# *Human Capital and Economic Growth in Albania*

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## Abstract

*Human resource development is one of the necessary conditions for all kinds of growth: social, political, cultural, or economic. The concept that investment in human capital promotes economic growth actually dates back to the time of Adam Smith (1776) and the early classical economists who emphasized the importance of investing in human capital. Sustained economic growth accompanied with social development is one of the notable macroeconomic objectives of every country and in this regard human capital is deemed as an essential ingredient. In this study, the relationship between education and health that are accepted as a proxy for human capital and economic growth is tested empirically. The study aimed at decomposing the relationship between human capital (using expenditure on education and life expectancy as a proxy) and economic growth in Albania over the period 1990-2014 using modern econometrics technique. In this model, gross domestic product (GDP real) is based on the Cobb Douglas form, which is the function on three variables: Real Gross Domestic Product (GDP), Expenditure on Education (EDU) and Life Expectancy (LE). The study uses Ordinary Least Squares (OLS). Long-run relationship among variables is confirmed through Johnson co-integration analysis. The finding indicates that in the long run investment on education and health would affect further economic growth. The empirical results support the main hypothesis of this study that human capital affects positively economic growth in Albania.*

**Keywords:** *Economic growth; Human capital; Expenditure on Education; Causality Tests*

## Introduction

Human capital refers to the "knowledge, skills, competence and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being" (OECD, 2001:17). Recent growth literature has given more emphasis to the consequence of human capital in economic growth and development. Economic growth and development theorists argued that human capital has a considerable effect on economic growth and development (Kefela and Ren, 2007). For example, according to Harbison (1971) wealth of a nation is critically determined by its level of human capital. For him, differences in the level of socio-economic development across nations is determined not so much by natural resources and the stock of physical capital but by the quality and quantity of human resources. In the same way, Lucas (1988); Romer (1990); Mankiw, Romer, and Weil (1992), argued that human capital is fundamental so as to increase the productivity of labor and physical capital. In addition, ILO report (2003) states that, "the knowledge and skills endowment of a country's labor force, rather than its physical capital, determines its economic and social progress, and its ability to compete in the world economy". In other terms, human capital is the main source of knowledge and a guide for the implementation of this knowledge in the production process.

Even though there is an argument on the importance of human capital for economic growth of any country, it is still controversial that what factors should be considered as human capital and how to measure it. In most of the studies education or health related indicators are employed as a proxy for human capital. Like other countries, Albania has devoted much resource and efforts to the education and health sectors anticipating productivity improvement of the citizens and thereby economic growth. These resources are cost to the society not only because they are economic resources but also because they have alternative uses. Therefore, investigating the relationship between human capital and economic growth may be a big concern to policy makers and even to the society.

## Scope and objectives of the study

This study examines the long run as well as the short run relationship between human capital formation and economic growth in Albania between 1990 and 2014. Despite the fact that human capital formation includes education, training, health, social capital, and more, the study confines itself by considering expenditure on education and life

expectancy as a proxy for human capital development. The core objective of the study is to examine the causal and co-integration relationships between human capital and economic growth in Albania. Under this specific objectives of the study are:

- To examine the short run as well as long run relationships between economic growth and health in Albania
- To examine the short run as well as long run relationships between economic growth and education in Albania

## Research question, hypothesis and methodology of the study

### *Research questions*

1. Does human capital development have a significant long-run and short-run impact on economic growth in Albania?
2. Is there a causal relationship between human capital development and economic growth in Albania?

### *Hypothesis*

$H_0$: Human capital has a significant impact on economic growth in Albania.

### *Methodology of the study*

Different scholars have designed different conceptual frameworks that incorporate human capital as one of the determinant factor of economic growth. Among those scholars, Mankiw, Romer and Weil (1992) and Weil (2009) has accommodated human capital as an independent factor of production in their empirical analysis. Referring to the model developed by Romer (1990), human capital (education and health) is considered as independent factor of production. This is presented in Cobb-Douglas production function with constant returns to scale as:

$$GDP = \alpha\, EDU^{\beta 1}\, LE^{\beta 2}\, \mu$$

Where GDP is defined as gross domestic product (output), $\alpha$ is the total factor productivity; EDU is government total expenditure on education; LE is life expectancy; $\beta_1$ and $\beta_2$ are the constant elasticity coefficients of education and health. The logarithmic conversion of the equation above yields the structural form of production function as:

$$LogGDP = Log\alpha + \beta_1 LogEDU + \beta_2 LogLE + Log\mu$$

Where LogGDP = Log of Gross Domestic Product; Log$\alpha = \beta_0$ is the intercept; LogEDU = Log of total government expenditure on education defined by recurrent and capital expenditure; LogLE = Log of life expectancy; Log$\mu$ = Log of white noise error term which is assume to be 1.

