Health Expenditure, education and Economic Growth in MENA Countries

Lacheheb, Miloud and Med Nor, Norashidah and Baloch, Imdadullah

Universiti Putra Malaysia

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Miloud Lacheheb[*1], Norashidah Med Nor[1], Imdadullah Baloch[1]

[1]Department of Economics, Faculty of Economics and Management, Universiti Putra Malaysia, UPM, Serdang, Selangor, Malaysia.

Abstract

This study examines the relationship between health expenditure, education and economic growth in MENA countries using panel data estimation. Our results based on random effect estimation endorse a relationship between health expenditure, education and economic growth. Data were obtained from the World Bank Development Indicators for the period of 1995 to 2010 for 20 countries from Middle East and North Africa region. Importantly, our results reveal that health expenditure and education have significantly positive effect on economic growth. Also gross fixed capital formation positively, but insignificantly, related to economic growth of MENA countries. Therefore, investment in human capital, namely health and education, will increase income in these countries.

Keywords: Economic growth; Education; Health expenditure; MENA countries

- Corresponding Author:

  Miloud Lacheheb, e-mail address: miloulach@gmail.com

1. Introduction

As an economic concept human capital is at least two centuries old, but its incorporation into the mainstream of economic analysis is a new and lively progress of the past few decades. Investment in education and health as an improvement in human capital has been a central part of the development strategies of most countries.

With income level improvement in a country, people tend to spend more on healthcare services and goods to achieve higher life quality. Middle East and North Africa countries in the last two decades have benefit from increased price of oil and gas, and thus, have a higher opportunity to achieve better life quality through additional expenditure on health care goods and services. Various empirical studies investigated the relationship between economic growth and health expenditure indicated that health expenditure varies among countries from similar and different growth level. However, commonly, expenditure on health increases gradually due to the increase in economic growth and population.

The importance of health care expenditure in macroeconomic indices rose after Second World War (Moon, 2003). Under this tendency, government created individual health account designed to estimate total national health expenditure. Subsequently, this framework has been widely accepted over the world. In spite of steady increase in total health expenditure, yet health expenditure as a percentage of Gross Domestic Product is instable (figure 1). Health expenditure among MENA countries is relatively insignificant compare with several other countries, for instance, in 2011 health expenditure in France was 11.6% of GDP, and reached 9.3%, 8.9% for Japan and Brazil respectively, where it exceeded 17% in US, while MENA region health expenditure denotes 5.8% only from total GDP.

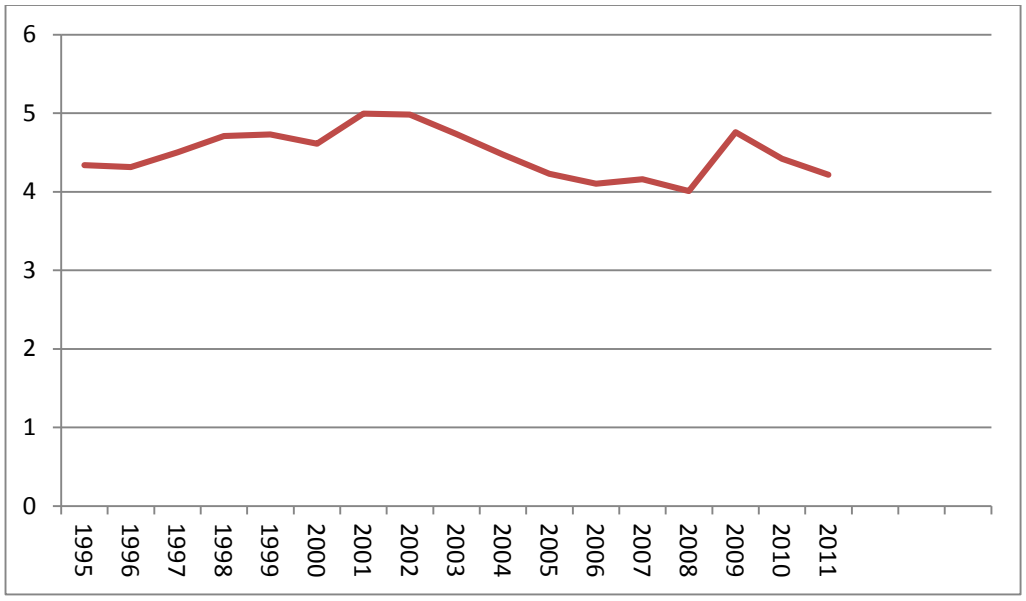

Figure 1: Time Trend of Health expenditure (% of GDP) in Middle East and North Africa region
Source: World Bank Database

