Study of the relation between health and economic growth: Validation empirical from a panel of 15 countries of the North and South Bank Mediterranean

Mekdem Majdi
University of Sousse
Faculty of Economic Sciences and Management of Sousse
[Unit of Research: Tourism and Development]

Abstract
Almost in all the countries the increase of healthcare costs improved as a rule the health of the population. Sometimes the positive effects of this spending are shaded off. On one hand, this spending improves the offer of the medical care. Other influential factors on the health of population, we quote as example the training, the lifestyle, the hygiene and the distribution of income. On the other hand the increase of these spending must be checked and assigned in a profitable way to have positive effects on the productivity of the work, on the offer of the hand of work and the training. This could contribute positively on the economic growth. The purpose of this paper is to study the relation between healthcare costs and economic growth, for 15 countries of the north and south bank Mediterranean by using econometric techniques given in panel, during period 1990-2008. We notice that, the variable healthcare costs contributed positively to the economic growth. We also notice that political implications have important effects on these results.

Key words: Healthcare costs, Gross domestic product, Human resources, Life expectancy, Economic growth; Data of panel.

JEL Classification: C23; I15; O14; O55; O57

1. Introduction

The human resources play a priority role for a bearable economic growth. The theories of economic growth suggest the role of the human resources as significant for the process of growth. In economic literature, the concept of human resources was defined by including the education and the other investments which increase the productivity of an individual. However, the economists of growth who incorporated human resources into the economic growth pay a bigger attention to analyze him of the impact of the education on the economic growth, whereas they ignore the role of the human resources of health. A problem to be solved is to know how to measure the capital health. According to the elaborate works, there are two main approaches.

At first we notice who about 60 % of the studies, the variable health was approximate by a certain measure of the life expectancy or the rate of survival of the adults, whereas in the other studies the health was estimated by a measure of the spending of health care. According to the studies of the OECD the variable of the most opted health is healthcare costs.

The purpose of this article is to analyze the report between the variable healthcare costs and growth of the GDP, by using econometric techniques, given by panel during period 1990-2008. Our sample consists of a group of 15 countries of the north and south bank Mediterranean of the north and south bank Mediterranean, namely Tunisia, Algeria, Morocco, Libya, Egypt, France, Portugal, Italy, Greece, Spain, Denmark, Henchman, Slovenia, Germania and Belgium. The organization of this paper is as follows: a first part is dedicated to study in theory the relation between healthcare costs and health. The second part
represents a comparative study which describes the evolution of the indicators of health in 15 countries of the north and south bank Mediterranean. In the third part we discussed the econometric model and the found results.

2. Relation between healthcare costs and health

The role of the public spending of health has for object to improve the access to health services. Income indeed gives an idea of the effort that a government for the health of her population could make but it is the public spending of health that allows measuring this effort. For Cutler and al. (2006), the quality of supply of health care is important for reducing the mortality of the poorest; and, according to the World Bank (2004), health services can be effective. The experiences of Brazil, Chile, of Costa Rica and of Cuba, Iran, Nepal, Tanzania, Benin, Guinea and Mali show that, health services, if they are of quality, can improve the health of the poorest of the population (World Bank, 2004).

One does not find nevertheless this consensus in the empirical studies, whether it is at the micro or macro level. One of the causes to that is that the quality of the expenditure can be radically different from one country to another. Another subjacent problem is the possibility of being endogenous, again. Indeed, a country with a low level of health of its population will probably seek to mobilize more resources in the sector of health. Thus, Gupta et al. (2002) worked out an analysis out of transverse section on 22 developing country and of transition and find that the share of the public expenditure of health according to the GDP, instrumented or not, contributes significantly to the reduction of the infant mortality rate and infant-youthful.

However, the number of observations is relatively limited to be able to make this result robust. Bokhari et al. (2007) found the same result, but with a sample of country much more varied: the rich countries and the poor are considered there together, whereas some completed their epidemiologic transition and others did not begin it.

Wagstaff (2003) was used data resulting from investigations for 42 countries. It showed that levels of public expenditure of health per capita higher are significantly associated on lower levels with mortality, among the very poor children, alive with less than one dollar per day. That suggests that, at least, the public expenditure of health is effective to improve health of poorest.

