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DO HEALTH SPENDING AND ECONOMIC GROWTH MATTER IN DEVELOPMENT? EVIDENCE FROM TURKEY*

Sağlık Harcamaları ve Ekonomik Büyüme Kalkınma Sürecinde Etkili mi: Türkiye Örneği

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JEL Codes:
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Abstract

Development is a multi-dimensional process that involves changes in social and economic structure. The study deals with the relationship between health spending (HS), economic growth per capita (RGDP), and development level (HDI). A country's healthcare situation is the key component of the development level. The study explores the interdependence in Turkey and aims to combine economic level and health aspects of development. Based on this idea, the relation between the variables is analyzed by using Johansen co-integration and causality tests. The data set covers the period from 1990-2019. The empirical findings of the study confirm a significant relationship between development level, health spending, and economic growth both in short term and long term in Turkey. The causality results showed only one-way causality was obtained, from HS to HDI and from GDP to HDI. Findings show that an increase in health spending and income level in Turkey affects development positively in the long run. A planned increase in health expenditures for sustainable development is presented as a future direction.

Anahtar Kelimeler:
Sağlık, Ekonomik Büyüme, Kalkınma, Eşbütünleşme, Nedensellik, Türkiye.

JEL Kodları:
C32, I15, O11, O15.

Öz

Kalkınma, sosyal ve ekonomik yapıdaki değişiklikleri içeren çok boyutlu bir süreçtir. Çalışma, Türkiye'de sağlık harcamaları (HS), kişi başı ekonomik büyüme (KBGSYH) ve gelişmişlik düzeyi (HDI) arasındaki ilişkiyi ele almaktadır. Bir ülkenin sağlık durumu, kalkınma düzeyinin temel bileşeni ile ilgilidir. Bu çalışma, Türkiye'deki karşılıklı bağımlılığı araştırmakta ve kalkınmanın gelir düzeyi ile sağlık yönünü birleştirmeyi amaçlamaktadır. Bu fikirden hareketle, değişkenler arasındaki ilişki Johansen eşbütünleşme ve nedensellik testleri kullanılarak analiz edilmiştir. Veri seti 1990-2019 dönemini kapsamaktadır. Çalışmanın ampirik bulguları, Türkiye'de hem kısa hem de uzun vadede gelişmişlik düzeyi, sağlık harcamaları ve ekonomik büyüme arasında anlamlı bir ilişki olduğunu doğrulamaktadır. Nedensellik sonuçları, HS'den HDI'ye ve KBGSYH'den HDI'ye yalnızca tek yönlü nedensellik elde edildiğini göstermektedir. Bulgulara göre Türkiye'de sağlık harcamaları ve gelir düzeyindeki artış uzun vadede kalkınmayı olumlu yönde etkilemektedir. Sürdürülebilir bir kalkınma için sağlık harcamalarında planlı artışların devam ettirilmesi çalışma önerisi olarak sunulmaktadır.

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1. Introduction

The determination of development level is one of the highly analyzed and most critical themes in economic research. The development level is viewed to provide high economic and social conditions. Generally, to rank the performance of development or growth, GDP has used. This approach has frequently been criticized. World Bank declared that *"The basic objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives. But it is often forgotten in the immediate concern with the accumulation of commodities and financial wealth"* (World Bank, 2001: 9). Since the 1990s, some new attempts had come up with new indicators in the literature. The Human Development Index (HDI) is a basic indicator based on three main indicators of an individual's income, health conditions, and basic education (UNDP, 1990; Cracolici et al. 2010: 340).

An increase in GDP per capita, good health service, better working conditions, and a sustainable environment, moreover, constitute an improvement to enhance productivity (Cracolici, 2010: 341). Healthy lives and better living standards at all ages are essential to development and health has a substantial economic return with its productive investment (DeVol and Bedroussian, 2007).

The health issue figures prominently among the Millenium Development Goals (MDG) and Sustainable Development Goals (SDG), set by the UN and signed by nearly 190 countries. The SDG, aims to embody a health strategy, adopted on September 25, 2015. Health policies are more efficient than other industries by reflecting a high efficiency of sustainability. Adam Smith defined human capital in 1776, as *"all useful abilities of people" that lead to "real income."* The role of health as a huge contributor to economic growth represents human capital (Becker, 1993). Institute of Medicine (2003) defined health capital, as *"the value of the health that individual's to have over the course of her or his lifetime"*.

