increase in the quality of life of individuals plays an important role in increasing economic activity. Indeed, the fact that a country is economically developed means that its residents' health and education options also improve.

The human development index (HDI), first developed in 1990 by Pakistani economist Mahbub ul Haq (Haq, 2011), has been submitted each year since 1993 in the United Nations Development Report. Despite the rapidly increasing production volume resulting from the Industrial Revolution, decrease in quality of life the labour force have made economic growth and human development relationship questionable. The existence of a relationship between economic growth and human development have been investigated much more after 1900s.The HDI shows the improvement in economic indicators such as national income and GDP per capita. However, "real" development must be evaluated not only through income levels, but also through human factors. Indeed, according to Todaro and Smith, development should aim to (Todaro and Smith, 2012: 22-23):
(i) Increase and expand the availability of facilities such as basic life needs, food, shelter, health and protection,
(ii) Provide job opportunities along with higher income, and better education,
(iii) Place more importance on cultural and humanitarian values,
(iv) Expand the opportunities for communities to recover from slavery and dependency.

Hence, human development as the ultimate goal of development, is viewed as more than simply economic growth (Ranis and Stewart, 2005). For example, financial instability, environmental pressures and climate change have been shown to weaken human development (UNDP, 2014). Therefore, growth should not only be based on an increase in income, but should also be transformed into a form that supports human development, as measured by increased welfare, healthcare and education resources. It is known that the people living in economically developed countries have better health and life conditions. Indeed, a mutual relationship between healthcare provision and economic growth has been proven (DSEAD, 2010). Bloom et al. (2004a) considered the motivating effect of this relationship and stated that, if improved health increases the productive potential of the economy, governments must aim to increase health levels in a country. Further, the positive relationship between economic growth and life expectancy has been, determined by a large number of studies. For example, Morand (2004) explained that increases in the length of life as a consequence of economic growth result from increased healthcare investment based on rising income as a result of economic growth.

Increased welfare is another factor affecting the relationship between economic growth and human development. The fact that welfare is typically only evaluated by using GDP is widely criticized because it only shows the financial side of welfare, ignoring the quality of life and social welfare (Stewart, 1974: 18). Social and individual gains such as environmental sensitivity, quality of life and the development of social rights seem more realistic and consistent indicators since they reflect total welfare. Similarly education indirectly affects economic growth through the income distribution (Ranis, 2004). Some, empirical studies have shown that education influences health as much as income does(Feinstein et al., 2006: 173). Grossman (1972) also pointed out the positive correlation between education and health. Education can positively affect health by changing behavioral patterns. For example, education provides benefits such as better nutrition, shelter and healthcare along with increased income. Moreover, education is also influenced by income. Studies in this area show that the schooling rate increases proportional to individual income (Hanushek and Wößmann, 2007).

The studies show that the variables used to measure human development generally effect each other directly or indirectly. In the relationship between economic growth and life expectancy, determined by a high number of studies to be interrelated, it is emphasized that economic growth positively effects life expectancy. Morand (2004) explains that increases the length of life as a consequence of economic growth is due to increased healthcare investments based on increased income after economic growth. However, despite the rapidly increasing production volume resulting from the Industrial Revolution, decreases in people's quality of life have raised questions about the economic growth–human development relationship. Although this relationship has been investigated much more since the start of the 20th century, the present study aims to bridge the gap in the body of knowledge on this topic by examining the schooling rate and life expectancy at birth in 10 selected OECD countries, using data from 2007–2013.

OECD countries are a suitable sample population for our study because the OECD encourages human development- based policies with a view to increasing economic and social welfare globally (OECD, 2008). From this point of view, the contribution of our study to the literature is to put forth a scientific approach with regard to the economic prosperity concept as an objective set out by the chosen OECD countries.
In this part of the study, human development has been revised from a historical perspective. In the second part relationship between human development and economic growth is evaluated according to literature. In the third part, panel causality test is applied to selected OECD countries covering 2007-2013 period. At the final section of the article, there are political recommendations according to empirical findings.