In other studies of the authors like Filming and Pritchett (1997, 1999), showed that the expenditure of health in spite of the instrumentation24 of the ratio of public expenditure of health on GDP does not have a significant effect on the infant-youthful death rate. In the same way, Wagstaff and Claeson (2004) are moderated and rule that the public expenditure of health is necessary but not sufficient. At this time it is difficult to measure the effectiveness of public expenditure of health whose composition and quality can appreciably vary from one country to another. Thus, certain researchers are concentrated in their research on the effectiveness of various public interventions.

Levine et al. (2004) lit that the effectiveness depends on many programs of intervention, like those of the vaccination campaigns against vaccinates and measles. In the same way, Hanmer et al. (2003) showed, starting from a sample of 115 countries over the period 1960-1997, which public interventions like the vaccination campaigns or the number of doctors compared to the population significantly reduce the death rates of the children. Thus, according to them, the public expenditure of health can be effective to improve public health, for a little which they are quite affected.

Moreover, for Fay et al. (2005), which studied data of investigations for 39 countries, a better access to the health services like vaccination, the antenatal care and the medical care with the childbirth reduces the death rates of the children. Lastly, Mac Guire (2006), starting
from two samples of developing country, for the years 1995-1996 and 1990, finds that infant-youthful mortality is associated the efforts of the health services maternal and infant-youthful. To conclude we note that the effectiveness of public expenditure of health to improve health also depends on the contexts and the systems of health, there too different from one country to another.

According to Herrera and Pang (2005), the public expenditure of health would be less efficient in the country’s most touched by the epidemic of AIDS, and which are discriminating compared to the foreign assistances. In the same way, Gupta and Verhoeven (2001) ensured that the public expenditure of health of the African countries would have worse results than those of the countries of Asia or Western countries. Certain authors studied the conditions under which the public expenditure of health is most efficient. Jayasuriya and Wodon (2003), out of 76 countries of 1990 to 1998, showed, starting from a method DEA, that the public expenditure of health is more efficient when the rate of urbanization is more significant and when the quality of the bureaucracy is better.

In the same way, Rajmukar and Swaroop (2002), starting from 90 developing countries in 1990 and 1997 find that the public expenditure of health reduces the death rates of the children where there is good governance, it is with-statement little of corruption and a good bureaucracy.

We note thus that there remains a broad work to be achieved concerning the specific choice of indicators of health to carry out effective estimators. Nevertheless, the positive effect of the improvement of the health (in particular of the profits in longevity) on the growth of long term seems to prevail, in particular if while being based on the conclusions of the relatively robust studies of Aghionet and al. (2010) or Suhrcke and Urban (2006), even if this result remains also reversible. So it is obvious that the health holds a significant place in the process S of the growth and that the expenditure allocated with the sector of health must also be analyzed with precision to stimulate the long-term growth of an economy.

However, as these results do not make it possible to quantify this positive impact precisely, they give only one approximate vision of the arbitrations on behalf of the expenditure devoted and how set out again this expenditure between the sectors of investment in human capital. In particular, the question which arises if the expenditure of health in the developed countries reached or not a threshold and up to what point the governments must continue their budgetary efforts?

3. Effect of the expenditure of health on the economic growth:

Rivera and Currais (1999) used 24 developed countries, and chose a model of the type Mankiw-Romer-Weil (1992), but they incorporated this time the expenditure of health like a proxy of the health. They used the method of the LSO and the double LSO with several instrumental variables. They noted a strong positive and robust impact expenditure of health per capita on the growth of GDP per capita. Beraldo et al. (2005), confirmed the results of Rivera (1999) but they took them with precaution because of the strong was endogen of the expenditure of health compared to the GDP and owing to the fact that this indicator is not correlated with the usual indicators of the health (it can, in fact, being a proxy of the size of the Welfare state, for example).