Health is central to well-being that contributes significantly to wealth and even economic progress, as a healthy population is more productive and lives longer. Health is defined as an *"economic engine."* Generally, good health leads to be a necessary prerequisite for economic development (Mirvis et al., 2008: 31). Based on this concept, the WHO promoted direct investment for developing nations to improve health and also economic levels (Commission on Macroeconomics and Health [CMH], 2001; World Bank, 2008).

Developed countries spend more on health services than emerging countries. A 1% increase in GDP per capita provides more than a 1% increase in national spending for health care (CMH, 2001). Developing countries view health expenditures as a development element and allocate scarce economic resources to support the health system. An increase in health situation not only increases efficiency but also contributes the productivity (Bloom and Canning, 2000). This is valid in either developed or developing countries.

Generally in developing countries, development is a necessary prerequisite to improving health status. But studies indicated that health is a basic indicator of development (World Health Organization [WHO], 2002; WHO, 2004; Ezzati et al., 2005). Thus, developing countries view health expenditures as a development instrument. Analyzing the correlation between HS and GDP in developing countries is more important; because they need to increase HS for a healthy and productive population to improve development and economic growth.

There are only a few studies that focused on Turkey and in this respect, this study focuses on Turkey as a developing country. By focusing on one developing country this study also aims to extend the existing literature from a dynamic perspective. The aim of the study is to reveal the effects of health spending and income per capita on the development level in Turkey. Additionally, the main purpose is to verify the importance of health spending and income level and to propose pragmatic strategies to improve the development level in Turkey.

1.1. Why Health?

Why the health question's first answer is the relationship between health and the development of countries. Healthy and good quality lives are affiliated with each other and indicated as life assets. That's why health and economic growth are together correlated factors of sustainable development (Alhassan et al., 2020: 1). Finlay reported that health plays a role in economic development. Healthy people are more energetic, vibrant, productive, and optimistic. These characteristics transform a positive effect on social and economic development (Finlay, 2007).

Development, not only the amount of the economic indicators, is expressed in terms of education, health, and social structure (Boyacioglu, 2012). Health is a component of HDI and health spending can increase human capital leading to overall economic growth. Although health is not a one-dimension for HDI (Klomp and Haan, 2008), it's an important factor and has a high correlation with GDP (Cracolici et al., 2010). A healthy population could bring higher economic value added. The financing of HS is a predominant concern for every country (Jaunky and Khadaroo, 2008). For these reasons, health spending that affects development level is one of the major variables. Health problems such as COVID-19 pose a global risk and have shown the critical need for preparedness.

In addition, in developing countries, a healthy population is a necessary precondition for improving economic and social development. Studies declared that health is not only a consequence of development, but also the main instrument for poverty reduction (Ezzati et al., 2005).

2. Literature

The interdependence between health spending, economic growth, and development has been focused on many empirical studies. The correlation between HS and GDP, is known as the Health-Led Growth Hypothesis (HLGH) and is discussed greatly in the literature (Lewis and Jack, 2009). After Mushkin's article (1962) it is declared that health is the investment of the countries. According to HLGH, health is an important capital that could increase income and lead to economic growth (Elmi and Sadeghi, 2012).

Human capital by Becker (1962) has opened a route to show health spending has an influence on GDP. In this direction, health spending by improving health indicators will increase development and GDP. The empirical literature indicates the correlation between health spending and economic growth via an indirect effect (Kalemli-Ozcan et al., 2000; Zhang et al., 2001; Blackburn and Cipriani, 2002). Baltagi and Moscone (2010) found a long term relationship between HS and GDP in 20 OECD countries during 1971-2004 period. Wang (2011) explored a

causality between an increase in HS and GDP for OECD countries during 1986-2007 period and indicated health expenditures can increase physical capital capacity and human capital, leading to overall economic growth.

Bouatyeb and Serghini (2006) found that health deficits impede development in 19 Arab countries. Elmi and Sadeghi (2012) investigated health spending and economic growth by panel co-integration and causality and found a bilateral causality and long term relationship between the variables in emerging countries. Jaunky and Khadaroo, (2008) found the difference in the income elasticity of public health expenditure and private health expenditure in 28 African countries for 1991–2000 period.

