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Can We Increase Health Expenditure Per Capita Through Higher Economic Growth? Empirical Evidence from Turkey

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Abstract

Many researchers indicate that health expenditures positively contribute to economic growth and prosperity, emphasizing that when healthy individuals are more efficient, they make a huge contribution to human capital, which in turn improves productivity. There is also a relationship between economic growth and health expenditures, meaning that health expenditure is a function of income and higher income leads to an increase in spending on health. In this study, we assess whether economic growth has an impact on healthcare expenditure by focusing on an emerging market economy. Therefore, the main objective of this paper is to test the impact of economic performance on health expenditure per capita for Turkey in the period of 1999-2018. In the analysis, the unit root properties are tested by using RALS (Residual Augmented Least Squares) ADF and traditional Augmented Dickey Fuller (ADF) unit root tests. In order to examine the long-run relationship between economic growth and health expenditure per capita, we employ the RALS Engle-Granger and traditional Engle-Granger cointegration tests. The findings of our analysis support the evidence of a long-run impact of economic growth on healthcare expenditure per capita for Turkey in the relevant period.

Keywords

Health Expenditure Per Capita, Economic Growth, RALS

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Can We Increase Health Expenditure Per Capita Through Higher Economic Growth? Empirical Evidence From Turkey

More investment in healthcare can lead to improved access to healthcare services, which in turn improves population health and productivity, thus further contributing to economic performance and fiscal resources. Wang (2015) indicates that economic growth rates are determined by the cumulative effect of several factors, rather than by the influence of just one or two key factors. While it is necessary to use public resources to provide healthcare services, a trade-off exists between the level of healthcare expenditures and other public expenditures, such as social security and government payments, which could have an impact on economic growth. From this perspective, increases in the ratio of health expenditure to GDP have a two-fold effect on economic performance. The first is partly related to the crowding-out effect, which occurs when an increase in health spending results in a reduction in expenditure on other public spending, which might potentially boost productivity. The second channel is connected to the impacts of public health improvements, where an increase in health spending generally results in a rise in worker productivity. While the first channel tends to have a negative impact on economic growth, the second channel contributes to a more prosperous economy. Therefore, the net impact of increased health spending on economic growth is determined by these two channels' relative strength.

Assessing a country's healthcare spending is of key importance and the relationship between healthcare expenditure and economic growth has been extensively studied in various research. It is also one of the primary research areas in the theory of welfare economics, as it concerns economic and social welfare by examining how the resources of an economy are distributed among various social agents (Raghupathi and Raghupathi, 2020). Economic growth also has a well-known effect on a healthcare system. Accordingly, the amount of money spent on health depends on the size of income or resources that are available in both the private and public sectors. An increase in income or resources is connected to the availability of additional funds to spend on health. A growing number of studies on health economics support the notion that healthcare expenditure per capita levels can vary due to differences in per capita gross domestic product (GDP) (Boussalem et al., 2014).

In a country or region, health expenditure includes all expenditures or costs related to medical care and treatment, prevention and promotion, community health facilities, rehabilitation, as well as capital formation, with the primary goal of improving health in that country or region (Ndedi et al., 2017). The COVID-19 pandemic showed that investing in the healthcare system has great importance and countries that have a strong healthcare system have coped better with this huge health crisis. According to a report published by the World Health Organization in 2019, global healthcare systems grew at a faster rate than economies until 2018. While global health spending

increased by 3.9 percent per year in real terms from 2000-2017, the economy grew by 3 percent per year during the same period. In middle-income countries, which are rapidly shifting towards higher levels of health spending, health spending increased by 6.3 percent per year, while the economic growth was 5.9 percent per year from 2000 through 2017 (World Health Organization, 2019). According to another report published by the WHO in 2020, global health spending increased by 8.3 trillion U.S dollars in 2018, accounting for 10 percent of global gross domestic product (GDP), representing the first time in the previous five years that health spending increased slower than GDP. Similarly, government health spending per capita increased between 2000 and 2018, but at a slower rate following the 2008-09 Global Financial Crisis (World Health Organization, 2020). Figure 1 shows the health expenditures of OECD countries as a share of GDP as of 2018.

