

THE IMPACT OF HEALTH ON ECONOMIC GROWTH IN PALESTINE (1997-2015)

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ABSTRACT

The purpose of this study is to examine the impact of the development of the health sector on economic growth in Palestine, through investigated the causality and co-integration relationships between health expenditure and GDP per capita. Data collected from the Palestinian Central Bureau of Statistics and The Ministry of health. Time series data has been taken on the above these variables for Palestinian ranging from 1997 to 2015. The impact of health on the GDP per capita is examined by using Co-integration, and Granger Causality techniques. The result of cointegration showed the existence of a long-term relationship between economic growth and spending on health. Granger casualty test indicate there only unidirectional relationship from economic growth to health expenditure in long and short run, but no casualty from health expenditure to economic growth, the study found the lack impact from health on economic growth. One of most important recommendations in this paper, increase investment in the health sector, by giving preliminary to spend more from GDP on health sector to enhance health situation in Palestine, and the government should also continue its leadership role in creating an enabling environment that encourages better investment in health by the private sector.

Keywords: Economic growth, healthcare, short run, long run, causality, co integration

INTRODUCTION

Everyone knows importance of health as a basic right for life. According to Amartya Sen health is a kind of empowerment that gives value to human life. It will be led to individual growth capacity and economic security for the individuals and families.¹

All countries are seeking to achieve economic growth rates, and an increase in gross domestic product through specific plans and mechanisms, designed to increase the contributions of the four sectors affecting GDP: consumer sector, investment sector, public sector spending and foreign trade.

The public spending on the health sector of the most important aspects of investing in human capital, which is sought by all States, and aims to achieve through increased efficiency in the production and individuals, which will reflect positively on the GDP, and economic growth rates.

Globally, there has been a tremendous improvement in health status. Medical technology has improved tremendously. Nutrition has improved while mortality among infants and children has declined culminating in the dramatic improvement in life expectancy at birth in almost all countries in the last few decades. Increases in health investments will further improve health conditions, especially in developing countries such as those in Sub-Saharan Africa where mortality (maternal, infant and under-five), and prevalence of diseases such as malaria, tuberculosis, and HIV/AIDS are high². Therefore, this study seeks to investigate and established the relationship that exists between health and GDP per capita in the long-run in Palestine. This study will further test whether, there exists causality is unidirectional between two variables (health expenditure and GDP per capita) or bidirectional causality given conflicting results in the previous studies.

Palestinian health sector

Health services in Palestine includes three main levels namely the primary, secondary and tertiary health care. The provision of health services are share from various sector, government health sector levels, The Palestinian Ministry of Health, the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), non-governmental institutions and institutions of donor countries in addition to the private sector.

Primary health care and public health services are considered the backbone of the Palestinian health system, where the ministry is committed to ensuring the right of all Palestinians to obtain high-quality primary health care. For that, the ministry worked to complete the development of this level through establishment and maintenance care clinics primary health in the various populated geographic areas and at different levels of these clinics so that guarantees the delivery of primary care services to various communities and to ensure that these clinics equipped with the necessary medical devices.

At secondary care institutions, treatment at this stage by specialized doctors in various medical fields and distributed to all hospitals, where it diagnosis and treatment of a patient who was transferred from a state of emergency or by primary health care providers.

Tertiary level of health service provision is the highest health care in the country, the Ministry of Health also plays a main role in this level, on one hand, through specialized services offered in hospitals, on other hand, through conversion Patients for services that are not available in

government centers to hospitals, medical centers and other specialized national, like Jerusalem hospitals and hospitals in the private sector.³

Palestine attaches great importance to the financing of the health sector despite the lack of national sources available and instability in the external support, in 2015, Share of total expenditure on health to GDP 11%⁴, and this percentage is higher than low- and middle-income countries, with an estimated per capita health spending by about \$ 3105. In 2014 health expenditure classified by providers, functions, and sources of funding, totalled USD 1,3916 million compared to USD 1,3477 million in 2013. More than, in the last decade, it observation improvement in health indicators, according to Central Bureau of Statistics estimates, the population of Palestine in 2015 amounted to about 4.68 million people, 61.1% in the West Bank and 38.9% in the Gaza, as well as the population pyramid shows that Palestinian society is young population, accounting for the age group under the age of fifteen accounted for 39.4%⁹ of the total, and low proportion of people over the age of 65 accounting for 9.2% of the total .Another health indicators, As a result of improved health conditions in Palestine and the gradual decrease of the infant and child mortality rates, life expectancy rose for individuals, with an expected survival in 2015 to 73.510 years old, of which 72 years for males and 75 years for females.