Apriority Expectation: $\beta_0 > 0$, $\beta_1 > 0$, $\beta_2 > 0$.

The study uses the multiple regression analysis, OLS technique. Secondary data, collected from World Bank Database are processed with Eviews.

## Theoretical and empirical literature review

Before the human capital theories come to literature, an economy is mostly believed to depend only on physical capital and labor. Investment in capital equipment was largely assumed the dominant factor of output. For instance, the classical theorists give much focuses on the exploitation of labor by capital. However, after 1950s some modern economists come and formally treat education and health as the key factors in improving human capital and thereby increasing economic progress (Kern, 2009).

### *Human capital and neoclassical growth theories*

Schultz (1961) and Becker (1962) are among the first human capital theorists. According to them, education augments individual's skill and thus his or her human capital. A higher skill level in the workforce increases the production capacity. Spence (1973) perceived education as a market signal for the potential productivity of workers. It also serves as a screening tool to select potential workers that can be trained for specific jobs more quickly and at a lower cost than their counterparts. But their argument was not practically incorporated in to economic growth theories until the standard neoclassical growth model was revised by Mankiw, Romer, and Weil in 1992. These scholars have used a Cobb-Douglas production function to reexamine the Solow growth model. Generally, neoclassical growth theory argues that long-term economic growth is determined solely by the accumulation of factor inputs such as physical capital and labor. Studies reveal a significant contribution from technical progress, which is defined as an exogenous factor. Solow (1957) and Cass (1965) are among those who first demonstrated this. They propose the convergence theory of growth which treats technology as the sole long run determinant of growth. In the long run, sustained positive growth rate of output per capita is only apparent if there is continues advances in

technological knowledge in the form of new goods, new markets, or new processes. If there is no technological progress, then the effects of diminishing returns would eventually cause economic growth to decease. When we continue to provide people with more and more of the same capital goods without inventing new uses for the capital, then the extra capital goods become redundant and therefore the marginal product of capital will become negligible. This idea is captured formally by assuming the marginal product of capital to be strictly decreasing in the stock of capital (Aghion and Howitt, 1998). In other words, assuming diminishing returns to scale, they said that as capital per worker increases, growth of the economy slows down until it reaches the steady state and the lower the initial level of income per capita the higher is the predicted growth rate (Weil, 2009).

## *Human capital and endogenous growth theories*

In order to address the limitations of the neoclassical theory and answer the long-run determinants of economic growth, in the mid 1980s, endogenous growth models were developed. Lucas (1988) and Romer (1990), include deliberately created technological changes as an explanatory variable in their growth model. For endogenous growth theorists, it is not only technology which determines the growth of a given nation, but there are other factors (such as human capital) that are not captured by the neoclassical growth model. Lucas (1988) considers human capital as a separate input in the production function formed predominantly by workers through education or on-the-job training. In the Lucas (1988) model, the rate at which human capital is being accumulated was seen as the critical determinant of productivity growth. On the other hand Romer (1990) treats human capital as a factor affecting innovation that have a positive impact on the long-run rate of productivity growth, instead of treating human capital as a direct input to the production of goods. That means, for Romer endogenous growth is caused by accumulating technology/knowledge while for Lucas it is the non-decreasing marginal returns of human capital that creates endogenous growth.

Generally, they conclude that just having a large population is not sufficient to generate growth, rather stock of human capital and research and development are sources of economic growth. According to these models, the law of diminishing returns to scale may not be true since the returns on physical and human capital goods do not necessarily diminish through time. If the owner of the capital employs a skilled and healthy worker, the productivity of the capital and the technology will improve. Another justification to the possibility of increasing returns to scale is the spillover of knowledge across producers and external benefits from improvements in human capital (Wilson and Briscoe, 2004).

