

Measuring and Analyzing the Impact of Human Capital Formation on Economic Growth in the Selected Countries during the Period (2000-2021)

By

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Abstract

This research is concerned with measuring and analyzing the impact of human capital formation, expressed by spending on health and education, on the economic growth of a sample of selected countries (Iraq, Kuwait, Malaysia) during the period (2000-2021), using the quantitative method of analyzing ARDL and Panel Models Data. The study concluded that investment in human capital over the study period has a considerable effect on economic growth, and that the effect of educational spending is not significant in the short term, but significant and positive in the long term. The impact of educational and health spending on economic growth in the countries under study, particularly in the long term (Panel Estimation), is much greater than the impact of educational and health spending in all countries separately (Time Series Estimation), so these countries must improve efficiency and increase investment in education and health sectors in line with economic needs.

Keywords: human capital, economic growth, health spending, educational spending.

Introduction

Recently, economic theories have emphasized the importance of increasing investment in human capital as an important factor in stimulating economic growth, particularly for countries experiencing stagnation at the level of their energies and resources, because human resources represent a continuous source that can be invested in a way that increases the harmony and equilibrium in the economy of a qualified labor force. Investing in the education and health sectors is one of the investments in the components of human capital. It is well known that many developing countries are lagging behind in this area, whether in terms of expanding the volume of investment spending in education and health, or in terms of the efficiency of this spending itself. And that social backwardness due to the poor educational level of the population and the deterioration of health services necessarily leads to the backwardness of one of the main drivers of economic activity.

And, in order for these countries to have a population structure rich in promising human energies, it is critical that they do not miss out on the opportunity to create sustainable capital in order to give a qualitative boost to production, which can guarantee good growth rates in the medium and long term. Just as it is very important to invest in human capital, what matters most is the type of human capital invested, which must be in line with the requirements of the economy in these countries.

Research Problem

The research problem lies in the following questions:

- 1- What is the impact of spending on education as one of the components of human capital on the economic growth of the selected countries?
- 2- What is the impact of spending on health as one of the components of human capital on the economic growth of the selected countries?

Research Importance

The importance of the research lies in the need to expand more in human capital in terms of spending on education and health in order to improve and increase the economy's stock of highly qualified labor force, and thus achieve harmony and appropriateness of production from human capital requirements. Furthermore, these countries allocate amounts from the government budget to be used to improve the quality of human **capital**, but ambiguity remains about the importance of the return on this expenditure in achieving positive development results.

Research objective

The research aims to measure the nature of the impact of spending on education and health as components of investment in human capital on the variable of gross domestic product, which represents economic growth during the period (2000-2021) for a sample of selected countries, depending on the data analysis methods ARDL and Panel Data CT panel and choose the optimal model.

Research Hypothesis

The research assumes:

- 1- Investment in education has a positive and significant impact on economic growth during the study period for the selected countries.
- 2- The investment in health has a positive and significant impact on economic growth during the study period for the selected countries.

Research Methodology

In order to achieve the goal of the research, the descriptive approach was followed to identify some theoretical aspects of the subject, followed by the quantitative approach using standard methods and estimating the research model, in addition to analyzing the results that are reached.

Research Structure

The research was divided into two sections, the first concerned with the theoretical side of human capital and economic growth, while the second section focused on the applied side, measuring and analyzing the impact of human investment on economic growth in the selected countries during the research period.

The Theoretical Side: Human Capital and Economic Growth

2.1 The Concept of Human Capital

It is difficult to find a comprehensive definition of human capital. Some believe that in order to reach a comprehensive definition of human capital, theories that emphasize the human element must be mentioned. Others believe that the concept of human capital expresses the development of human resources and their indicators represented by increasing the opportunities for choice for individuals. Society in many areas, especially (education, health and income), so the definition of human capital can be stated as (the sum of working individuals who will possess rare knowledge, skills and capabilities of economic value in increasing the wealth of nations). (Hamad, 2010: 4).

Human capital also represents the stock of knowledge, skill, health, training, in addition to innovation and other investments, embodied in the ability of individuals to carry out their various work tasks in a more productive manner. Human capital formation refers to the process of acquiring and increasing the number of people who have the skills, good health, education and experience that are important for economic development (Eggoh, 2015: 93-111).

It is also known as workers who possess a group of competencies, experiences and skills capable of introducing modifications or fundamental changes and producing new ideas and advanced methods in everything, thanks to innovation and continuous improvement, and thinking minds that are familiar with great knowledge that makes the organization able to distinguish globally through responsiveness to the desires of customers and to seize the appropriate opportunities offered by technology (Shabeer, 201: 35).

As for the investment in human capital, it represents the inputs achieved by the institutions in terms of talents and advanced technology that their members use efficiently in order to achieve competitive advantages, and because this resource is rare and unique in its kind, it is difficult to interact with it. More precisely, the workers who possess these characteristics in both quantity and quality are the ones who call it human capital. (Al-Anzi, 2010, 8).