2. Literature Review

Many studies examine the relationship between the HDI and economic growth. Human capital, which is the subject of human development index includes fundamental elements such as education, health and life expectancy. Lucas (1988) described human capital as the engine of growth, using the endogenous growth models developed by Romer (1990)that absorb technology and the exogenous growth models of Mankiw et al. (1992),who emphasized the importance of human capital taken as an exogenous variable of the production function. Fogel (1994) and Barro (2013) also, emphasized the relationship between HDI and economic growth, using variables such as GDP for economic growth and health expenditure, life expectancy and education level for human development.

We should note the reason for the importance of these three variables that represent human development index, and how successful they are in indicating human growth. For example, education is recognized as a basic human right and there is a general acceptation that a better education is effective in increasing the people's welfare. Churchill et al. (2015) stated that education spending has a positive impact on the economy. In particular, education supports business and life skills, which then stimulates economic growth (Hannum and Buchmann, 2005).Given that education increases income, its importance as a criterion for measuring the HDI is clear. Education also influences the demographic structure and healthcare provision. Razmi et al. (2012) found unidirectional causality

between health expenditure and the HDI (see also Mushkin, 1962).Previous studies have used both microeconomic and macroeconomic data to examine the relationship between health expenditure and economic growth. Life expectancy, described as living a long and healthy life (UNDP, 2015), is also considered to be an important indicator for measuring the HDI and thus examining the human development–economic growth relationship. Countries with a long life expectancy are generally economically developed countries. Thus, the existence of a relationship between economic growth and life expectancy is also generally accepted in the literature. This study examines this relationship by using the variables of economic growth (GDP), education (higher education schooling rate), and life expectancy at birth, as discussed in the following subsections.

2.1. Education and Economic Growth

Deyon (1969) indicated that Mercantilists placed importance on education as a precursor to economic and industrial growth by emphasizing the national income growth–human capital relationship. According to the Modern Growth Regime an increase in education duration decreases birth rates (Lagerlöf, 2003:766). Romer (1989) found a theoretical connection between human capital and economic growth, adding that although the change in literacy rates does not affect growth as a variable, it may explain investment rates. Barro (1991), using the school enrollment rate as an indicator of human capital, and Barro and Sala-i-Martin (1995) both found a positive relationship between education and economic growth (see also Stevens and Weale, 2003). Barro (2001) noted the importance of human capital making it easier to absorb technology from developed countries and stated that education affects GDP through the relationship between human capital and physical capital. Sylwester (2000) determined that although there is a short-term negative impact of public spending on education, it positively affects economic growth in the long-term. Hanushek and Wößmann (2007) stated that the quality of education affects personal income and thus economic growth. Likewise, Ali and Jabeen (2015) pointed out that a real GDP increase is related to primary school enrolment in Pakistan, suggesting that higher school enrolment rates have a heavy influence on economic growth. Aghion et al. (2009) found that investment in education affects economic growth, especially in industrialized countries. Asteriou and Agiomirgianakis (2001) showed a causal relationship from the enrollment rate in higher education to economic growth, while Oztunc et al. (2015) indicated that women's education has contributed to rapid economic growth in Pacific Island countries. Finally, Sims (2004) concluded that education increases labor productivity and maximizes business profits.

2.2. Life Expectancy and Economic Growth

Life expectancy has a positive impact on economic growth (Boucekkine et al. 2007; Chakraborty, 2004; Reinhart, 1999; Taban and Kar, 2006). Acemoglu and Johnson (2007) noted that although increased life expectancy may raise total income, it can trigger fast population growth and thus negatively affect per capita income. Cervellati and Sunde (2009) also expressed that increased life

expectancy in pre-transitional countries increases the population and decreases per capita income, while decreasing the population and increasing per capita income in post-transitional countries. Pritchett and Summers (1996) determined that income has a larger impact on health than do other factors.

Barro and Lee (1993) stated that higher income may increase life expectancy at birth through its effects on nutrition, health, and health services and decrease infant mortality. Turan (2009) emphasized that the increase in life expectancy in sub-Saharan Africa has had positive effects on economic growth and connected this to the low birth rates in countries with high rates of HIV. Elmi and Sadeghi (2012) stated that short-term health expenditure does not affect economic growth in developing countries, but rather that economic growth impacts on health expenditure; moreover, in the long-term, bidirectional causality exists between health expenditure and economic growth. Kunze (2014) mentioned that life expectancy increases the rate of physical capital accumulation and influences economic growth by increasing savings. Mahumud et al. (2013) pointed out that areas with a high per capita income in Bangladesh have longer life expectancy; however, Oni (2014) found that life expectancy in Nigeria between 1970 and 2010 had a negative impact on economic growth. Bloom et al. (2004b) concluded that good health significantly affects aggregate output, arguing that the life expectancy effect in growth regressions appears to be a real labor productivity effect.