A review of the literature between health and GDP has been provided by Bhat and Jain, (2004) and summarized in many categories. Bloom and Canning (2005) pointed out the micro and macro evidence between health and economic growth. On the microeconomic level, healthy workers are more productive and command a higher income. The macroeconomic level is based on the correlation between better health and higher economic growth. Acemoglu and Johnson (2006) have analyzed the direct labor productivity effects of economic growth where health improvement leads to an increase in per capita GDP directly.

Grossman (1972) health spendings increase health care and provide benefit to continue for the economy. A healthy population reflects the economic productivity of individuals (Mirvis et al., 2008: 38). Schultz (1999) reported that a healthy population in general implies an increase in total factor productivity increases the work duration, learning ability, and efficiency of the economy. Barro (1991) pointed highly negative correlation between GDP and fertility rate.

Bukenya (2009) investigated possible dynamic relations between HS and GDP, measured by gross state product, and the results confirm a weak, but positive relationship between HS and economic growth in the southeast United States. Mehrara and Musai (2011) indicated a long run relationship between HS and GDP for Iran in the 1970-2008 period. Bloom et al. (2004) reported a %1 growth in the population under age 15 is associated with a 0.4% reduction in GDP per capita. Health spending is on the verge of surpassing $10 trillion and accounts for 10% of the world's total economy.

2.1 Discussion of Previous Studies Related to Health and GDP in Turkey

Studies, before the 1980s focused on health spending, are very limited and generally applied by governmental institutions' reports. Although some studies applied mathematical modeling techniques to analyze the relationship between HS and GDP in the late 1990s, empirical methods began to use after the Health Transformation Program was shaped in 2003 (Akdag, 2009).

Due to HTP reforms implemented since 2003, Turkey's health expenditures, and healthcare services have had a positive effect on life expectancy. Though Turkey's health expenditure per capita fluctuated widely, it inclined to increase through the 2003-2018 period (World Bank, 2022).

Table 1. Turkey Health Data and GDP, 2000-2018

Years	Health Expenditure (Per Capita US$)	Health Expenditure (%of GDP)	GDP (Current US$)	GDP Per Capita (Current US$)	Life Expentancy at Birth (Total Years)	HDI Score	HDI Rank
2000	199.4	4.60	274,302	4.337	70.01	0.660	88
2001	153.6	4.89	201,751	3.142	70.56	0.666	88
2002	186.6	5.06	240,253	3.687	71.08	0.677	88
2003	238.6	5.01	314,592	4.760	71.56	0.684	89
2004	299.5	4.91	408,876	6.101	72.00	0.690	88
2005	364.9	4.89	506,308	7.456	72.42	0.696	91
2006	416.9	5.15	557,057	8.101	72.83	0.704	89
2007	512.8	5.24	681,337	9.791	73.24	0.712	89
2008	570.8	5.22	770,462	10.941	73.65	0.714	94
2009	500.1	5.49	649,272	9.103	74.07	0.720	89
2010	539.3	5.02	776,992	10.742	74.51	0.739	83
2011	531.4	4.65	838,762	11.420	74.94	0.753	78
2012	524.2	4.44	880,556	11.795	75.37	0.765	73
2013	551.4	4.37	957,783	12.614	75.78	0.785	62
2014	525.4	4.33	938,952	12.157	76.17	0.796	59
2015	453.1	4.12	864,316	11.006	76.53	0.801	59
2016	466.7	4.28	869,692	10.894	76.86	0.808	58
2017	442.6	4.18	858,996	10.589	77.16	0.814	55
2018	389.8	4.12	778,471	9.454	77.44	0.817	54
2019	396.4	4.34	761.004	9.121	77.69	0.820	54

Source: World Bank.

In 2019, $9·7 trillion was spent globally on health and the current health expenditure per capita of the World was $1121 (World Bank, 2022). Spending per capita varied widely across countries, spanning from less than $100 per capita per year on health (Bangladesh, Benin, Burkina Faso, Burundi, Central African Republic, Ethiopia, Mozambique, Niger, Somalia, South Sudan, and Togo) to more than $5000 per capita (Austria, Denmark, Germany, Ireland, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, and the USA). High-income countries spent $5551 (5503 to 5605) per person on health, whereas upper-middle-income countries spent $949 (942 to 959) per capita. Lower-middle-income countries spent $266 (263 to 268) per capita and low-income countries spent $110 (108 to 111) per capita on health (Dieleman et al., 2018: 1810).