The economic importance of investing in human capital.

Human capital represents the cornerstone of economic importance in developed societies, as it is the foundation on which the development of society in general is built. The human element is one of the most important elements of production at the present time, and it is not only the goal and purpose of development, but also its main management as well. Technological changes led to major changes in the production processes, which resulted in an increase in the complexity and accuracy of the production process, which created an increasing need to raise the level of population numbers, increase the periods of education and training, and increase scientific practices in both theoretical and applied research (Al-Shammari, 2009: 42).

The term human capital refers to the economic value of a worker's experience and skills. Human capital includes assets such as education, training, intelligence, skills, and health, as well as other things employers value such as loyalty and punctuality. As such, it is an intangible asset or unlisted quality. Human capital is seen as increasing productivity and thus profitability. The greater the investment in people, the greater the chances of its productivity and success. Therefore, developed countries have realized the importance of investing in the human element as a real wealth, and the world (Peter Drucker) believes that by the year 2030, 40% of the workforce will have knowledge. However, their manual work is based on their cognitive abilities, and they acquire knowledge through vocational education (Al-Rubaie, 2008: 225). The interest in human capital and increasing investment in people is due to (Hamad, 2010: 9):

1- The large increase in the size of the national product compared to the increases in natural resources, working hours and productive capital. This is due to the high level of investment in human capital. Statistical estimates in the United States indicate that less than half of the increase in national product can be explained by an increase in physical capital. The rest is the productive efficiency of the human element.

2- The growing interest in economic development in underdeveloped countries, which are still suffering from underdevelopment despite achieving their political independence due to the heavy concentration in the old economic and social systems that isolated man and made him lose control over his surroundings and made him unable to show his sufficient energies.

According to what has been mentioned, investment in human capital outperforms investment in material resources in terms of economic and social outcomes.

2.2. The Concept of Economic Growth

Great attention has been paid to defining the concept of economic growth and the factors contributing to its realization because it is a complex social phenomenon that includes quantitative and qualitative changes in the economic system over successive periods of time, which helps in a better and broader mobilization of the available economic surplus and directs towards creating the necessary accumulation for the process of continuous expansion of productive capacity. the college.

Simon Kuznets defined economic growth as a process that secures a continuous increase in the production of material wealth and an increase in the per capita share or the share of the labor element in the size of the output (this means that the increase in the volume of output is often accompanied by an increase in the size of the population, so the real estimate of the level of economic prosperity requires relying on calculating of economic growth rates using the indicator of per capita output (Karim, 201: 71).

Economic growth is measured by the rate of increase in average per capita real national income. It is the most commonly used standard for measuring the degree of economic growth for most countries in the world. However, developing countries face many difficulties and problems in obtaining correct figures that reflect the real income of the individual, and among these difficulties is the lack of accurate statistics. On the population and income, in addition to the fact that there are no appropriate methods of analysis, for example, is the income divided among the entire population or among the unemployed? For the entire population, it benefits the consumption side, but for workers only, it will include calculating the income of the labor force and thus benefit the production side, as well as the currency variation between countries and the constant fluctuations in the exchange rate, in addition to the gross domestic product, which is known as the total added values achieved by the activity economy during a specific period, usually a year (Matar, 2004: 5).

It is one of the most important indicators used in analyzing and measuring the performance of economic growth. It also reflects the development of the level of income, which can reflect the level of economic well-being for members of society. As for the method of measuring economic growth, it is measured according to two methods: (Garden, 1987: 554-556).

First: Gross Domestic Product (GDP) growth, as it shows us the rate of increase in the real GDP of goods and services in a country's economy. An increase in real GDP means the growth of the economy, while stable GDP indicates the stability of the economy, while decreasing GDP indicates growth at a negative rate. No deterioration of the economic level.

Second: GDP per capita, which is a better measure of the rate of increase in the standard of living of the population, is nothing but an increase in per capita GDP that accompanies the increase in the population during a certain period of time (one year).

2.3. Human Capital and Economic Growth

Investment in human capital is one of the pillars of economic growth and an effective tool for economic development because it represents great importance in economic activity and is one of the determinants of productive capacities, as there is no production without investment, investment in human resources through education is what achieves economic development on the basis that education is a part of economic development. It is integral to the development of human resources, which is represented in building effective human capabilities and skills in society (Amassoma, 2015: 115).

The relationship between education and health and economic growth is very important as a means of knowing the mutual impact between them, as education and health are closely related to income, as it depends on its level and degree of growth, and spreading education through expansion in different stages and improving human health means necessity Providing (money and costs) and income is its source, and income growth in a stable manner is only characterized by a high level of education and its outputs (Al-Maliki and Obaid, http://www.ksu.edn.sa/sites_ksu_Arabic). There is a strong relationship between human capital and economic growth, which is why it can help boost the economy. It is because people have a variety of skills and knowledge. This relationship can be measured by the amount of investment that goes into educating people. And his health.