3. Data, methodology and results

The aim of this study is to test whether there is a relation between human development indicators and economic growth of 10 OECD countries. This study examines the relation between human development and economic growth between 2007 and 2013 in 10 OECD countries: Belgium, Finland, France, Germany, the United Kingdom, Spain, Sweden, Switzerland, Italy and Turkey. The analysis focuses on three variables: GDP, the higher education schooling rate (SR), and life expectancy at birth (LE). All variables are logarithmic. Economic growth and schooling rate data are obtained from the OECD database and life expectancy at birth data are obtained from the World Bank database.

3.1. Panel Unit Root Tests

In time series studies, unit root tests are important for obtaining significant results from econometric analyses. Panel unit root tests have been developed by Levin and Lin (1992), Quah (1994), Im, Pesaran and Shin (1997), Maddala and Wu (1999), Choi (1999, 2001), Kao (1999), Harris and Tzavalis (1999), Hadri (1999), Levin, Lin and Chu (2002), Breitung (2000) and Harris and Sollis (2003) in the literature (Baltagi and Kao, 2000; 2).

In addition, Bhargava et al. (1982), Boumahdi and Thomas (1991), and Breitung and Wolfgang (1994) have proposed a new test for dynamic fixed effect models. The Durbin- Watson (DW) statistic is a modified version of the test statistic based on the fixed effect residuals and differentiated EKK residuals. When N approaches infinity, they suggested their own DW statistics in micro panels. Furthermore, they suggested a unit root test in a panel data model in which the N/T ratio is constant; here, the N and T values approach infinity and do not have fixed effects (Quah, 1994).

Levin and Lin (1992) improved on this model to allow fixed effects, individual determining trends, and heterogeneous serial correlation errors. Levin and Lin assumed that in all cases the limiting distributions are N→∞and T→∞.However, the convergence rates are faster as T→∞ than as N→∞ (Maddala and Wu, 1999: 632-633). Im et al. (2003) stated that the value T→∞ is followed by N→∞. A diagonal convergence result occurs with T and N→ ∞, while N/T→ k; k is a finite non-negative constant.

In our study, the stationarity of the variables is determined by using the unit root tests developed by Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS) as well as the ADF, and PP tests. These first-generation unit root tests show that the GDP, SR and LE series only have a constant and no trend. The stationarity of the general unit root process for the GDP, SR and LE series at first difference, significant at the 5% level for the LLC, IPS, ADF-Fischer, ADF and PP-Fisher tests, is presented in Table 1.

Table 1- Panel Unit Root Tests

Variables	Method	Statistic	Prob*	Statistic	Prob*
	Level	1st difference			
LGDP	Levin, Lin & Chu	-1.002	0.158	-9.142	0.000*
	Im, Pesaran and Shin W-stat	1.337	0.909	-1.941	0.026*
	ADF-Fisher Chi-square	8.845	0.984	36.658	0.012*
	PP-Fisher Chi-square	9.596	0.974	47.135	0.000*
LSR	Levin, Lin & Chu	-1.657	0.048*	-15.553	0.000*
	Im, Pesaran and Shin W-stat	0.216	0.585	-4.369	0.000*
	ADF-Fisher Chi-square	19.232	0.506	56.812	0.000*
	PP-Fisher Chi-square	32.191	0.041*	73.331	0.000*
LLE	Levin, Lin & Chu	-3.445	0.000*	-6.696	0.000*
	Im, Pesaran and Shin W-stat	0.469	0.680	-1.876	0.030*
	ADF-Fisher Chi-square	0.701	0.827	19.279	0.013*
	PP-Fisher Chi-square	15.700	0.474	25.390	0.000*

* Im, Pesaran and Shin; ADF-Fisher and PP-Fisher- Null Hypothesis: Unit root (Individual unit root process), Levin, Lin & Chu Test- Null Hypothesis: Unit root (Common unit root process).Automatic lag length selection based on Modified Schwarz Criteria and Bartlett Kernel.

