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The Relationship between Health Expenditures and Economic Growth: Turkish Case

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Abstract
Health expenditures is one of the basic components of human capital. Increase in health expenditures and improvements in the field of health enhance the quality of human capital. There are a large number of theoretical and empirical studies indicating that increase in human capital affects economic growth positively. In this study, the existence of a long-term causality relationship between health expenditures, economic growth and life expectancy at birth series was investigated for the Turkish economy. As a result of the analysis it was concluded that there is not a short-term relationship between the series although there is a long-term relationship between health expenditures and economic growth.
Key Words*: Health Expenditures, Economic Growth, Human Capital.*

INTRODUCTION

The twentieth century provided important gains regarding health. Average life expectancy in developing countries increased from 40 years in 1950 to 63 years in 1990s (World Bank, 1993). The factors such as improved nutrition, better sanitation, innovations in medical technologies and public health infrastructure gradually increased average lifespan of people. The relative contribution of these factors depends on the level of economic development; there are synergisms between the important factors that function in complex ways (Bhargava et al., 2001: 428).

"Improvements in health status over the last 50 and 100 years have been nothing short of spectacular, as indicated/measured by a number of indicators. Vaccines, antibiotics and the other pharmaceutical developments have drastically reduced the frequency of the incidence of death and illness. Economic growth has also helped this situation: rich people are better nourished and educated and richer countries are more able to provide public goods (such as supply of water, sanitation, and control of disease vectors such as mosquitoes) that reduce the spread/transmission of disease" (Jack and Lewis, 2009: 1).

Health Economics helps find the options concerning which economic and social system provides support for health and how the resources will be allocated to health in order to reach the aim of making society healthy along with the justifications of this. Improvement of health constitutes complex processes. Economics is also a science and a discipline. Therefore, health economics includes the characteristics of the supply and demand of health service, mechanism of health service market, the role of the state in the market, basic characteristics of health services, health systems (service offering and financing), budgeting and monitoring mechanisms, health planning, health manpower planning and evaluation of the entire system (Çilingiroğlu, 2001: 1595–1596; Akın, 2007: 12).

Health used to be viewed as an end product of the growth process: people with higher incomes were healthier because they had more power/command on the goods and services promoting health. However, the thinking that health enhances economic growth reinforces/supplements and, to a degree, realigns ideas of the justifications of spending on health, justifications that were based on humanitarian and equity arguments. Wealth undoubtedly leads to health but health should be seen as a form of human capital and therefore it is seen as an input as well as an output for the growth process: the countries with educated and healthy populations are in a better situation regarding welfare especially in a favorable policy environment (Alleyne and Cohen, 2002: 1).

Improvements in health may be as important as improvements in income in thinking about development and human welfare. Good health can be thought of as a goal in its own right, independently of its relationship with income. However, there is a link between health and income, which is important for policy purposes. To the extent that health follows income, income growth should be the priority for developing countries. To the extent that income is a consequence of health, investments in health, even in the poorest developing countries, may be a priority. This argument for health as an investment good is particularly relevant since there are cheap and easily applicable health policies that can improve health dramatically even in the poorest countries (Bloom and Canning, 2008: 1).

Economic crises and natural disasters, thus, through their impact on health, can cause irreversible losses of human capital affecting not only current living standards but also poor people's ability to improve their

living standards in the future. This points to the importance of formulating a response that helps reduce the impact of systemic shocks on poor people's health (Alleyne and Cohen, 2002: 56).
In this study, the relationship between health and growth is discussed. Firstly, the theoretical foundations of the relationship between health and economic growth are emphasized and then the situation in Turkey is examined with empirical analysis.

RELATIONSHIP BETWEEN HEALTH AND ECONOMIC GROWTH

The relationship between *macroeconomics and health* was the subject of an influential commission, chaired by Jeffrey Sachs, which reported to the World Health Organization in 2001 (Commission on Macroeconomics and Health 2001b). The commission identified channels through which health affects economic growth and some of the policy levers that governments can use for improving health and, thereby, a country's broader development prospects (Alleyne, 2009: 43). As outlined in the commission's overall report (Commission on Macroeconomics and Health 2001a), health inputs contribute to economic growth through three channels (Alleyne, 2009: 45):

- Returns to individual health, through labor market outcomes, a demographic dividend, and increased savings,
- The net value of increased income from household investment in human capital,
- Societal returns to health, through economic activity such as the tourism industry or agriculture.

