American Journal of Clinical Neurology and Neurosurgery
Vol. 2, No. 1, 2016, pp. 5-9
http://www.aiscience.org/journal/ajcnn

Health Spending and Economic Growth in Selected OECD Countries

Arash Ketabforoush Badri[1, *], Saeed Ketabforoush Badri[2]

[1]Department of Economics, College of Management and Accounting, Qazvin Branch, Islamic Azad University, Qazvin, Iran
[2]Department of Medical, College of Medical, Tabriz Branch, Islamic Azad University, Tabriz, Iran

Abstract

Health is One of the items that can have a significant impact on economic growth, by increasing the power of national human resources. It can be said health promotion brings people are healthier and more productive. Due to this, This paper is trying to examine effect of health spending on economic growth in 24 selected countries of OECD in the period 2006-2013 using GMM methods. The results show that health spending has a significant and positive effect on economic growth, so that an increase of 1 percent of its value, economic growth 0/04 percent increased. Also, physical capital and the working population have a significant positive effect on economic growth. However, inflation has a negative effect on economic growth, as inflation increased the rate of economic growth decreased.

Keywords

Health Spending, Economic Growth, Human Resources, GMM Methods

Received: September 6, 2015 / Accepted: November 2, 2015 / Published online: January 11, 2016

1. Introduction

Economic growth and increase gross domestic product, beside raising the quality of life and equality in income distribution is among the main objectives of economic and development plans. In all economic research conducted directly or indirectly had been considered the impact on economic growth and has been introduced several strategies to achieve this goal.

In the beginning and until the theory of human capital, physical investment was known the only way to increase economic growth in communities. But, after that in the early 1960s, the concept of human capital beside physical capital was raised as economic growth and gradually became more prominent role. Most economists believe that economic and social development process that ultimately determines a country, that country's human resources and the importance of human capital in the growth process not less than physical capital. Studies show that investment in human capital, increasing productivity, and ultimately, increase economic growth. Human capital, was introduced, and trained first with concepts such as labor and education level of the workforce but, soon, health was also, along with training in the field of human capital and was a special place, to the extent that, today, health promotion and health workers known as one of the ways of improving the human capital [1].

Finlay (2007) believes that, enjoy good health and long, is one of the principles of human experience. Healthy people have more energy and freshness and have a positive outlook towards life better. These characteristics not only are interpreted, with a positive impact on social infrastructure, but, on economic growth and economic development, as well as affect. Therefore, to improve health, can increase workforce efficiency and bring economic growth. Health, through various channels can affect the level of a country's production. The first method is referred to in most studies, healthy workers are more efficient than others [2]. Healthy workers are more and work better than others and have a

* Corresponding author
E-mail address: arashkbadri@gmail.com (A. K. Badri), saeedkbadri@gmail.com (S. K. Badri)

creative mind and better prepared. Beside these direct effects, health has indirect effects as well as on production. For example, health human resources will follow motivation to study and better skills, Because improvement in sanitary conditions, on the one hand, will increase the attractiveness of investment in education and training opportunities, on the other hand, increased learning ability will be more susceptible individuals for continuing education and higher skills. Also increasing health and health indicators in society by reducing mortality and increasing life expectancy, will encourage more people to savings. To increase savings in the community, physical capital increases, and this, too, will help, indirectly on labor productivity and economic growth [3].

For this purpose, this study tries to investigate the relationship between health spending and economic growth in the 24 selected countries of the OECD in period 2006-2013 using GMM methods.

2. Theoretical Foundations and Previous Studies

Theories of human capital, as well as health, considers, like any other commodity market and as a durable good So that the all people are born with healthy reserves some less and some more of that benefit. Grossman also believes that every person at the beginning of each period as the beginning of a given year, with a reserve inventory of health. Over time the stock of one's health with increasing age decreased, this process is called aging and when the available storage is less critical than the health of a person, then the person will be eliminated.

Healthy people are more energetic and enthused and motivated to work and operate. Also, the direct and indirect costs to the national income and leads to the growth and development decreased. That is why, today all societies have paid special attention to enhancing the health indices. In economic literature is presented to health, various definitions. The World Health Organization defines health as not just the absence of illness, but the welfare of complete physical, mental and social [4].