Despite the modest economic growth rate of MENA countries, health status among their population has notably improved in the last two decades. Mortality rate decreases to 22 deaths per 1000 births in 2011, while life expectancy increases to 71.2 years (World Bank, 2013). Furthermore, countries of MENA region are less threatened by communicable diseases compare to sub-Saharan region, while non-communicable diseases in the region dominate 53% of total diseases. However, some communicable diseases are emerging among the MENA countries such as HIV/AIDS. On the other hand, most MENA countries place and strength its health expenditure on health care infrastructure, such as hospitals, beds, and acquiring new technologies, aiming to meet the increasing growth of the population without proper improvement in the investment mechanism of health sector, which, indeed, requires an appropriate mechanics to achieve illness prevention and services promotion. Outcome of health expenditure is highly associated to governance quality. MENA region suffers from weak governance and this led to limit participation of private sector in health care expenditure, in which the private sector and non-governmental

organization could play an important role in health sector effectiveness (Akala & El-Saharty, 2006).

On the other hand, despite the increasing of total education spending, education in MENA countries does not explain MENA countries economic progress (Limam, Samir, & Zeki, 2006). Illiteracy and unemployment ratio remain very high and the educational attainment of the labor force very low in comparison with the other regions in the world. Barro & Lee (2001) provide an evidence of the relative weaker education attainment of MENA region compare with other regions. For instance, years of schooling for the population aged 15 and above in Egypt in 2000 were 5.51; while were 8.83 for Argentina.

In last two decades, numerous studies of different methods have been adopted to examine the relationship between health expenditure, education and economic growth. (Mushkin, 1962; Romer, 1986; Schultz, 1961; Van Zon & Muysken, 2003) have argued the importance of health as human capital which, in fact affect economic growth. (Mayer, Mora, Cermeño, Barona, & Duryeau, 2001) indicated that health affects growth through the increase in productivity, education level, and women participation in economic.

With regard to previous studies, enormous have probed one way impact of GDP per capita on health expenditure. (Wang, 2011) investigated the impact of GDP per capita on health expenditure, and also highlight the need to emphasis this relationship reversely. Although several empirical studies examined the impact of health expenditure on economic growth, this hypothesis has been conducted under different categories. Gyimah-Brempong & Wilson (2004) examined the relationship between health human capital and economic growth in Sub-Saharan countries, while Li & Huang (2009) used China to investigate this relationship. Thus, further stress on this

relationship for MENA countries may benefit to better understand the impact of human capital on economic growth.

This paper attempts to place more emphasis on the impact of human capital on economic growth in 20 selected countries in MENA region. Likewise this study aims to find out whether health expenditure insignificantly and positively enhances GDP in those countries. Moreover, the study attempts to assess the role of governments in promoting health sector, and hence, improve economic development in MENA countries. Moreover, this study examines the relationship between education and economic growth in MENA region. Contribution of this paper are: i) results may be used by different countries to effectively monitor the expenditure on health sector for attaining higher level of GDP in those countries, ii) helps policymakers to better understand the relationship between human capital and economic development and apply utmost appropriate policies, iii) empirical results can enrich the literature for better understand the effect of health expenditure and education on economic development.

The other parts of the paper are organized as follows section 2 literature reviews, section 3 explains methodology and data. Section 4 reports empirical results. Finally, section 5 concludes the paper.

2. Literature Review:

A growing contemporary both theoretical and empirical bulk of literature shows how health expenditure enhance economic growth (Barro, 1991; Caselli, Esquivel, & Lefort, 1996; Mankiw, Romer, & Weil, 1992). Rosen (1993) and Morand (2005) argued that economic growth is enhanced through improvements in medical science as a part of physical capital; in fact, labor productivity

may increase when health of individuals improves. Accordingly, health capital should be as additional exogenous variable in formulating economic growth endogenous model.