The overall recommendation of the Commission on Macroeconomics and Health was that the world's low- and middle-income countries, in partnership with high-income countries, should scale up the access of the world's poor to essential health services, including through specific interventions (Alleyne, 2009: 47). At the time that Selma Mushkin (1962) was writing, there was still a certain amount of debate as to whether improvement in human capital, as contributed by investment in health, was important for economic growth. A purple passage by Bauer and Yamey (1957) said, *"Once one leaves the terra firma of material capital and branches out in the upper ether of human capital, there is endless difficulty in finding a resting place*" (Alleyne, 2009: 45).

Howsoever healthy internal growth is for an economy, health and growth are that much internal. Labor is one of the basic elements of economic growth. When considered on a micro level, labor productivity will fall depending on the rate of the unsoundness of individual labor. For example, a person with influenza is not expected to work productively on a macro level. As the average health reduces in the society, total and individual labor productivity will also decrease. For example, it is estimated that in the South Africa one out of five adults have HIV virus today. Moreover, this means at least one household member of a family has HIV virus and will die of AIDS soon. In such a social environment, even if it is healthy, it is very difficult for labor to work productively. As stated in different examples, health has a feature of being a prerequisite on productivity therefore economic growth (Yetkiner, 2006: 83).
There are two approaches to estimating the effect of health on economic growth. The first is to take estimates of the effect of health from microeconomic studies and use these to calibrate the size of the effects at the aggregate level. The second is to estimate the aggregate relationship directly using macroeconomic data. We begin by considering the calibration approach (Bloom and Canning, 2008: 11).
Clearly, health is important. The largest poll in the world found that, across the world, health is what people value most - more than a happy family life, more than employment, and more than living in peace. The intrinsic, or constitutive, value of health is an important topic that has engaged the minds of many people. Those who would argue for the use of some metric like Jeremy Bentham's Felicific Calculus (Bentham 1780) would say, "*We should be involved in promoting health, because health in itself is a good thing*." (Alleyne, 2009: 41-42).
In developing countries, infectious diseases causing great losses in the society have higher incidence rates when compared to the richer countries. While the spending related to infectious diseases and contagious diseases is useful for the present society, it will also cause improvements in the health conditions of the next generations. Therefore, the outputs of the health expenditures in underdeveloped countries will be more apparent than developed countries. Besides, in the globalizing world, prevention of an epidemics in one country will also protect the neighboring countries, and increase in health in these countries and the neighboring countries will reflect to the economy as an improvement (Mushkin, 1962, 132; Akın, 2007: 30-31).
Empirical results regarding the relationship between human capital and growth indicate that improvements in the field of health and education affect productivity, increase in production and therefore economic growth. When education and health are considered as the two basic components of human capital, it is a fact that the investments made in these fields will provide contribution to economic growth in the long or short run. When the countries with higher economic development levels are considered, it is generally seen that the levels of education and health in these countries are also high.

LITERATURE

In the literature, empirical research on the causes of growth shows that the initial levels of population health are a significant predictor of economic growth. By some authors, the relationship between the growth and health are determined as follows

Aghion et al. (2010: 5) look more closely at the relationship between health and growth across OECD countries, using cross-country panel regressions. They find a significant and positive impact of health on growth between 1940 and 1980, but this relationship tends to weaken over the contemporary period, say from 1960 onwards. They interpret this finding as reflecting an age-specific productivity effect of health. Indeed, as of 1960, a large share of the growth in life expectancy at birth appears to be related to a reduction in mortality at old age, but they find that it is mostly the decrease in the mortality of individuals aged forty or less that matters for growth.

Bhargava, et al. (2001) argue that the effect of health on economic growth is larger in developing countries than in developed countries. The extent to which macroeconomic crises affect child health is an important policy question.

