



## Research Letter

# A Review of the Relationship between the Health Expenditure and the Economic Growth: Turkey as an Example

Veysel ALADA<sup>a\*</sup>

<sup>a</sup> Kuveyt Turk Participation Bank, İstanbul / TURKEY

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### ABSTRACT

Health is the first thing that all humanity cares about and pays attention to protect. Since healthy people are more fit, strong, efficient and beneficial, it is clear that health has an important role in the production, development and growth of the country. Therefore the health expenditures of the countries are also of great importance. In this article the importance of the health spendings is mentioned and its impact on economic growth is investigated in Turkey. The relationship between health expenditures for the period 1976-2017 and economic growth is examined by using some econometric tests.

## 1. Introduction

People have various needs to maintain their lives. Individuals try to meet these needs with consumption of goods and services. According to science of economy there is scarcity of resources while people's demands for consumption of goods and services which is one of the important source of happiness is unlimited. At this point economy deals with how to meet the need for consumption better with scarce resources. (Ertek,2005:1). In other words science of economy deals with how to meet the unlimited individual needs most appropriately with scarce resources.

Scarcity of resources indicates its existence in the field of health as in all areas of life. Therefore, steps taken to improve health-related conditions may be limited. And it is necessary to benefit from basic economic concepts in order to make the most optimal health expenditures. (Tokalaş, 2006: 10). Since the main purpose in every economy is to increase the wealth level, economic growth of the country becomes important. Growth is the increase in goods and services over time, in other words gross domestic product(GDP). Within this direction, the high growth rate is considered as an indicator of economic success and low growth rate is an indicator of failure. In this sense, it is seen that in the countries with strong economy a greater share is reserved because of health expenditures and correspondingly they have healthier societies. When looking at the share of health expenditures, it is clear to what extent the country attaches importance to healthcare. (Yeğınboy, 1993).

Health expenditures in a country are shaped on the axis of health policies and socio-cultural factors. Many health variables such as health expenditures, average life expectancy, child mortality, have a field of study. However, in general, the positive situation at the health level or the increase in spending has a direct impact on the development and the growth of that country, thus increasing the level of income and welfare, labor productivity and human capital factors, according to most economists

\* Corresponding author.  
e-mail: [aladaveysel@gmail.com](mailto:aladaveysel@gmail.com)

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(Taban,2006: 33).

While health expenditures in countries are evaluated as expenditures that directly affect the economic developments, the health sector should be considered among the priority sectors, along with education. Therefore it is necessary to consider health expenditures as an important consumption expenditure. In addition, the lack of health expenditures as an investment spending will pose nonrecoverable negative effects in the future.(Gülcan, 2008: 24). Because the main purpose in all kinds of health services carried out to prevent the disease or in both investment and treatment is always to extend the healthy life of individuals. (Bulutoğlu, 1981:251). Turkey is behind all the developed and many developing countries as a result of the level and quality of health expenditures in terms of health service indicators. In consequence of literature reviews it is concluded that the reasons for the increase in health expenditures of developed and developing countries are generally common. It can be said that the reasons for the increase in health expenditures are technological, economic, social and cultural factors (Aydemir&Baylan, 2015: 419).

## **2. Health and Economic Growth**

Explaining the relationship between health and economic growth requires a good understanding of the concept of health. In fact health is not just the absence of disease, it is the ability of people to increase their lifelong potential. In this sense health is considered to be the most important thing that people have, as well as the most important source of welfare (Lusting, 2004: 15). The definition of health concept is defined as “mentally, physically and socially well-being” by World Health Organization-WHO. (Akalm, 1986: 270). It is understood that healthcare is not just about healing and improving human health, it is extensive and it must be carried out in a multisectorial extent to make the health services effective. In other words, cross-sector cooperation is essential (Yıldırım, 1994:10).

When people and societies can live healthfully, sources will be used effectively, a more active part will be taken in production and ultimately it will contribute significantly to social wealth which is the main purpose of economic science. Today the countries which have reached a certain welfare level and developed, allocate resource to health expenditures at an increasing rate every year in order to improve the quality of health services due to the investment in manpower (Aydemir&Baylan, 2015: 418).

## **3. Literature and the Data Set**

Kar and Ağır (2003), use causality analysis in order to test out the relationship between economic growth and health for the period 1926-1994 in Turkey. In consequence of analysis, a casual relationship between economic growth and health expenditures for the period 1926-1994 in Turkey could not be found.

Kıymaz, Akbulut ve Demir (2006), use Johansen cointegration analysis to see the relationship between health expenditures and economic growth for the period 1984-1998 in Turkey, and it is appeared that there is a cointegration relationship between private health expenditures and GNP in the study.

Taban(2006), researches the GDP and the relationship between economic growth and health for the period 1968-2003 by using the causality analysis over variables such as number of health institutes per capita, life expectancy at birth, number of people per healthcare personnel, number of beds in health institutes. As a result of causality analysis no casual relationship between the number of health institutes and real GDP is emerged, however a bilateral relationship between other health variables and real GDP is seen.

Sülkü and Caner (2011), evaluate the relationship between GDP per capita, health spendings per capita and population growth rate variables for the period 1984-2006 in Turkey with cointegration analysis. It is found in the study that there is a positive relationship between real GDP per capita and real health expenditures per capita, however a negative relationship between population growth rate and health expenditures.