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3.2. Panel Cointegration Test

The panel cointegration test is then conducted to test the existence of a long-term relationship between the examined variables. One of the most frequently used tests in the literature is the Pedroni cointegration test.This test allows for heterogeneity in the cointegration vector, as well as different cointegrated vectors between sections under the alternative hypothesis. Pedroni cointegration is based on the Engle-Granger method. Its most general form is as follows (Pedroni, 2004: 599);

$$y_{i,t} = \alpha_i + \delta_{it} + \beta_{1i}X_{1i,t} + \beta_{2i}X_{2i,t} + \cdots + \beta_{Mi}X_{Mi,t} + e_{i,t} \quad (1)$$

t=1,…, T ; i=1,…, N ; m=1,2,…, M

for a time series panel of observables y_{it} and X_{it} for members i=1,…,N, where t=1,…, T indicates the total number of observations during the time period and m=1,2,…, M indicates the number of variables in the regression. The parameters α_i and δ_i allow for the possibility of member specific fixed effects and deterministic trends, respectively. The existence of a cointegration relationship between the variables is tested through the stationarity of the error terms above.

For the non-parametric statistics estimate (Pedroni, 1999: 659):

$$\hat{e}_{i,t} = \hat{\gamma}_i \hat{e}_{i,t-1} + \hat{u}_{i,t} \quad (2)$$

For the non-parametric statistics estimate (Pedroni, 1999: 662):

$$\hat{e}_{i,t} = \hat{\gamma}_i \hat{e}_{i,t-1} + \sum_{k=1}^{K_i} \hat{\gamma}_{i,k} \Delta\hat{e}_{i,t-k} + \hat{u}^*_{i,t} \quad (3)$$

The H_0 hypothesis indicates no cointegration for all units, and the H_1 hypothesis indicates cointegration for all units. The alternative hypothesis does not assume a common first order autoregressive coefficient for all units and its test statistics have a normal distribution.

$$\frac{X_{N,T} - \mu\sqrt{N}}{\sqrt{v}} \Rightarrow N(0,1) \quad (4)$$

$X_{N,T}$is the form of the test statistic. The μ and v values correspond to the mean and variance of the test, respectively (Pedroni, 1999: 665). The Pedroni cointegration test results indicating a long-term relationship between the variables are shown in Table 2.

Table 2- Pedroni Cointegration Tests

Model 1: $LGDP_{it} = \alpha_{it} + \beta LSR_{it} + u_{it}$

			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	0.1277	0.4492	-0.3034	0.6192
Panel rho-Statistic	-0.1974	0.4218	-0.2617	0.3968
Panel PP-Statistic	-5.4182	0.0000	-6.0404	0.0000
Panel ADF-Statistic	-3.5495	0.0002	-5.8336	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	0.6661	0.7473
Group PP-Statistic	-8.5434	0.0000
Group ADF-Statistic	-6.5827	0.0000

Model 2: $LGDP_{it} = \alpha_{it} + \beta LLE_{it} + u_{it}$

			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	-1.8956	0.9710	-1.9212	0.9727
Panel rho-Statistic	0.1672	0.5664	-0.1208	0.4519
Panel PP-Statistic	-5.5924	0.0000	-6.0918	0.0000
Panel ADF-Statistic	-9.6823	0.0000	-8.8722	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.5291	0.9369
Group PP-Statistic	-6.8874	0.0000
Group ADF-Statistic	-11.1079	0.0000

Model 3: $LSR_{it} = \alpha_{it} + \beta LLE_{it} + u_{it}$

			Weighted	
Statistic	Prob.	Statistic	Prob.	
Panel v-Statistic	1.7284	0.0420	1.2081	0.1135
Panel rho-Statistic	-0.2582	0.3981	-0.8465	0.1986
Panel PP-Statistic	-3.2051	0.0007	-4.8363	0.0000
Panel ADF-Statistic	-4.3088	0.0000	-4.2969	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

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	Statistic	Prob.	
Group rho-Statistic	0.8541	0.8035	
Group PP-Statistic	-5.2448	0.0000	
Group ADF-Statistic	-7.1880	0.0000	

H_0= No cointegration
H_1= Cointegration

The above hypothesis testing statistics are greater than $Z_{0.05}$=1.96. Model 1investigates the long term relationship between economic growth and the schooling rate, Model 2 investigates the long term relationship between economic growth and life expectancy at birth, and Model investigates the long term relationship between the schooling rate and life expectancy at birth. The probability values in Table 2 for, panel PP, panel ADF, group PP and group ADF are significant at the 5% level, confirming the long term relationship between the variables GDP and SR, GDP and LE, SR and LE.