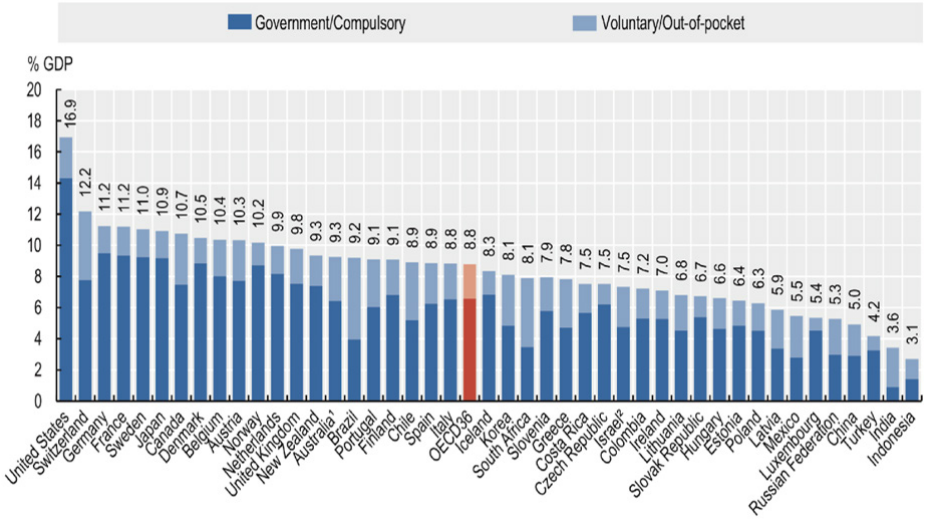


Figure 1. Health expenditure as a percent of GDP, 2018
Source: OECD (2019). Health at a Glance 2019, OECD Indicators.

Turkey launched an unprecedented health system reform program known as the Health Transformation Program (HTP) in order to eliminate notable inequities in the healthcare system and to ensure citizens against financial hazard. Following the HTP, Turkey accomplished universal health coverage and significant improvements in terms of outcomes and equity (Atun, 2015). The creation of universal health insurance, the extension of health insurance benefits, and access to healthcare services for all residents, especially for low-income groups, is one of the key components of the HTP. Figure 1 shows the population coverage for a core set of services for OECD countries. Although nearly all OECD countries provide universal health coverage to their citizens, there are persistent gaps in certain countries. Population coverage for core services stands below 95 percent in seven OECD countries, and is lowest in Mexico, the United States, and Poland (OECD, 2020). According to Figure 2, Turkey,

with a rate of 99.2 percent, seems much better when compared to other emerging market economies.

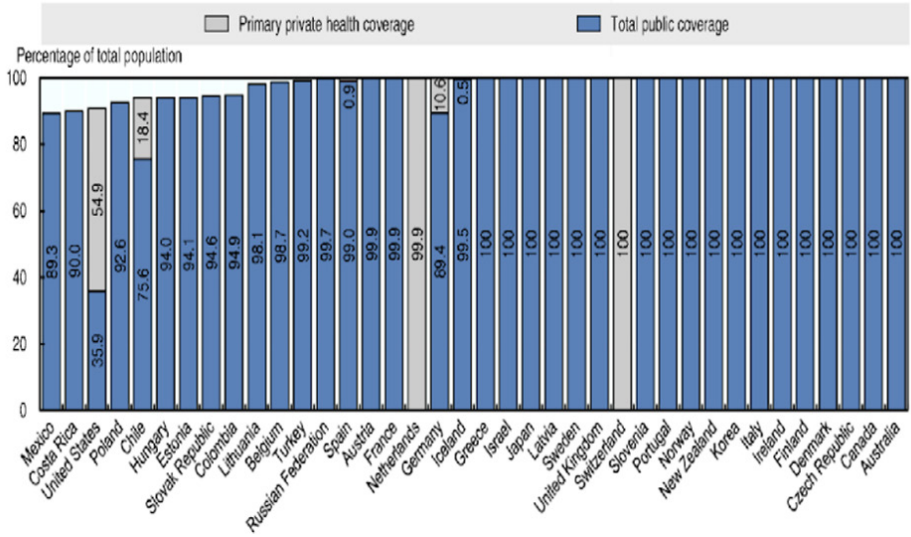
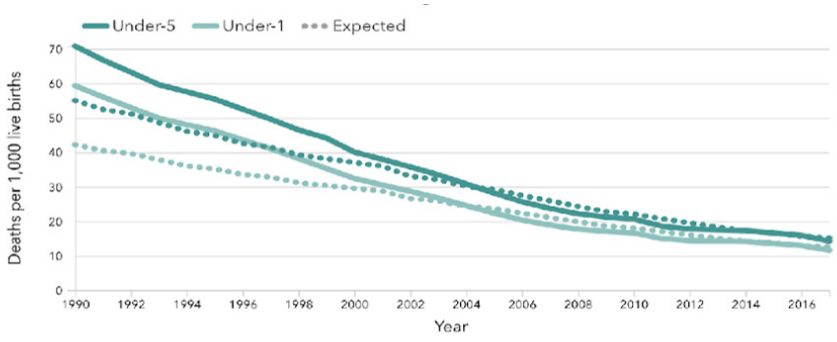