Suhrcke and Urban (2006) put forward thus that the bond between the expenditure and different the outcome from health yet rather well is not known and is not shown so that the first is used like a proxy of the second. They have use as indicator of health, in their regression of growth, the death rate by cardiovascular diseases among the population of
active age. Their results are particularly robust and significant with regard to the developed countries: the improvement of 1% of the indicator of health would generate a profit of 0.1% not growth rate of the income per capita in the five following years. With regard to the sample of less developed countries, this indicator has, none does not influence on the growth.

Ulmann (2003) considered the correlations cross of the growth rate of the national expenditure of health (in % of the GDP) with the growth rate of the GDP for the 22 OECD countries between 1960 and 1996. There concluded that, for eight of the twenty-two analyzed countries (Germany, Austria, Denmark, France, Italy, Netherlands, Portugal and Greece), he is a correlation significant and positive between the national expenditure of health in t and the GDP in t+2 and/or t+3.

These results would encourage, according to the author, to push back the "liberal" assumption of a negative relation of short term between the expenditure of health and the growth in the countries developed because of the excessive weight of the public expenditure. It does not remain about it less than these results are subjected to problems involved in the low depth of the base (36 years), on the low number of countries with a positive result (8/22), and on the intrinsic limits of the analysis by cross correlations.

Table 1. Evolutions of the indicators of health in 10 countries of northern and southern bank

<table>
<thead>
<tr>
<th>Country</th>
<th>Life expectancy</th>
<th>Rate of survival of adults</th>
<th>Numbers of doctors by 10000 H</th>
<th>A number of beds by 10000h</th>
<th>Infant mortality rate</th>
<th>Spend of health in % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morocco</td>
<td>64</td>
<td>72</td>
<td>787</td>
<td>824</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Algeria</td>
<td>67</td>
<td>73</td>
<td>819</td>
<td>867</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Tunisia</td>
<td>70</td>
<td>76</td>
<td>819</td>
<td>870</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Libya</td>
<td>68</td>
<td>75</td>
<td>814</td>
<td>856</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Egypt</td>
<td>62</td>
<td>72</td>
<td>782</td>
<td>818</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Portugal</td>
<td>74</td>
<td>78</td>
<td>873</td>
<td>907</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>France</td>
<td>77</td>
<td>82</td>
<td>885</td>
<td>906</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Italy</td>
<td>77</td>
<td>82</td>
<td>905</td>
<td>940</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Spain</td>
<td>77</td>
<td>82</td>
<td>879</td>
<td>927</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Greek</td>
<td>77</td>
<td>81</td>
<td>914</td>
<td>926</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: World Development Indicators

3.1. The life expectancy to the birth:

The analysis of the life expectancy shows that this indicator evolved/moved in a remarkable way especially in the last decade. The average life expectancy in Tunisia with the birth in 2008 is 76 years.

This life expectancy increased of more than three years during the fifteen last years. These figures translating the demographic and the epidemiologic transition which currently Tunisia crosses. The life expectancy to the birth in Tunisia is higher than that in Algeria and Morocco and remains lower than that in the countries of northern bank of Mediterranean, 82 in France and Italy.

3.2. Infant mortality

The infant mortality knew a clear reduction. In Tunisia for 1000 births the TMI<1 was reduced of 51.4‰ in 1984 to 18‰ in the 2008 same TMI<5 knew the same reduction For Morocco a reduction passing of 118‰ in 1962 to 40‰. This level remains high by report/ratio of the homologous countries like Tunisia and Algeria 34‰. Broadly in the North African countries the TMI was divided by 4 between 1970 and 2005. These results are satisfactory and could reach the threshold hoped for OMD related to health.
This significant retreat of the infant mortality recorded in the North African countries expresses well the means implemented in favor of the policy of health and the evolution as of the these companies under several aspects.

3.3. Maternal mortality

The evolution of maternal death rate in the North African countries is characterized, certainly, by a reduction. For example in Morocco reduced east of 631 deaths percent miles births to 230 in 2005.

In Tunisia this rate is estimated at 100 percent miles births in 2005. Nevertheless, the rate/rhythm of the evolution of this rate remains with the lower part of threshold hoped for OMD. A national strategy of reduction of maternal mortality was implemented since 1998. This strategy made it possible to set up a monitoring system of the deaths nursery schools whose objectives are to provide the data necessary for the installation of action correct to the regional level, to mobilize the professionals of health to improve quality of the services in obstetrics and to supervise on the scale national the progress achieved in the fight against maternal mortality.