3.3. Granger Causality Test

Series in practice may have deterministic elements and are not necessarily covariance stationary. Hence, we also investigate the causality between the variables as follows (Şen et al., 2015:9):

$$GDP_{1t} = \alpha_{11} + \sum_{l=1}^{P_1} \beta_{11l} GDP_{1t-l} + \sum_{l=1}^{P_1} \delta_{11l} SR_{1t-l} + \sum_{l=1}^{P_1} \varphi_{11l} LE_{1t-l} + \varepsilon_{11t} \quad (5)$$

$$GDP_{Nt} = \alpha_{1N} + \sum_{l=1}^{P_1} \beta_{1Nl} GDP_{Nt-l} + \sum_{l=1}^{P_1} \delta_{1Nl} SR_{Nt-l} + \sum_{l=1}^{P_1} \varphi_{1Nl} LE_{Nt-l} + \varepsilon_{1Nt}$$

$$SR_{1t} = \alpha_{21} + \sum_{l=1}^{P_2} \beta_{21l} GDP_{1t-l} + \sum_{l=1}^{P_2} \delta_{21l} SR_{1t-l} + \sum_{l=1}^{P_2} \varphi_{21l} LE_{1t-l} + \varepsilon_{21t} \quad (6)$$

$$SR_{Nt} = \alpha_{2N} + \sum_{l=1}^{P_2} \beta_{2Nl} GDP_{Nt-l} + \sum_{l=1}^{P_2} \delta_{2Nl} SR_{Nt-l} + \sum_{l=1}^{P_2} \varphi_{2Nl} LE_{Nt-l} + \varepsilon_{2Nt}$$

$$LE_{1t} = \alpha_{31} + \sum_{l=1}^{P_3} \beta_{31l} GDP_{1t-l} + \sum_{l=1}^{P_3} \delta_{31l} SR_{1t-l} + \sum_{l=1}^{P_3} \varphi_{31l} LE_{1t-l} + \varepsilon_{31t} \quad (7)$$

$$LE_{Nt} = \alpha_{3N} + \sum_{l=1}^{P_3} \beta_{3Nl} GDP_{Nt-l} + \sum_{l=1}^{P_3} \delta_{3Nl} SR_{Nt-l} + \sum_{l=1}^{P_3} \varphi_{3Nl} LE_{Nt-l} + \varepsilon_{3Nt}$$

where N is the number of countries in the panel (i=1,2,3,…,N), t is the time period (t=1,2,3,…,T) and "l" is the lag length. The error terms ε_{1Nt}, ε_{2Nt}, ε_{3Nt} are supposed to be white-noise (i.e., they have zero means and constant variances) and may be correlated with each other for a given country. The Granger causality test results indicating the causality between the variables are shown in Table 3.

Table 3- Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
ΔLGDP does not Granger cause ΔLSR	40	4.6794	0.0158
ΔLSR does not Granger cause ΔLGDP		14.6129	2.E-05
ΔLLE does not Granger cause ΔLSR	40	0.5373	0.5890
ΔLSR does not Granger cause ΔLLE		0.3093	0.7359
ΔLLE does not Granger cause ΔLGDP	40	0.3736	0.6910
ΔLGDP does not Granger cause ΔLLE		3.4658	0.0423

The results in Table 3 can be interpreted as follows.

For GDP-SR:

H_0 (GDP does not cause SR) is rejected since the probability value is not significant at the 5% level. This means that there is unidirectional causality from GDP to SR.

For GDP-LE:

H_0 (GDP does not the cause of LE) is also rejected, again implying unidirectional causality from GDP to LE. These results suggest the existence of a relationship between the HDI and economic growth. The higher the economic development of a country, the higher are improvements in education and health. When the economy is growing, investment in health and education thus rises.