For Turkey, Kiymaz et al. (2006) used the Johansen method and found a cointegrating relationship between HS and per capita GDP, and a 10% increase in GDP would translate into a 21.9% increase in total healthcare spending. Sulku and Caner (2011) found that in long term income elasticity of total HS is less than one and health care is a necessity during the 1984-2006 period in Turkey. Empirical findings also showed a 10% increase in per capita GDP leads to an 8.7% increase in per capita HS. Tirasoglu and Yildirim (2012) used the time-series method for Turkey and the results indicated a long term relation between HS and GDP under the presence of one structural break.

Ak (2012) investigated causality between HS, GDP, and life expectancy for the Turkish economy and found a long term relationship between the variables although there is no short-term relationship. According to Akar (2014), there is a significant relationship between HS and GDP in long term, while there is no relationship in the short term in Turkey for the 2004-2013 period and an increase in HS has a positive effect on the life expectancy and quality of people. Dikmetas Yardan et al. (2016) made a study with a trend analysis in Turkey and found that the ratio of

private HS to GDP, current HS to total HS, and the pharmaceutical expenditure to total HS trends toward decreasing. Atilgan et al. (2017) stated 1 % increase in health expenditure leads to a 0.434% increase in GDP per capita in Turkey. According to Ercelik (2018) there is a significant relationship between per capita HS and GDP in the long-term for the 1980-2015 period in Turkey.

In agreement with the mentioned literature, for assessment of a country's development, both economic and health situations must be considered within a consistent framework simultaneously. A multidimensional approach to the analysis is needed as a country's development cannot be limited to only one variable.

3. Data and Methodology

Economic theory suggests that many time series data sets will move together, fluctuating around a long-run equilibrium. Cointegration is a technique used to find a possible correlation between time series processes in the long term. Cointegration occurs when two or more nonstationary time series have a long-run equilibrium and move together so that their linear combination results in a stationary time series and share an underlying common stochastic trend. The Engle-Granger method starts by creating residuals based on the static regression and then testing the residuals for the presence of unit root. Compared to the Engle-Granger test, the Johansen test allows for more than one cointegrating relationship. Johansen's test comes in two main forms trace tests that are evaluated the number of linear combinations in a time series data

$$H0: K = K0$$
$$H0: K > K0 \quad (1)$$

and as maximum eigenvalue test that is defined as a non-zero vector which, when a linear transformation is applied to it,

$$H0: K = K0$$
$$H0: K = K0 + 1 \quad (2)$$

changes by a scalar factor. The null hypothesis should be rejected to confirm the existence of a cointegration relationship in the sample. When Y_t is a group of time series composed of three independently nonstationary time series as $y_1=(y_{11},y_{12},\ldots,y_{1t})$, $y_2=(y_{21},y_{22},\ldots,y_{2t})$ and $y_3=(y_{31},y_{32},\ldots,y_{3t})$, then cointegration implies that y_1, y_2, and y_3 can be combined in a way that their linear combination

$$\beta Yt = \beta 1y1t + \beta 2y2t + \beta 3y3t \sim I(0) \quad (3)$$

is stationary. β is a cointegrating vector that dictates how cointegrating series are combined. Because there can be multiple cointegrating vectors that fit the same economic model, identification restrictions

$$\beta = (1, -\beta 2, \ldots, -\beta N)$$
$$\beta Yt = y1t - \beta 2y2t - \beta 3y3t \sim I(0) \quad (4)$$

must be imposed to normalize the cointegrating vector for estimation. Cointegration implies that time series will be connected through an error correction model. The error correction model allows us to better understand long-run dynamics. Moreover, the error correction model includes

a short-run dynamic adjustment mechanism that describes how variables adjust when they are out of equilibrium. In a bivariate cointegrated system $Y_t=(y_{1t},y_{2t})$ and a cointegrating vector $\beta=(1,-\beta_2)$ such that

$$\beta Yt = y1t - \beta 2y2t \tag{5}$$

the error correction model depicts the dynamics of a variable as a function of the deviations from long-run equilibrium

$$\begin{aligned} \Delta y1t &= c1 + \alpha 1(y1,t-1-\beta 2y2,t-1) + \sum j\psi 11j\Delta y1,t-j + \sum j\psi 12j\Delta y2,t-j \\ &\quad + \epsilon 1t \\ \Delta y2t &= c2 + \alpha 2(y1,t-1-\beta 2y2,t-1) + \sum j\psi 21j\Delta y1,t-j + \sum j\psi 22j\Delta y2,t-j \\ &\quad + \epsilon 2t \end{aligned} \tag{6}$$

and the vector error correction model (VECM) is the multivariate extension of the error correction model

$$\Delta Yt = \Phi Dt + \Pi Yt-1 + \Gamma 1\Delta Yt-1 + \cdots + \Gamma p-1\Delta Yt-p+1 + \epsilon t \tag{7}$$

that reflect the long-run and short-run dynamics of the system.

