Private Health Care Versus Public Health Care: Complements or Substitutes

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Abstract

This study seeks to examine the intricatelink between public and private health care expenditures by using a panel of 148countries over a 19-year period by employing Constant Elasticity of Substitution (CES) type health production function. Under the umbrella of nonlinear and linear estimation techniques, results suggest that private and public health expenditures are complements for high-income OECD countries whereas they are substitutes for low and middle-income countries. Empirical findings reveal that the dominant role of private health spending melts down the impact of public spending on life expectancy and the unbalanced use of health resources could be the source of ill health and low life expectancy rates in low and lower middle income countries. Further results suggest that elasticity of substitution decreases with the level of income.

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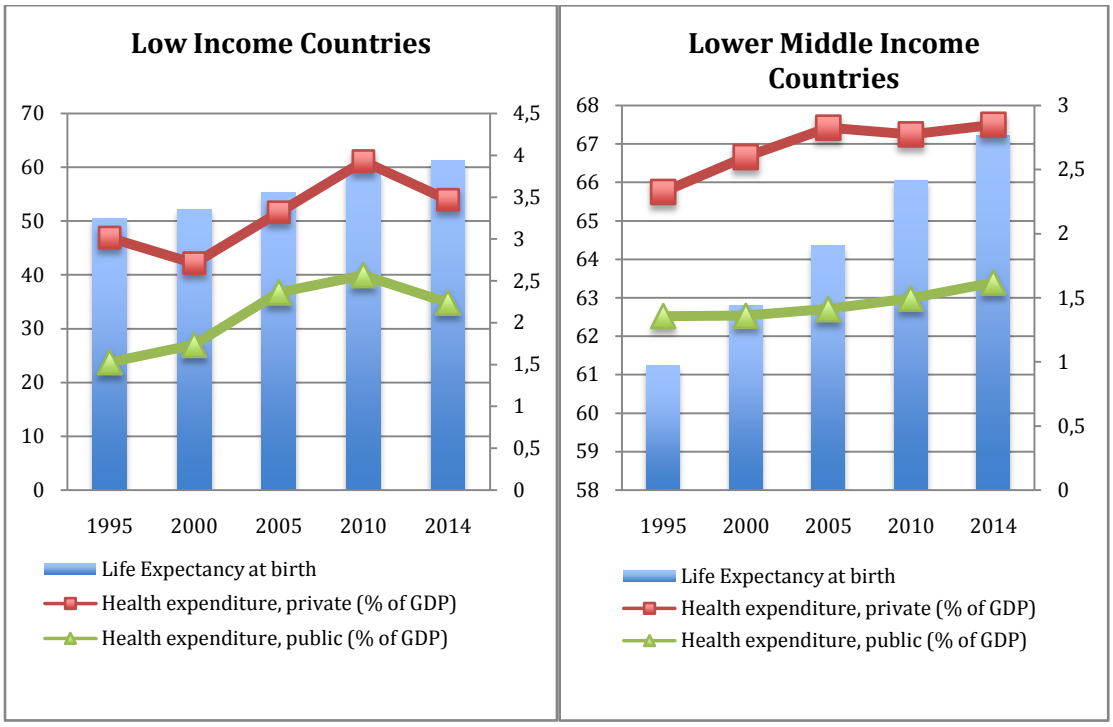
I. Introduction

Throughout the last decade, the relationship between health spending and longevity has received a great deal of attention. Most of the literature has highlighted the inevitable role of adequate and efficient health spending on the improvement of health status. Yet, not only does the size of the health expenditure is vital to enjoy a fair level of health capital, but also, the extent and optimality of public and private health care expenditures play a significant role in improving health status. There are considerable variations in the mixture of public and private health spending across countriesdue to the demographical differences, individuals' preferences for health care services, pricing and coverage of health care services[1]. While the aging population has important implications for the size and the composition of health expenditure in the OECD countries, the prevalence of HIV/AIDS is mainly responsible from the rapid change in the provision of health care in Sub-Saharan African countries.Furthermore, the public's intervention into health sector has been widely discussed issuein the OECD countries due to an aging population. But, the discussion has been revolved around the dominant role of private sector in providing health carein the low-income countries.In this context, the use of public and private health services at a different extent may generate different health outcomes for those countries.

[1] Gouveia (1997) and Filmer (2000) have argued that the degree of substitutability between private and public health care expenditures depends onthe several micro-level factors such as income/wealth, location, socio-economic status, the absolute expense of the treatment and the quality of services.

