
COMPARISON OF THE EFFECTIVENESS OF EDUCATION AND HEALTH EXPENDITURE ON ECONOMIC GROWTH IN PROVINCES OF IRAN

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Abstract: Proper economic growth and achievement to it always has been one of the fundamental concerns in governments. Recent studies indicate a high impact of health investment, education and health expenditure on economic growth that through enter to growth dependencies can measure its direct and indirect effects on labor productivity. In present study, regarding the importance of human capital and the role of consuming capacity in all provinces has been evaluated the comparison of the effects of education and health expenditure on economic growth in the Province of Iran. The model used in this study was internal growth model by using Panel data technique, i.e. compound Cross-Section with time-series of 1998-2011 data of Iranian provinces. Growth Variables of household health expenditure and investment education in household along with health, and civil government investment had a positive effect on economic growth of the country's provinces. But the impact of healthcare costs on the province's economic growth has been higher than the cost of education. Significant coefficients expressed the important role of health in economic growth in provinces that increase the level of charges and provincial health level could improve economic growth in country and provinces.

Keywords: Economic Growth, Health Expenditure, Human Capital, Educational Expenditure

1. INTRODUCTION

Neoclassical economists paid attention to the reasons of further economic development such as accumulation of physical capital and the abundance of natural resources. Weakness in the neoclassical theory in the expression of differences in economic performance across countries, leading to solo due to the effects of technological progress and human capital accumulation developed path. Regarding the importance of human capital as an effective factor on economic growth refers to the time of Becker (1964), Chadwick (1965) and Mincer (1974) According to Becker, the training could provide an opportunity for individuals to increase their skills, which will enhance and facilitate economic growth. Knowles, S. and Owen, D (1995) developed a model of Mankiw-Romer-Weil (1992) considered the health as one of human capital in growth models. In Knowles and Owen model and Owen health will be affected economic growth through increased labor productivity finally (2007). Health expenditure increases health workforce and enter more healthy individuals into the production process that increase economic growth with higher productivity growth. Through having more healthy people, it would be provide more appropriate ground in production factors, economic growth and productivity. Health of work force lead to reduce the costs of removing disease, so from these savings new investment has been done and increase production capacity to accelerate future growth.

In this study, in order to investigate the relationship between human capital and economic growth following by Knowles and Owen model, health and education are the components of human capital and are considered as two separate factors of production. Expansion and further isolation of effective factors on economic growth can prevent from incorrect analysis of the role of each of these factors on economic growth. Thus following hypotheses were formulated:

H1: Health expenditure has more impact on education spending on economic growth of provinces.

H2: Health expenditure has significant and positive impact on economic growth in provinces.

H3: Government construction spending has significant and positive impact on economic growth in provinces.

H4: Education spending in has significant and positive impact on economic growth in provinces.

H5: The rate of impact of health spending on the economic growth in the provinces that are above the average of health expenditure is more than the provinces with low average.

2. THEORETICAL PRINCIPLES

Health and education are as a part of the human capital have a vast literature. According to Salma Mashkin health is a capital and improvement in health can be as an investment. Grossman has developed a model that according to it disease prevent of working in the workforce was working, so sick and weak spending on health workforce is wasting work time. (Mehrrara et al., 2007)

Blog believes that level of health in workforce, health care, job training and work experience will increase earnings. Martin studies indicated that the most important component of human capital are including education, health and working experience. According to Straves and Tomas, health increase the learning and also, increase the efficiency invested in education. Corey and Madaryan, know health as a field of raising productivity, and Surki et al. know health as an increasing factor in savings and investment, as well as increasing the supply of work force. (Hartwing, 2009, 314).

Health of workforce by increasing labor productivity contributes to economic growth and due to this way, the health and its related spending come to the production. In new growth model with human investment in production function through increased productivity and efficiency of production factors, capital restrictions to diminishing offset neutralize investment and causes increased efficiency of production factors and thereby have a positive impact on economic growth.

There are various studies on the health effects and related factor on economic growth that a summary of the internal and external studies are given in Tables 1 and 2.

Table 1. Summary of internal Study

Authors	Year	Topic	Result
Mojtahedi& Javadpoor	2002	The effect of health expenditure on economic growth (case study of selected developing countries)	The impact of physical capital is less than the rates that commonly believed . Coefficients indicate the impact of human capital on economic

			growth in developing countries.
Amini	2005	Analysis and evaluation of health promotion Productivity of labor in the economy	Improve physical and mental health workers to increase their productivity
Ghanbari & Baskha	2006	Effects of changes in health spending and economic growth in Iran (1957-2002)	The positive impact of government spending on education and health, there is increased production of the country. Long-term impact of health spending in the economy over the impact of education costs
Hadian et al.	2006	The impact of Health costs on economic growth in Iran	Physical investment to GDP ratio and the ratio of health expenditure to have a positive effect on economic growth