Similarly, in order to re-examines the Solow growth model and to explain the cross country per capita income variation, Mankiw, Romer, and Weil (1992) has formulated an augmented Solow model, in which human capital enters as a factor of production with those of physical capital and raw labor. They conclude that differences in human capital, saving and population growth determines cross-country differences in income per capita. That means accumulation of physical capital and population growth has greater impacts on income per capita when human capital is taken into account in the model. According to the above researchers, excluding it from the model may result in biased results.

## *Empirical Literature Review*

Despite their conclusions are controversial, different scholars have tried to analyze the relationship between human capital and economic growth. Mankiw, Romer, and Weil (1992), on their cross-country regression analysis, have showed human capital as one of the reasons for income variation across countries. They found a positive and significant correlation between human capital and per capita income growth. Barro (1991) also found the same result on 98 countries during the period from 1960 to 1985. In their OLS based human capital augmented Cob-Douglass production function analysis, enrollment rates to primary and secondary school are taken as a proxy of the human capital.

Again, Barro (1996; 2013) have measured human capital using average years of schooling in primary and secondary school. He found positive and significant relationship between per capita income growth and human capital from 1960 to 1990. Based on his simple panel regression analysis, Barro reported that the process of catching up was firmly linked to human capital formation: only those poor countries with high levels of human capital formation relative to their real GDP tended to catch up with the richer countries. Similarly, Bassanini and Scarpetta (2001) investigate the relationship between human capital accumulation and economic growth for OECD countries between 1971 and 1998. They said that one extra year of schooling increases the long-run average per capita output level by about 6%.

Barro and Sala-i-Martin (1995; 2004) also tried to prove the effect of primary, secondary, and tertiary school attainment (by sex) on economic growth. They got an insignificant effect of primary education of males and females on economic growth. But they found significant relationship for males' secondary and tertiary education. They also analyzed the role of educational attainment on the convergence theory. Their result proves that countries with relatively low initial GDP grow faster when they have higher levels of human capital in the form of educational attainment. Baldwin and Borrelli (2008) also wrote an article that show relationship between

higher education and economic growth in US and conclude that expenditure on higher education has a positive relation with per capita income growth.

Health capital is an asset that enables us to fully develop our capacity. The life of human being is incomplete if there is health problem (physical and /or mental). Theoretically, a healthy person can not only work more effectively and efficiently but also devote more time to productive activities. However, there is little empirical literature on the effects of health capital on growth as compared to the other macroeconomic studies. Some scholars like, Barro (1996; 2013) has formulated a model that includes physical capital inputs, level of education, health capital, and the quantity of hours worked. The model assumes that "people are born with initial endowments of health which depreciate with age and grow with investment in health". Based on his analysis, he concluded that an increase in health indicators raises the incentives to invest in education and a raise in health capital lowers the rate of depreciation of health. It is commonly believed that economic growth leads populations to live better, have longer lives and good health. Firstly, economic growth means rising per capita income and part of this increased income is translated into the consumption of higher quantity and better quality nutrients. Through nutrition, health as measured by life expectancy responds to increases in income. Taking life expectancy as an indicator of health, Bloom Canning, and Sevilla (2004) also found a strong positive and statistically significant effect on output. They suggest that each extra year of life expectancy raises the productivity of workers and leads to an increase of 4% in output.

Gyimah- Brempong and Wilson (2005) also argued that education captures just one aspect of human capital. It could not account the differences in school quality and health aspect of human capital. For instance, based on microeconomic evidences, Strauss and Thomas (1998) argue that health explains the variations in wages at least as much as education. Gyimah-Brempong and Wilson (2005) find that health capital indicators positively influence aggregate output. They find that about 22 to 30 percent of the growth rate is attributed to health capital, and improvements in health conditions equivalent to one more year of life expectancy are associated with higher GDP growth of up to 4 percentage points per year. Barro and Sala-i-Martin (1995; 2004), have also included life expectancy and infant mortality in their growth regressions as a proxy of tangible human capital and concluded that life expectancy has a strong positive relation with growth. Using other indicators of human capital, some researchers have analyzed the relationship between the two macroeconomic variables. For instance, using the dynamic panel estimator method, Odior (2011) also made a research in Nigeria to provide empirical evidence on whether government expenditure on health can lead to economic growth or not. He used an integrated sequential dynamic computable general equilibrium (CGE) model and found a significant relationship between economic growth and government expenditure on health sector. In addition, taking government recurrent and capital expenditures on education and health, Oluwatobi &