Figure 1. Health Status and Trends in Public and Private Health Expenditure



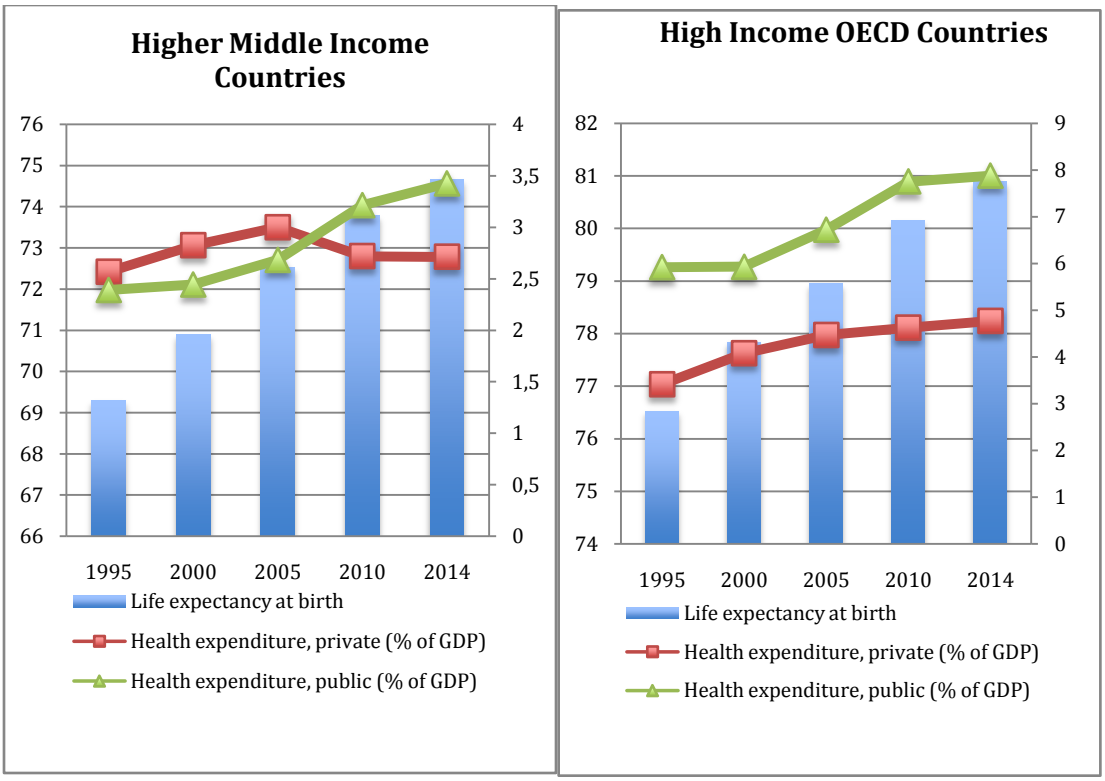


Figure 1 plots the unclear relationship between public-private mix and life expectancy. One of the most striking observations from Figure 1 is that the public health expenditure accounts for the 8% of the GDP in the high income OECD countries while it constitutes approximately 2% of the GDP in the low and middle income countries[2]. The prevalence and the importance of public sector diminish as countries get poorer. This is in part associated with the scarce resources in those poor countries. Further,since low level of public health spending forces people to use private services, private health expenditure makes up the largest component of the total health expenditure in low and lower middle income countries (Lehan et al., 2005). In the higher middle-income countries, the share of private health expenditure in GDP was higher than that of the public until 2007, then the role of public sector in health financing dominates the role of private sector.Another important observation from Figure 1 is that larger the role of public on health, higher the

[2]In the high-income OECD countries, health is extensively publicly financed but as population ages the public health care system may become less sustainable so the government may need to encourage the private health insurance (Pammolli et al. 2012).

life expectancy at birth[3]. In particular, the life expectancy at birth is lowest in the low and lower middle-income countries, whose health systems are privately financed.

Despite the large variations in the public private mix of health expenditures across countries, the impact of composition of health expenditure on achieving good health status has not received enough attention. On the empirical side, majority of the literature has focused on the separate roles of public and private health care on the health status by using different techniques, data sets and country groupings.Prior empirical studies by Osang and Sarkar (2008), Lichtenberg (2002) and Blackburn and Cipriani (2002) have all mentioned the positive and significant role of public health expenditure on the life expectancy. However, Self and Grabowski (2003) have found that public health expenditure is effective in improving health in developing countries, but it is not significant in developed countries.Studies by Gupta et al. (2001) and Bidani and Ravallion (1997) have provided evidence that public health spending matters most for the poor.On the other hand, some country based studies present different results for different countries. While Propper (2000) have found that private and public health care are complements for UK, Cutler and Gruber (1996a,b) and Gruber and Simon (2008) have stated that they are substitutes for US. For the OECD countries, Guison and Arranz (2001) have found that they are complements for the period 1970-1994. Cigno and Pinal (2004) have argued that public health crowds in private health expenditure in Argentina.