1. Literature Review

The relationship between health and economic growth has received attention in the literature. Fatima, Zina, and Abdelaziz (2014) used granger causality and cointegration technology to discuss the relationship between health expenditure and economic growth in Algeria from 1974 to 2014, the result was as follows: There is no effect from health expenditure on gross domestic product in the short term, that reason because of misuse and poor distribution of health, and also there was insignificantly impact on long-term, but if we look to other direction, they found that economic growth affects positivity way to increase spending on health in the short and long run, that thus is a one-way directional, not a two- way.¹¹

Also, Mehrara and Musai write two papers on this topic in 2011. In first paper, they have studied the health situation in Iran, the results were that there was no causality or influence from health spending to economic growth, and a strong effect from economic growth to health spending, were obtained these results by using several tests, including a test of granger causality and co integration, with applied it to the period of time from 1970 to 2008, they recommended to improvement and development of the health sector to contribute in economic growth. Second paper, they investigated effect of two variable on each other in the Petroleum exporting countries, by using the same as the previous tests, they concluded the lack of effect of health expenditure on GDP per capita in the short and long term, so to make positive and good effect on

economic growth, the government must restore accountability and regulate the use of health and allocation of large revenue for this sector.12-13

Miniar and Sami (2013) examined the direction causality from growth economic to health spending and vice, by using serial data of developed countries from 1975 to 2011 , they confirmed the presence of a bi-directional relationship between two variables, in addition to the existence of a long run relationship between economic growth and health expenditures.14

Adeniyi and Abiodun (2011) used similar variables like the previous study with the distinction between capital spending and recurrent spending on health to investigated the health effect on the growth and prosperity of the economic in Nigeria, through the cointegration and granger causality, he found that the health impact of a positive effect on GDP, moreover he is invited to increased interest and investment in the health sector and therefore a rise in the growth of the economy.15

2. Methodology

Annual data on nominal GDP per capita and health expenditure were used for this study. These data will collect from the Palestinian Central Bureau of Statistics and The Ministry of health . Time series data has been taken on the above these variables for Palestinian ranging from 1997 to 2015

We construct the long-run relationship between nominal GDP per capita and health expenditure in the following manner: (in log term)

$$LGDP_t = \alpha_t + \delta LHE_t + \varepsilon_t$$

GDP: nominal GDP per capita HE: health expenditure

α : the intercept

δ : coefficient of the independent variable ε : error term

t: time

The dependent variable will be the nominal GDP per capita, whereas the independent variables will be health expenditure. Then the impact of health on the GDP per capita will be examined by using The Co-integration, and Granger Causality techniques. Moreover, other tests will be performed such as ADF Test (Augmented Dickey and Fuller methodology) to investigate the stationary process for all the series.

We will make three steps to test the causal relationship between health expenditure and economic growth. The first step: test the root of the unit to check the stability of the data over time, the second step: finding a long-term relationship between the two variables, the last step examining the relationship on a short-term.

3. Results

Table 1 displays the basic statistics for GDP per capita and health expenditure in Palestine. The standard deviation indicates that health expenditure is the most stable. Looking at skewness, variables are identified as left-skewed. All variables display a leptokurtic distribution since kurtosis is more than

The kurtosis for normal distributions is set at 3, and a distribution is taken as leptokurtic.

Table 2 shows results of ADF test, null hypothesis is no stationary for the data, it have unit root over time, the table 2 show the two variables are non-stationary at level, we cannot rejected the null hypothesis, but at the first difference, null hypothesis of unit root is rejected for these variables, so we can say GDP per capita and health expenditure are stationary at first difference.

Table 3 present the result of the vector error correction model (VECM) and Johansen test which includes the results of trace test and maximum Eigen values test statistics for the existence of long run equilibrium between GDP per capita and health expenditure.

According to the table 3, results of both trace static and maximum Eigen value suggest that there exist one cointegrating vectors between GDP and health expenditure .

The null hypothesis of no cointegration based on both the maximum Eigen values test and the trace test between GDP and health expenditure (none) is rejected at (5%) level of significance. On the other hand, the null hypothesis (at most 1) could not be rejected. The estimated two tests indicate that there is only one cointegration vector.

In table 4, the estimated results of effect health expenditure on GDP shows that estimated lagged error correction term is negative but insignificant at 1%, also the value lagged of health expenditure are insignificant.

In table 5 the estimated results of effect GDP on health expenditure shows that estimated lagged error correction term is negative and significant at 1%, suggesting that error correction is happening in the model. The coefficients of the explanatory variables in their first differences are jointly statistically significant at 1%, reinforcing the R-squared of the specified model, means that

a statistically significant portion 75% of the variance in health expenditure is jointly explained by the GDP.

The results indicate that there is a unidirectional causality between GDP per capita and health expenditure in the long run .