This research examines the correlation between health spending, economic growth, and development in addition to the direction of causality. Health is represented by health spending (HS). Economic growth is modeled by identifying GDP per capita and development is represented by HDI.

The aim of the study is to empirically examine the causality and relationship existence between HDI, HS, and GDP in Turkey. This study covers the Turkish economy over a thirty-year period spanning from 1990 to 2019. Data evaluated annually extracted from World Bank Development Indicators (WDI) in 1990-2019 period considering availability of data. The relationship between HE, GDP and HDI is analysed by using Augmented Dickey Fuller (ADF), the co-integration and causality tests, cointegration tests and vector error correction model.

The variables used within the scope of the study are included in the methodological process by taking their logarithmic forms in order to balance the extreme variation in the series that show an exponential increase-decrease in level, to express them in a linear form and to show random distribution of the variables.

Table 2. Description of Variables

Variable Symbol	Description	Source
HDI	HDI measures the country in three basic dimensions of development: health, education, and GDP per capita.	World Bank
RGDP (constant 2015 $)	GDP per capita is GDP divided by the midyear population.	World Bank
HS=Total, ($/capita)	Health spending measures the final consumption of healthcare goods and services	World Bank

After the GDP variable is seasonally adjusted using the Tramo-Seat method, it is included in the analysis process by taking its natural logarithmic forms in order to balance the extreme variation in the series by expressing it in a linear form. Descriptive statistics of variables are also

shown in the Table 3. J-B value indicates that errors are normally distributed at %5 significant level.

Table 3. Summary of Statistics

	HDI	**GDP**	***HS***
Mean	0.691	9.518	4.130
Median	0.687	9.492	4.357
Max.	0.820	9.967	5.494
Min.	0.579	9.150	2.446
Skewness	0.099	0.301	-0.558
Kurtosis	1.771	1.750	1.902
Jargue-Berra(J-B)	*1.934*	*2.404*	3.067

After exploring the descriptive statistics, it is also a necessity to test the stationary of the variables. In order to apply the causality analysis, it has critical importance for the series to be stationary. ADF and Phillips-Perron (PP) tests were used for stability tests. Table 4 presents the ADF and PP, Zivot-Andrews (Z-A) and Lee-Strazicich (L-S) unit root tests employed to examine the integration of the variables. Dickey-Fuller unit-root results confirm that all the variables are non-stationary at level but stationary at first difference. Also, Philip-Perron unit root tests set out that all variables are stationary at first difference according to the 5% significance level.

The series were also examined in terms of structural breaks, this is because the study period includes economic and politic crises in Turkey. The results obtained from structural unit root tests (Z-A and L-S) reveals that there is no structural break in the series.

Table 4. Unit Root Test Results

	ADF		**PP**	
	I(0)	**I(1)**	**I(0)**	**I(1)**
HDI	-2.980	-4.724**	-2.472	-5.261**
HS	-0.814	-3.574**	-1.131	-3.725**
GDP	-2.504	-5.336**	-2.534	-6.436**
	Z-A			
	A-Intercept	**B-Trend**	**C-Both**	
HDI	-4.326	-3,488	-4,181	
HS	-2.608	-4.987	-4.931	
GDP	-4.016	-3.459	-3.949	
	L-S			
	I.Break		**II.Break**	
	Crash	**Break**	**Crash**	**Break**
HDI	-5.060	-4.053	-5.266	-4,124
HS	-6.936	-6.002	-1.948	-4.240
GDP	-3.805	-2.809	-2.740	-5.230

Note: *, **, ***, respectively indicate the significance levels of 1%, 5% and 10%.

The aim of the cointegration rationale is to search for linear combinations of time series which are not independently stationary. After unit root tests, the next step is to examine if there is the existence of long run and short run equilibrium between the variables. The maximum lag length considered in the study is 12 and the appropriate lag length was found as 2.