Paxson and Schady (2004) show that the infant mortality rate increased by 2.5 percentage points during a deep economic crisis in Peru in the late 1980s. As a result, there were more than 17,000 excess deaths. The data they have do not allow for a complete parsing out of the causes of the increase in infant mortality-particularly, because of limited information on the economic circumstances of households over the crisis period. However, they document a collapse in public expenditures on health during the crisis period, and they find evidence that women's use of health care during pregnancy and childbirth declined. Households appear to have protected expenditures on food, but not on other, possibly important determinants of child health status, such as medications. As a whole, the evidence supports the hypothesis that the collapse in public and private expenditures on health contributed to the observed increases in infant mortality. There is no evidence that the increase was due to changes in the composition of women giving birth, to outbreaks infectious disease, or to terrorism.

Even if a causal interpretation of the effect of health on individual productivity and economic growth is accepted, the argument for using health as an input depends on there being low-cost health interventions that can increase population health without first having a high-income level. However, there are a large number of such interventions that can be implanted (Bloom and Canning, 2008: 16).

Bloom et al. (2004) stated that their main result is that health has a positive and statistically significant effect on economic growth. It suggests that a one-year improvement in a population's life expectancy contributes to a 4 % increase in output.

Taban (2006) investigated the relationship between health and economic growth in Turkey within the context of causality by using the data of the 1980-2000 period. According to the empirical results, while a two-way causality relationship is seen between life expectancy at birth and economic growth, no causal relationship is found between health expenditures and economic growth.

Temiz and Korkmaz (2007) examined the relationship between health and economic growth in Turkey within the context of causality by using Johansen co-integration test and error correction model. In this study, life expectancy at birth and infant mortality rates were taken as the variables representing heath level, and economic growth was expressed with real GNP. It was determined that there was a negative one-way causality relationship from infant mortality rates to economic growth although empirical results showed a positive two-way causality relationship between life expectancy at birth and economic growth.

Çetin and Ecevit (2010) examined the effect of health on economic growth by using the data of 15 OECD countries belonging to the years 1990-2006 with panel data analysis. In the analyses, besides the other explanatory variables, the share of the public health expenditures in the total health expenditures was used. The relationship between health expenditures and economic growth was estimated by panel OLS method within the framework of Pooled Regression model. According to the empirical results, a statistically significant relationship between health expenditures and economic growth was not determined.

AMPIRICAL ANALYSIS

The purpose of this study is to analyze the relationship between health expenditures and economic growth. In this context, the existence of a long-term causality relationship between health expenditures, economic growth and life expectancy at birth series will be investigated. Economic growth series is real GNP series. The data regarding economic growth series is obtained from the Central Bank of Turkey (TCMB), health expenditures from the Turkish Statistical Institute (TUIK), the values regarding life expectancy at birth from the Human Development Report Turkey 2001, Human Development Report Turkey 2004, and Human Development Report Turkey 2006. In order to apply the causality analysis, it has a critical importance for the series to be stationary. The test of the series if they are stationary is shown in Table-1.

Table-1: Unit Root Test Results

ADF Test Results			
	ADF test statistics	*ADF Critical Value (%1)*	*ADF Critical Value (%5)*
LGSMH	-0.714	-3.724	-2.986
LSH	-0.231	-3.724	-2.986
LDYB	-2.938	-3.724	-2.986
Dickey Pantula Test Results of the Residual Series			
	ADF test statistics	*ADF Critical Value(%1)*	*ADF Critical Value (%5)*
DGSMH	-3.609	-2.664	-1.955
DSH	-3.896	-2.664	-1.955
DDYB	-2.536	-2.664	-1.955

When the results in Table-1 are considered, it is seen that series are stationary in the first difference. This indicates that the suitable causality test would be Johansen test. Optimum delay length for Johansen procedure has to be determined. The test results regarding the optimum delay length is shown in Table-2.