3.4. Expenditure of health:

The expenditure of health increased in a remarkable way in all the countries of world. They augmented on average to 67$ in South Asia, 79$ in Africa Sub-saharienne14, 132$ in Asia of East and the Pacific, 173$ with the Middle-East and in North Africa, 271$ in Latin America and the Caribbean and 300$ in Europe and Central Asia. We note that in the countries in the process of development, the expenditure of health remains quite lower than the amounts which would be necessary for porter OMD. These last accounted for on average 26$ in 2006 and among the countries with low income, more of the three quarter between them recorded a level of expenditure per capita lower than the threshold of the 34$ (CMS). The expenditure of health in % of GDP remains rather weak in the countries of southern bank Mediterranean and is close to 6% in 2008 in Tunisia on the other hand are higher in the Mediterranean countries of northern Bank, 11% in France in 2008.

3.5. The AIDS:

The fight counters the AIDS started, in 1986. The data available on the North African countries indicate that the infection with the VIH/SIDA east can active because of several factors related mainly on the social culture and the improvement of the living conditions of the woman. In Tunisia the first case is observed in 1985. At the end of 2003, the cumulated numbers of infected Tunisian with VIH amounts to 1175 distributed as follows:

- Old men of more than 15 years: 808.
- Women old of more than 15 years: 284.
- Old children of less than 15 years: 83.

The adopted strategy is based primarily on the epidemiologic monitoring, the prevention and the assumption of responsibility of the patients, with an implication of the civil company and other social departments.

3.6. Human poverty

The data available on the North African countries indicate that the rate of human poverty regresses in a way remarkable because of several factors related mainly to the improvement of the health in these countries (organization of system of health, equity,
efficiency, and good governance). In Tunisia this rate is moved back of 19.9% in 2000 (UNDP, 2001) to 17.9% in 2005, is remainder lower than that observed in Algeria and Morocco, 21.5% and 33.4%.

4. Relation between expenditure of health and economic growth empirical validation

This bets is devoted to empirically study the relation between various indicators of health and economic growth, for 15 countries of northern and southern bank Mediterranean by using econometric techniques, given of panel lasting the period 1990-2008.

4.1 Data and variables

4.1.1. Data

Given Gross domestic product per capita are extracted from the statistics "chains indexes" make information comparable between countries. For the physical capital, the data were obtained starting from the Table of the world of Penn (Heston and al., 2002), the data on the life expectancy to the birth, the infant mortality, the rate of schooling, the classification of the countries by areas are extracted from the base of the data "world development indicators". The data relating to expenditure in health per capita ($ US currents) are extradites from the base "health nutrition and population" placed at the disposal on line by "the world Bank". The data have a structure of panel rolled of 10 bearing countries over the period going from 1990 to 2008.

4.1.2. The variables retained for the analysis

- The Explained variable
  Gross Domestic Product per capita: Gross Domestic Product (GDP) is an economic indicator used to measure the production in a given country. It is defined like the total value of the production of richness’s (value of the goods and services created - value of the goods and services destroyed or transformed during the production process) in a country given during one year given by the economic agents residing inside the own territory. It is also the measurement of the income coming from the production in a given country. One speaks sometimes about annual economic production or simply about production.

- The explanatory variables
  - The physical capital: The physical capital is measured by using actions of series capital for each country by using a method of perpetual inventory during the year 1970, which is the year under review. During the following years, this capital is calculated by multiplying the capital of the previous year with the rate of depreciation (in this case, 5%) and by adding the current investment.
  - The life expectancy to the birth: The number of years that new born could live if the normal conditions of mortality to its birth should be the same ones throughout its life.
  - The rate of schooling: It is the report/ratio of the total number of registered voters (without consideration of age) to the population of age corresponding officially at the level of education considered. One considers the rate of schooling in primary education, secondary education and in the higher education.
Expenditure in health per capita ($ US currents): The total of the expenditure of health is the sum of the expenditure of public health and private as a ratio of the whole of the population. It includes the provision of services of health (preventive and curative), the activities of family planning, the activities having milked with the nutrition and the emergency aid reserved for health but it excludes the service from water and services of hygiene. The data are in current American dollars.