Due to the fact that all the series are stationary in the first difference at a 5% significance level, it was decided to use the Johansen cointegration (Johansen, 1988) method coined by Pesaran et al. (2001). The aim of the cointegration rationale is to search for linear combinations of time series which are not independently stationary. Model 2 is selected for the VECM (2) model since the cointegration value in the Table 4 is negative and statistically significant, a cointegration relationship can be mentioned. HS and GDP have a positively and statistically significant effect on HDI in the long-run. Also, the lagged values of the HDI, HS and GDP have a positive and statistically significant effect on HDI in the short-run. Trace tests and Max-eigenvalue tests indicate one cointegrating equations at the 0.01 level in Table 5. All assumptions are provided according to autocorrelation, heteroscedasticity and normality test results.

Table 5. VECM (2) Estimation Results

Long-Run Equation Results					
HDI(-1)	HS(-1)	-0.032**	GDP(-1)	-0.120**	C
1	HS(-2)	-0.010**	GDP(-2)	-0.072**	0.704***
Short-Run Equation Results (Error Correction Model)					
Variables	**DHDI**	**Variables**	**DHDI**	**Variables**	**DHDI**
D(HDI)(-1)	0.250*	D(HS)(-1)	0.014**	D(GDP)(-1)	-0.036**
D(HDI)(-2)	-0.042**	D(HS)(-2)	0.002**	D(GDP)(-2)	0.285***
EC	-0.22*	C	0.08***		

	Trace Test			**Maximum Eigenvalue**		
	Eigen Val.	**Trace Stat.**	**Critical Val.**	**Eigen Val.**	**Max-Eigen Stat.**	**Critical Val.**
None *	0.911	88.698	42.915	0.911	67.905	25.823
At most 1	0.397	20.793	25.872	0.397	14.188	19.387
At most 2	0.210	6.604	12.517	0.210	6.604	12.517

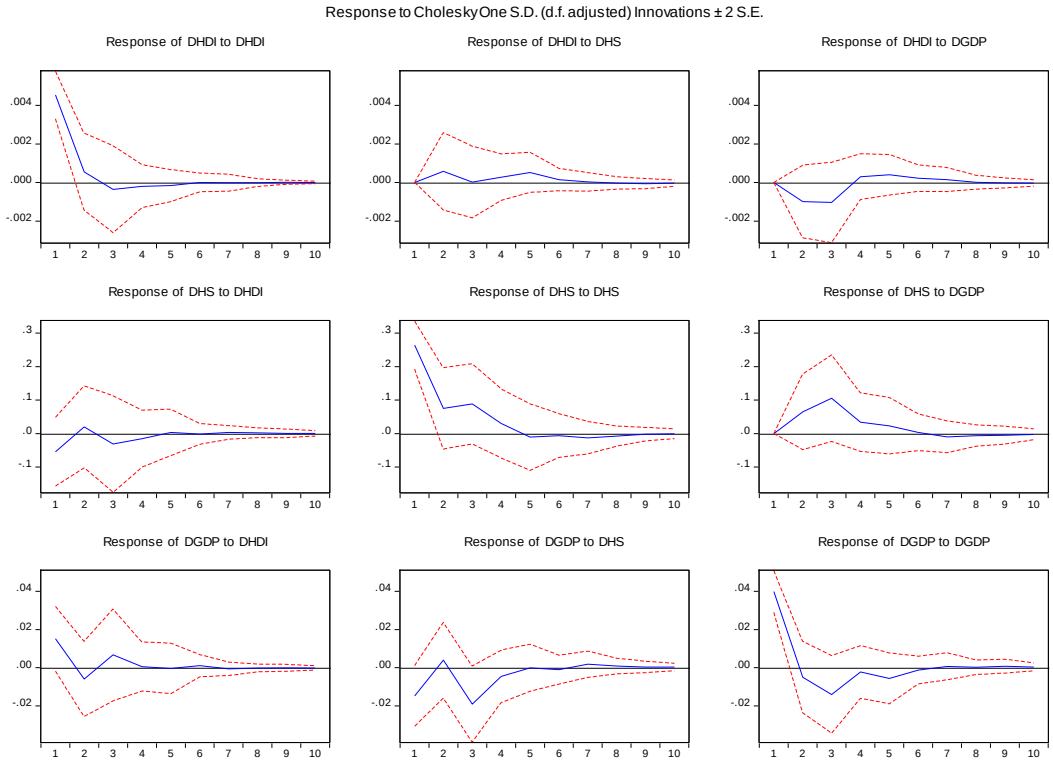
Diagnostic Tests						
LM Autocorrelation Test			**White Heteroscedasticity Test**		**Normality**	
	Lag 1	Lag 2	Chi-square	134.019	J-B Test	3.908
LRE stat	13.085	11.329				
Rao F-stat	1.653	1.791				