Another strand of the literature theoretically focuses on the impact of public-private mix on macroeconomic outcomes. But, again, a few of them, based on overlapping generations (OLG) models, have considered the joint roles of both public and private health expenditures such as Bhattacharya and Qiao (2007), Gamlat and Lahiri (2014), Lahiri and Richardson (2009), Li et al. (2012) and Varvarigos and Zakaria(2013). Bhattacharya and Qiao (2007) and Varvarigos and Zakaria(2013) assumed thatprivate health expenditure is more productive when it is accompanied by public health expenditure. Under the assumption of dynamic complementarity between public and private health expenditures, Bhattacharya and Qiao (2007) have stated that tax-financed

[3]One needs to keep in mind that health expenditure is not the only determinant of the health status. The literature on health economics has identified income, education of the female, infrastructure and socio-economic status as the main determinants of health status in addition to the health expenditure (See Filmer and Pritchett, 1999).

public health expenditures aimed at improving longevity may generate endogenous volatility in the economy. Further, Varvarigos and Zakaria(2013)have argued that complementary effect of public health on private health expenditure may responsible from the decline of fertility during the process of growth. Both studies by Bhattacharya and Qiao (2007) and Varvarigos and Zakaria(2013) have highlighted the importance of interplay between public and private health expenditures on capital accumulation and demography.

On the other hand, Gamlat and Lahiri (2014), Lahiri and Richardson (2009) and Li et al. (2012) have developed a political economy model to discuss the welfare implications of the substitutability between public and private health care. Gamlat and Lahiri (2014) worked with Variable Elasticity of Substitution (VES) whereas Lahiri and Richardson (2009), Li et al. (2012) have employed CES type health production function to study the impact of substitutability on welfare and inequality. They have underlined that increased substitutability, measured by elasticity of substitution between public and private health expenditure, reduces inequality and improves welfare in the long run.

Although the importance of the elasticity of substitution has been recognized in the OLG framework with developmental implications, it has not received enough attention empirically. The recent study by Aisa et al. (2014) have reported new evidence on the contribution of health expenditure on life expectancy, differentiating the effects of public and private health expenditures by using a cross country fixed effects multiple regression analysis for a sample of 29 OECD countries over the period 1980-2000. They demonstrated that the weight of public and private health expenditures matters for longevity rather than the aggregate health expenditure.

The current study is motivated by the inconclusive debate on the relationship between health expenditure and health outcomes. To the best of our knowledge, none of the studies seek to analyze the interaction between public and private health expenditures. Understanding the interaction between public and private provision of health care can help policy makers to allocate health resources more efficiently and productively so as to achieve better health outcomes. Therefore, the primary aim of this paper is to investigate the substitutability between public and private health care expenditures by the help of

CES type health production function for a panel data set of 148 countries over the period 1995-2013.The CES specification is estimated for four different subsamples of countries, grouped according to the level of income (World Bank Classification).[4]The results in this paper imply that public and private health expenditures are substitutes in the low and middle-income economies where the extent of public sector involvement in health is relatively much lower. On the other hand, public and private health expenditures are complements in the high-income OECD countries where the health spending is mainly publicly financed. For these subsamples, we found evidence that the elasticity of substitution may vary with the stage of development. To testrobustness of the empirical findings, both linear and nonlinear techniques are employed for all subsamples. For the further sensitivity of findings, CES specification is re-estimated for different subsamples. The subsamples are constructed by ranking all countries according to the share of public health expenditure in total health expenditure, total health expenditure in GDP and old age dependency ratios. The similar results are also supported for these subsamples.

Section 2 presentsthe CES type Health Production Function and introduces the data,Section 3provides empirical results and Section 4 provides policy implications and concludes.

2. Estimation of a CES type Health Production Function

2.1. CES type health production function

CES type health production function allows us to understand the tradeoff between public and private healthcare expenditures in improving the health status. It makes available to reveal elasticity of substitution between public and private health care expenditures. In the theoretical literature, CES type health production function has been widely used and the role of elasticity of substitution on inequality and economic development is examinedby Gamlat and Lahiri (2014) and Lahiri and Richardson (2009). Since there is no empirical attempt to examine the elasticity of substitution between public and private health expenditures, this study aims to highlight the substitutability or complementarity

[4]According to the GNI, World Bank classifies countries into four categories, namely, low income, lower middle- income, higher middle- income and high income OECD. See appendix for the classification of the countries.

between public and health expenditure in improving health status for different income groups by applying linear and nonlinear estimation techniques.