One of the macroeconomic policies is to stimulate economic growth rates by investing in human capital, which is represented in health and education. Although human capital is multifaceted, many theories largely link investment in human capital development to education, while other aspects are absent, especially Inventory and investment in health, but health also plays an important role in the accumulation of human capital and is closely related to education, as individuals who are in good health are more fit, whether physically or mentally, to contribute more to production, then increased productivity has a positive effect on Economic growth, On the other hand, when a person is healthy, their life expectancy increases, which enhances individual savings and private investments in education, thus health expenditures contribute to human capital investments and development (Kurt, 2015: 441-447).

Human capital allows the economy to grow. When human capital increases in areas such as science, education, and management, it leads to greater innovation, social welfare, equality, increased productivity, and better participation rates, all of which contribute to economic growth. Increases in economic growth tend to improve the quality of life for the population.

Applied side: Measuring and analyzing the impact of human capital formation on economic growth in the selected countries

To measure the impact of human capital formation on economic growth in the selected countries (Iraq, Kuwait and Malaysia), secondary data collected from the World Bank, official institutions and some academic sources have been used.

3.1. Description of the variables and approved models:

This aspect is concerned with measuring and analyzing the impact of human capital formation on economic growth in the selected countries (Iraq, Kuwait and Malaysia) during the period (2000-2021), using a number of stages, tests and estimates, which are:

$$GDPP_{it} = B_0 + B_1 ED_{it} + B_2 HT_{it} + U_{it}$$

Dependent variables:

GDPP_t: GDP per capita / as an indicator of economic growth.

Independent Variables:

ED: educational expenditure ratio of the gross domestic product / as an indicator of human capital formation

HT: Health expenditure ratio of GDP / as an indicator of human capital formation

U: random error

i: the number of syllables/three states

t: time

3.2. Stationary test

Stability is one of the important tests to reveal the stability of the data and variables in the model used, and the results of this test appear as follows:

Table (1): Results of (Stationary test) for the variables included in the model

Countries	Variables	Augmented Dickey-Fuller test statistic			
		Level		First Difference	
		Trend	Intercept	Trend	Intercept
Iraq	GDPP	-3.3987 (0.0785)	-1.9929 (0.2873)	-5.6720 (0.0010)	-5.8048 (0.0001)
	ED	-3.3211 (0.0901)	-2.8268 (0.0715)	-6.7950 (0.0001)	-6.5701 (0.0000)
	HT	-2.4327 (0.3540)	-2.3900 (0.1562)	-4.1686 (0.0190)	-4.0289 (0.0063)
Kuwait	GDPP	-1.9996 (0.5680)	-0.9957 (0.7351)	-4.9482 (0.0384)	-4.8355 (0.0159)
	ED	-1.1720 (0.8903)	0.0360 (0.9520)	-4.6415 (0.0075)	-3.8334 (0.0095)
	HT	-2.1282 (0.5004)	-1.8657 (0.3403)	-1.9883 (0.5635)	-5.0642 (0.0100)
Malaysia	GDPP	-1.8030 (0.6668)	-0.8568 (0.7814)	-10.5104 (0.0100)	-4.4826 (0.0024)
	ED	-0.0645 (0.9907)	-2.5603 (0.1199)	-4.4886 (0.0126)	-5.1969 (0.0006)
	HT	-3.5142 (0.0699)	-1.5233 (0.5025)	-6.2915 (0.0190)	-6.5200 (0.0000)
Countries	Variables	Phillips-Perron test statistic			
		Level		First Difference	
		Trend	Intercept	Trend	Intercept
Iraq	GDPP	-3.3325 (0.0883)	-1.9929 (0.2873)	-5.9191 (0.0006)	-6.1405 (0.0000)
	ED	-3.2360 (0.1045)	-2.8251 (0.0718)	-18.2948 (0.0000)	-7.7601 (0.0000)
	HT	-2.5960 (0.2851)	-3.2922 (0.0285)	-4.2687 (0.0157)	-4.0245 (0.0063)
Kuwait	GDPP	-2.0151 (0.5600)	-1.2330 (0.6398)	-2.6496 (0.2647)	-2.7902 (0.0775)
	ED	-1.3205 (0.8903)	-0.1956 (0.9251)	-4.6148 (0.0079)	-3.8586 (0.0090)
	HT	-1.0918 (0.9064)	-1.2157 (0.6474)	-2.9919 (0.1583)	-2.6447 (0.1010)
Malaysia	GDPP	-1.8030 (0.6668)	-0.8594 (0.7805)	-4.7124 (0.0068)	-4.4812 (0.0024)
	ED	-3.6106 (0.0533)	-3.3708 (0.0242)	-19.7654 (0.0000)	-9.4822 (0.0000)
	HT	-2.9570 (0.1663)	-1.5168 (0.5057)	-6.2920 (0.0003)	-6.5154 (0.0000)

Source: prepared by the researcher based on the results of E-views 12.

