Humain Capital In Algeria And Its Impact On Economic Growth: Standard Study During The Period (2000-2022)

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Summary: The study aims to study the impact of human capital on economic growth in Algeria. Through the statistical results, it is clear to us that there is a positive impact of investment in human capital in Algeria on economic growth. As the increase of human capital by one unit will lead to an increase in the economic growth index by 2.36 at the significant level 5%, this reflects the role that human capital plays on economic growth by enhancing the productivity of enterprises within the country, which requires Algeria to work on developing human capital, especially at the qualitative level, by adopting more reforms by improving education, linking it to the labor market, and raising the return on it. Until we reach sustainable economic growth.

Keywords: Education; Economic Growth; Human Capital; Labor Market; Algeria.

Jel Classification Codes : Q15 ; Q34

I- Introduction:

This study examines the extent to which human capital contributes to economic growth through the study of the case of Algeria, through a theoretical and applied study. As interest in education has increased in the last quarter of the twentieth century, and the economics of Education has become one of the important topics in the field of economics, the new models of growth, in addition to physical capital, have paid attention to human capital and work on its development through education and the development of the spirit of creativity and innovation, which is considered an essential source of economic growth that promotes economic growth and ensures its stability and continuity in the long term.

I.1. Research Problem.

To address the topic, the following problematic study is presented : What is the impact of investing in human capital on economic growth in Algeria ?

I.2. Hypotheses of the study.

based on the problem of the study, the following hypothesis can be formulated :
There is no statistical correlation between investment in human capital and economic growth in Algeria.

II– Previous studies:

- A study of Golin and Kanz (Goldin & Katz, 2001). During the period (1890-1999).

showed that the average growth rate of educational productivity in the USA increased from 0.29% per annum in (1890-1915) where the growth rate of per capita output in that period was 11% to 0.53% per year in (1915-1999) where the growth rate of per capita output was 20% per year (Abraham, 2012, p .34).

- The study carried out by (Barro & Xavie, S.M., 1995).

For a sample of a certain age group of the population enrolled in schools as a percentage, this study has proved a positive relationship between school enrollment rates at the beginning of the period covered by the sample and economic growth rates (Martin, 1995).

- Denson's study (Dension, 1962) entitled: sources of economic growth in the United States of America.

This study is one of the most important studies that used the residual element input to explain economic growth in America and its relationship with education. These studies have reached a set of results:

. The average education of a worker increased by 2% per year, has improved the quality of work by 97% and has contributed 67% to the GDP of the same year ؛
. Investment in education contributed to economic growth by 42% during the period (1929 - 1957), while the percentage of investment in education contributed to economic growth by 23% during the period (1909-1929) ؛
. Investment in workforce education in the USA accounted for about 23% of the real GDP per capita growth that occurred during the period (1909 - 1928).

While the share of physical capital was estimated at 15% of GDP per capita, the share of the development of general knowledge accounted for 20% of this increase (Alwahab, 2017, P.20).

III- The concept of economic growth and its relationship to development:

There are many concepts of growth and economic development in different economic schools, and below we mention the most important of those concepts.

III.1. The concept of economic growth

Long-term economic growth is defined as the rate of increase in GDP, which leads to a high growth rate of per capita income, and there are several definitions of economic growth, Schumpeter defines economic growth as a systematic gradual change that occurs over the long term as a result of the quantitative increase in resources (Ahmed, 1999, p.40), according to The Economist " Paul. Samuelson " the real national net or crude output is considered the main indicator of economic growth, where he pointed out to me that the gross national product and the net national product as a set of three main elements are private expenditures, consumer expenditures related to goods and services, in addition to investment expenditures (Samwilson, P.A., 1991, pp. 108-125). According to (Lewis), economic growth is necessary for development because it enables raising the standard of living, and therefore it is a continuous and long process, and there is agreement that the concept of economic growth means quantitative growth of both national income and then it has a quantitative and qualitative character, as for Shumpert, growth is a regular gradual change in the long term as a result of the quantitative increase in resources, but international as an annual rate of GDP growth The real has been at or above 7 percent for a quarter of a century or more, and such high growth rates qualify countries to double the size of their economy every ten years (Ali, 2009, p.81).