Table-2: Determination of Appropriate Delay Length

Delay	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	81.70577	NA	1.57e-07	-7.155070	-7.006291	-7.120022
1	**145.4912**	**104.3761***	**1.09e-09***	**-12.13556***	**-11.54045***	**-11.99537***
2	150.1649	6.373352	1.71e-09	-11.74227	-10.70082	-11.49693
3	161.6299	12.50721	1.58e-09	-11.96635	-10.47857	-11.61588
4	166.2577	3.786426	3.22e-09	-11.56889	-9.634765	-11.11326

From Table-2, it is seen that appropriate delay length is 1. Johansen test procedure results, which analyses the causality relationship in the long run between the series for 1 delay are shown in Table-3.
The equation (1) will be used to investigate the long-term relationship between the series by means of co-integration analysis.

$$LGSMH_t = \alpha_0 + \beta_1 LSH_t + \beta_2 LYB_t + \varepsilon_t \quad (1)$$

Table 3: Johansen Co-integration Test Results

Maximum Eigenvalue Test				Trace Test			
Null (H_0) Hypothesis	***Alternative Hypothesis***	***Test Statistics***	***% 5 Critical Value***	***Null (H_0) Hypothesis***	***Alternative Hypothesis***	***Test Statistics***	***% 5 Critical Value***
$r = 0$	$r = 1$	38.110	35.192	r= 0	$r > 0$	16.044	21.131
$r = 1$	$r = 2$	19.281	20.261	$r \leq 1$	$r > 1$	8.840	14.264
$r = 2$	$r = 3$	4.497	9.1645	$r \leq 2$	$r > 2$	1.591	3.8414

As seen from the results, maximum eigenvalue test statistics is 38,1 and exceeds 5 % critical value of 35,1. Therefore, according to the maximum eigenvalue test statistics, the alterative hypotheses asserting that there is at least one co-integrated vector between the series is accepted. On the other hand, trace test statistics is 16,04, and does not exceed 5 % critical value of 21,1. In conclusion, according to the trace test statistics, it was found out that there was not a co-integrated vector between the series. However, maximum eigenvalue statistics showed us that there was a long-term relationship between the series. Following this finding, normalized coefficients can be examined. When the obtained co-integrated vector is normalized according to the GNP variable, the results seen in Table-4 are obtained.

Table-4: Normalized Co-integration Vector

LGSHM	*LSH*	*LYB*	*Constant*
	0.378885	2.617403	0.012602

From Table-4, it is seen that a one-unit increase in health expenditures increases the GNP in the rate of 0.37 unit; on the other hand, a one-unit increase to be seen in the life expectancy at birth increases the GNP in the rate of 2,6 units. Following the investigation of the long-term relationship between the series, now the short-term dynamics between the series can be investigated.
The error correction model is used to investigate the short-term relationships between the series. The equation will be used to investigate the short-term dynamics between the series:

$$\Delta GSMH_t = \alpha_0 + \sum \beta_1 EC_{t-1} + \sum \beta_2 \Delta GSMH_{t-1} + \sum \beta_3 \Delta SH_{t-1} + \beta_6 \Delta DYB_{t-1} + \varepsilon_t \quad (2)$$

Table-5: Results of Error Correction Model

Variables	*DG*	*Standard Deviation*	*t - statistics*
EC	0.021805	(0.21337)	[0.10219]
DLG(-1)	-0.185176	(0.43057)	[-0.43007]
DLG(-2)	0.213029	(0.41472)	[0.51367]
DLSH(-1)	-0.031116	(0.08935)	[-0.34825]
DLSH(-2)	-0.097977	(0.08485)	[-1.15468]
DLYB(-1)	-0.863738	(4.34359)	[-0.19885]
DLYB(-2)	-1.289.536	(4.51188)	[-0.28581]
C	0.060554	(0.02255)	[2.68490]
R-squared	0.164207	**Log likelihood**	37.49311
Adj. R-squared	-0.225830	**Akaike AIC**	-2.564.618
Sum sq. resids	0.051682	**Schwarz SC**	-2.169.664
S.E. equation	0.058698	**Mean dependent**	0.042372
F-statistic	0.421003	**S.D. dependent**	0.053016

In order for the coefficient of the error correction model to be interpreted, it should be negative and statistically significant. However, since the error correction coefficient is positive (0.0218), it is concluded that there is no relationship between the series in the short run.