4.2. Theoretical model

We start with the function of aggregate output which follows

\[ Y = AK^\alpha W^\beta \]  

(1)

Where

\( Y \): Production or gross domestic product (GDP).
\( A \): Represent the factor of total productivity (TFP).
\( K \): Is the physical capital.
\( W = EHL \), where \( H \) is the capital of the workers of the man in the form of health, \( E \) is the human capital in the form of education and \( L \) is the number of workers.

The human capital is composed of the multiple components:

\( E \): Rate of schooling.
\( H \): Variable health measured by (life expectancy, Expenditure in health per capita ($ US currents)).

We can now rewrite the equation. (1) In the natural logarithm of the following form:

\[ \log Y_{it} = \alpha_0 + \alpha_1 \log k_{it} + \beta_1 \log S_{it} + \beta_2 \log D_{it} + \beta_3 \log EV_{it} + \mu_{it} \]  

(2)

4.3. Methods of estimate:

We estimate in this part the model represented in the relation (2) by using various methods. We propose initially traditional estimators in the context of the data of panel such as the models for fixed or random purposes.

4.3.1. Method of the data of the static panel

- Test of specification:

From a sample of data of panel one must check the homogeneous or heterogeneous specification firstly generating process of data. From the economic point of view, the tests of specification amount determining if there is the right to suppose that the studied ideal model is perfectly identical for all the countries, or on the contrary if there are specific specificities to each country.

One starts to test the assumption of a perfectly homogeneous structure (the constant and the slope are identical). If the statistics of Fischer associated with the test with total homogeneity rank above Fischer of the table, one thus rejects this assumption.

Then, one tests the presence of the individual effects while supposing thus that are \( \beta_i \) constant for them for all the countries. After having carried out these two tests, the model selected will be estimated by two specifications of heterogeneous panel, where the only source of heterogeneity comes from the individual constants:
If the \( \alpha_i \) is constant determinists, one speaks about a model for fixed purposes. And if the parameters \( \alpha_i \) is achievements of a random variable of hope and finished variance the model is for random purposes.

**Model for Fixed Individual effects:**

The use of the fixed effects results in supposing the existence of an effect specific to each individual. The taking into account of a specific effect is carried out only on the level of the residue \( \varepsilon_{it} \). In the estimate of an equation of growth, the existence of this fixed effect could correspond to the detention of factors specific to each country not directly observable.

The estimator of Ordinary Least Squares (OLS) of the parameters \( \alpha_i \), \( \hat{\beta} \) in the model for fixed purposes is called within estimator or estimator LSDV (Least Square Dummy Variable). The method of estimate thus consists in redefining all the variables around their individual averages to remove the constant. The estimator of the parameter \( \hat{\beta} \) is given by the following relation:

\[
\hat{\beta}_{LSDV} = \left[ \sum_{i=1}^{N} \sum_{t=1}^{T} (x_{i,t} - \bar{x}_i)(x_{i,t} - \bar{x}_i) \right]^{-1} \left[ \sum_{i=1}^{N} \sum_{t=1}^{T} (x_{i,t} - \bar{x}_i)(\bar{y}_t - \bar{y}) \right]
\]

The value within, obtained in the model with fixed effects is identical to the value of the MCO obtained from a transformed model where they explained and explanatory variables are centered on their individual averages.

**Model with random individual effects:**

According to (Hsiao, 1986), in the model with random effects, the residue can be decomposed into two main components in the following way:

\[
\xi_{it} = \alpha_i + \varepsilon_{it} \text{ when } i = 1, \ldots, N
\]

With, \( \alpha_i \) have the individual effects which represent all the structural specificities of the endogenous variable, which different according to the individuals. The stochastic process \( \xi_{it} \) indicates the component of the orthogonal total residue \( \xi_{it} \) to the individual effects. For the model with effects random, the not biased value can be built from the value the Slightest Generalized Squares (SGS).