Table (1) shows the results of Augmented Dickey-Fuller and Phillips-Perron tests, that all variables are significant at the level of statistical significance (5%), because the critical probability value (Prob.) is less than the specified value (0.05), that is, there is stability in the time series data and supports the integration process.

3.3. Co-integration between the variables included in the model:

Integration is one of the important tests to find out the level of the relationship between the variables of the research subject, in order to allow the model to be estimated, it is necessary to have at least one relationship between one of the independent variables and the dependent variable, and the results of this test are shown in Table (2).

Table (2): Results (Johansen Test) among variables for the countries under study

Countries	Variables	Prob.	Critical Value (0.05) Trace statistic	Prob.	Critical Value (0.05) Maximum Eigenvalue
Iraq	GDPP	0.0000	59.05875	0.0000	41.19546
	ED	0.0216	17.86329	0.0361	15.15123
	HT	0.0996	2.712060	0.0996	2.712060
Kuwait	GDPP	0.0000	99.53925	0.0000	51.83607
	ED	0.0000	47.70319	0.0001	34.86793
	HT	0.0442	12.83525	0.0442	12.83525
Malaysia	GDPP	0.0000	62.12139	0.0004	34.78902
	ED	0.0005	27.33237	0.0012	23.68936
	HT	0.0563	3.643011	0.0563	3.643011

Source: prepared by the researcher based on the results of E-views 12.

Through the previous table, (Johansen Test) shows that the variables included in the models have a common complementary relationship with each other at the level of significance (1%, 5% and 10%). Therefore, we accept an alternative hypothesis that recognizes the existence of significant complementary relationships from an economic, statistical, and standard point of view. Thus, these results support the procedure for estimating the standard model correctly for all variables.

3.4. causal relationships between the variables of the different models (Granger Causality Tests):

In the table below, the results of testing the causal relationships between the variables of the research subject:

Table (3) shows, by comparing the p-value at the significant level (1%, 5%, and 10%), that the results confirmed the existence of a one-way causal relationship between educational spending and per capita GDP and a two-way relationship between health spending and per capita GDP in Iraq, while the causal relationship is one way between health spending and per capita GDP and in two directions between educational spending and per capita GDP in Kuwait, while the relationship is one way between educational spending and per capita gross domestic product and in two directions between health spending and per capita GDP in Malaysia. Therefore, these results seem to provide a strong and logical basis for estimating the standard models correctly.

Table (3): Results of the Granger Causality Tests between the variables of the approved model

Countries	Variables	Prob.
Iraq	Education spending tends to per capita GDP	0.0010
	Health spending is directed to the per capita share of the gross domestic product	0.0021
Kuwait	The per capita share of GDP goes to health spending	0.0196
	Education spending tends to per capita GDP	0.0191
	Health spending is directed to the per capita share of the gross domestic product	0.0672
Malaysia	The per capita share of GDP goes to educational spending	0.0145
	The per capita share of GDP goes to health spending	0.0370
	Education spending tends to per capita GDP	0.0955
	The per capita share of GDP goes to health spending	0.0177

Source: prepared by the researcher based on the results of E-views 12.

3.5. Econometrics Model Estimation

The results of stability and the results of joint integration are two strong and logical foundations for estimating the model, in order to measure and analyze the impact of human capital formation on the economic growth of the selected countries during the period (2000-2021), after testing some models and several attempts to reach a good model, a model was chosen (ARDL) as the best model, especially for finding short- and long-term relationships and effects:

3.5.1. Estimating standard models for time series data and analyzing them (Time series data)

This paragraph is concerned with measuring and analyzing the impact of human capital formation on economic growth in the countries under study (Iraq, Kuwait and Malaysia) separately during the period (2000-2021), as follows:

Iraq

In the table below are the results of short and long-term estimates in Iraq:

Table (4): Results of short and long-term estimates in Iraq

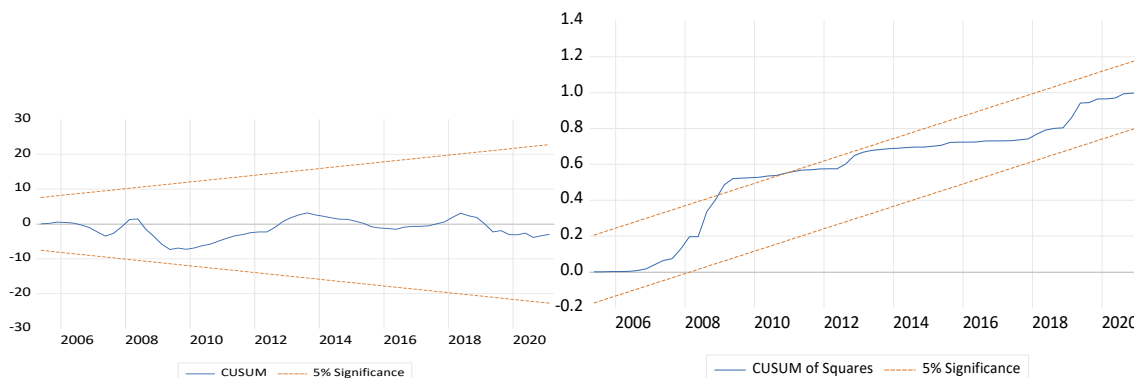
Variables	Short term effects		Long term effects	
	Coefficient	significant level	Coefficient	significant level
education	0.0020	0.0672	0.1249	0.0000
health	0.0055	0.0056	0.3364	0.0000
constant (C)	0.1281	0.0018		
Coint Eq(-1)	-0.0163	0.0000		
Bounds Test for Co-integration	F =6.04 > 3.87			
Type standard problems and their tests	Prob.	Statistical indicators	Prob.	
(Breuch-Godfrey Test)	0.7756	R-Squared	0.9993	
(Variance Inflation Factor Test)	1.0692	Adjusted R ²	0.9992	
(Breuch-Pagan Test)	0.1031	F-statistic	11108.29	
(Ramsey Reset Test)	0.5011	Prob. (F-statistic)	(0.0000)	
(Jarque –Bera Test)	0.0840	S.E. of regression	0.0047	
		Sum squared resid	0.0015	
		AIC	-7.7190	