Ogunrinola (2011) and Umaru (2011) have made an econometric analysis in Nigeria, over the period 1970-2008 and 1977- 2007 respectively, to analyze the relationship between government spending on education and health and economic growth. They followed the Johnson co integration technique and got a positive relationship between government recurrent expenditure on human capital development and real output, while capital expenditure is negatively related to the level of real output. Several empirical cross-country studies document that education is important for economic growth in the early stages of development. Most notably, Krueger and Lindahl (2001) illustrate that the strong impact of education on economic growth may not hold in the latter stages of development due to decreasing returns to education. Their research suggests that it is crucial for developing nations to invest significant resources in education in their early developmental stages when returns to education are greatest.

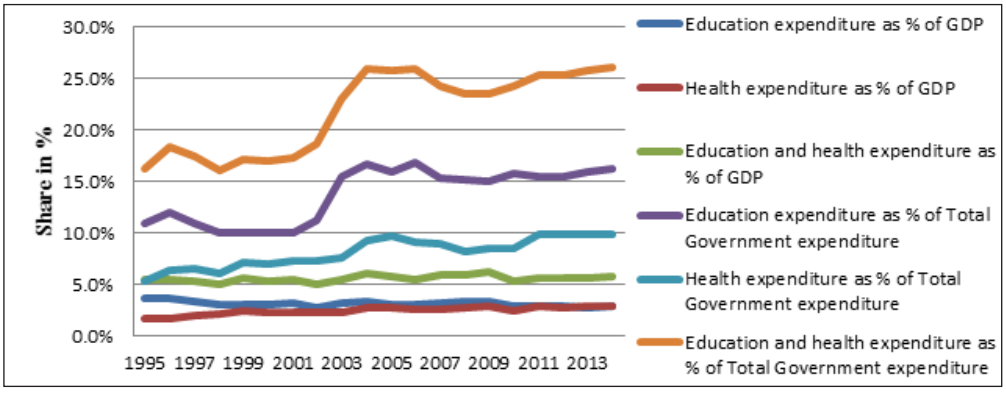
Another study by Simon Appleton and Francis Teal (1998) suggests that the role of human capital in Africa's economic development is complex. Inadequate investment in education and health are clearly not the only cause of Africa's economic difficulties. However, the poor health and education of Africa's workers is one factor explaining her low income.

## Overview of economic growth, education and health in Albania

### *Public spending on education and health in Albania*

Given the importance of human capital is paid and the effect it has on economic growth, it is appropriate to analyze the trends of education and health expenditures in real terms. Thus, the share of public expenditure on education and health to GDP is used as one indicator to see the trends in the improvement of the education and health sector.

**FIGURE 1:** Trends in the share of public spending on education and health to GDP and total government expenditure in Albania (1995-2014)




Source: Own calculation based on Ministry of Finance, 2016

As shown in Figure 1, the share of total education spending to GDP has decreased from 3.7% in 1995 to 2.85% in 2014. Although the decline has not been constant all over the period we study. During 1995-2002, the share has also decreased to an average value of 0.9%. From 2002- 2009, total expenditure on education as a percentage of GDP have been rising continuously (with the exception of 2005-2006) by 0.6%. Albania during the communist regime in 1989 spent about 4% of GDP. Although there was not s strong economic, the government has always given education the same importance as countries that had a richer economy. Despite these indicators, we can say that the budget allocated for education is quite low compared to the average of OECD countries. This sector has always been underfunded, due to the contraction of funding and because of the crisis in recent years. On the other hand, the value of expenditure on health as a percentage of GDP has increased during the period (except 2006 and 2010). The budget allocated to health is lower than education.