Having estimated the parameters by both models. It is advisable to know what the good model for our sample is. The choice is thus, enters the model fixed individual effects and the model with random individual effects. For that purpose, we proceed to an analysis of test of specification of Hausman.
Test of Hausman:

The test of specification of Hausman (1978) is a test of specification of the individual effects. He serves to discriminate between the fixed and random effects. The tested hypothesis concerns between the individual effects and the explanatory variables:

\[
\begin{align*}
H_0 &: E(\alpha_i \mid X_i) = 0 \\
H_1 &: E(\alpha_i \mid X_i) \neq 0
\end{align*}
\]

Under \( H_0 \), the model can be specified with random individual effects and we then have to hold the value of the SGS. Under the alternative hypothesis \( H_1 \), the model must be specified with fixed individual effects and we then have to hold the value within. The statistics of test of Hausman applied to the test of the specification of the individual effects is the following one:

\[
H = (\beta_{\text{within}} - \beta_{SGS})\,[\text{var}(\beta_{\text{within}} - \beta_{SGS})]^{-1}(\beta_{\text{within}} - \beta_{SGS})
\]

Under \( H_0 \), the statistics \( H \) follows asymptotically Chi- two (\( \chi^2 \)) in \( K \) degrees of freedom.

4.3.2. Results of estimation by the method of the data of static panel:

By using the method of the data of static panel for 15 countries of the north and south bank Mediterranean 1990-2008, we obtain the results presented in the table 2.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Fixed effects</th>
<th>Random effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Gross Domestic Product (LogGDP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>(-11.28)***</td>
<td>(-5.94)***</td>
</tr>
<tr>
<td>L K</td>
<td>(0.338)***</td>
<td>(0.186)***</td>
</tr>
<tr>
<td>L TS</td>
<td>(0.278)***</td>
<td>(.1518334)*</td>
</tr>
<tr>
<td>LEV</td>
<td>(2.025)***</td>
<td>(1.428)***</td>
</tr>
<tr>
<td>LDS</td>
<td>(.3555102)***</td>
<td>(.564)***</td>
</tr>
</tbody>
</table>

| Degree of freedom (K)  | 4             | 4              |
| Number of year         | 19            | 19             |
| Number of countries    | 10            | 10             |
| Number of observations | 190           | 190            |

Prob > \( \chi^2 \) (4) = 0.0000

Value significant in a threshold of: (*) 1 %; (**) 5 % and (***) 10 %.
One must now choose the test which one will use it all while basing oneself on the test of Hausman which makes the comparison between the fixed effects and the degree random effects with 4 of freedom. It consists in testing the null assumption of independence between the errors and the explanatory variables with an aim of seeing which test one will choose. And since Prob > $X^2(4) = (0.0000) < 5\%$, one must reject the null assumption. In other words the errors depend on the explanatory variables. And consequently one will choose the test for purpose fixes i.e. all the countries have the same individual effect. For the whole of the countries, the results show significant impacts of all the explanatory variables. These results show that of elasticity of the growth of the GDP compared to the expenditure of health positive and it is equal to 0.35. In other words an increase in the expenditure of health 10% entailed, anything equal in addition a rise of 3.5% of the GDP per capita. In the same way we also note as the increase in the physical capital, of rate of schooling and the life expectancy of 10% entailed an increase respectively in the GDP per capita from (3.38%, 2.78%, 20.27%)%.

One will estimate now the model at the same time by using the method GLS which is adapted to estimate the model out of longitudinal transverse section and, allows to include the options panels (heteroscedastic) to specify the heteroscedasticity structure without transverse correlation of the errors and corr (ar1) to specify that inside the panels. There is car-creation of order 1. The results are reproduced in tables 2, 3 and 4 following.

Table 3. Countries of Northern Bank Mediterranean (CNBM)

| LogGDP  | Coefficient | Standard deviation | Stat Z  | P>|Z| |
|---------|-------------|--------------------|--------|------|
| Constant| -1.2371     | 2.676494           | -0.46  | 0.644|
| LK      | .0827       | .011187            | 7.39   | 0.000|
| LS      | 1.266945    | .4279144           | 2.96   | 0.030|
| LDS     | .8865344    | .0464296           | 19.09  | 0.000|
| LEV     | 1.857147    | .5488271           | 3.38   | 0.000|

According to these results one notes well that the regression explaining the GDP per capita by the various factors referred to above, shows significant effects of all the explanatory variables. Since the variables are expressed in logarithms, the coefficients correspond to elasticity’s.