Table 2. Summary of Foreign Studies

Authors	Year	Topic	Country	Result
Strauss et al.	1994	Type of relationship that disability income	Netherlands	Physical abilities to influence the employment situation caused considerable income
Barro & Sala	1995	The effect of life expectancy at birth and GDP	Developing countries	3-year increase in life expectancy increase the average annual economic growth rate to 4.1 percent
Rivara & Kovariz	1999	The effect of health expenditure on GDP	24 countries OECD member	There is a strong statistical association between health expenditure and economic growth.
Bloom & Kening	2000	The relationship between health and economic growth in developing countries	Some developing countries	In countries where life expectancy is 5 times more than other countries, the real annually growth rate is between 0.3 to 0.5 percentages.
Bhargava et al.	2001	92 countries	Modeling the cost of health on economic growth	One percent increase in life expectancy leads to a 0.05 % Increase in GDP in poor countries.
Kooiberia	2002	Health and development	South East Asia	Improving in healthcare condition lead to reducing death in children and affected population variables.
Jamisen	2003	Investigation the impact of health on economic growth	Universal Bank	Improvements in health spending cover 11 percent of growth. Study include investments in physical education and health spending
Bloom et al.	2004	Relationship between hope to life and economic growth	European countries	Health not only through improvements in labor productivity through capital accumulation leading to increased production but also increases the production capacity.
Giamah-berim poong	2004	Relationship between health and economic growth	Developing countries	.Investment (health expenditure) and balance health (life expectancy) has a positive and significant effect on per capita income growth
Talinn	2006	Relationship between growth and death	Estonia	The birth rate and mortality rate of adults has a negative relationship with economic growth.
Chau	2007	Investigation on relationship between health expenditure in government and economic growth	China	The effect of this spending is not the same in different parts of China.
Weo et al.	2010	Investigation on relationship between health government expenditure and economic growth	182 countries	Their results are approved. robust relationship between government spending and economic growth in health expenditure

Baltachi & Moosken	2010	The relationship between health expenditure and economic growth	20 membership country OECD	Economic growth has high elasticity than the in health expenditure
Wang	2011	Health care expenditure and economic growth	30 countries	Long-term sustainability will emerge health expenditure growth
Fanti	2011	Public health expenditure, older exploitation and economic growth	Some European countries	Long-term sustainability of health expenditure growth will emerge. Increasing public expenditure on health administration resulted in increased life expectancy, as well as increase the efficiency of labor in the service terminal
Masonianovang	2012	Economic growth and public expenditure in Kenya	Kenya	Tensile strength of economic growth to health expenditure in Kenya is further in poor province
Covari	2013	Does health investment have different effects on economic growth?	US countries	Capital health indicators, including life expectancy has a positive impact on economic growth of the developing world

3. ESTIMATION

This study used a model of endogenous growth models of Romer that it has been used to examine the impact of family health and education spending as a component of human capital on economic growth in the provinces. The aforementioned model has been estimated after identifying the techniques and econometric analysis by using panel data techniques. It means, the combination of the 28 provinces of Iran with a series of cross-sectional data from 1998 to 2011 is estimated. To estimate the selected model, Eviews7 Excel software was used.

Variables that has been used in this study are based on an interpretation of the Cobb-Douglas production function $Y_t = A_t K_t^\alpha L_t^\beta$ that K is physical capital, L is labor force and A is a level of technology that can be considered as exogenous. According to theoretical principles that has been expressed, the form of Cobb-Douglas function which is considered widely.

With regard to variables such as household health spending, spending, education, family, health, physical capital stock index, the overall form and function were as follows:

$$Y_t = AK_t^{\alpha 1} HCE_t^{\alpha 2} EDU_t^{\alpha 3} SHC_t^{\alpha 4}$$

Because of the lack of information due to the physical capital stock in the provinces, the provincial government's development budget was used to demonstrate the effect of investment growth. The main feature of this study is to highlight the health capital stock (SHC), investment in health (HCE) (as Gyamah – Berim Puang (2004)) were used simultaneously. 3-Health capital (SHC) can be obtained by consumer products and services, including health services as a result of the consumption model of Grossman (1972) that the information such as the amount of time devoted to health and manufacture composite products that are

not available at the provincial level. In this regard Chou (2007) suggested that the researchers such as Ride, Grossman, Yasayuky, Naim concluded that it can be used indicators of health, such as life expectancy, child mortality rate as an indicator for the health capital stock. Finlay (2007) states that Pedrik, Bloom and others, Hoviat, Hangi concluded from their researches that Concomitant use of health expenditure and education expenditure can be a good indicator of the quality of human capital, so these two variables used together in the model. A livestock variable has been used to distinguish the impact of health expenditure on economic growth in the province with higher average of health expenditure towards the provinces with moderate to low. In order to transform the growth model, the logarithmic difference of the variables were used.