CONCLUSION

There is a mutual relationship between economic growth and health level of the society. It is possible for a country's economy to be strong by means of a sustainable economic growth and a healthy society. In order to mention about the existence of a healthy society, the government should offer adequate health services to meet all the needs of the society. As the resources allocated to health in the societies with a certain level of economic growth increase, the awareness of the individuals about health also increase. Therefore, it is seen that education and health complement each other and that it is compulsory to make similar investments in health as those made in physical capital and education regarding the development of the country. It is concluded that there is a relationship between health expenditures and economic growth in the long run while there is no relationship in the short run.

REFERENCES

Aghion, Philippe, Howitt, Peter and Murtin, Fabrice (2010). The Relationship Between Health and Growth: When Lucas Meets Nelson-Phelps, Bruegel Working Paper 2010/04, 1-25, http://www.economics.harvard.edu/faculty/aghion/files/Relationship%20Between%20Health.pdf, 08.02.2011.

Akın, Cemil Serhat (2007). Sağlık ve Sağlık Harcamalarının Ekonomik Büyüme Üzerine Etkisi: Türkiye'de Sağlık Sektörü ve Harcamaları, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Yüksek Lisans Tezi, Adana.

Alleyne, George A.O., and Daniel Cohen (2002). Health, Economic Growth, and Poverty Reduction, The Report of Working Group 1 of the Commission on Macroeconomics and Health, World Health Organization, Geneva, April, 1-114.

Alleyne, Sir George (2009). Health and Economic Growth: Policy Reports and the Making of Policy, Chapter 2, in Health and Growth (Editors: Michael Spence Maureen Lewis), 1-189), 41-52.

Bauer, Peter T., and Basil S. Yamey (1957). The Economics of Under-developed Countries. Chicago: University of Chicago Press.

Bhargava, Alok, Jamison, Dean T., Lau, Lawrence and Murray, Christopher JL. (2001). Modeling The Effects Of Health On Economic Growth, Journal of Health Economics, 20 (3), 423-440.

Bloom, David E., Canning, David and Sevilla, Jaypee (2004). The Effect Of Health On Economic Growth: A Production Function Approach, World Development, 32 (1), 1-13.

Bloom, David E., and Canning, David (2008). Population Health and Economic Growth, Commision on Growth and development, Working Paper No.24, 1-25.

Commission on Macroeconomics and Health (2001a). Health, Economic Growth, and Poverty Reduction: Report of Working Group I. Geneva: World Health Organization.

Commission on Macroeconomics and Health (2001b). Macroeconomics and Health: Investing in Health for Economic Development. Geneva: World Health Organization.

Çetin, Murat ve Ecevit, Eyyup (2010). Sağlık Harcamalarının Ekonomik Büyüme Üzerindeki Etkisi: OECD Ülkeleri Üzerine Bir Panel Regresyon Analizi, Doğuş Üniversitesi Dergisi, 11 (2), 166-182.

Çilingiroğlu, Nesrin (2001). Ekonomik Gelişme ve Sağlık Ekonomisi, Yeni Türkiye, Temmuz-Ağustos, Sayı: 40, 1594.

Jack, William and Lewis, Maureen (2009). Health Investments and Economic Growth: Macroeconomic Evidence and Microeconomic Foundations, World Bank Policy Research Working Paper Series, No. 4877, The World Bank Press, 1-37.

Mushkin, Selma J. (1962). Health as An Investment, The Journal of Political Economy, 70 (5), Part 2.

Paxson, Christina and Schady, Norbert (2004). Child Health and Economic Crisis in Peru, Princeton University, World Bank, December 22, 1-33,

http://weblamp.princeton.edu/~chw/papers/paxson_schady_peru.pdf, 10.02.2011.
Taban, Sami (2006). “Türkiye’de Sağlık ve Ekonomik Büyüme İlişkisi: Nedensellik Testi”, Sosyo Ekonomi Dergisi, Yıl: 2, Sayı: 4, 31-47.
Temiz, D., ve Korkmaz, S. (2007). Türkiye’de sağlık ve ekonomik büyüme ilişkisi: 1965-2005, TUIK 16’ncı İstatistik Araştırmaları Sempozyumu, Ankara, 266-278.
World Bank (1993). Investing in Health: World Development Report 1993. Washington, D. C., The World Bank.
Yetkiner, İ. Hakan (2006). Sağlık ile Büyüme (Growth with Health), Ege Academic Review, 6 (2), 83-91.