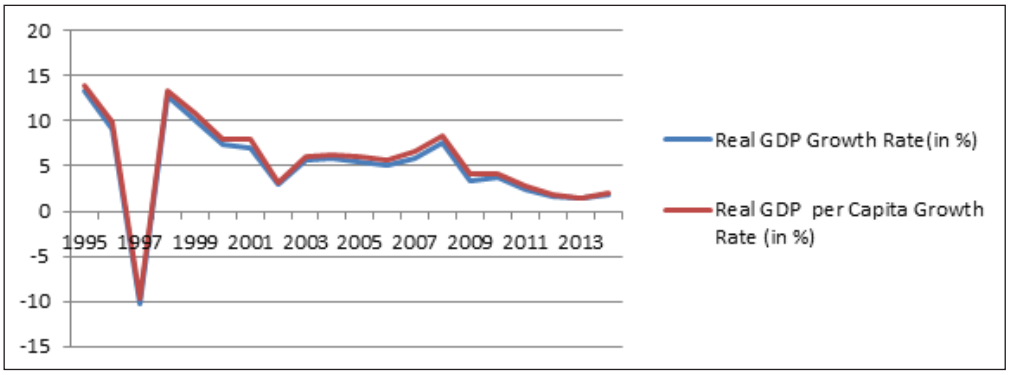
Percentage of public expenditure on education and health to the total expenditure budget gives us a clearer idea of the importance and priority of these sectors given by the policy. As shown in Figure 1, the share of education expenditure as a percentage of total government expenditure during the last two decades has had enough fluctuation. From 1995 to 2001 we see a steady decline of this indicator; it came as a result of the fiscal crisis in Albania in 1997. During 2001 – 2004, the share has increased by reaching the maximum value 17%. During the global crisis, these expenses have been shrinking, in contrast to many other countries which are responding to the crisis by investing in human capital. Spending on health as percentage of total budget expenditures are in a pretty level lower than education. This means that the government considers as a priority the education compared to health. From 1995-1997 these expenditures has increased. In 1998, a decrease of spending comes from its political and economic situation that was Albania in this period. Recent years has been shown a greater importance to the health, as has increased the public expenditure on health. However, in the education and health isn't spent enough as they do countries in the region or even beyond.

## *Trends on real GDP and per capita income growth in Albania*

The average rate of growth in real gross domestic product and per capita income goes in the same direction. During 1995 – 1997 has been a drastically decreased, from 13.3% to -10.2%. Albanian economy manages to recover marking a growth of 12.7% directly after 1997, the maximum amount that far. From 1998 - 2001 has been declining but with an acceptable level of 7%.

After 2008, the period of global crisis, the Albanian economy is significantly affected by the crisis. As shown in Figure 2, economic growth has reached its minimum in 2013 by 1.4%. Also a factor that has contributed to economic growth is the debt that Albania has. Meanwhile gross domestic product per capita, calculated as real GDP divide for the population, serves as an index of the wealth of individuals. This index has been declining in recent years, reaching its lowest level in 2013 1.5 %.

**FIGURE 2:** Trends of real GDP and GDP per capita growth in Albania




Source: World Bank database, 2016

## Analysis and findings

This study is an effort to unveil the contribution of human capital to economic growth of Albania. The results have been derived by using the method of Ordinary Least Squares (OLS). Most economic variables that exhibit strong trends are not stationary. Unit root test is a common method to accommodate non-stationary of the data. If non-stationary of macro variables is not corrected, it would lead to the problem of spurious regression (false relationships among the variables). When a series contains unit root, it is common to transform the variables so as to make it stationary. Such a transformation process can be carried out through differencing. The number of times in which the series is differenced to attain stationary is referred to as the order of integration.

A formal test for stationary and the order of integration of each variable are undertaken using different methods (mostly ADF). Here, the test for ADF is performed for the model with intercept and trend component and also for the model without intercept term and trend component.

**TABLE 2:** Unit root tests result

| Variable | Level (Intercept) | | | | First Difference (Intercept) | | | |
|---|---|---|---|---|---|---|---|---|
| | Calculated value | Critical value | | P-value | Calculated value | Critical value | | P-value |
| | | 1% | 5% | | | 1% | 5% | |
| GDP | 1.6889 | -3.7378 | -2.9918 | 0.9992 | -4.6432 | -3.7529 | -2.9980 | 0.0013 |
| EDU | 1.4783 | -3.7378 | -2.9918 | 0.9986 | -3.6401 | -3.7529 | -2.9980 | 0.0128 |
| LE | -0.0427 | -3.7378 | -2.9918 | 0.9448 | -6.6263 | -3.7529 | -2.9980 | 0.0000 |

Source: Author's Calculations, 2016

The results of ADF unit root test shows that all variables are non stationary at level. They become stationary when first difference at the 5% significance level is taken. This is shown in the Table 2. The order of integration would be determined to be I (1) for all the variables.