Source: prepared by the researcher based on the results of E-views 12.

From the above table it appears:

1. Depending on the (size) of the estimated parameters and their special signs, as more spending on education increased by (1%), it led to an increase in per capita gross domestic product (GDPP) in the short run of (0.0020%) in Iraq, but This effect has increased to (90.124%) in the long term.
2. With regard to health, and depending on the (volume) of the estimated parameters and their special signs, as more spending on health increased by (1%), it led to an increase in the per capita share of the Gross Domestic Product (GDPP) in the short run by (0.0056%). However, this effect has increased significantly to (0.3364%) in the long term.
3. The determination coefficient (R^2) and the adjusted coefficient of determination (Adjusted R^2) are high and amount to (99%). This means that all independent variables included in the models have a strong relationship with the dependent variables and explain about (99%) of the changes that occurred in the dependent variable. GDPP).
4. The difference between the determination coefficient (R^2) and the adjusted coefficient of determination (Adjusted R^2) is very small, and this means that all variables included in the estimated models are necessary and important, and this is evidence of good use of models and good judgment.
5. Due to the value of (F) and the fact that statistical significance (0.0000) is less than the value of (P-value 0.05), we reject the null hypothesis, which acknowledges the lack of relationship between the independent variables and the dependent variable on the one hand, and it is noted that the value of (SSR / Standard Error) generally results in a positive result. On the other hand, the table is brief and acceptable, indicating the statistical validity of the model.
6. (AIC) is the amount of missing information in the estimated models, and it is considered one of the important statistical indicators, and the lower the value, the better, and through the table it is clear that the missing values in the estimated model are generally acceptable, and this is evidence of a good estimate of the approved models.
7. It appears from Table (4) that the approved model passed all standard tests and all basic standard problems (such as autocorrelation, multiple correlation, heterogeneity of variance, diagnosis and non-normal distribution) because the value of the estimated parameters is greater than (0.05) and the value of the estimated features of the (VIF) is less than (10), which is evidence of proper use of the forms.
8. With regard to the equilibrium point (error correction limit coefficient), it represents the amount of change in the dependent variable as a result of the deviation of the value of the independent variable in the long run by one unit. Statistically, unless the negative sign indicates the speed of adjustment from the short term to the long term.
9. With regard to the Bounds Test, it is clear that there are variables included in the model with a long-term co-integral relationship, because the calculated (F) value of (6.04) is greater than the tabular (F) value, which amounts to (3.87).

In order to ensure the stability of the structural changes in the model adopted for this research in Iraq, appropriate tests should be used, such as the cumulative sum of the returned residues (CUSUM), as well as the cumulative sum of the squares of the residuals (CUSUM of Squares Test), and these two tests are among the most important tests in this field, this can be depicted through the graphic forms of the approved models as follows:



Through the above figures, the model used is stable, because the curve of the data lies between the two lines, and this indicates the stability of the estimated parameters at the level of significance (5%).

Kuwait:

In the table below are the results of short and long-term estimates in Kuwait:

Table (5): Results of short and long-term estimates in Kuwait

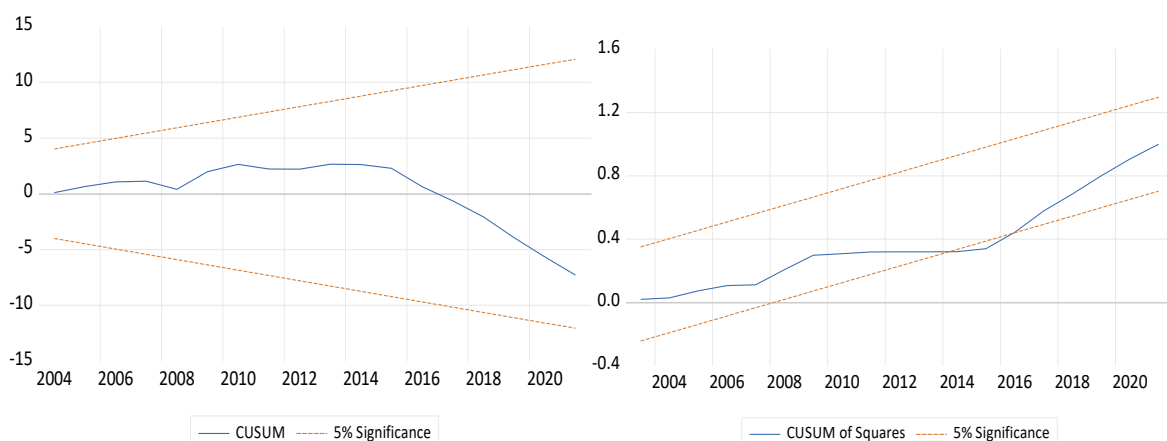
Variables	Short term effects		Long term effects	
	Coefficient	significant level	Coefficient	significant level
education	0.0571	0.4939	0.1119	0.0000
health	0.3297	0.0465	0.1683	0.0000
constant (C)	5.2906	0.0000		
Coint Eq(-1)	-0.5111	0.0328		
Bounds Test for Co-integration	F =41.85 > 4.85			
Type standard problems and their tests	Prob.	Statistical indicators	Prob.	
(Breuch-Godfrey Test)	0.0633	R-Squared	0.9994	
(Variance Inflation Factor Test)	1.0106	Adjusted R ²	0.9918	
(Breuch-Pagan Test)	0.3391	F-statistic	132.4076	
		Prob. (F-statistic)	(0.067928)	
(Ramsey Reset Test)	0.5706	S.E. of regression	0.0126	
(Jarque –Bera Test)	0.8434	Sum squared resid	0.0001	
		AIC	-6.7377	

Source: prepared by the researcher based on the results of E-views 12.

1. Depending on the (volume) of the estimated parameters and their special signs, it is noted that whenever spending on education increased by (1%), it led to an increase in the per capita share of the Gross Domestic Product (GDPP) in the short term by (0.0571%) in Kuwait, However, this effect rose to (0.1119%) in the long term.
2. With regard to health as well, and in view of the (volume) of the estimated parameters and their special signs, it turns out that whenever the spending on health increased by (1%), it led to an increase in the per capita share of the Gross Domestic Product (GDPP) in the short term by (0.3297%). In Kuwait, however, this effect decreased to (0.1683%) in the long term.
3. The determination coefficient ((R²) and the adjusted coefficient of determination (Adjusted R²) are high and amount to (99%). This means that all independent variables

- included in the models have a strong relationship with the dependent variables and explain about (99%) of the changes that occurred in the dependent variable. GDPP).
4. The difference between the coefficient of determination (R^2) and the adjusted coefficient of determination (Adjusted R^2) is very small, and this means that all the variables included in the estimated models are necessary and important, and this is evidence of the good use of the models and good judgment.
 5. We reject the null hypothesis because the value of (F) and with statistical significance (0.067928) is less than the value of (P-value 0.05). On the other hand, we note that the value of (SSR/standard error) in general indicates that the table results are few and acceptable, indicating the statistical validity of the model.
 6. With regard to the value of (AIC), the table shows that the missing values in the estimated model are generally acceptable, and this is evidence of a good estimate of the approved models.
 7. It is also noted from the table that the approved model passed all standard tests and all basic standard problems (such as autocorrelation, multiple correlation, heterogeneity of variance, diagnosis and non-normal distribution) in Kuwait because the value of the estimated features is greater than (0.05) and the value of the estimated features of the (VIF) is less than (10), which is evidence of proper use of the forms.
 8. With regard to the equilibrium point (error correction limit coefficient), it reached (-0.5111), which does not indicate the correctness of the statistically estimated error correction model, unless the negative sign is achieved that indicates the speed of adjustment from the short term to the long term.
 9. Through the above table, the (Bounds Test) test confirms that there are variables included in the model with a long-term co-integral relationship, because the calculated (F) value of (41.85) is greater than the tabular (F) value, of (4.85).

In order to ensure the stability of the structural changes in the model adopted for this research in Kuwait, appropriate tests should be used, such as the cumulative sum of the returned residues (CUSUM) as well as the cumulative sum of the squares of the returned residues (CUSUM of Squares Test), and these two tests are among the most important tests in this field, this can be depicted through the graphic forms of the approved models as follows:



As seen in the above figures, the model used is stable, because the curve of the data lies between the two lines, and this indicates the stability of the estimated parameters at the level of significance (5%).