Previous studies, by utilizing framework of Solow growth model, attempted to examine the impact of health expenditure on economic growth through technical changes; (Newhouse, 1992) advocated that technical change is a major factor in health expenditure enhancement. While (Gerdtham & Jönsson, 2000), using cross-sectional data, advocated the importance of income in enhancing health expenditure.

In addition, a bulky number of cross-section empirical studies have examined the relationship between health expenditure and economic growth. (Gerdtham, Søgaard, Andersson, & Jönsson, 1992; Kleiman, 1974; Newhouse, 1977; Parkin, McGuire, & Yule, 1987) emphasized the role of income in determining health expenditure. (Parkin et al., 1987) found that purchasing power may reduce elasticity of medical care.

Moreover, several studies have probed the relationship between health expenditure and economic through technical changes. (Finkelstein, 2007) advocated that implementation of healthcare leads to rise in health expenditure. Finkelstein concluded that technical changes are an endogenous, which is driven by GDP per capita and health insurance.

The role of education in enhancing economic growth is, also, equally investigated in numerous literatures. The education concept, in commencement, was fundamentally probed under human capital. Indeed, recent literatures have supported this hypothesis. In cross country study (Barro, 2003) concluded that higher human capital predicts high economic growth. Barro (2001) in a panel data estimation of 100 countries for the period 1965 to 1995 found that growth is positively related to starting level of average years of school attainment of adult males at the

secondary and higher levels, this is because educated employees would be complementary with new technologies, the result emphasizes the importance of knowledge spillover.

In recent studies education along health are categorized under human capital. Economic growth model has been extended to comprise the effect of education and health on economic growth (Knowles & Owen, 1995; Mankiw et al., 1992).

3- Methodology and data:

3.1 The Data:

The study applies panel data observation of 20 countries with time span from 1995 to 2010. The data collected from World Bank indicators, 2013, Washington, D.C. World Bank.

3.2 Model specification:

Starting from on Mankiw et al. (1992), Knowles and Owen (1995), Solow growth model has been further extended to incorporate both health and education as human capital.

$$Y = K^{\alpha}W^{\beta}A^{\psi}$$

Where, Y is output. K refers to capital, W is health expenditure, while, A represent education. After including our independent proxies, we specify our model as follows (while all variables are in natural logarithms):

$$Ln(RGDP) = \beta 0 + \beta 1\ Ln(he) + \beta 2\ Ln(gfcf) + \beta 3 Ln(edu) + \varepsilon$$

Where, *RGDP* is real GDP (constant 2000 LCU), *he* refers to health expenditure, *gfcf* is capital. And finally, *edu* is Secondary education enrollment.

Although the numerous studies that have examined the relationship between health expenditure and economic growth, this issue is still debatable. Moreover, the above mentioned literatures have applied panel country estimation, developing and developed countries from different income level. Thus, this study which focusing in Middle East and North Africa countries may be effective to better understand the relationship between health and economic growth among countries as those countries share various similarities such as language, culture, and economy characteristics.

The simplest and most intuitive way to account for individual and/or time differences in behavior, in the context of a panel data regression problem, is to assume that some of the regression coefficients are allowed to vary across individuals and/or through time. The regression coefficients are unknown, but fixed parameters.

This study applies basic panel model for short run time period. These estimations are: Fixed Effect Model, Random Effect Model, and Pooled OLS. Thus, three estimations are calculated and cross tests are also applied to select most reliable estimation among three models.

Fixed effects model and random effects model can be shown as follow:

Fixes Effects Model:

$$y_{it} = \alpha_i + \sum_{k=1}^{k} \beta_k x_{kit} + \mu_{it}, \qquad i = 1, \dots, N, \qquad t = 1, \dots, T \qquad (1)$$

Random Effects Model:

$$y_{it} = \sum_{k=1}^{k} \beta_{kx_{kit}} + (\alpha_i + \mu_{it}), \qquad i = 1, \dots, N, \qquad t = 1, \dots, T \qquad (2)$$

Index *i* differentiates the subjects and ranges from *1* to *N*. *N* is the number of subjects. Each subject is observed *T* times and the index *t* differentiates the observation times through *1* to *T*. *K* is the number of the explanatory variables.