At the end of this study similar studies made within the literature; Pritchett and Summers (1996) confirm the influence of income on the health. Taban and Kar (2006)show that the economic growth increases the lifetime. Elmi and Sadeghi (2012)point out that, in developing countries, short-term health expenditures don't have any effect on economic growth, whereas the economic growth has an impact on health expenditures. Mahumud et al. (2013)emphasize that high income per capita also increase the life expectancy. Barro and Lee (1993) find that a higher income can increase the life expectancy at the birth and reduce the infant mortality by having positive effect on the nutrition and health services. Boucekkine et al. (2007), Asteriou and Agiomirgianakis (2001) in their works have found similar results. Hanushek and Wößmann (2007)emphasize the influence of income on the education which, in turn, has an impact on the economic growth. Barro (1991)has found out that bidirectional relationship between the education and economic growth.

Chakraborty (2004), Turan (2009), Boucekkine et al. (2007) have found out, as different from our study, that the life expectancy also has a positive effect on the economic growth. Aghion et al. (2009), Sylwester (2000) and Oztunc et al. (2015) emphasize that the education contributes to the economic growth. Whereas our study reveals only unidirectional causality as from the economic growth towards the schooling rate and the life expectancy at the birth. The relationship works conversely.

4. Conclusion

This study analyzed annual time series data from 10 OECD countries (Belgium, Finland, France, Germany, the United Kingdom, Spain, Sweden, Switzerland, Italy, Turkey)during 2007-2013.It used a panel causality test to examine the relations among the higher education schooling rate, life expectancy at birth and economic growth, finding unidirectional causality from economic growth to the schooling rate as well as from economic growth to life expectancy at birth. Our findings concur with those of some studies, but differ from those of others. Pritchett and Summers (1996), Taban and Kar (2006), Elmi and Sadeghi (2012), Mahumud et al. (2013), Barro and Lee (1993), Boucekkine et al. (2007), Asteriou and Agiomirgianakis (2001) in their works have found similar results, Hanushek and Wößmann (2007), Aghion et al. (2009), Oztuncet al. (2015), Sylwester (2000), Cervellati and Sunde (2009) have found different results in their studies.

Investment increases the economic development status of a country. In particular, health and education expenditure leads to an increase in residents' quality of life. For example, investment in education generates a higher quality labor force, which raises productivity and encourages further economic growth, thereby creating a more peaceful social environment. Increased life expectancy in society also increases the accumulated physical capital in the economy, which stimulates economic growth. If the growth in the economy is channeled to investment in education and health, countries are in a better position to improve their human development indicators. Economic growth and increases in health expenditure also affect life expectancy positively, contributing to the creation of a healthier and more productive workforce. Furthermore, showed that economic growth increases the schooling rate of higher education, which includes information about the quality of growth. This finding confirms the role of education in building occupational expertise, which increases the expectation of future growth for forthcoming generations.

On the other hand, while the results take a look at the relation between economic growth and human development, they stress the importance of the most important indicators of human capital like education and health on economic. On the other hand, while the results take a look at the relation between economic growth and human development, they stress the importance of the most important indicators of human capital like education and health on economic growth. Furthermore, another result- in which economic growth was shown to cause increasing the schooling rate of higher education- includes information about the quality of growth. When we look from this perspective and think about the role of education in building occupational expertness, it is seen that the growth in the period in question encourages expertness in business. This increases the

expectation of a more qualified growth for the next generations. Economic growth and increase in health expenditures affect positively the life expectation and contribute to the creation of a healthier and more productive human capital. As it is expected in education, it is also expected to contribute positively to the quality of the growth for the next generation.

Based on this results, the suggestion of the article is that works focused on nurturing occupational staff should be done for the selected sectors of education that are necessary for the qualified growth. In this respect, applied to the selected sectors or regions by the states for realizing the targeted growth, such incentive policies as tax incentives, financial conveniences and subsidies should be applied also in the field of education for the increase in qualified human capital and occupational expertness. Another suggestion is that positive effect of the economic growth on the life expectation should be sustainable. More specifically, the increase in the health expenditures is not only important as a separate indicator by itself, but correct management of the health expenditures is also important. While making the health investments, efficiency of the investments should be increased by keeping away from the political concerns. For example, regional solutions should be found for the form and quality of the investments by taking into consideration of population, geographical position and regional disturbances.

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