Todo this, we make use of the two level CES type health production function

$$H = H_0[\delta g^{-\rho} + (1-\delta)m^{-\rho}]^{-v/\rho}$$

where H is the health status proxied by the life expectancy at birth, H_0denotes the scale factor, m is the private health expenditure per capita, g is the public health expenditure per capita and $\delta, \rho \; and \; v$ are parameters satisfying H_0>0, $\delta \in (0,1)$, $\rho \geq -1$ and $v > 0$. The elasticity of substitution between any two inputs σ_{ij} is constant and equal to $\frac{1}{1-\rho}$.

If the elasticity of substitution between public and private health expenditures is high, the two types of health expenditure are more substitutable and therefore an increase in one type of health expenditure is more likely to crowd out the other type of health expenditure. However, if the elasticity of substitution between public and private health expenditure is low, the two types of health expenditure are more complementary so increase in one type of health expenditure supports the development of the other type. In other words, if ρ is positive, than public and private health expenditures are substitutes whereas if ρ is negative, than public and private health expenditures are complements in improving health status.

2.2. Data

The data set consists of a panel of annual observations from 148 countries where 25 of them are low-income, 44 of them are lower-middle income and 47 of them are higher-middle income and 32 of them are high-income OECD countries for the 1995-20103 period. The data on life expectancy is borrowed from World Development Indicators Database and the data on per capita public health expenditure Purchasing Power Parity (PPP) and per capita privatehealth expenditure PPP were obtained from the World Health Organization's database.

Table 2reports the descriptive statistics of the variables. There is a large discrepancy in the four subgroups of countries. In the high-income OECD countries, the average life

expectancy is 78 years and the average per capita public health spending and average per capita private health expenditure are 1908$ and 715$, respectively. It is crucial that high-income OECD countries have the highest health expenditure, which is mostly publicly financed. Consequently, life expectancy at birth is highest in the high-income OECD countries. On the other hand, low and lower middle-income countries are the worst performers in the terms of life expectancy. In fact, the average per capita public spending on health is only 38$ and 98$ in low and lower middle income countries, respectively. In low and lower middle income countries public expenditure is largely financed by grants and loans, this explains the high levels of private health expenditure in those countries since limited resources are assigned to the provision and maintenance of health related infrastructure (WHO, 2010). In the higher middle-income countries, the average public health expenditure per capita is 308$, the private health expenditure per capita is 220$ and the life expectancy at birth is 70. In addition, total health spending as a share of GDP fluctuates around 5% in the low and middle-income countries, but it was around 8% in the high-income OECD countries.

Table 2. Descriptive Statistics

	Observation	Mean	Standard Deviation	Min	Max
Low Income Countries					
life	475	53.56	6.46	31.24	71.75
pub	475	23.71	14.38	0.05	95
prv	475	37.54	25.62	6	196
puGDP	475	2.25	1.07	0.04	6.6
prGDP	475	3.48	1.7	1.34	10.54
heGDP	475	5.72	2.07	1.45	13.79
pop65	475	3.02	0.54	1.7	5.26
Lower Middle Income Countries					
life	836	63.95	7.31	40.78	75.76
pub	836	97.8	78.43	6	426
prv	836	93.06	75.15	3	547
puGDP	836	2.88	1.96	0.27	12.61

prGDP	836	2.65	1.45	0.23	11.35
heGDP	836	5.53	2.05	1.92	14.56
pop65	836	4.76	2.66	2.42	16.14
Higher Middle Income Countries					
life	893	70.06	6.64	42.05	80.13
pub	893	308.16	216.07	26	1947
prv	893	220.02	150.61	14	920
puGDP	893	3.34	1.39	0.79	11.25
prGDP	893	2.46	1.33	0.5	10.24
heGDP	893	5.8	1.88	1.88	15.23
pop65	893	6.67	3.23	2.31	19.37
Higher Income OECD Countries					
life	608	78.36	2.73	67.54	83.33
pub	608	1908.63	1069.29	152	5682
prv	608	714.7	614.44	41	4839
puGDP	608	6.21	1.52	1.44	10.29
prGDP	608	2.4	1.37	0.41	9.05
heGDP	608	8.63	1.99	3.84	17.1
pop65	608	14.69	3.01	5.91	25.01

Note: life: Life expectancy at birth, pub: Public health expenditure per capita (PPP International $), prv: Private health expenditure per capita(PPP International $), puGDP:The share of public health expenditure in GDP, prGDP: The share of private health expenditure in GDP, heGDP:The share of total health expenditure in GDP, pop65: Old age dependency ratio.