From a consumer perspective, people are looking for a healthy because in this case to improve their quality of life and pleasure are more favorable. From the perspective of investment, the relationship between time and health, so that, if a person's health is good, time will be less disease and more days to work and earn more money and have a rest and recreation [5].

Chadwick in 1842 with the publication of an article, introduced health expenditure as an investment in human capital [6]. In spite of this introduction of health and growth in theory, only in recent decades has been conducted, a series of scattered studies on the health effects on economic growth.

Health status of a person, depends on, to a set of behavioral variables, environmental and economic (including health expenditures) affecting him. Capital health of any person as part of his human capital contribute to economic growth. Due to this, it could be a result of human capital and health capital in the economic development functions.

Schultz believes that human capital does not occur only through the accumulation of knowledge and education. In his view, education and health is one of the investment in human capital. Belag also believes that other forms of investment in human capital to foster personal property and help improve the quality of the labor force. The health workforce and health care, job training and job experience can increase their income. Therefore, they should also be considered as investment in human capital [1].

Attention the use of health and welfare in the field of economy began when as Rosenthal in 1960, in an article health and society, studied the history of health in the economy of United States [7].

Arrow (1963), with release paper of the government's involvement in health care justified and posed the question which theoretically would provide the health service should be done by the government or the free market? In this decade, economists over how to allocate the performance and health costs and paid to the effects of improving health on economic growth [8]. Also, Solow (1965) for the first time, enter the human capital in the production function, and measured the contribution of education to economic growth in this way [9].

Grossman (1972) was the first person who entered, health capital in the production of utility functions. He believed that the situation of human health is considered as a reserve and Therefore, health, is capital goods which produces a healthy time. Therefore, it can be entered in the production and utility function. He also believes that capital of knowledge and education is affected market and non-market labor productivity [10]. However, capital of individual health plays an important role in determining when a person is able to monetize it. Grossman considers gross investment in health and health which leads to the production of goods is a function of medical care, proper diet, exercise, healthy recreational activities and so on. In his view health will be asked by different people the two main causes. First, health itself directly into a commodity and utility functions, so that the disease will lead to a decrease in the utility. The second reason is that health is an investment product that determines the ability to perform non-economic and economic activities

in the community. In other words, capital of individual health reduces the time lost (due to illness) for him and the proceeds from this time can be regarded as an indicator for increasing individual productivity. That can proceeds from this time to take into account as an indicator of improved individual performance.

Kulindwa and Nerima (2012) in a study analyzing the relationship between health expenditure paid to economic growth in Uganda in the period 1980-2010 by using OLS methods. Results showed that health spending on economic growth in Uganda is positive and significant in the long run [11].

Mila and Sadeghi (2012) have studied the effects of health spending on economic growth in developing countries in the period 1990-2009 using the VECM.The results showed that in the short term, there was no relationship between health spending and economic growth of the countries studied. However, that was approved the relationship between health spending and economic growth in the long term [12].

Lago et al (2012) have analyzed the relationship between GDP and health spending in the 31 OECD countries in the period 1970-2009. Results indicate that in the long term, health spending increased significantly, per capita income in the countries studied [13].

Mehrara and Musai (2011) have examined the relationship between health spending and economic growth in the period 1979-2008 using OLS. The results suggest that health spending in the long term increase in the growth rate in the period studied [14].

Bakare and Sanmi (2011) have examined the relationship between health spending and economic growth in Nigeria in the period 1970-2008 by using OLS. The results show that with the increase in health expenditure also increased in Nigeria's economic growth [15].

Rahman (2011) examined the relationship between health and education spending and economic growth in Bangladesh in the period 1990-2009 by using ECM. The results showed that the increase in investment in education and health have a significant effect on the growth of human and physical capital that it provides increased economic growth in Bangladesh[16].

Adeniyi et al (2011) in a review examined the relationship between health spending and economic growth in Nigeria in the period 1985-2009. The results indicate that spending can improve health status government that this would reduce poverty and increase economic growth and development [17].

Safdari et al (2011) have analyzed the impact of health spending on economic growth in the period 1973-2008 by using VAR. The results showed that the rate of health spending is a significant and positive effect on the rate of economic growth [18].