**TABLE 3:** Regression results for economic growth model

| Variable | Coefficient | Std.Error | t-statistic | Prob. |
|---|---|---|---|---|
| C | -1.03E+11 | 2.17E+10 | -4.739939 | 0.0001 |
| EDU | 20.30138 | 2.360309 | 8.601150 | 0.0000 |
| LE | 1.45E+09 | 3.07E+08 | 4.730329 | 0.0001 |
| R-squared 93,959% F-statistic 527.9521<br>Adjusted R-squared 93,773% Prob.(F-statistic) 0.000000<br>DW- stat 0.970472 | | | | |

Source: Author's Calculations, 2016

The OLS results show that expenditure on education is statistically significant at 5% level of significance. Life expectancy also showed positive significant impact on GDP. Both variables taken as a proxy for human capital (expenditure on education and life expectancy) has a positive impact on economic growth (Gross Domestic Product). The value of R-Sq is 93,989%, so 93,989% of variation of GDP is explained by the variation of human capital.

**TABLE 4:** Johansen Co integration test for economic growth model

| Trace test | | | | |
|---|---|---|---|---|
| Hypothesis Null | Critical value 5% | $\lambda_{trace}$ | Eigen value $\lambda_i$ | Prob. |
| r≤0 | 29.7970 | 23.1758 | 0.5225 | 0.0023 |

| | | | | |
|---|---|---|---|---|
| r≤1 | 15.4947 | 6.1698 | 0.2181 | 0.1781 |
| r≤2 | 3.8414 | 0.5111 | 0.0219 | 0.0806 |

Source: Author's Calculations, 2016

As justified by unit root test all the variables of the study are integrated of order one so co –integration tests are possible. Both the trace and maximal Eigen value tests reveal that there is only one co-integrating vectors in the system at 5% level of significance. This suggests the existence of long-run relationship between the variables. The co integration test result for human capital does not accept the null hypothesis of no co integration. This means that human capital does affect real GDP in long run in Albania. The results are displayed in table 4. We can conclude that human capital has an impact on economic growth in Albania.

Last test, granger causality is made to identify the direction of causality between the dependent variable, education and health. The result revealed that, at lag length of one, there is significant causality between real GDP per capita, education human capital (proxy by expenditure on education) and health human capital (proxy by the life expectancy).

**TABLE 5:** Granger causality test

| | Lag length 1 | | Lag length 2 | |
|---|---|---|---|---|
| Null Hypothesis | F-Stat. | Prob. | F-Stat. | Prob. |
| EDU does not Granger Cause GDP | 6.42435 | 0.0221 | 0.94552 | 0.4136 |
| GDP does not Granger Cause EDU | 1.87232 | 0.1901 | 2.59055 | 0.1130 |
| LE does not Granger Cause GDP | 11.1415 | 0.0042 | 2.26647 | 0.1431 |
| GDP does not Granger Cause LE | 0.39202 | 0.5401 | 0.17556 | 0.8409 |

Source: Author's Calculations, 2016

There is a uni-directional causal relationship between education and health human capital economic growth. On the other hand, when the lag length increases to two, there is no any significant causality between real GDP, education human capital and health human capital.

## Conclusion

The core objective of the study was to analyze the impact of human capital development on economic growth in Albania (using real GDP as a proxy for

economic growth). To determine the impact of human capital development on economic growth (real GDP), the study has used the multiple regression analysis and co -integration method. The main finding of this paper is that in the long run health human capital (proxy by the life expectancy) and education human capital (proxy by public expenditure in education) are the main contributors to real GDP per capita rise. In other words, the result reveals that economic performance can be improved significantly when the life expectancy improves and when public expenditure in education increases. Holding other things constant, a one unit change in health (proxy by life expectancy) brought 20.3 unit changes in real GDP. Next to health, education has significant long run impact on the Albania economy. A one unit increased in public spending in education has resulted in 1.45 unit change in real GDP. The findings of this research concerning the long run positive impact of the education and health human capital are consistent with the endogenous growth theories (mainly advocated and/or developed by Lucas (1988), Romer (1990), Mankiw, Romer and Weil (1992) which argue that improvement in human capital (skilled and healthy workers) leads to productivity improvement and thereby output growth.

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