3. Estimation of CES type Health Production Function

To estimate CES specification by using nonlinear techniques, we take the logarithms of both sides, which gives us

$$\log H_{it} = logH_0 + \lambda_t - \frac{\upsilon}{\rho}\left[\delta g_{it}^{-\rho} + (1-\delta)m_{it}^{-\rho}\right] + \varepsilon_{it} \qquad (1)$$

The equation (1) is estimated using nonlinear regression techniques. Estimation of CES type health production not only allows us to determine the trade off between public and private health expenditure, but also it helps us tocheck whether the health production function exhibits for constant returns to scale or not.

The estimates from nonlinear least squares (NLLS) regression are provided in Table 3 and it reports that all of the estimated coefficients are significantly different from zero and economically plausible. The positive coefficient of ρindicates that public and private health expenditures are substitutes in the low and middle-income countries. In other words, consumption of one type of health expenditure crowds out the consumption of other type of health expenditure. A higher ρ implies a greater substitutability between

public and private health expenditures. Particularly, the highest degree of substitutability between public and private health care is experienced by the low and lower middle-income countries, whose health care is privately financed. As it is argued by Lehan et al. (2005) and Filmer et al. (2000), poor facilities and inadequate quality in the public sector constrained people in low and lower middle countries to use private health services. Therefore, private health expenditure crowds out public health expenditure in those countries. At the same time, one can safely argue that the low life expectancy in the poor countries might be explained by the huge degree of substitutability between public and private health care. In other words, reversals in life expectancy rates and poor health status may in part devoted to the improper balance between public and private health care expenditures[5]. Guided by this finding, the optimal and effective allocation between public and private health expenditures should attract more attention in the improvement of health status.

Table3. Non-Linear Estimation of Constant Elasticity of Substitution Health Production Function

	Non Linear			
	δ	υ	ρ	σ
Low Income Countries	0.599* (0.131)	0.087* (0.004)	0.691** (0.3956)	3.23
Lower Middle Income Countries	0.686* (0.024)	0.081* (0.002)	0.925** (0.456)	13.3
Higher Middle Income Countries	0.715* (0.032)	0.043* (0.034)	0.111* (0.0022)	1.12
High Income Countries	0.96* (0.027)	0.047* (0.0006)	-2.13* (0.5833)	0.319

Note: Standard errors are in parenthesis. Time dummies are included. Estimates for constant terms not shown. Significance at the 10% level. ** Significance at the 5% level.*** Significance at the 1% level.

As for the higher middle-income countries, the sign of ρ is found to be positive and significant, implying that public and private health expenditures are substitutes. But, the

[5]The misallocation of health resources across public and private sectors has not only detrimental health effects but also unequal private health investments lead to persistence of income and wealth inequality in the long run (Chakraborty and Das, 2005; Deaton, 2003 and Ray and Streufert, 1993).

degree of substitution between public and private health care expenditures is lower than that of the low and lower middle-income countries. This is quite plausible since the funding for health care shifts from private to public starting from 2007 in the higher middle-income countries.

The value of ρshows that public and private health expenditures are complements in the high-income OECD countries. This is quite plausible as both public and private health care is of comparable quality, accessibility and affordability in those countries. In addition,this finding supports the assumptions by Bhattacharya and Qiao (2007) and Varvarigos and Zakaria(2013), Gamlat and Lahiri (2014) suggesting that in developed countries where people are generally wealthier, public and private health expenditures are likely to be characterized by a greater degree of complementarity.

Next interesting finding from NLLs estimation of the model concerns the estimate of δ. The effectiveness of public health expenditure on health capital formation is captured by δ.In the low and lower middle-income group of countries δ is lower than that of the other countries. A lower δ indicates that public health expenditure is less effective than private health expenditure in improving health status in the low and lower middle-income countries. This fits with the findings by Filmer (2000). Hehas revealed that as private health care becomes more substitutable for the public health care, the impact of public health spending on health status will be smaller.In the OECD countries, having the highest δ,the findings suggest that public health play a more effective role in forming health capital to promote life expectancy,

Further, obtaining linearized version of the CES specification allowsus to compare non-linearized estimations with those obtained using linear estimation techniques. Log linearizing the equation around $\rho = 0$ gives

$$logH_{it} = logH_0 + \lambda_t + \delta v log g_{it} + (1-\delta) v log m_{it} + \frac{1}{2}\delta\rho v(1-\delta)\log(g_{it} - m_{it})^2 + \varepsilon_{it} \quad (2)$$

After estimating equation (2), one can recover the CES parameters. Estimates from Kmenta are obtained by using fixed effects model and robust regression techniques[6].