3. Material and Methods

3.1. Data and Statistics

The population of this study are 24 selected countries of the OECD, including Australia, Austria, Belgium, Canada, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom and United States. The period has been used 2006-2013. This is the time series data collected from WDI2015 and OECD site statistics. The model presented in this study, inspired by the Akram et al (2009) as follows:

$$\mathrm{LGDPC}_i=\beta_0+\beta_1 L(\mathrm{HEALTH}_i)+\beta_2 L(\mathrm{GFC}_i)+\beta_3 L(\mathrm{POP}_i)+\beta_4 L(\mathrm{INFL}_i)+\varepsilon_i$$

LGDPC_i i = logarithm of GDP per capita of country i

L HEALTH_i = logarithm of per capita health spending in dollars i country

LGFC_i= logarithm of physical capital as a percentage of GDP of country i

LPOP_i= logarithm of the ratio of the working population as a percentage of the total population of country i

3.2. Estimation Method

Panel Data Panel data is data from a (usually small) number of observations over time on a (usually large) number of crosssectional units like individuals, households, firms, or governments. In other words panel data analysis is a method of studying a particular subject within multiple sites, periodically observed over a defined time frame. With repeated observations of enough cross-sections, panel analysis permits the researcher to study the dynamics of change with short time series. The combination of time series with cross-sections can enhance the quality and quantity of data in ways that would be impossible using only one of these two dimensions [19]. It should noted that, panel data has some more advantages. For example, since panel data relate to individuals, firms, states, countries, etc. over time, there is bound to be heterogeneity in these units. The techniques of panel data estimation can take such heterogeneity explicitly into account by allowing for individual-specific variables. By studying the repeated cross section of observations, panel data are better suited to study the dynamics of change. Panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data. By making data available for

several thousand units, panel data can minimize the bias that might result if we aggregate individuals or firms into broad aggregates [20].

3.3. GMM Methods

Generalized Method of Moments (GMM) Generalized Method of Moments (GMM) refers to a class of estimators which are constructed from exploiting the sample moment counterparts of population moment conditions (some-times known as orthogonally conditions) of the data generating model. GMM estimators have become widely used, for the following reasons. First, GMM estimators have large sample properties that are easy to characterize in ways that facilitate comparison. A family of such estimators can be studied a priori in ways that make asymptotic efficiency comparisons easy. The method also provides a natural way to construct tests which take account of both sampling and estimation error. Second, in practice, researchers find it useful that GMM estimators can be constructed without specifying the full data generating process (which would be required to write down the maximum likelihood estimator). This characteristic has been exploited in analyzing partially specified economic models, in studying potentially dis specified dynamic models designed to match target moments, and in constructing stochastic discount factor models that link asset pricing to sources of macroeconomic risk. To ensure the appropriate the method for estimating the model, Wald test and Sargan test is proposed. Wald test used for the significance repressors and Sargan test is used to prove the validity of instrumental variables [21].

4. Results and Discussion

Estimating the Model Using Generalized Method of Moments (GMM)

Table 1 shows the results of the effects of trade on employment in selected countries with GMM method. In this table is given statistics relating to the Wald and the Sargan test.

Table 1. Results of the effects of health spending on growth by using GMM.

Variables	The first difference		
	Coefficients	T statistics	prob
LGDPC(-1)	0.4321	6.4326	0.0000
LHEALTH	0.0482	10.1298	0.0000
LGFC	0.0389	9.7643	0.0000
LPOP	0.0298	7.3124	0.0000
LINF	-0.0010	4.3241	0.0000
Walt Test	9234/130		
Sargan Test	410/15		
F	3670/8 (0/000)		

Sources: research findings

The table 1 showed that all coefficients have signs consistent with the theoretical basis and all coefficients are significant. According to the results, one percent increase in GDP per capita with a time lag, health, physical capital, working population and inflation, respectively, 0/432, 0/048, 0/038, 0/029 and -0/001% increase in GDP per capita the studied countries. Also, the Wald test is used to determine the significance of the model that according to the P-Value in this test, the model proved to be significant. Sargan test statistic distribution χ 2 is the degrees of freedom equal to the number of over-identifying restrictions and the test of the null hypothesis that there is no correlation tools disturbing components. By examining P-Value of the test; The results indicate the validity of the assumptions of estimates, namely, the tools are valid, the results confirm the validity of the results for interpretation.