Figure 2. Population coverage for a core set of services, 2017
Source: OECD (2020). Beyond Containment: Health Systems Responses to COVID-19 in the OECD Countries.

Turkey's success in improving the health care system's performance and healthcare coverage has been impressive, with great progress in critical areas of reforms along with indicators such as maternal and infant mortality (OECD, 2014). Figure 3 shows the mortality trend in the under-5 and under-1 age groups in Turkey in the period 1990-2017.



	Expected		Observed	
	1990	2017	1990	2017
Under-5	55.0	15.1	70.8	14.2
Under-1	42.2	12.5	59.3	11.5

Figure 3. Mortality trend in the under-5 and under-1 age groups
Source: Institute for Health Metrics and Evaluation (2017).

Parallel to the Health Transformation Program, health expenditure per capita also changed dramatically between 2003 and 2018. Given the fact that there is a strong relationship between economic growth and health expenditures, our study aims to assess the impact of economic growth on health expenditure per capita in Turkey through an empirical analysis for the period from 1999 through 2018. The data has been acquired from the World Bank Health Nutrition and Population Statistics, OECD Health Statistics, and the Turkish Statistical Institute. Our research contributes to the current literature in a number of ways. First, to the best of our knowledge, there are few studies for Turkey focusing on the relationship between economic growth and health expenditures. Furthermore, the RALS (Residuals Augmented Least Squares) methodology is employed in the analysis, which uses the non-normality information found in the higher moments of the residuals. Im et al. (2014) and Lee et al. (2015) implement a two-stage methodology based on the RALS technique in the RALS ADF unit root test and RALS Engle-Granger cointegration test. The most noteworthy feature of their unit root and cointegration tests is that the proposed RALS methodology does not rely on nonlinear estimation techniques. since their RALS unit root and cointegration tests are executed in a linear system using the least-squares method. Using the RALS methodology allows us to acquire more robust results by increasing the power of unit root and cointegration tests.

The remainder of the paper is structured as follows: Section 2 reviews the literature on the relationship between health expenditures and economic growth. Section 3 documents empirical findings after presenting data and methodology of the unit root tests and the cointegration tests. Finally, the paper concludes by drawing some policy implications in the last section.

The Literature on the Relationship Between Health Expenditures and Economic Growth