III.2. The concept of economic development

Development is the process by which the transition from a state of backwardness to a state of progress takes place, and this requires a lot of radical and fundamental changes in the economic structure, so it is an integrated, continuous and planned process for all functional and social aspects and different levels of the economy, and this is what distinguishes it from growth, which is achieved for a limited period and may stop there, and unlike economic growth, which can be considered a quantitative phenomenon (Wafa, 2000, p. 5), where Sears (seers) says that development is defined by the magnitude of the problems of poverty, unemployment and inequality in income distribution, development in a country what he sees is the fight against the problems of poverty, unemployment and inequality in distribution, and if the severity of One or more of these problems or all of them, it is impossible to say that there is development in that country even if the national and individual income from it is doubled (Mokatel, 2014, P.09).

Economic development is how and involves a change in the structure of income distribution, the structure of production, the quality of goods and services produced, improving the levels of health, education and culture, in other words, development includes structural changes in society in its various organizational, economic and political dimensions to achieve well-being Campbell R et all 1993). therefore, development contains all that economic growth contained in the aforementioned elements and some call it continuous development.

The rapid growth of development over the past few years has led to the emergence of many negative effects that threaten the environment with dangers in order to achieve continuous development that balances the environment and natural resources, that is, growth should take place without the environment hindering the development process, and without development affecting the environmental resource, and thus achieve sustainable development.

III.3. The concept of sustainable development

Sustainable development means meeting the needs of the current generation without harming the ability of future generations, and based on this concept, a reciprocal relationship arose between economic growth and Environmental Protection, and was thus introduced into the core of the development strategy for the benefit of future generations (Hani, 2005, p.06), and the concept of net or green GDP, sometimes called environmentally moderate growth, appeared in the framework of sustainable development.

- The concept of development has gone through several stages.in the past, economic development was seen as an increase in the level of income of individuals and is synonymous with the concept of growth. during the sixties of the last decade, it meant the extent to which the national economy was able to achieve an annual increase in output so that it exceeds the growth of the population. after the growth rates of the economy were accompanied by an increase in the number of poor and high unemployment, development was redefined in the mid-seventies of the last century to become the process of reducing poverty, income distribution and unemployment through a continuous increase in economic growth, and then at a later stage it meant the comprehensive advancement of the entire society. It can be said that the most important recent developments in development thought are those that called for expanding the concept of development away from focusing on material factors, and includes the real freedoms enjoyed by humans, including political freedoms (Sen, 1999) (Proton, 2001), and then the International Development Goals advocated at the global level can be viewed as an applied attempt to take these developments into account .

True development is necessarily human development, and the basic dependence in development is dependence on human beings, the human being should be the primary goal and the mainstay of development in any society, and it logically follows that two important things:

A) the need to take care of people by giving the maximum possible attention to satisfy their basic needs, and the formation of an industrial structure whose various branches and components are increasingly integrated in a way that makes it possible to move at a rapid pace towards the goal of self-reliance in satisfying human needs.

B) the need to involve people in decision-making in all fields and at all levels and not just implement them, increase real freedoms and build an effective human being does not work, and therefore the need to take care of people and develop their abilities to innovate and creativity and restore their self-confidence, which was hit by colonialism and undermined by dependency and reshape education and culture programs to support the values of productive work, build a spirit of participation and awaken the national conscience (Alissawi, 2001, pp. 27-29).

IV- The importance of investing in human capital and its role in promoting economic growth:

Human capital is represented by the totality of experience, knowledge, skills, creativity and qualities that employees of the enterprise possess and invest in work, and is considered an integral part of the assets of the enterprise.

Investing in human capital through spending on developing human capabilities, skills and talents in a way that enables it to increase its productivity leads to long-term benefits, which are represented in changing the mental image towards the nature of work, which leads to increasing creative abilities, improving productivity, increasing revenues, improving relations between suppliers and customers and achieving many services.