Our estimate gives a modulus of elasticity of the growth of the positive GDP compared to the expenditure of health and it is equal to 0.886. In other words an increase in the expenditure of health 10% entailed, anything equal in addition a rise of 8.86% of the GDP per capita what is logical and confirms the empirical studies.

The physical variable capital is strongly significant. An increase of 10% Of the physical capital suggests a rise of the GDP Indeed per capita of 0.84%. Any new issue of physical capital is associated a growth of the GDP per capita.

Concerning the life expectancy, we note a significant and positive effect on the economic growth, where an increase in the life expectancy of 10% generates a rise of GDP per capita of 18.57%, which confirms the positive effect of the lengthening of the lifespan of the households on the economic growth.

The rate of schooling is used like the stock of human capital. We note a significant and positive effect indicator of education on the economic growth owing to the fact that an increase of 10% of the rate of schooling is associated an increase of 12.6% on the level of the GDP per capita. This confirms the strong effect of the accumulation of the human capital on the improvement of the economic growth.
Table 4. Countries of South Bank Mediterranean (CSBM)

| LogGDP  | Coefficient | Standard deviation | Stat Z | P>|Z| |
|---------|-------------|--------------------|--------|------|
| Constant| 17.33602    | 11.73121           | 4.48   | 0.039|
| LK      | 0.2197498   | 0.0663936          | 3.31   | 0.001|
| LS      | 0.7787682   | 0.2844905          | 2.74   | 0.006|
| LDS     | 1.276601    | 0.2655969          | 4.81   | 0.000|
| LEV     | 1.895739    | 2.859335           | 3.66   | 0.007|

For the countries of southern bank Mediterranean all the explanatory variables (K, S, DS, EV) are significant and positive but with coefficients of elasticity’s differ with those found in (CNBM).

Our estimate gives a modulus of elasticity of the growth of the positive GDP compared to the expenditure of health and it is equal to 1.27. In other words an increase in the expenditure of health of 10% entrained, anything equal in addition a rise of 12.7% of growth of the GDP per capita.

- An increase in the life expectancy of 10% generates a rise of economic growth health of 18.9%.
- Increase in rate of schooling of 10% entrained an increase in growth of the GDP per capita of about 7.78%.

The physical variable capital checks the theoretical assumption it contributes positively the economic growth. In (CSBM) increase in the equipment of 10% entrained rise of growth of the GDP per capita 2.19%.

5. Conclusion and remarks

The effects of the physical capital, the percentage of children in full-time education, the life expectancy, the healthcare costs on economic growths were examined during the present study. Our results indicate the positive impact of healthcare costs as well as on the economic growth. Our estimation gives a modulus of elasticity of the growth of the GDP with regard to healthcare costs equal to 0.86 in the (CNBM) and 1.27 in the (CSBM).

We also notice the positive effect of the life expectancy in both zones what confirms that the improvement of the life expectancy could motivate to save for the pensions. These savings improved liquid assets for the investment.

By basing itself on our empirical studies between healthcare costs. We notice that the increase of healthcare costs is not bad in itself but strategies will follow them as for example the systematic consideration of the efficiency in terms of costs, costs of opportunity and the led effects:

The available means are used as effectively as possible. The efficiency of the additional spending (measures of prevention or the remedial medicine) in terms of costs as well as the costs of opportunities (compared with spending for the education additional) must be examined thus systematically.

Complementary aspects (efficiency, quality, financing, structural changes) are taken into account, to be able to identify more finely still the positive effects. He takes there place to lead complementary searches on the subject.

Healthcare costs increased in a remarkable way. It would thus be important to take incentive measures adapted to the actors of the Healthcare sector, but also to verify systematically the efficiency in terms of costs of the recommended measures and to compare these measures with possible alternatives.
References