Several studies have focused on the relationship between health expenditures and economic growth in academic literature. Nevertheless, the findings of these studies on the relationship between health expenditure and economic performance seem unclear, as each country has its own historical and institutional characteristics. For instance, Bloom and Canning (2000) state that health expenditures positively contribute to economic growth and prosperity, emphasizing that when healthy individuals are more efficient, they make a huge contribution to human capital. Therefore, in countries with a weak healthcare sector, capital efficiency is negatively affected (Bloom and Canning, 2000; Bloom et al., 2001; Sachs, 2001; Lusting, 2006). Healthcare investments are expected to increase in countries in which economic growth is high. Increased investments in healthcare, hence, have a positive impact on health indicators. For instance, they lead to improvement in the living standards of economic agents and an increase in the qualifications of human capital. Finally,

these positive developments in the determinants of economic growth contribute to increases in healthcare investments. Furthermore, Ozlale (2007) emphasizes causality from healthcare policies to economic growth, indicating that the number of studies focused on the impact of healthcare policies on growth has been rapidly increasing in academic literature as a result of the rising importance of human-oriented policies. The most widely studied topics in academic literature in recent periods are issues such as mechanisms through which health policies have impacts on economic growth, the design of optimal health policies to improve social welfare and income distribution, the required level of healthcare expenditures, and the measurement of the impact of health expenditures on the economy, in general. Emerging economies do not have sufficient savings to finance the investments which they need to achieve high economic growth through their internal resources. It is seen that savings in the country cannot provide the necessary capital formation. This phenomenon lies at the heart of fundamental macroeconomic problems such as the failure to create a sustainable growth pattern, external dependence, and high levels of current account deficit. Implementing the right health policies and investing in health both directly and indirectly contributes to economic growth. If a country's target is developing long-term strategies to improve and protect human and social capital in a society, it is essential to prioritize health policies. In order to provide the most fundamental benefits such as living well, freedom, and equality that a social state has to provide, promoting effective health policies has a critical role.

Brempong and Wilson (2004) examine the relationship between healthcare indicators and economic growth with the data set from 1975-1994 for sub-Saharan Africa countries from 1961-1995 for OECD countries. Using the ratio of national income per capita to economic growth as a growth indicator and the ratio of public and total health expenditures to national income and the expected life expectancy at birth as healthcare indicators in their analysis, they find that healthcare indicators have positive impacts on economic growth. In another study focusing on the OECD countries, Dreger and Reimers (2005) analyse whether there is a long-term relationship between healthcare spending and economic growth in 21 OECD countries for the period of 1975-2001 and find evidence of a cointegration relationship between the variables. Dormont et al. (2008), in their study, which investigates the relationship between healthcare expenditures and economic growth for the U.S, Euro-area countries, and Japan, imply that increases in healthcare expenditures leading to improving human capital accelerate economic growth significantly. Baltagi and Moscone (2010), testing the relationship between healthcare expenditures and income throughout 1971-2004 for the 20 OECD countries, find significant results supporting the relationship. Using the variables health expenditures per capita, income per capita, the ratio of health expenditures to national income, and the ratio of the population aged 65 and over 65 to the population aged 15-64, they emphasize the necessity of health expenditures to increase incomes. Focusing on 20 emerging market economies from 1990 to

2009, Elmi and Sadeghi (2012) try to examine both the cointegration and causality relationship between health expenditures and economic growth, and they find evidence of a long-run relationship between variables. They also indicate that there is a one-way causality relationship from economic growth to health expenditures, while there is no causality relationship from health expenditures to economic growth.

Analysing the relationship between public healthcare expenditures and economic growth in Algeria with the annual data covering the period from 1974 through 2014, Boussalam et al. (2014) conclude that there is a relationship between variables in the long run with the impact of public health expenditures on economic growth. As mentioned before, the level of development in the countries is one of the determinant factors of healthcare expenditures. Chaabouni and Saidi (2017), examine the relationship between environmental quality, healthcare expenditures, and economic growth for 51 countries divided into three groups as low-income, middle-income, and upper-middle-income countries in the period of 1995-2013. Their findings support the evidence of a bidirectional relationship between CO2 emissions and per capita GDP between healthcare expenditures and economic growth for the three groups examined. The results also show that there is a one-way causality relationship from CO2 emissions to healthcare expenditures for two groups except for low-income countries. In another study analysing OECD countries, Cima and Almedia (2018) attempt to find relationships between healthcare expenditures, economic growth, and economic crises for 25 OECD countries in the period of 1993-2015. They reveal that while there is a causality relationship from healthcare expenditures to economic growth, there is no significant change in the 2008-09 Global Financial Crisis period. In the following period, the number of studies on health systems and health expenditures is expected to increase significantly as a result of the COVID-19 pandemic.

