

STUDYING THE EFFECT OF HUMAN CAPITAL ON ECONOMIC DEVELOPMENT IN OPEC COUNTRIES

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ABSTRACT

One of the worlds important subjects in the recent decide is human force. Human force quality or the science of basing in human leads to increase production and degree of economic development of the countries. Although there were arguments about human force since classical economists, there were concentration on modelling and presenting national patterns of economic growth in which human force must have been mentioned. In other words, among the classical production subjects which is subjected to human force and capital, the qualitative factor of human force must be respected as a changeable. While the effect of human force and technical science is not covered; this investigation is going to reveal the effect of human force on the degree of economic development in the country members of OPEC. Different economists have used different indices to measure human force which one of them is the amount of government expenses for training. There have been used data panel in this investigation since 1995 to 2012. Investigation results imply that the effect of all the coefficients of the models changeables based on the expected theoretical foundations and also in terms of statistics are meaningful and human force has a positive and meaningful effect on the degree of economic development. Thus with due attention to investigation results, it is recommended to pay attention to human force in order to increase skills and human forces production capacities which lead to increase enjoying and production; moreover pay attention to increasing the expenses of investigation and development in order to access higher degree of economic development.

Keywords: *Human capital, Economic Development Degree, OPEC Countries, Panel Data*

1. INTRODUCTION

One of the world important subjects in the recent is human force. Human force quality or the science of basing in human leads to increase production and degree of economic development of the countries. Although there were arguments about human force since classical economists, there were concentration on modelling and presenting national patterns of economic growth in which human force must have been mentioned. In other words, among the classical production subjects which is subjected to human force and capital, the qualitative factor of human force must be respected as a changeable. Take a look at countries like Japan and Germany which lost their economic sources during second world war, we understand that with due attention to the mentioned countries, there must be something else rather than physical factors which lead them to be such powerful today. Lester Taro in his book a great dream, has written.” Although America may be the world superior military force in the future century, Japan will be the highest, economically”. Not only economic growth made them so high but also human force, creative power and thought resulted in quick growth and development this growth has not resulted from physical factors.

Skilled human force provides the possibility of increasing production and added value, pay no attention to this important factor leads to development in developing countries. Investments not only play a great role in human force but also lead to increase its share in total investment of the country. Also it causes better exploitation of physical force. Investment is an important factor in the growth of development degree.

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2. LITERATURE & THEORETICAL

Combined data have been used in this investigation to estimate the pattern for 1995 to 2012 and relation between human capital on the degree of economic development has been obtained in 10 country members of OPEC and the results will be evaluated. Research hypothesis is explained as “there is a positive and meaningful relation between human capital and economic development degree in country members of OPEC”. Scientific bases like world development indicator (WDI), books, related articles and library documents have been used to gather information and study subject literature.

The organization of oil exporters called OPEC is an international oil cartel composed of countries like Algeria, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirate, Ecuador, Anguilla, Venezuela. OPEC is international origin domicile is Geneva since 1960 and changed to Vienna in Austria in 1965. Oil exporter countries established an united organization to protect their profits at 12 September of 1960 which called OPEC. This mutual agreement was achieved at the end of representative negotiations of these countries in Baghdad. The organizations main goal which is stated in the constitution is as follow: “Unitizing the oil policies of country members and determining the best way to provide cumulative or individual profits, designing methods to guarantee the constancy of oil price in the international oil market in order to remove harmful and unnecessary fluctuation, paying special attention to countries who produce oil and paying special attention to the necessity of providing constant income for countries producing oil; providing oil for user countries of oil efficiently and permanently, and proper and equitable outcome for countries who invest in oil industry”. OPEC tried to survive in its first decade and tried to affect oil market and giving back the rights of countries who are producer in the second decade of its lifetime. By increasing unity among OPEC members, it could have positive effects to prevent sudden falling and also to prevent sudden increasing of oil price.

In this investigation, world development indicator (WDI) have been used for GDPP, L, K, TFP. Among different indicator of human capital, the average of training years is more important. In this investigation, for human capital changeable there have been used the average training years of the 3 sections including primary schooling, secondary schooling and tertiary schooling which have been extracted from Barro and Lee data.

3. RESULTS

3-1-INTRODUCING MODEL AND USED CHANGEABLES

With due attention to the present research and information, there have been used following changeables to specify the model:

$$GDPP_{it} = f(L_{it}, K_{it}, TFP_{it}, EDU1_{it}, EDU2_{it}, EDU3_{it})$$

Changeables:

$GDPP_{it}$: degree of economic development (inner production share) for 10 country members of OPEC during (1995-2012).