[6]Since we found that robust regression techniques do not change the main conclusion we obtained from the fixed effect techniques, we did not report it.

Table 4 presents estimation of CES type health production by employing fixed effect linear regression techniques. According to the Table 4, public and private health expenditures are substitutes in low and middle-income countries (ρ>0), whereas they are complements in the high-income OECD countries (ρ<0).The coefficient estimates from linear estimation techniques provide similar results with ones reported by NLLs. The fixed effect estimate of δ remains significantly positive and less than unity. The value of δ is highest in the high-income OECD countries, suggesting public health care is more effective than private health expenditure in improving health capital. The value of δ is lowest in the low-income countries, suggesting private health care is more effective than public health expenditure in improving health capital.

Table4. Linear Estimation of Constant Elasticity of Substitution Health Production Function

	Klementa Fixed Effect			
	δ	υ	ρ	σ
Low Income Countries	0.471* (0.0083)	0.066* (0.0056)	0.760* (0.0010)	4.16
Lower Middle Income Countries	0.55*(0.003)	0.061*(0.004)	0.78*(0.001)	4.54
Higher Middle Income Countries	0.742*(0.03)	0.041*(0.003)	0.110*** (0.0021)	1.12
High Income Countries	0.76* (0.057)	0.040* (0.017)	-1.25*** (0.0094)	0.44

Note: Standard errors are in parenthesis. Time dummies are included. Estimates for constant terms not shown. Significance at the 10% level. ** Significance at the 5% level.*** Significance at the 1% level.

Further, both linear and non linear estimation techniques for all income groups reveal that estimated value of ν is found to be less than unity, suggesting that there are slightly decreasing returns to scale in production.This result supports the findings by Galama et al. (2012) who argue that a model incorporating decreasing returns to scale may provide a more realistic representation of real world health production process.

To test the robustness of our empirical findings,both linearized and non-linearized production functions are re-estimated for certain subsamples. The subsamples were constructed by first ranking all countries according to their the share of public health expenditure, share of total health expenditure on GDP, and the old age dependency ratio. In the sample of high pub countries, the share of public health expenditure constitutes

more than 70% of the total health expenditure while in the low pub sample this ratio is less than 35%. In the subsample of high health countries, the share of total health spending on GDP is more than 12% while in the low health subsample, this ratio is less than 9%. The population age structure is important for the public private mix of health expenditures because elderly citizens usually demand more funding for the public health care system (Mou, 2013).In order to take into account of an aging population, the share of population over 65 (POP65) is used. As for the high age subsample, the age dependency ratio is more than 14% but for the low age subsample this ratio is less than 2%[7].

Table 5. Estimation of Constant Elasticity of Substitution Health Production Function

	Non Linear Klementa Fixed Effect			
	δ	υ	ρ	σ
High Public	0.993* (0.007)	0.036* (0.002)	-3.19* (0.981)	0.238
LowPublic	0.52* (0.069)	0.07* (0.024)	0.88* (0.047)	8.333
High Health	0.80* (0.0019)	0.04* (0.0020)	0.30* (0.005)	1.420
Low Health	0.58* (0.0037)	0.086* (0.0036)	0.76* (0.0076)	4.161
High Age Dependency	0.97* (0.037)	0.05* (0.024)	-2.17* (1.13)	0.315
Low Age Dependency	0.32* (0.1050)	0.067* (0.0038)	0.80* (0.4304)	5.000

Note: Standard errors are in parenthesis. Time dummies are included. Estimates for constant terms not shown. Significance at the 10% level. ** Significance at the 5% level.*** Significance at the 1% level.

The coefficient estimates for these subsamples are provided in Table 5 and Table 6. The estimation of linearized and non-linearized CES type health production function reveals that public and private health expenditures are complements in the high pub and high age sub samples. Particularly, results are compatible with the findings presented in Tables 3 and 4 where OECD countries are associated with aging population and they have publicly financed health system. On the other hand, ρ is positive and significant in the low pub and low age subsamples, where those subsamples are extensively formed by low and lower middle income countries.