4. Empirical results:

We have employed standard OLS estimation, fixed-effect panel estimation, and random coefficient estimation in our regression analysis. Hence, we have three estimation results for the equation.

For the estimated traditional panel, coefficients seem to carry its expected signs. Health expenditure and education positively related to economic development. In lieu of the estimated OLS, health expenditure insignificantly associated with GDP, while school enrolment significantly related to economic development.

Table 1: Traditional Panel Estimations

Variables	Pool OLS	Fixed Effects	Random Effects	RE (Cluster)
Constant	3.575	8.588	8.472	8.472***
	(0.887)	(0.317)	(0.403)	(0.638)
lhe	0.141	.280	0.272	0.272***
	(0.157)	(0.035)	(0.035)	(0.083)
lgfcf	1.594	.043	0.041	0.041
	(0.498)	(0.051)	(0.051)	(0.108)
lsep	0.902	.325	.347	0.347***
	(.114)	(0.063)	(0.062)	(0.105)
Breusch & Pagan Test		F-statistic = 1330.56		P-value = 0.000
Hausman Test		F-statistic = 3.86		P-value = 0.2771
Wooldridge Test (autocorrelation)		F(1,17) = 161.038		Prob > F = 0.000

Note: values in parentheses represent standard error. ** and *** denote significance at 5% and 1% respectively.

A few tests have been applied to verify the existence of variances across countries and correlation problem (Table 1). Lagrangian multiplier test proposed by (Breusch & Pagan, 1980) were applied to test for any variance across units. Breush & Pagan test confirm the existing of variance across the countries, hence, random effects estimator is more appropriate.

Furthermore, Hausman test were conducted to verify the existence of correlation between errors and the variables (Hausman & Taylor, 1981). This test is, in fact, conducted to choose between random and fixed effects estimation. Hausman test recommends for random effect estimation.

Above all, autocorrelation test has been applied to random effects estimation (Table 1). Since we fail to reject the null hypothesis, autocorrelation in random effect model is valid. Robustness method has been applied to grab autocorrelation problem. Cluster random effects estimation (Wooldridge, 2003) is presented in table 1.

The estimation in table 1 column 5 (RE cluster) shows that health expenditure is statistically significant at 1% level; also, the coefficient of health expenditure holds its expected positive sign with 0.272 in explaining the changes in income. The increase in health expenditure in MENA countries promotes GDP with indeed, about 27% of the average growth rate of income in MENA countries can be attributed to health, all things equal. Given the relatively low stock of health human capital in MENA region, increases in the stock of health human capital will continue to have large positive growth impacts on income. The findings are consistent with (Barro, 1991; Caselli et al., 1996).

The coefficient of *lsep* is positive and significant at 1% level, indicating that education human capital has a positive, direct, and significant impact on the growth of income in Middle East and North Africa countries, after controlling for the stocks of health human capital. The positive and significant effect of *lsep* is consistent with modern growth theory and similar to those obtained by other researchers (Barro, 1991; Caselli et al., 1996; Hanushek & Kim, 1995). The increase in school enrollment in MENA countries raises GDP with 34% of the average growth rate of income in MENA countries can be attributed to education, all things equal.

4. Conclusion

This paper attempts to examine the impact of health expenditure on economic growth in 20 selected countries in MENA region. Using Fixed Effect Model, the results reveal that health expenditure among Middle East and North Africa is insignificant.

Our results confirm that both the health and the education investment have positive effects on economic growth. Specially, stock of health human capital has positive direct effect on income level has implications for growth research and growth policy. The policy implications are that nations of MENA region that desire high levels of income can do so by increasing the stock of health human capital, particularly if their current stocks are low. The increase in education level will promote income, since investment in education becomes part of human capital stock in MENA countries. Moreover, policies in MENA region may consider the efficient allocation of funds in order to achieve higher outcome, also encouraging private sector may proportionally decrease public expenditure in favor to private sector and increase allocation efficiency of funds.

From a research perspective, our results imply that the stock of health human capital and investment in education human capital should be included in growth equations as added regressors. However, our results should be interpreted with caution. In particular, our model assumes that the coefficients are allowed to vary across individuals and/or through time. The regression coefficients are unknown, but fixed parameters.

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