Emphasizing health is the locomotive of economic growth and plays a critical role in mitigating problems such as poverty and inequality, Akinci and Tuncer (2016) try to analyse the relationship between health expenditures and economic growth in Turkey in the period 2006:Q1-2016:Q2. Their findings indicate there is a long-term relationship between health expenditures and economic growth. Furthermore, the causality test of this relationship is bidirectional, implying a mutual interaction between health expenditures and economic growth. Sahin and Durmus (2019), investigate the effect of economic growth and environmental damage on health expenditures for 21 OECD countries in the period 1990-2014 by using real GDP per capita as an indicator of economic growth, CO2 emissions as an indicator of environmental damage, and health expenditure per capita as a healthcare indicator. They find that there is a bilateral causal relationship between economic growth and health expenditures in Australia, Canada Finland, Greece, Sweden, Spain, Switzerland, Italy, Poland, Netherlands, and Norway, while there is a one-way causality relationship between CO2 emissions

and health expenditures in Finland, Spain, Sweden, Portugal, and Greece. Similarly, Sancar and Polat (2021) attempt to find out whether there is a relationship between economic growth, CO2 emissions, and health expenditures for Brazil, China, India, Mexico, South Africa, and Turkey between 2000 and 2016. Their findings support the evidence of bilateral causality relationships between economic growth and health expenditures, between CO2 emissions and health expenditures, and between economic growth and CO2 emissions, providing empirical evidence to policymakers that interconnected policy implementations could be used to achieve higher levels of growth, better environmental quality, and an appropriate level of health expenditure in developing countries. In another study published recently, Esen and Kecili (2021) examine the impacts of health expenditure on economic growth in Turkey for the period 1975-2018. They also utilize life expectancy at birth, household consumption, foreign direct investment, and trade as control variables in their analysis. Their findings indicate that while there is a long-term relationship among all variables, there is also a unidirectional causality from health expenditure to economic growth in the short run. These findings show the importance of investments in healthcare services in Turkey, meaning that health expenditure should be encouraged to promote economic growth.

Empirical Analysis

In the academic literature, it is emphasized that there is a relationship between economic growth and health expenditures. From this perspective, we assess whether there is a long-run relationship between economic growth and health expenditure per capita for Turkey in the period 1999-2018. After testing the stationary properties of variables using the RALS (Residual Augmented Least Squares) ADF and traditional ADF unit root tests, we test whether there is a cointegration relationship between economic growth and health expenditure per capita by employing the RALS Engle-Granger cointegration test proposed by Lee et al. (2015). According to the findings, if the t-statistics are above the critical values which are stated in the study of Lee et al. (2015), we, therefore, can identify a cointegration relationship between the variables signalling that economic growth can trigger healthcare expenditures. The unit root and cointegration tests based on RALS methodology allow the use of non-linear moment conditions through a computationally simple procedure. With increased power, it is emphasized that when the information including non-normality is used in the analysis, the findings can significantly change and the strength of the test can increase dramatically.

Data

In analysing the cointegration relationship between economic growth and health expenditure per capita, we use annual data belonging to current health expenditure

per capita in U.S dollars. In our study, our data set spans the period 1999-2018. Even though our sample appears to be more limited than the samples of the studies that focus on developed economies, such as some European countries and the U.S, our data set contains the available data since we couldn't obtain health expenditure data before 1999. Despite this limitation, our data set appears to be adequate for our analysis.

Table 1
List of Variables

Variables	Measure	Abbreviation	Expected Relationship
Economic Growth	Percent change in GDP	GROWTH	(+)
Health Expenditure	Health expenditure per capita in USD	PER CAPITA	(+)

Table 1 presents information about our variables, abbreviations, and expected relationship. We acquired data from OECD Health Statistics, World Bank Health and Nutrition Statistics, and Turkish Statistical Institute spanning the period from 1999 through 2018. Table 2 presents the healthcare expenditures for 2000, 2003, 2006, 2009, 2014 and, 2018, respectively.