The coefficient estimates of high health and low health subsamples reveal that ρ is positive and significant, expressing public and private health expenditure as substitutes. The high health subsample contains not only high-income OECD countries, but Sierra

[7] A list of countries in each subsample is available upon request.

Leone and Micronesia from other income groups are also members of this subsample. The low health subsample mainly consists of low and middle-income countries but ρ is higher than that of the high health sample. Once we consider the top countries that have health expenditure more than 8%, the evidence from linear and non-linear regression techniques do not reveal different results for those two extreme groups. That is, what matters for the substitutability or complementarity between public and private health expenditure is not the share of total health expenditure in GDP.

Table 6. Estimation of Constant Elasticity of Substitution Health Production Function

	Klementa Fixed Effect			
	δ	υ	ρ	σ
High Public	0.94* (0.042)	0.007* (0.028)	-1.31* (0.013)	0.432
LowPublic	0.48* (0.010)	0.09* (0.048)	0.82* (0.002)	5.555
High Health	0.86* (0.059)	0.06* (0.016)	0.27* (0.007)	1.369
Low Health	0.68* (0.041)	0.06* (0.013)	0.73* (0.027)	3.703
High Age Dependency	0.82* (0.016)	0.087* (0.017)	-1.8* (0.0059)	0.357
Low Age Dependency	0.34* (0.0097)	0.067* (0.081)	0.68* (0.0211)	3.125

Note: Standard errors are in parenthesis. Time dummies are included. Estimates for constant terms not shown. Significance at the 10% level. ** Significance at the 5% level.*** Significance at the 1% level.

To sum up, high pubsubsample generally contains the world's richest countries, while the low pubsubsamplegenerally contains the world's poorest countries. More importantly, in the high pub subsample the coefficient estimate for ρ is significantly negative while in the low pub subsample, the coefficient for ρ is significantly positive.The coefficient estimates for ρ in the two extreme subsamples highlight that the substitutability of public and privatehealth expenditures may depend on the stage of economic development. Stated differently, the negative estimate for ρ in the high pub subsample, which includes the richest countries suggests that the complementarity between public and private health expenditures and the superior role of public health on longevity generates better health status. However, the positive estimate for ρ in the low pub subsample, which includes the world's poorest countries, suggests that private health expenditure crowds out public health expenditure and reduces the effect of public health expenditure on longevity and

this might explain the relatively lower life expectancy rates and poor health status in low and lower middle income countries.

4. Conclusion and Policy Recommendations

There are various factors that can improve health status, among those the most important factors are public and private health expenditures. Even though both wings of the health expenditure have critical roles in improving health status, interaction between public and private health care expenditures has not received enough attention in the literature.Further, the relative weight of public and private health expenditures varied greatly across the countries. Within this context, the main aim of this paper is to address the trade off between public and private health care expenditures by estimating a CES type health production function for 148 countries between 1995 and 2013. Thus, preliminary effort on this paper may stimulate further enquiry on this issue and help policy makers to rebalance the distribution of public and private health care expenditures. Both nonlinear and linearized estimates suggest that public and private health expenditures are complements in the high-income OECD countries whereas they are substitutes in the low and lower middle-income countries. Further, the degree of substitution between public and private health expenditures increases with the level of income. In addition, estimation of health production function reveals that there are decreasing returns to scale in the specified health production function.

Within this framework, in wealthier countries, whose health care is publicly financed, public and private health expenditures are complements.This complementary link between public and private health care in those rich countries might responsible from higher life expectancy rates.Thus, one can conclude that effective public and private partnership in allocating health expenditures may generate better health outcomes.

But, in poor countries, whose public investments are restricted with the scarce resources, people are forced to opt private health care. The poor revolution of life expectancy in countries with a high amount of private health sources devoted to the crowding out effect of private health investment on public health. Therefore, diverse roles played by public

and private health spending on health formation should lie at the center of health policy and strategies should based on the efficient, adequate and optimal use of health resources.

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Table 1. Total Health Expenditure

		Health expenditure, total (% of GDP)	Per capita total health expenditure (PPP international $)	Per capita public health expenditure (PPP international $)	Per capita private health expenditure (PPP international $)
Low-Income Countries					
	1995	4.54	28	10	18
	2000	4.45	33	12	21
	2005	5.68	50	18	32
	2010	6.50	77	30	47
	2014	5.71	92	36	56
Lower Middle-Income Countries					
	1995	3.68	86	31	55
	2000	3.96	108	37	71
	2005	4.24	163	51	112

2010	4.27	209	76	133
2014	4.47	250	93	157
Higher Middle-Income Countries				
1995	4.96	179	90	89
2000	5.27	263	123	140
2005	5.69	398	186	212
2010	5.94	639	350	289
2014	6.14	823	462	361
High-Income OECD Countries				
1995	9.33	57471	41306	16165
2000	10.00	77112	55576	21536
2005	11.19	101112	74550	26562
2010	12.38	116552	85450	31102
2014	12.65	77710	56370	21340

Source: World Development Indicators Database, 2013 and World Health Organization Database, 2013.