The process of investing in human capital is linked to two interrelated aspects, the first is related to the acquisition of knowledge and skills, forming the aspect of qualification, and the second is related to Labor and employment issues, and these two aspects are the basis in the formation of determinants of investment in human capital, represented by: Planning, Development and employment (Fairuz, 2021, pp. 165-167). Investing in human capital has become an important factor to enhance the productivity and competitiveness of organizations, through :

- That **creativity** and innovation are through human capital, through which organizations achieve their competitive advantage in the markets ؛
- The basis of coordination of various operations of the organization is human capital ؛
- Human capital is the key to strategic management specific to development, it is characterized by a characteristic that is not available in others, which is that its productivity curve escalates in the same direction as the curve of its experience and skills, and that its moral age is renewed with the changes of the Times, and will not disappear only with the cessation of its chronological age, therefore it is not subject to the law of diminishing utility ؛
- Human capital is an essential resource for the creation of knowledge, and it is also considered an effective weapon in the knowledge economy, and a source of added value (Ahlam, 2017, p.516).

V- Standard study of the impact of investment in human capital on economic growth in Algeria:

Through the standard study, we are trying to clarify the impact of investment in human capital on Algeria's economic growth during the period from 2000 to 2022, so that there is a lot of evidence that unless human capital is strengthened, countries will not be able to continue their sustainable and inclusive economic growth, and they will not have a qualified workforce to fill jobs that require a high level of skill and competence in the future.

V.1. Methodology

in this study, we used standard analysis by following the following method: The analysis includes four basic steps: the stability of variables and descriptive statistics with correlation matrix estimation and the significance test, as well as the estimation of the simple regression model, and finally the test of the integrity of the estimated model.

V.2. Identification of study variables

for the purposes of this study, we used a linear regression model to estimate the impact of investment in human capital on Algerian economic growth.

Sources of variables:

We have been relying on variables data from the World Bank.

The formulation of the general model of the study:

after determining the independent variable and the dependent variable, the model used is as follows:

$$CH= F(CGDP)\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where:

CHt: human capital

CGDP : economic growth rate

Introducing the logarithm to the side of Equation (1) until all the variables of the Model become homogeneous in terms of composition, we obtain the following new equation :

$$CH_t= a_0(CGDP)^{\alpha 1} \ldots\ldots\ldots\ldots\ldots(2)$$

Inserting the logarithm on both sides of Equation (2), we get :

$$Log(CH)=a_0+\alpha_1 Log(CGDP_t)_t+£_t\ldots\ldots\ldots\ldots(3)$$

Where: £t residuals of function.

V.3. Descriptive statistics of study variables and correlation matrix

Table (1): The correlation matrix between the study variables

	CH	CGDP
CH	1	0.5895473726796419
CPIB	0.5895473726796419	1

Source: based on EVIEWS software.

Table (2): Descriptive statistics of study variables

	CH	CGDP
Mean	5.378261	2.921739
Std. Dev.	4.035519	2.304335
Skewness	-1.002149	-1.549263
Kurtosis	4.085263	7.830467
Jarque-Bera	4.978548	31.56202
Probability	0.082970	0.000000
Sum	123.7000	67.20000
Sum Sq. Dev.	358.2791	116.8191
Observations	23	23

Source: based on EVIEWS software.

Table (1)., shown above, concerning the linear correlation matrix between the study variables, we note that the correlation coefficient reached r=0.58, which indicates the strong centrifugal relationship between the economic growth rate and the human capital variable, that is, the increase in human capital will lead to an increase in the economic growth rate in Algeria during the study period.