Table 2
Healthcare Expenditure Per Capita in Turkey for Selected Years

	2000	2003	2006	2009	2014	2018
Health expenditure per capita (US$)	199.5	238.6	416.8	500	527	421

Empirical Methodology and Results

It is a common practice in the unit root test literature to disregard the information contained in non-normal errors. An important consideration might be that neglecting non-normal errors does not have an impact on the limited distribution of the traditional unit root tests. Im et al. (2014), pointing out that the traditional unit root tests have a low level of strength, propose a new unit root test that makes use of non-normal error information to improve the strength of the test. Their tests demonstrate a significant increase in control compared to traditional tests that do not use non-normal error information. In other words, when the information contained in non-normal errors is utilized, the outcomes are more efficient. Im et al. (2014) indicate that utilizing this information is an important source for increasing the power of unit root tests and trying to examine how to use the information in their analysis on non-normal errors. The RALS technique also can be used if the residuals are normally distributed. According to their simulation results, the developed RALS experiments have substantially greater power than the traditional Dickey-Fuller tests [1].

The ADF testing regression is defined for two cases. In equation 1, intercept is allowed in the model and in equation 2, the model involves a linear time trend and intercept. The ADF regressions are written as follows:

1 For more details regarding the RALSADF methodology, see Im et al. (2014): 10.2 and 10.3(p. 317-323).

$$\Delta y_t = \alpha_1 + \beta y_{t-1} + \sum_{j=1}^{p} \delta_j \Delta_{t-j} + e_t, t = 1,2,\dots,T, \quad (1)$$

$$\Delta y_t = \alpha_1 + \alpha_2 t + \beta y_{t-1} + \sum_{j=1}^{p} \delta_j \Delta y_{t-1} + e_t, t = 1,2,\dots,T, \quad (2)$$

where $\Delta_{yt} = y_t - y_{t-1}$ and β is the least-squares estimator.

Im et al. (2014) define equations 3 and 4 as the RALS regression for two cases involving an intercept and a linear time trend and intercept:

$$\Delta y_t = \alpha_1 + \beta y_{t-1} + \sum_{j=1}^{p} \delta_j \Delta y_{t-j} + \hat{w}_t' \gamma + \nu_t, t = 1,2,\dots,T, \quad (3)$$

$$\Delta y_t = \alpha_1 + \alpha_2 t + \beta y_{t-1} + \sum_{j=1}^{p} \delta_j \Delta y_{t-1} + \hat{w}_t' \gamma + \nu_t, t = 1,2,\dots,T, \quad (4)$$

where $\hat{w}_t$, which is a function of the residuals acquired from this regression, augments the Dickey-Fuller regression.

Im et al. (2014) adjust the residuals as follows:

$$\hat{w}_t = [\hat{e}_t^2 - m_2, \hat{e}_t^3 - m_3 - 3m_{2t}\hat{e}_t]', t = 1,2,\dots,T, \quad (5)$$

Im et al. (2014) generate the limiting distribution of the RALSADF t-statistic as follows:

$$t_{G,\mu} \Rightarrow \rho DF_\mu + \sqrt{1-\rho^2}.Z, \quad (6)$$

where DF_μ represents the limiting distribution of the t-statistic from least squares in regression.

Table 3
Jargue-Bera Test Results

Series	Level	Prob.	First Difference	Prob.
Growth	16.08255	0.00003***	6.36906	0.04825**
Per capita	7.62038	0.02214**	20.4051	0.00003***

Note: ** and *** indicate that residuals are not normally distributed at 5 percent and 1 percent significance levels, respectively.