Malaysia:

In the table below the results of short and long-term estimates in Malaysia:

Table (6): Results of short and long-term estimates in Malaysia

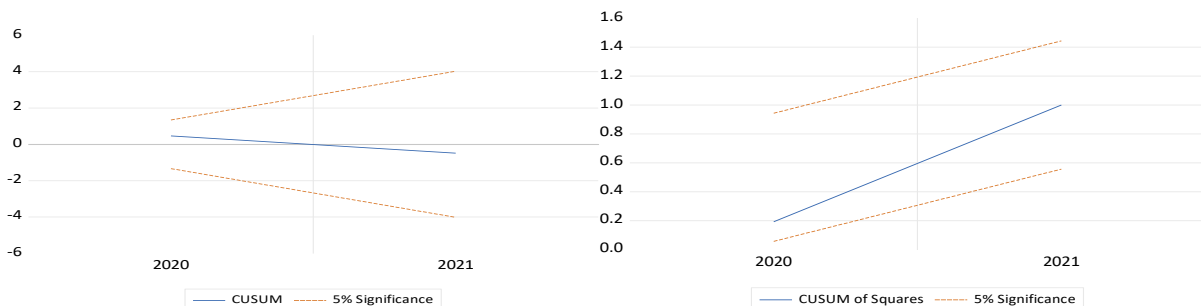
Variables	Short term effects		Long term effects	
	Coefficient	significant level	Coefficient	significant level
education	0.4717	0.0416	1.3784	0.0001
health	0.0347	0.5089	0.0340	0.0660
constant (C)	8.4616	0.0050		
Coint Eq(-1)	-1.0192	0.0102		
Bounds Test for Co-integration	F = 9.65 > 3.87			
Type standard problems and their tests	Prob.	Statistical indicators	Prob.	
(Breuch-Godfrey Test)	0.3998	R-Squared	0.9996	
(Variance Inflation Factor Test)	5.8327	Adjusted R ²	0.9973	
(Breuch-Pagan Test)	0.8965	F-statistic	434.6821	
(Ramsey Reset Test)	0.1815	Prob. (F-statistic)	(0.0022)	
(Jarque –Bera Test)	0.4689	S.E. of regression	0.0072	
		Sum squared resid	0.0001	
		AIC	-7.3489	

Source: prepared by the researcher based on the results of E-views 12.

1. Based on the volume of the estimated parameters and their special signs, it is observed that the higher the (education expenditure) by (1%), the greater the increase in the per capita share of the Gross Domestic Product (GDPP) in Malaysia (0.4717%) in the short term. However, this effect has risen to (1.3784%) in the long term.
2. In terms of health, based on the volume of the estimated parameters and their special signs, it appears that the more health spending increased by 1%, resulting in a 0.0347% increase in the per capita share of the Gross Domestic Product (GDPP) in the short term. In Malaysia, however, this effect has reached (0.0340%) in the long term.
3. The determination coefficient ((R²) and the adjusted coefficient of determination (Adjusted R²) are also high and amount to (99%). This means that all the independent variables included in the models have a strong relationship with the dependent variables and explain about (99%) of the changes that occurred in the dependent variable. (GDPP).
4. There is also a very small difference between the determination coefficient ((R²) and the adjusted coefficient of determination (R²), which means that all variables included in the estimated models are necessary and important, and this confirms the good use of models and good estimation.
5. The value of (F) and with statistical significance (0.0022), which is less than the value of (P-value 0.05), so we reject the null hypothesis that recognizes the lack of relationship between the independent variables and the dependent variable on the one hand, and we note that the value of (SSR / Standard Error) in general results The table is few and acceptable and indicates the validity of the model from a statistical point of view on the other hand.
6. With regard to the value of (AIC), the table shows that the missing values in the estimated model are generally acceptable, and this is evidence of a good estimate of the approved models.
7. It is also noted from the table that the approved model passed all standard tests and all basic standard problems (such as autocorrelation, multiple correlation, heterogeneity of

- variance, diagnosis and non-normal distribution) in Kuwait because the value of the estimated features is greater than (0.05) and the value of the estimated features of the (VIF) is less than (10), which is evidence of proper use of the forms.
8. As for the equilibrium point (error correction limit coefficient), it reached (-1.0192), which does not indicate the correctness of the statistically estimated error correction model, unless the negative sign is achieved which indicates the speed of adjustment from the short term to the long term.
 9. The (Bounds Test) confirms that there are variables included in the model with a long-term co-integral relationship, because the calculated (F) value of (9.65) is greater than the tabular (F) value, which amounts to (3.87).

To ensure the stability of the structural changes in the Malaysian model used for this research, appropriate tests such as the cumulative sum of the returned residues (CUSUM) and the cumulative sum of the squares of the returned residues (CUSUM of Squares Test) should be used. These two tests are among the most important in this field, and it can be depicted through the graphic forms of the approved models as follows:



As seen in the above figures, the model used is stable, because the curve of the data lies between the two lines, and this indicates the stability of the estimated parameters at the level of significance (5%).