L_{it} : Labor force³ for 10 country members of OPEC during (1995-2012).

K_{it} : Physical capital⁴ for 10 country members OPEC during (1995-2012).

TFP_{it} : Total factor productivity⁵ of 10 country members of OPEC during (1995-2012).

$EDU1_{it}$: Average year of primary schooling⁶ for 10 country members of OPEC during (1995-2012).

$EDU2_{it}$: Average year of secondary schooling⁷ for 10 country members of OPEC during (1995-2012).

$EDU3_{it}$: Average year of tertiary schooling⁸ of 10 country members of OPEC during (1995-2012).

$i=1,2,3,\dots,10$

$t=1995-2012$

In this investigation to estimate the changeable of stock capital, we use the relation of stock capital adjustment which is as follow:

$$K_t = (1-\delta)K_{t-1} + I_t$$

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In which K_t is stock capital, I inner investment and δ is the price of amortization which is 4 present for all the countries by following Romer (Romer, 2001) because the statistics of the price of amortization is not accessed. In accomplished studies in Iran economy, the price of amortization is estimated about %4. As you see, to use above formula, primary quantity of stock capital is needed. To achieve stock capital quantity, we use pim^9 method. According to mentioned method, primary quantity of stock capital (K_{t-1}) is calculated as follow:

$$K_{t-1} = \frac{I_t}{r+\delta}$$

In which r is the average price of investment growth yearly.

Also in this investigation, the changeable of enjoying work force, according following formula, we have used Divizhia method for all the countries and in each year:

$$TFP = \frac{GDP}{K^\alpha \times L^{1-\alpha}}$$

In which GDP is inner production, K is stock capital, L is occupying work force, α is capital share in production and $1-\alpha$ is work force share of production. Romer says work force share for countries is about $\frac{1}{3}^{10}$ and this can be used as an estimation for the productive capacity of capital. It is worth saying, under complete competition and constant output regard to scale and lack of external results, productive capacity of capital is equal to capital share of production and the results of TFP calculation by remaining method of Soloo and Divizhia indicator will be equal.

3-2-CHAW TEST (LAGRANGE COEFFICIENT):

With due attention to the results of Chaw test, as shown in table (1), H_0 hypothes is based on the pool model (not being panel) is rejected; So it is the model of panel not pool. Using Hausman test in the next stage, it will be clear that for final estimation of model, panel must be considered either with constant effects or by chance effects. The results of Chaw test is delivered in Table (1):

Table (1): the results of Chaw test

Effect Test	Statistic	Degree of freedom	Prob
Cross-Section F	4.360310	(9,84)	0.0001

Source: Calculations of research

3-3-HAUSMAN TEST:

With due attention to the results of hausman test, as shown in table (2), H_0 hypothes is based on the pool model (not being panel) is rejected; So it is the model of panel not pool. At the next stage, primary model considers the method, panel will de estimated with constant effects. The results of Hausman test are presented in table (2):

Table (2): the results of Hausman test

Effect Test	Statistic	Degree of freedom	Prob
Cross-Section random	17.642449	6	0.0072

Source: Calculations of research

3-4-ESTIMATION OF THE MODEL AND INTERPRETATION OF THE RESULTS:

As said, mentioned pattern is estimated by synthetic method, its model is as follow:

$$GDPP_{it} = \beta_1 + \beta_2 (L_{it}) + \beta_3 d_1(K_{it}) + \beta_4 d_1(TFP)_{it} + \beta_5 (EDU1_{it}) + \beta_6 (EDU2_{it}) + \beta_7 (EDU3_{it}) + AR(2) + u_{it}$$

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Achieved results of the estimation of the model are presented in table (3):

Table (3): The results of model estimation

Dependent Variable: degree of economic development (GDPP)			
Descriptive variable	Combinational data test		
	Coefficient	T statistic	P-value
Labor force	0.000435	4.361481	0.0000
Physical capital	1.31E-11	2.503168	0.0142
Total Factor Productivity	-8.06E-38	-2.195254	0.0309
Average of primary education years	32027.43	4.820195	0.0000
Average of secondary education years	-17235.87	-2.679857	0.0089
Average of higher education years	100975.5	3.136745	0.0024
c	-180452.8	-10.28383	0.0000
F- statistic	875.5341		
Prob(F-statistic)	0.000000		
R ²	0.996177		
Adjust R²	0.995039		
Durbin-Watson statistic (D-W)	1.532583		

Source: Calculations of research

The variable coefficient of work force (L) has a positive and meaningful effect equal to 0.000453. in other words, one percent increase of work force leads to an increase equal to 0.000453 in the degree of economic development.