V.4. Estimation of simple regression by the OLS method

Table (3): Estimation of simple regression by the OLS method

Dependent Variable: CH				
Method: Least Squares				
Sample: 2000 2022				
Included observations: 23				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CGDP	1.032458	0.308683	3.344723	0.0031
C	2.361687	1.139021	2.073437	0.0506
R-squared	0.347566	Mean dependent var		5.378261
Adjusted R-squared	0.316498	S.D. dependent var		4.035519
S.E. of regression	3.336333	Akaike info criterion		5.330563
Sum squared resid	233.7534	Schwarz criterion		5.429301
Log likelihood	-59.30147	Hannan-Quinn criter.		5.355395
F-statistic	11.18717	Durbin-Watson stat		1.095419
Prob(F-statistic)	0.003071			

Source: based on EVIEWS software.

By the results of the model estimation in Table 3 we obtain :

$$\widehat{CH} = 2.36 + 1.03CGDP$$

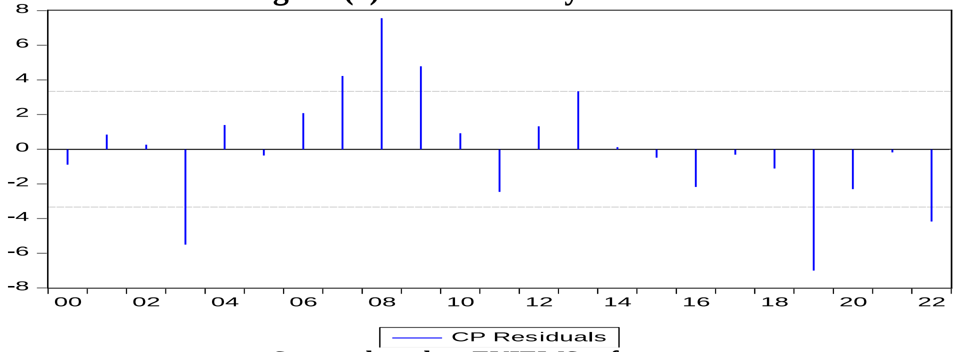
$$prob_{\hat{\beta}}: \quad (0{,}050) \quad (0{,}0031)$$

$$R^2 = 0{,}31 \qquad \overline{R^2} = 0.34$$

$$Fc = 11.18 \quad prob_F = 0{,}0000 n = 23$$

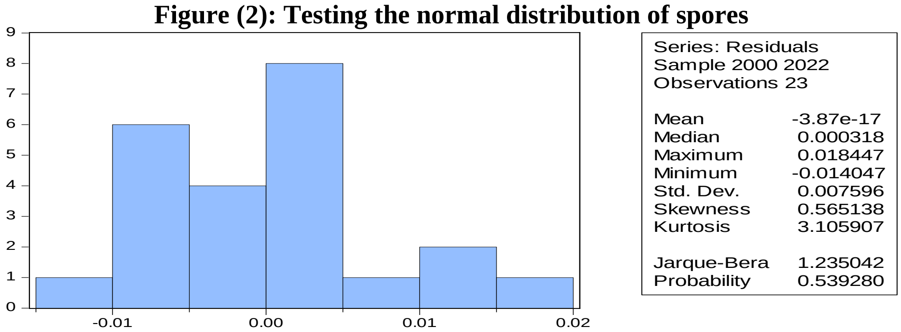
The determination coefficient R2=34 was estimated, which indicates that the model has the ability to explain more than 34% of the changes in the dependent variable, which is the Human Capital Index, and the rest are caused by other changes not included in the standard model, and the fixed limit parameter was statistically significant, because the probability accompanying it is smaller than 0.05, which leads us to reject the hypothesis of with a probability of 11.18445.32 and an estimated probability of 0.0000, which is less than p=0.01, and this leads us to reject the nihilistic hypothesis, that is, the coefficients of the model are non-nihilistic when The morale level is 1%, so the model has statistical significance The Human Capital Index was statistically significant because the probability associated with it is smaller than 0.05, and the accompanying morale was estimated at 0.005, which means that an increase in human capital by one unit will lead to an increase in the economic growth rate by 2.36 at a morale level of 5%, and this reflects the role that human capital plays on economic growth.