APPENDIX

Low Income Countries	Lower Middle- Income Countries	Higher Middle- Income Countries	High Income OECD Countries
Benin	Armenia	Albania	Australia
Burkina Faso	Bangladesh	Algeria	Austria
Burundi	Bhutan	Angola	Belgium
Cambodia	Bolivia	Azerbaijan	Canada
CentralAfrican Republic	Cabo Verde	Belarus	Chile
Chad	Cameroon	Belize	Czech Republic
Comoros	Congo Democratic Republic	Bosnia &Herzegovina	Denmark
Congo	Côte d'Ivoire	Bostwana	Estonia
Eritrea	Djibouti	Brazil	Finland
Ethiopia	Egypt	Bulgaria	France
Gambia	El Salvador	China	Germany
Guinea	Georgia	Colombia	Greece
Guinea-Bissau	Ghana	Costa Rica	Hungary
Haiti	Guatemala	Cuba	Iceland

Madagascar
Malawi
Mali
Mozambique
Nepal
Niger
Rwanda
Sierra-Leone
Tanzania
Togo
Uganda

Guyana
Honduras
India
Kenya
Kiribati
Kyrgyz Republic
Lao PDR
Mauritania
Micronesia
Moldova
Morocco
Nicaragua
Nigeria
Pakistan
Papua New Guinea
Philippines
Samoa
Sao Tome and Principe
Senegal
Solomon Islands
Sri Lanka
Sudan
Swaziland
Tajikistan
Ukraine
Uzbekistan
Vanuatu
Vietnam
Yemen
Zambia

Dominica
Domican Republic
Fiji
Gabon
Greneda
Iran
Jamaica
Jordan
Kazakhstan
Lebanon
Libya
Macedonia
Malaysia
Maldives
Mauritıs
Mexico
Mongolia
Montenegro
Namibia
Panama
Paraguay
Peru
Romania
South Africa
St. Lucia
St. Vincent and the Grenadines
Suriname
Thailand
Tonga
Tunisia
Turkey
Turkmenistan
Uruguay
Venezuela

Ireland
Israel
Italy
Japan
Korea
Luxemburg
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Slovania
Spain
Sweden
Switzerland
United Kingdom
United States

Low Income Countries	Lower Middle- Income Countries	Higher Middle- Income Countries	High Income OECD Countries
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Ethiopia	Egypt	Bulgaria	France
Gambia	El Salvador	China	Germany
Guinea	Georgia	Colombia	Greece
Guinea-Bissau	Ghana	Costa Rica	Hungary
Haiti	Guatemala	Cuba	Iceland
Madagascar	Guyana	Dominica	Ireland
Malawi	Honduras	Domican Republic	Israel
Mali	India	Fiji	Italy
Mozambique	Kenya	Gabon	Japan
Nepal	Kiribati	Greneda	Korea
Niger	Kyrgyz Republic	Iran	Luxemburg
Rwanda	Lao PDR	Jamaica	Netherlands
Sierra-Leone	Mauritania	Jordan	New Zealand
Tanzania	Micronesia	Kazakhstan	Norway
Togo	Moldova	Lebanon	Poland
Uganda	Morocco	Libya	Portugal
	Nicaragua	Macedonia	Slovak Republic
	Nigeria	Malaysia	Slovania
	Pakistan	Maldives	Spain
	Papua New Guinea	Mauritıs	Sweden
	Philippines	Mexico	Switzerland
	Samoa	Mongolia	United Kingdom
	Sao Tome and Principe	Montenegro	United States
	Senegal	Namibia	
	Solomon Islands	Panama	
	Sri Lanka	Paraguay	
	Sudan	Peru	
	Swaziland	Romania	
	Tajikistan	South Africa	
	Ukraine	St. Lucia	
	Uzbekistan	St. Vincent and the Grenadines	
	Vanuatu	Suriname	
	Vietnam	Thailand	
	Yemen	Tonga	

Zambia

Tunisia

Turkey

Turkmenistan

Uruguay

Venezuela