Ak(2012), researches the long-term causality relationship between economic growth series, health expenditures and life expectancy at birth in Turkey. As a result of this analysis, although there could not be found a short-term relationship between series, there is a relationship between economic growth and health expenditures in long-term. Sargutan(2005), the period between 1978-2003 is researched and an increase in health equipment is observed in Turkey.

Emiroğlu(2012), interaction of health and economic growth for the period 1996-2012 in Turkey is researched and it is seen that health studies show a change over time related with growth.

## **4. Econometric Analysis**

In the study a semilogarithmic model is used based on annual data for the period 1976-2017. The logarithm of right side of

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equation, in other words the independent variable side, is taken and the tests are performed in this way. And the estimations are made by applying the least square method.

Y: Economic Growth (GNP)

K: Capital

L: Labor

SH: Health Expenditures (total health expenditures both private and state)

$\mu$ : Error Term

a0: C (constant term)

**Model:**  $\Delta Y/Y = a_0 + a_1 \cdot \log(K/Y) + a_2 \cdot \log(\Delta L/L) + a_3 \cdot \log(SH/Y)$

Datas are processed by using Eviews program in reference to model and the results are below.

**Table1:** The results obtained from datas in Eviews program (by the author).

Dependent Variable: EKONOMIKBUYUME				
Method: Least Squares				
Date: 12/16/19 Time: 11:18				
Sample (adjusted): 1976 2017				
Included observations: 37 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGEM	1.762219	0.591942	2.977010	0.0054
LOGSAG	6.067896	3.025064	2.005873	0.0531
LOGSER	-35.39325	14.36660	-2.463579	0.0191
C	33.33166	12.24510	2.722042	0.0103
R-squared	0.319891	Mean dependent var	4.212328	
Adjusted R-squared	0.258063	S.D. dependent var	4.543339	
S.E. of regression	3.913441	Akaike info criterion	5.668517	
Sum squared resid	505.3956	Schwarz criterion	5.842670	
Log likelihood	-100.8676	Hannan-Quinn criter.	5.729914	
F-statistic	5.173875	Durbin-Watson stat	1.641309	
Prob(F-statistic)	0.004845			

### Parameter Interpretations

- While the impact of other variables is constant, a 1 percent increase in labor increases the economic growth by 1,7622 units.
- While the impact of other variables is constant, a 1 percent increase in health increases the economic growth by 6,0679 units.
- While the impact of other variables is constant, a 1 percent increase in capital increases the economic growth by 35,3932 units.

It is understood from the parameters that health expenditures have a positive effect on economic growth in Turkey.

### Tests Applied

#### a) T Test (Singly Statistical Significance Test)

T test is used to test the significance of parameters in other words whether they are different from zero, in multiple linear regression as well as in simple linear regression. The processes that should be done in multiple linear regression are the same. The tests are done one by one for all parameters (Güriş&Akay, 2018: 213).

#### Independent variables t test probe values

logem(Labor): 0,0054

logser (Capital): 0,0191

logsag (Health expenditures): 0,0531

C: 0.0103

T test is applied to variables used in study, as can be seen in the table above and as a result it is analyzed that all the variables are statistically significant since all variables of probe values are less than 5 percent.

#### **F test (Statistical Significance Test of all Variables)**

No importance in simple linear regression. But significance of all the parameters aside from constant parameters are tested in multiple linear regression.(Güriş&Akay, 2018: 215).

Prob(F-statistic):0,0048

Since the probe value is less than 5 percent, it is concluded that all the variables are statistically significant amongst themselves.

### b) Durbin Watson Test

It is a test which is widely used as the first thing come to mind about autocorrelation and included in almost all econometrics and statistical package programs. It is found out for first degree autocorrelation by Durbin Watson (Güriş&Akay, 2018: 492).

Durbin Watson statis in study.: 1,6413

When Durbin Watson value is examined from the table used in study with 37 data number and  $\mu:0,05$  error term and compared with table values, it is determined that there is no autocorrelation and it is observed that it coincides with the region. In the table below, the datas of the research are given.

**Table:2** Datas are prepared by obtaining from the result table of Durbin Watson test by author.

k' (number of independent variables)	3
n (number of data used)	37
$\mu$ (error term)	0,05
dL	1,31
dU	1,66

### c) R Square Test

The result of R square demonstrates at what rate the dependent variable is explained by independent variables. According to result above, approximately 31 percent of the change in economic growth is explained by independent variables. However, a result of at least 67 percent between dependents and independents in R square indicates a healthier relationship.

## 5. Conclusions

Health is a phenomenon that humanity values the most, and even the most valuable property can be expended without hesitation when it comes to the health of individuals and society. Therefore, this situation is also important for the states. States want their communities to be healthy for many reasons and they set and implement policies in this respect. There are increasing expenditures for health and various projects and investments are made in Turkey too. Expenditures in Turkey are mainly covered by public and private sector sources. While health expenditures of public sector include expenditures made by local government, social security funds and central government, expenditures of private sector mostly consist of payments made by households, made by companies for personnel, organisations serving households without profit and private health insurance expenditures. (Özbay, 2007: 178).

In the study the relationship between total health expenditures and economic growth for the period 1976-2017 in Turkey is researched. In the study datas on GDP, labor and capital are obtained from Penn World Table (PWT 9.1) datas, however the datas on health expenditures are obtained from a different data center, OECD Data Center, since the older dates are not in PWT9.1. By optimizing the found data, T test, F test, Durbin Watson test, R square test are used and analyzed in Eviews program. As a result of analysis a positive relationship between health expenditures and economic growth is seen, therefore economic growth is increasing with the increase of health expenditures in Turkey.

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