HEALTH EXPENDITURE AND SOCIO-ECONOMIC DETERMINANTS OF LIFE EXPECTANCY IN THE OECD ASIA/PACIFIC AREA COUNTRIES

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Abstract

Recent economic research is focused on the study of the relationship between socio-economic factors and health outcomes. In this study, it is explored that relationship in the OECD Asia/Pacific area countries regarding life expectancy. Data from the World Bank and OECD Health Statistics (2015) have been used to build a panel data during the period 1995-2013. On the one hand, it was found that per capita income, unemployment and exchange rates improve health outcomes. On the other one, poor performance, in terms of government expenditures for the countries-sample, comes across. Empirical results highlight the importance of cost-effectiveness analysis.

Keywords:

Life expectancy;

Asia/Pacific countries;

Panel data model

JEL Classification:

I1, D6

I.   Introduction

Health is nowadays considered as one of the key policies to guarantee fiscal sustainability. And so, along the main objectives of developed countries it is the following one: "maintain and/or improve its population health". Thus, in recent years due to the availability of new data, empirical applications have been developed for health care outcomes in general, and to life expectancy in particular. Indeed, several studies have examined the relationship between different socioeconomic factors such as income, education or labour status, and the level of health (Cantarero and Pascual, 2005; Bayati, Akbarian and Kavosi, 2013; Varvarigos, 2013 or Sede and Ohemeng, 2015). In fact, for countries that are already experiencing population ageing, such as Australia, Japan and New Zealand, impending demographic change has an immediate negative impact on living standards (Guest, 2006).

Although there is a bulk health economics research devoted to explain the returns of different health policies on population's health, the recent economic crisis makes that research line more necessary. Therefore, the present study aims to explore the relationship between different socioeconomic factors and health outcomes in the OECD Asia/Pacific area countries regarding life expectancy. The main question we want to solve is how health policy efforts influence health outcomes. Despite the fact the crisis has affected these countries in different ways, almost all of them are suffering financial problems. Precisely, we are going to work with a completed panel data (nineteen years and eight countries) making explicit the causal links between health outcomes (life expectancy), economic development (income) and health policy (health care expenditure).

The structure of the paper is the following one. Section 2 describes the empirical model and a brief description of the data. Section 3 presents the empirical results. The final section concludes.

II.   Model and data

As pointed out before, health economics literature has suggested different socioeconomic determinants on health outcomes in general, and life expectancy in particular. However, empirical research is often restricted by the availability and quality

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of data. In this study, our temporal analysis period is 1995-2013 for the eight OECD Asia/Pacific area countries: Australia, Canada, Chile, Japan, Korea, Mexico, New Zealand and the United States (US). So, we have enough observations and degrees of freedom to capture the effect of socio-economic variables on life expectancy over time. In spite being countries of the same area, it is important to note that these countries can choose different types of funding: public, private, or a combination of both. In our sample, there are four countries (Australia, Canada, Mexico and New Zealand) which run a National Health Service (NHS), two countries (Japan and Korea) characterized by a Social Security Health Insurance (SS) and Chile and the US that together form the group "Others" as they can neither be classified as NHS nor as SS countries because they have a private or mixed health care system, respectively.

Our empirical model is based on previous studies on this field, pretending in turn, expanding and adapting it to the sample case. Thus, the election of the variables determining life expectancy is influenced by both previous literature and our preliminary estimates. We have considered as socio-economic determinants the following: per capita income (development indicator), per capita health care expenditure (health policy indicator), and the exchange and unemployment rates as control variables. Accordingly, based on the above reasons and availability of data, Table 1 presents the details concerning the definitions and sources of the variables. Also, Table 2 summarizes the descriptive statistics.

[Insert Table 1. Here]

[Insert Table 2. Here]

Here, it is noteworthy that there is an interrelationship between some of the variables, mainly between per capita income and health expenditure. In fact, the empirical evidence points out that income is one of the most important factors in explaining health expenditure and that aging population could reveal a "crowing out effect" (OECD in its periodic reports "Health at a Glance"), while in addition it is has been also demonstrated how healthy populations increase labor productivity and per capita income (Rivera and Currais, 1999; Bloom and Canning, 2000), and vice versa (Pritchett and Summers, 1996) ——that is, wealth allows better health results. Therefore, the model should allow this interactions:

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$$\log le_{it} = \eta_i + \log gdp_{it} + \log hce_{it} + \log ur_{it} + \log er_{it} + \varepsilon_{it} \tag{1}$$

$$\log gdp_{it} = \alpha_i + \log le_{it} + u_{it} \tag{2}$$

$$\log hce_{it} = \beta_i + \log gdp + \log le_{it} + v_{it} \tag{3}$$

where ε_{it} , u_{it} and v_{it} are error terms.

III.   Results

In this section we present the empirical results for the model described above using Seemingly-Unrelated Regressions (SUR). Table 3 analyzes the socioeconomic factors. Thus, Column 1 presents the detailed results for the full sample, whereas the following ones do it for each of the countries.

As we can see, coefficients are to some extent statistically significant but not in all cases they have the expected signs according to the priori economic criteria. As expected, income (when significant) has a clear positive effect on our health indicator. However, health expenditures do not meet up with the expected sign. In addition, we obtain a negative effect for the full sample and the US whereas the expected positive one it is shown for the rest. A similar result was also found in Sede and Ohemeng (2015) for Nigeria. This is indicative of poor performance, in terms of government expenditures on capital inputs into healthcare. Therefore, not always spending more is better and a cost-effectiveness analysis should be done.