3.5.2. Estimating the standard model using Panel Data (integrating and analyzing data)

The main objective of estimating standard models for panel data and analyzing them is to support the results obtained from the analysis of time series data, as well as clarify more about the variables studied and reduce the impact of variables not included in the model. Therefore, this paragraph is concerned with measuring and analyzing the impact of human capital formation on economic growth in the countries under study (Iraq, Kuwait and Malaysia) as a group during the period (2000-2021). The (PMG / ARDL) model was chosen as the best model based on economic theory and reality. The economic studies of the countries under study, in particular to find out the short and long-term relationships and effects, and the results of the tests and estimates were as follows:

Table (7): Results of short and long-term estimates for the countries under study (Iraq, Kuwait, Malaysia).

Dependent variable	Independent variable	Short term		Long term	
		Coefficient	Prob.	Coefficient	Prob.
GDPP	Education	-0.3734	0.3927	2.3779	0.0000
	Health	0.2436	0.5225	3.1048	0.0000
	Coint Eq(-1)	-0.0911	0.0383		
	constant (C)	0.4113	0.0964		

Source: prepared by the researcher based on the results of E-views 12.

From the results of the assessment in Table (7), it is clear that:

1. Depending on the (volume) of the estimated parameters and their special signs, the effect of educational spending on per capita gross domestic product (GDPP) in the short term is not significant, but this effect is significant and positive in the long term, and the more (educational spending) increases in countries, Selected education at 1% resulted in a 2.37% increase in per capita GDP. The reason may be due to the fact that educational investment needs a long period of time in order to obtain results, especially in developing countries.
2. Depending on the (volume) of the estimated parameters and their special signals, the effect of health spending on per capita gross domestic product (GDPP) in the short term is not significant, but this effect is significant and positive in the long term and the more (health spending) increases in countries The selected investment increased by (1%), which led to an increase in (per capita GDP) of (3.10%). The reason may also be due to the fact that most developing countries need a longer period to benefit from this type of investment.
3. Depending on the (size) of the estimated parameters, the effect of (health spending 3.10) on per capita GDP in the countries under study is greater than the effect of (educational spending 2.37), and this agrees with the economic theory in that investment in human capital has a significant impact On economic growth, and the reason may be due to the fact that health investment enables a person to be physically sound and ready for work, unlike educational investment, which requires a longer time machine so that a person can be ready for work.
4. With regard to the equilibrium point (error correction limit coefficient), it represents the amount of change in the dependent variable as a result of the deviation of the value of the independent variable in the long run by one unit. It is expected to be negative and significant, and it reached (-0.0911), which indicates the correctness of the correction model. The estimated error is statistically achieved and the negative sign indicating the speed of adjustment from the short term to the long term is also achieved.

In the light of these results, we find that there are different effects of the variables included in the various models, but the effect of educational and health spending on the per capita share of GDP, especially in the long term in the countries under study (Panel Estimation), is much greater than the effect of educational and health spending on the per capita share. of the gross domestic product in each country separately (Time Series Estimation).

Conclusions

- 1- The study's findings revealed the interrelationship between human capital represented by health spending with economic growth in two directions in Iraq, while the relationship between human capital represented by educational spending with economic growth in only one direction, meaning that educational spending only affects economic growth in Iraq.
- 2- Regarding Kuwait, the research showed a two-way reciprocal relationship between educational spending and economic growth, while the relationship was one-way between health spending and economic growth, meaning that health spending only affects economic growth.
- 3- With regard to Malaysia, the research showed a reciprocal relationship between health spending and economic growth in two directions, while the relationship between

- educational spending and economic growth was only in one direction, meaning that educational spending only affects economic growth.
- 4- The research findings also revealed a direct relationship in the short and long term between investment in education and economic growth on the one hand and investment in health and economic growth on the other in each country of the research sample separately and countries together, confirming the proof of the research hypotheses.
 - 5- The impact of human capital components on economic growth in the long term is greater than in the short term, which is consistent with economic theories that say investments in education and health require a long period of time to obtain the returns on these investments.
 - 6- The research showed in its results for all countries together that investment in human capital during the study period has a significant impact on economic growth, and that the impact of educational spending in the short term is not significant, but this effect is significant and positive in the long term. The effect of health spending in the short term is not significant, but this effect is significant and positive in the long term.
 - 7- The effect of educational and health spending on economic growth, especially in the long term, in the countries under study together (Panel Estimation) is much greater than the effect of educational and health spending in all countries separately (Time Series Estimation).

Proposals

- 1- Reconsidering government spending priorities in accordance with policies that underpin and support human resource development by connecting the educational system to the labour market.
- 2- The importance of investment in health emerges as it helps advance economic growth and alleviates poverty. Therefore, it is necessary to increase the resources spent on the health sector as well as expand the scope of basic primary health care services to include the poor and those with limited income.
- 3- Increasing spending on education and ensuring the provision of free education to the community, and working to provide the necessary requirements for all components of the education sector, which leads to the provision of skilled manpower in the future for all economic activities.
- 4- Increasing health expenditure allocations and ensuring the provision of free health services to all members of society in terms of medicines, laboratories, and everything related to health services provided to the community, which leads to individuals participating in economic activities living longer lives and being more productive.

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