According to Table 3, the residuals of growth and per capita series are not normally distributed. The RALS ADF test developed by Im et al. (2014) allows us to use the information in non-normality in residuals and by doing that it aims to strengthen the test power when compared to the traditional ADF unit root test. Table 4, which presents the RALS ADF and ADF unit root test, is stated below:

Table 4
RALS ADF and ADF test results

Series	RALS ADF t-statistic	ADF t-statistic	ρ
Level			
GROWTH	0.19878	-4.49911***	0.412408
PER CAPITA	-1.33799	-1.65908	0.947238
First Difference			
GROWTH	-10.33649***	-7.587861***	0.548508
PER CAPITA	-4.163676***	-3.021829**	0.480965

Notes: Critical values for the RALS ADF test for T=20 and ρ values (0.40; 0.50; 0.60; 0.70; 0.90) are stated in the study by Im et al. (2014). Critical values for the ADF test are; -3.831511, -3.029970 and -2.655194 for 1, 5, and 10 percent, respectively. *, ** and *** denote 10, 5, and 1 percent significance levels.

Table 4 indicates that the growth series is stationary in level and the per capita series becomes stationary in its first difference according to the ADF unit root test findings. On the other hand, when we employ the RALS ADF unit root test, the findings differ notably. While the growth series has a unit root in level, it becomes stationary in its first difference. Also, the per capita series becomes stationary in its first level, while it has a unit root in level.

After testing the stationary series, in the second stage, we employ the RALS Engle-Granger cointegration test to assess the long-run relationship between economic growth and health expenditure per capita. After stressing that the cointegration test developed by Engle and Granger (1987) is a two-stage test which is commonly used in the literature owing to its ease of application, Yilancı and Aydin (2018) explain the RALS Engle-Granger procedure in their studies. Accordingly, at the first step, the following regression model is estimated by the least-squares (LS) method between two series which are stationary at the same level:

$$y_t = \beta x_t + u_t \tag{7}$$

At the second stage, the augmented Dickey-Fuller (ADF) unit root test is applied to the residuals of the estimated model.

$$\Delta\hat{u}_t = \alpha_0 + \rho\hat{u}_{t-1} + \sum_{i=1}^{k} \alpha_t \, \Delta\hat{u}_{t-1} + e_t \tag{8}$$

If the residuals are stationary, it can be said that there is a long-run relationship between the series. Here, although they use the ADF unit root test to test the stationary of the residuals, the critical values of the Engle-Granger test are utilized. Since the Engle-Granger test has low power compared to the alternative tests, Yilanci and Aydin (2018) suggest using a more powerful test which is proposed by Lee et al. (2015) by using the residual augmented least squares method instead of the least-squares method. RALS-EG cointegration test use information of the high moments of non-normal distributed residuals. They estimate the following model:

$$\Delta\hat{u}_t = \alpha_0 + \rho\hat{u}_{t-1} + \sum_{i=1}^{k} \alpha_t \, \Delta\hat{u}_{t-1} + \hat{w}_t^{'}\gamma + \nu_t \tag{9}$$

As seen in Equation 9, they augment the Equation 8 with $\widehat{w}_t$, which is defined as follows:

$$\widehat{w}_t = [\hat{e}_t^2 - m_2, \hat{e}_t^3 - m_3 - 3m_2\hat{e}_t]' \quad (10)$$

Where, $m_j = T^{-1}\sum_{t=1}^{T}\hat{e}_t^j$. They test the null of no cointegration by testing the significance of ρ.

The limiting distribution of the RALS EG t-statistic derived by Lee et al. (2015) is defined as follows:

$$t_{REG} \rightarrow \rho.t_{EG} + \sqrt{1-\rho^2}.Z \quad (11)$$

Lee et al. (2015) stress that the critical values of the RALS EG and EG cointegration tests become equal, in this case ρ^2=1.

Table 5
Jargue-Bera Test Results

Residuals of EG Cointegration Test	JB t-statistic	Prob.
Constant	5.709455	0.057572*
Constant and trend	5.397781	0.067280*

Note: * indicate that residuals are not normally distributed at 10 percent significance level.

Table 5 indicates that the residuals of EG cointegration test results are not normally distributed. Lee et al. (2015) suggest that we can acquire more robust results by employing the RALS Engle-Granger cointegration test. Therefore, we can now employ the RALS EG and traditional EG cointegration test. Our dependent and independent variables are growth and health expenditure per capita, respectively.