Consequently, we understand that only when this analysis has been done, such additional expenditures would be then socially productive and profitable. That is, countries that would devote more "productive" resources to health would get better health indicators than others who do not follow the same policy lines. Regarding unemployment and exchange rates we found a generally positive effect. Thus, overall life expectancy would be enhanced if these rates could be raised. So, the result is especially striking for unemployment rates. However, what is also true is that in spite there is some evidence that individual-level job loss can lead to worse habits and lifestyles (and subsequent health care problems). Moreover, it is also related to mental health disorders, there is not a consensus on which is the final effect.

[Insert Table 3. Here]

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IV. Conclusions

There are several studies which have studied the relationship between health policies and outcomes but new research is required. In our analysis, we have focused on the relationship between socio-economic factors and life expectancy. To carry this out, we have used data from the World Bank and the OECD Health Statistics (2015) and we have applied panel and time-series data techniques. In particular, we have worked with eight OECD Asia/Pacific countries during the period 1995-2013.

Although these Asia-Pacific countries considered cover a wide geographical area with diverse economies and health outcomes, they enjoyed remarkable economic growth since the last decades. Despite all the efforts, there exist new challenges for sustainable development related with population health. The empirical results suggest that per capita income, unemployment and exchange rates, does cause different health outcomes. Furthermore, related to health expenditure it is found that not always spending more produce better results. Finally, from a policy economic perspective, it would be interesting and valuable, to implement health policies after applying a cost-effectiveness analysis. Therefore, government expenditure on health is needed for enhancing life expectancy.

References

Bayati, M., Akbarian, R. and Kavosi, Z. (2013) Determinants of life expectancy in eastern Mediterranean region: a health production function, *International Journal of Health Policy and Management,* **1**, 57-61.

Bloom, D.E. and Canning, D. (2000) The health and wealth of nations, *Science,* **287**, 1207-1209.

Cantarero, D. and Pascual, M. (2005) Socio-economic status and health: evidence from the ECHP, *Economics Bulletin,* **9**, 1-17.

Guest, R.S. (2006) Demographic change in the Asia-Pacific: The effect on average living standards, *Journal of the Asia Pacific Economy,* **11**, 229-248.

Pritchett, L. and Summers, L.H. (1996) Wealthier is healthier, *Journal of Human Resources,* **31**, 841-868.

Rivera, B. and Currais, L. (1999) Economic growth and health: direct impact or reverse causation?, *Applied Economics Letters,* **6(11)**, 761-764.

Sede, P. I. and Ohemeng, W. (2015) Socio-economic determinants of life expectancy in Nigeria (1980–2011), *Health Economics Review,* **5,** 1-11.

Varvarigos, D. (2013) Environmental dynamics and the links between growth, volatility and mortality", *Bulletin of Economic Research,* **65**, 314-331.

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TABLE 1

Variables and data sources

Variable	Definition	Data Source
le	Life expectancy at birth, total (years)	World Development Indicators
gdp	Gross Domestic Product per capita (US$)	World Development Indicators
hce	Health expenditure per capita (US$)	World Development Indicators
ur	Unemployment, total (% of total labour force)	World Development Indicators
er	Exchange rate (US$)	OECD Health Statistics (2015)

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TABLE 2

Descriptive statistics

Variable	Mean	Std. Dev.	Min.	Max.
log le	4.36	0.03	4.29	4.42
log gdp	9.92	0.74	8.19	11.12
log hce	7.56	0.77	5.92	9.12
log ur	1.67	0.36	0.69	2.28
log er	2.65	2.74	-0.03	7.25

TABLE 3

Socio-economic determinants of health outcomes (1995-2013). Dependent variable: *log le*

Variable	Full sample	Australia	Canada	Chile	Japan	Korea	Mexico	New Zealand	U.S.
log gdp	0.054 ***	-0.001	0.030 *	0.027 ***	-0.014	0.017 **	0.024 ***	-0.004	0.143 ***
	(11.54)	(0.56)	(1.82)	(8.11)	(0.67)	(1.93)	(5.59)	(0.30)	(3.84)
log hce	-0.014 ***	0.058 ***	0.028 ***	0.015 ***	0.054 ***	0.054 ***	0.024 ***	0.059 ***	-0.062 **
	(2.95)	(21.93)	(2.57)	(3.65)	(24.38)	(9.32)	(4.92)	(6.64)	(2.33)
log ur	0.011 ***	-0.002	0.005	0.001	0.002	0.004 ***	0.006 ***	-0.003	0.018 ***
	(2.91)	(1.61)	(0.94)	(0.40)	(0.96)	(3.01)	(3.87)	(1.23)	(4.03)
log er	0.002 ***	-0.001	0.038 **	0.051 ***	0.010	0.019 **	0.016 ***	0.003	Omitted
	(3.60)	(0.47)	(2.19)	(11.35)	(0.59)	(2.31)	(4.42)	(0.23)	
constant	3.906 ***	3.943 ***	3.821 ***	3.688 ***	4.072 ***	3.672 ***	3.911 ***	3.969	3.341 ***
	(157.60)	(292.70)	(37.98)	(123.62)	(13.23)	(36.16)	(250.54)	(52.17)	(19.43)

Notes: ***, ** and * indicate significance at 1%, 5% and 10%, respectively.