5. Conclusion

Health, by different channels can affect the production level of a country. The first channel that has the effect referred to in most studies healthy workers are more efficient than others. Healthy workers are more and work better than others, have a creative mind and better prepared. In addition to these direct effects, health has indirect effects on production. For example, health human resources, will follow, motivation to continue their education and better skills, because good health situation, on the one hand, will increase the attractiveness of investment in education and training opportunities and on the other hand, increased learning ability, people will be more prone to continue their education and skills more. Also, Increasing hygiene and health indicators in society by reducing mortality and increasing life expectancy will encourage people to savings more. Following the increase in public savings, increased physical capital and this will affect, indirectly on labor productivity and economic growth. In this paper, we examined the effect of health on growth for 24 selected OECD countries by using the generalized method of moments (GMM) for the period 2006-2013. The results showed that GDP per capita with a time lag, health, physical capital, working population and inflation have positive and significant effect on growth in studied countries.

References

[1] Emadzadeh, M., Sameti, M., Safi, D. (2011), The relationship between health spending and economic growth in Iran, Health Information Management, Vol. 8, No. 7, 928-918.

[2] Finlay, J. (2007), The Role of Health in Economic Development, Harvard Initiative for Global Health; Available From:URL://www.hsph.harvard.edu/pgda/Working Papers/PGDA_WP_21.pdf/

[3] Weil, D. (2007), Accounting for the Effect of Health on Economic Growth, The Quarterly Journal of Economics, 122 (3), 1265–1306.

[4] World Health Organization (2010), World Health Statistics; 2010.

[5] Lotfalipour, M., Fallahi, M., Borji, M. (2011), The effect of health indicators on economic growth, health management, 14 (46), 57-70.

[6] Spence, M., Lewise, M. (2009), Health and Growth, The International Bank for Reconstruction and Development, The World Bank.

[7] Ghanbari, A., Basakha, M. (2006), Changes in the cost of government health effects on economic growth (1338-83 years), Journal of Economic Research Tehran University, No. 83, Summer, 187-224.

[8] Arrow, K.J. (1963), Uncertainty and the welfare economics of medical care, American Economic Review (American Economic Association via JSTOR), 53 (5): 941–973.

[9] Solow, R. (1956), A contribution to the theory of economic growth. Quarterly Journal of Economics, 70, 65-94.

[10] Grossman. M. (1972), On the concept of health capital and the demand for health, Journal of Political Economy, 80(2), 223-255.

[11] Kulindwa, Y. J., Nerima, E. (2012), Empirical Analysis of Health Care Expenditure and Ugandan Economic Growth, European Journal of Economics, Finance and Administrative, Issue 53 September, 81-93.

[12] Mila, Z. Sadeghi, S. (2012), Health Care Expenditures and Economic Growth in Developing Countries: Panel Co-Integration and Causality, Middle-East Journal of Scientific Research 12 (1), 88-91.

[13] Lago-Peñas, S., Cantarero, D., Blázquez, C. (2012), On the Relationship between GDP and Health Care Expenditure: A New Perspective, Instituto de Estudios Fiscales Working Paper No. 4, April.

[14] Mehrara, M., Musai, M. (2011) The Causality Between Health Expenditure and Economic Growth in Iran, Int. J. Eco. Res., 2(4) July-August, 13-19.

[15] Bakare A.S., Sanmi, O. (2011), Health Care Expenditure and Economic Growth in Nigeria: An Empirical Study, Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 2 (2), 83-87.

[16] Rahman, M. (2011), Causal Relationship among Education Expenditure, Health Expenditure and GDP: A Case Study for Bangladesh, International Journal of Economics and Finance, Vol. 3, No. 3, August,149-159.

[17] Adeniyi, O., Lawal, M., Abiodun N. (2011), Health Expenditure and Nigerian Economic Growth European Journal of Economics, Finance and Administrative Sciences, Issue 30, 125-129.

[18] Safdari, M., Abouie Mehrizi, M., Elahi, M. (2011), The Effect of Health Expenditure on Economic Growth in Iran, American Journal of Scientific Research, Issue 37, 5-11.

[19] Gujarati, D. (2003). Basic Econometrics, the McGraw-Hill.

[20] Greene, W. H. (2003). Econometric Analysis, Prentice Hall.

[21] Hansen, L.P. (2007), Generalized Method of Moments Estimation, Department of Economics University of Chicago, June, 17, 2007, available at: http://home.uchicago.edu/~lhansen/palgrave.pdf.