The variable coefficient of physical capital (K) is positive and meaningful and equals 1.31E-11 which shows the positive and meaningful effect of physical capital on economic development degree in country members of OPEC. In other words, one percent increase of physical leads to an increase equal to 1.31E-11 of economic development degree.

The variable coefficient of enjoying all the factors (TFP) has a negative but meaningful equal to -8.06E-38. In other words, one percent increase of enjoying all the factors causes -8.06E-38 decreases in economic development degree.

The variable coefficient of average years of primary schooling (EDU1) has a positive and meaningful effect equal to 32027.43. in other words, one percent increase in the average years of primary schooling causes 32027.43 percent increase in economic development degree.

The variable coefficient of average years secondary schooling (EDU2) has a negative but meaningful effect statically and equal -17235.87. This means that if average years of secondary schooling increases one percent, economic degree development should decrease -17235.87.

The variable coefficient of average years of tertiary schooling (EDU3) has a positive and meaningful effect equal to 100975.5. In other words, one percent increase in the average years of tertiary schooling causes 100975.5 percent increase in economic development degree.

Based on the table, F test shows total meaningfulness of regression.

Statistical quantity of Durbin-Watson is 1.53 which is high and shows that there is not self-correlated problem.

Determination coefficient (adjusted and unadjusted) of the model is very high, which explains the high power of explaining the model.

4. CONCLUSION

Before 1960s, economic paid scattered attention to training. Primary studies related to evaluation have done about the importance of training of human capital quality that is attributed to “William Peti”. More

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serious work is attributed to Adam Esmith, at one hand, he considers human capital skill as the origin of progress and economic welfare and at the other hand, he believed that by increasing competition between universities, efficiency of training centers increase.

After “Esmith”, “Alfred Marshll” revived “economic and training” seriously and studied the relation of them. He reminds training as national investment in his economy principles. He believes that conditions which lead to participating parents in training, must be studied seriously. In the middle of 1930s, “Walesh” accomplished the first empirical study in the frame of expense-profit. We can say unit 1950s, economists and social scientists have studied training and its importance. After that (since the beginning of 1960s) the way of facing problems was changed; however, they considered different growth of different countries as the problem of training. So in 1970s “Sholtez”, “Dison” and “Baker” by spreading the results of their studies, tried to explain the nature and main of economic growth fluctuations by a new changeable called “training”. Certainly, a little before, other people like “Minser” and “Miller” evaluated the effect of training on received difference of people. By explaining theoretical record, we can say that university is effective in economic development and service development by two aspects: one, of providing effective human force by increasing efficiency and individuals enjoying, two, of developing science, technic, and technology; because universities are responsible for training human force and increasing enjoyment and efficiency in high specialized levels; so university is important in basic roles of servicing, since tertiary schooling as a part of the total process of training leads to promotion of enjoyment level of human force by marking skill and expert in individuals and by improvement their recognition force. Through a comprehensive look at theoretical principles of human capital relation on economic development degree, relation among these chargeable for an elected list of ten country members of OPEC is considered during 1995-2012 which can be used by researchers. The results are as follow:

1. Existence of liner relation between human capital and economic development degree in exporter countries of oil who are members of OPEC: as results off Hausman and Chaw tests showed, the model of exporter country members of OPEC is panel and has constant effects and all these cases are the reason of choosing linear model.
2. Hausman force effect on economic development degree in exporter countries of oil who are members of OPEC is positive and meaningful statistically.
3. The effect of physical capital on economic development degree in country members of OPEC is positive and meaningful statistically.
4. The effect of enjoying all the factors on economic development degree in country members of OPEC is negative but meaningful statistically.
5. The effect of primary schooling on economic development degree in country members of OPEC is positive and meaningful statistically.
6. Existence of negative and meaningful relation between secondary schooling and economic development degree in exporter countries of oil who are members of OPEC.
7. Existence of positive and meaningful relation between tertiary schooling and economic development degree in exporter countries of oil who are members of OPEC.

Studying different method of economy measuring like studying false regression and solving this problem by using regression of second stage; it is observed in some researches that during the model, little attention is paid to falsehood of regression and such cases is really important, since regression is false, results and studies will be unreliable, so this point is considered in this investigation.

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