Figure (1): Residuals by estimator



Source: based on EVIEWS software.

Figure (2): Testing the normal distribution of spores



Source: based on EVIEWS software.

Figure 2. expresses the normal distribution test on the study of the symmetry coefficient and the flatness coefficient in addition to the JARQUE-BERA probability and the results obtained through this test show that the probability of jarque-bera=0.53>0.05, which indicates that the residuals follow the standard normal distribution. As well as the results of testing the autocorrelation function of the remainder of the model, we note the statistical probability value K Squared greater than 0.05, which leads us to accept the nihilistic hypothesis, that is, the remainder of the model is stable and has constant variance.

Table (4): Testing the residue correlation function

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |*** |	. |*** |	1	0.414	0.414	4.4701	0.034
. |* . |	. | . |	2	0.168	-0.003	5.2443	0.073
. |* . |	. |* . |	3	0.171	0.124	6.0843	0.108
. | . |	. *| . |	4	0.053	-0.073	6.1707	0.187
. | . |	. | . |	5	-0.013	-0.026	6.1758	0.289
. *| . |	. *| . |	6	-0.095	-0.114	6.4837	0.371
. *| . |	. | . |	7	-0.104	-0.023	6.8701	0.443
. | . |	. |* . |	8	0.018	0.105	6.8824	0.549
. *| . |	.**| . |	9	-0.169	-0.23	8.0516	0.529
.**| . |	.**| . |	10	-0.323	-0.213	12.656	0.244
.**| . |	. | . |	11	-0.237	-0.062	15.356	0.167
.**| . |	. *| . |	12	-0.225	-0.082	17.991	0.116

Source: based on EVIEWS software.

Table (5): Testing the correlation of buffers

Breusch-Godfrey Serial Correlation LM Test :			
F-statistic	2.575271	Prob. F(2,19)	0.1024
Obs*R-squared	4.905168	Prob. Chi-Square(2)	0.0861

Source: based on EVIEWS software.

Through the table shown above to test the correlation of errors by the Correlogram partial test method, the residual correlation function of the self-regression model shows the absence of correlation of errors due to the fact that the p-value probability values are greater than 0.05, which leads us to confirm the acceptance of the model from a statistical point of view. As for testing the LM results, as in Table 5., it becomes clear to us that the model does not suffer from the problem of autocorrelation of the remainders. These statistical results showed that there is a positive and significant moral impact of investment in human capital in Algeria on economic growth. An increase in human capital by one unit will lead to an increase in economic growth by 2.36 at a morale level of 5%, which reflects the role that human capital plays on economic growth. Investing in human capital is an important factor to enhance the productivity and competitiveness of enterprises in the country, through creativity and innovation resulting from the human element in upgrading enterprises to achieve competitive advantage in the markets and this leads to an increase in revenues and promote economic growth in Algeria.

VI- Conclusion:

Through this study on the impact of investment in human capital on economic growth in Algeria during the period from 2000 to 2022, we have found the following :

- The human element has an important role in activating economic growth through the link between human capital and economic growth ؛
- The standard study showed a strong direct relationship between the study variables, that is, the increase in human capital led to an increase in the rate of economic growth in Algeria during the study period, and this reflects the role that human capital plays on economic growth ؛Through these statistical results, it is clear to us that there is a positive impact of investment in human capital in Algeria on economic growth, and this proves the validity of the hypothesis put forward. As the increase of human capital by one unit will lead to an increase in the economic growth index by 2.36 at the level of morale 5%, this reflects the role that human capital plays on economic growth by enhancing the productivity of enterprises within the country ؛
- Raising economic growth is considered a goal of government policy in any country, and this goal can be achieved in a sustainable and long-term manner through the availability of an educated society with advanced health services and the ability to absorb future generations in vital jobs within highly productive innovative sectors, and relying on knowledge and technology.

This requires Algeria to work on the development of human capital, especially at the qualitative level, by pursuing further reforms through improving education, linking it to the labor market and raising the return on it, so that we reach sustainable economic growth.

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