Table 6 presents the results of the short run Granger causality test based on a standard F-test statistics, null hypothesis of first section is that GDP per capita does not cause health expenditure , the probability from f test is significant at1%, then rejected this hypothesis, and thus there is a causal relationship from GDP per capita on health expenditure in short run, second null hypothesis says that health expenditure does not cause GDP per capita, based on the results that appear in this table, cannot reject the second null hypothesis, therefore o health does not cause GDP per capita in the short term.

So in short run, the relationship between the two variables is unidirectional, (from GDP on health expenditure, not vice).

Table 1: Basic Statistics of Variables

Variables	Mean	Std .Dev	Min	Max	Skewness	Kurtosis
Log GDP per capita	7.501896	0.3177179	7.074794	8.003764	-0.01993	2.7973
Log Health expenditure	13.40262	0.5558123	12.658123	14.17689	-0.22249	1.8879

This table displays the basic statistics for GDP per capita and health expenditure. The standard deviation indicates that health expenditure is the most stable. And we have normal distribution in this model

Table 2: Results of ADF Test

Variable	Level			1 difference		
	Intercept	Trend	None	Intercept	Trend	None
GDP percapita	1.11 (-3.00)	-2.614 (-3.60)	0.316 (-1.95)	-2.328 (-3.00)	-2.376 (-3.60)	-2.02 (1.95)**
Health EXP	-1.62 (-3.00)	3.39 (3.60)	0.654 (1.90)	4.692 (-3.70)*	-4.548 (-4.38)*	-4.578 (-2.66)*

Values in parenthesis are MacKinnon critical values for rejection of hypothesis of a unit root.

The * and ** sign shows the rejection of the null hypothesis of non-stationary at 1%, 5% significant level respectively.

Results of ADF Test show null hypothesis is no stationary for the data, we cannot rejected the null hypothesis, but at the first difference, we can say GDP per capita and health expenditure are stationary

Table 3: Johansen tests for cointegration (Trace and Maximum Eigen value):

Null Hypothesis	Trace Statistic	Max-Eigen Statistic	95% critical value for trace test	95% critical value for maximum Eigen value test
None *	42.1964	38.8694	15.41	14.07
At most 1 *	3.327	3.3.27	3.76	3.76

According to this table, results of both trace static and maximum Eigen value suggest that there exist one co integrating vectors between GDP and health expenditure

Table 4: Error Correction model estimation (effect of Health EXP on GDP)

logGDP per capita	Coefficient	std.error	Probability
Cel	-0.975118	0.4154991	0.019
loghealth EXP			
LD	-0.9985	0.6614178	0.131
L1D	-1.0168	0.7062268	0.15
L2D	-0.2065	0.5535388	0.709

The estimated results of effect health expenditure on GDP shows that estimated lagged error correction term is negative but insignificant at 1%, also the value lagged of health expenditure are insignificant.

Table 5: Error Correction model estimation (effect of GDP on Health EXP)

logHealth EXP	Coefficient	std.error	Probability
Cel	-0.9603026	0.1357692	0.000
logGDPper capita			
LD	0.908386	0.1293459	0.000
L1D	0.2211803	0.1792769	0.217
L2D	0.5835586	0.1823466	0.001

The results indicate that there is a unidirectional causality between GDP per capita and health expenditure in the long run

Table 6: Results of Granger Causality Test

Null Hypothesis causality	F Statistic	Probability	Direction of Causality
GDP does not Granger Cause health EXP	88.04	0.000	GDP → Health EXP
Health EXP does not Granger Cause GDP	3.09	0.3777	

Table 9 presents the results of the short run Granger causality test, the relationship between the two variables is unidirectional ,(from GDP on health expenditure , not vice).

4. Conclusions

The goal of this paper is to investigate the long run relationship between health expenditure and economic growth in Palestine using co-integration technique and the direction of causality in both long and short run through integrating the Error Correction Model into the Granger causality test.

Data properties were analyzed to determine their stationary using ADF unit root tests which indicated that the series are I(1). The results of the cointegration based on Johansen technique indicate that there is a long run equilibrium relationship between GDP and health expenditure; although, they may be disequilibrium in the short run.

The long run causality tests reveals that the coefficients of the explanatory variables in their first differences are and negative and jointly statically significant at (1%) level of significance only in

GDP which indicate that there is a unidirectional causality between GDP and health expenditure the long run.

The short run causality tests indicates that the error terms in GDP is statically significant at 1% level of significance which means that there is a unidirectional causality between GDP and health expenditure in the short run too. And health expenditure has insignificant effect on GDP in both long and short run.

The lack of strong link from health to economic growth is not necessarily a reason to reallocate health investment away from the health sector. The vital problem is to make health spending more effective in improving health outcomes, through improvements in accountability and incentives. The improvements in health status will be worth the effort even if they turn out to have little effect on growth.¹⁶

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