Long-run and Short-run Causality			
	$f(HDI\|HS, GDP)$	$f(HS\|HDI, GDP)$	$f(GDP\|HS, HDI)$
Long Run (Chi-square)	5.734**	6.034	3.460
Short Run (t-stat)	2.380**	0.154***	1.008***

Note: *, **, ***, respectively indicate the significance levels of 1%, 5% and 10%.

In the short term, the lagged values of the HDI series positively and statistically affect the HDI series. Since the cointegration value in the table is negative and statistically significant, a cointegration relationship can be mentioned. Also in the long term, effect of HS and GDP found statistically positive.

As seen in Table 5, HS and GDP are both short-term and long-term causes of HDI. Since there is no causality from HDI to other variables, there is one-way causality at %5 significant level. When the impulse-response graphs in Graph 1 are examined, it is found that a one standard deviation shock to GDP affects the HDI variable negatively in the first periods and then positively in other periods. Moreover, a one standard deviation shock to to HS affects HDI positively in all periods.



Graph 1. Impulse-Response Results

The long- term and short-term effects of HS and GDP variables on HDI were found to be positive. However, when the causality was examined, only unidirectional causality was obtained from HS to HDI and from GDP to HDI.

4. Conclusion

The correlation between health spendings, economic growth and development has been focused in many empirical studies. Health spendings have an important role in development process of countries. Therefore, the relationship between health expenditures and development needs to be demonstrated. Different studies made comparisons in many countries and regions. This study explores the interdepence at Turkey and aims to combine economic level and health aspects of development in Turkey.

Cointegration and causality tests were used in the analyzes of HS, GDP per capita and HDI covering the period 1990–2019. The empirical results of analysis suggest that a relationship can be confirmed. The results show that there is a significant relationship among HS and GDP per capita and HDI in the short and long run in Turkey. The causality results showed only one-way causality was obtained, from HS to HDI and from GDP to HDI. It can be said that each unit of health spendings and increase in income level in Turkey affects development positively in the long run. Also the long- and short-term effects of HS and GDP variables on HDI were found to be positive.

Health has been considered as one of the remarkable elements that results in the increase in GDP for a country. Thus, there have been many studies related to the relationship between health, economic growth and development. The findings of the study is similar to earlier country

studies Elmi and Sadeghi (2012) and Kiymaz et al., (2006) that find cointegration in general, as a long run relationship in health spending and economic growth. In addition, the literature review basically indicates that healthcare spendings affect economic growth and development positively. Moreover, numerous studies have emphasized a strong and positive correlation between HS and GDP. As a result, the contribution of health to economic growth is substantial. Besides, the importance of health for economic growth has been provided by World Health Organization indicates significant links of health with economic growth (WHO, 2001). To sum up, it can be considered that total health spendings have remarkable effects on per capita GDP. In other words, health affects GDP per capita in a positive way since the development of the country is improved.

The results of analysis give a panaroma of Turkey. The relation between health and GDP for development is well illustrated. The analysis shows clearly how health spendings and income level are advancing development in Turkey and allows us to create suggestions to improve development. From the findings stated above, it is important to continue health spendings in a planned manner for a sustainable development. Turkey made substantial socio-economic progress during Despite improving health conditions and income level from 1990s, Turkey has accomplished less than targeted development. For Turkey it can be recomended to policy-makers a huge attention to health and to prioritize in development through the provision of income and health level affordable. Actualing these will not only assure effective labor and also provide an increase of the productive capacity of economy.

Declaration of Research and Publication Ethics
This study which does not require ethics committee approval and/or legal/specific permission complies with the research and publication ethics.

Researcher's Contribution Rate Statement
The authors declare that they have contributed equally to the article.

Declaration of Researcher's Conflict of Interest
There is no potential conflicts of interest in this study.

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