Table 6
RALS EG and EG cointegration test results

Relationship	EG	RALS EG	ρ^2
Constant	-4.355211***	-6.138595***	0.326941
Constant and trend	-4.368977**	-5.918510***	0.345290

Note: ρ denote to the correlation coefficient between the residuals of RALS EG and EG cointegration tests. Critical values for the RALS EG cointegration test are -2.33197, -2.67463, -3.33927 and -2.59387, -2.94141, -3.58756 for constant and constant and trend, respectively when ρ^2= 0,32 and ρ^2= 0,34. Critical values for the EG cointegration test are; -3.831511, -3.029970, -2.655194 and -4.532598, -3.673616, -3.277364 for constant and constant and trend, respectively. *, **, and *** denote 10, 5, and 1 percent significance levels.

Table 6 presents the findings of the RALS EG and EG cointegration tests. We see that there is a long-run relationship between economic growth and health expenditure per capita, supporting the evidence of the impact of economic growth on health expenditure per capita in U.S dollars for the period 1999-2018.

Conclusion

Based on empirical evidence compiled from OECD countries, when the health spending to GDP ratio is less than 7.5 percent, higher health spending is strongly

correlated with better economic outcomes. Providing high-quality health care to people would allow the population to be healthier, thus contributing to human capital. That higher level of human capital, in turn, would help the nation's economy through higher productivity (Wang, 2015). Economic growth also has an impact on the healthcare system. When a country has more income, it will allocate more resources to the healthcare system. In this paper, we attempt to analyse the long-run relationship between economic growth and health expenditure per capita in the period 1999-2018. In the empirical analysis, we employ the RALS Engle-Granger and traditional Engle-Granger cointegration tests by considering the argument that neglecting the non-normality information in residuals might lead to wrong inferences concerning the existence of cointegration. As a first step, the unit root properties of the series are examined by using the RALS ADF developed by Im et al. (2014) and traditional ADF unit root tests. Having verified that economic growth series and health expenditure per capita are integrated of order one, we test whether there exists any long-run relationship between series by employing the RALS Engle-Granger cointegration test developed by Lee et al. (2015) in addition to the traditional Engle and Granger (1987) cointegration test. The results indicate that economic growth and health expenditure per capita in Turkey for the period 1999-2018 are cointegrated, supporting the evidence of the long-run relationship. The level of development in countries is obviously one of the determinant factors of healthcare expenditures. We also see that the findings are in line with the results of studies by Bloom and Canning (2000), Dreger and Reimers (2005), Elmi and Sadeghi (2012), and Chaabouni and Saidi (2017).

As emphasized in the report published by the World Health Organization (2020), the global health crisis caused by the COVID-19 pandemic, which is having a catastrophic impact on health systems around the world, is being paralleled by a serious global economic crisis that has the potential to have a long-term impact on health financing. In response to the COVID-19 health and economic crisis, most countries set out high levels of budget allocations with the health sector receiving a very small percentage of that. In particular, the health budgets of low-income countries were affected most severely by the COVID-19 pandemic. Many countries are required to borrow additional funds due to the economic crisis, which limits their public revenues. A crisis such as the COVID-19 pandemic will have a large effect on overall health spending for several years to come, but it will depend on various factors such as broader macroeconomic indicators and the cyclical nature of demand and supply for healthcare services. Both pre-existing health financing vulnerabilities and those to be introduced by 2020 will affect future health spending. Unfortunately, making accurate predictions is impossible, but the combined health and economic shocks triggered by COVID-19 will result in healthcare costs and the progress of universal health coverage being directly and indirectly affected. As the pandemic rapidly spread across the globe, the world came to understand how important

it is to maintain greater and more stable public funding for healthcare. However, because COVID-19 would increase healthcare spending, it is impossible to predict the macro-fiscal impact on healthcare spending with complete certainty. Given the increasing pressures on financing systems, along with the need to protect vulnerable communities, targeted and deliberate policies will be required. From this perspective, future research might focus on the impact of COVID-19 on health spending. Besides, we acknowledge that our paper is refined to a single country with a limited sample size using yearly observations. We expect our work could be expanded by including a comparative analysis with other countries.

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