Regarding the theoretical discussion and above materials, the structure of the model is as follows:

$$\ln Y_{it} = \alpha_0 + \alpha_1 \ln K_{it} + \alpha_2 \ln HCE_{it} + \alpha_3 \ln EDU_{it} + \alpha_4 \ln SHC_{it} + \alpha D1$$

Where i denotes province and t is time.

$\ln Y_{it}$ is impure in internal production growth of provinces

$\ln K_{it}$ is the growth of physical capital that is used in the construction of provinces.

$\ln HCE_{it}$: Growth in household health expenditure as an indicators of investment in health

$\ln EDU_{it}$: The growth of household education expenditure.

$\ln SHC_{it}$: The growth of provincial health balance of life expectancy which was used as a substitute.

D1: Dummy variable to distinguish which of household health expenditure in the country is greater than the average, so by using it can be demonstrated

that, Does household health expenditure growth are effective on economic growth or not?

4. RESULTS

Before estimating coefficients, the reliability of variables were evaluated. The results of the summary statement expressed that its Variables don't have the width of target and unit root simultaneously. Although because of the short period (Short Panel) unit root test is not necessary.

In panel data model of heterogeneity F Limer should be investigated. If heterogeneous model confirmed due to estimation of panel data. Otherwise is estimated using, OLS model and obtained test

statistic (6.91) was significant compared with F statistics table (1.16), at the 5% meaningful level. Therefore, Brosh panel model was approved. Moreover, the regression analysis on a combination of data acquired according to the method of random effects or fixed effects is also discussed. (Ashrafzadeh & Mehregan, 125.2006)

In order to determine of the correct model the Hausman test has been used, so based on calculations, statistic obtained is equal to 61.53 and P-value for this statistic is equal to 0.00. So using the fixed effects model is more appropriate for estimating the model.

Table 3. Summary of the results of estimation and coefficients model

$\ln Y_{it} = \alpha_0 + \alpha_1 \ln K_{it} + \alpha_2 \ln HCE_{it} + \alpha_3 \ln EDU_{it} + \alpha_4 \ln SHC_{it} + \alpha D1$				
variable	coefficient	SD	T- statistics	Prob
Intercept	3.566	1.3361	2.7	0.008
Construction budget of government (LK)	0.40869	0.02381	17.1789	0.000
Expenditure health of household (LHCE)	0.16357	0.027323	5.9867	0.000
Expenditure of household Education (LEDU)	0.07485	0.02326	3.22	0.00143
Health Capital(LLife)	3.02026	0.3991	7.568	0.000
Dummy variable (D1)	0.138408	0.029432	4.70263	0.000

$$D.W = 1/99941 \quad \bar{R}^2 = 0/986267 \quad R^2 = 0/98757$$

As shown in Table 3, the coefficient of growth variable of Construction budget of government in provinces is 0.409 with high confidence level. This is express that one percent increase in the growth of construction government charges in the provinces led to an increase of 0.409 percent of the country's economic growth in investigated period. Household health expenditure growth variable allocate 0.164 to itself and expressed that a percentage increase in the growth of household health leads to 0.164 percent increase in economic growth in the country. Obtained coefficients due to its high level of reliability confirm the effectiveness of the impact of health expenditure on economic growth of the country. The growth variable coefficient of household education expenditures on economic growth provinces is 0.075 that has high confidence level and also expressed that

by one percent increase in education spending of households, only 0.075 percent increase in economic growth in provinces in the period of study. The next variable growth is healthy life in provinces that expectancy index were used as substitutes. The index coefficients obtained higher rates than any other which is equal to 3.02 and has high level of confidence. This coefficient implies that one percent increase in life expectancy of people in the provinces led to 3.02 percentage point increase in economic growth of the country which is express that the high ability in economic growth of the country indicate an increase in household health inventory. Dummy variable coefficients in the model to distinguish the standards of a country's level of health expenditure is more than mean of country which indicates that the degree of impact of a unit increase in health

expenditure in the provinces is more than the effects of this unit in increasing health expenditure in other provinces. It can be observed that all the hypotheses stated above are accepted with a high level of confidence.

5. CONCLUSION

Regarding findings and obtained coefficient for governments' budget in construction growth in different provinces, it would be mentioned that economic growth in the provinces has increased which is in line with the findings of Shah Abadi (1999), Tari (2000), Taghavi (2006), Emadzadeh (2011) and Wei (2010). The growth in health household expenditure with 0.164 coefficient has impact on economic growth in provinces which confirm the theoretical principles and is similar to the results of Mojtahed (2002), Ghanbari and Baskha (2006), Hadianet al. (2006), Mehrara & Fazaeli (2007), Salmani & Mohammadi (2007) Emadzadeh (2011) and also Kuybiry (2002), Jami Sen (2003), Giamah berim Pong (2004), Tallinn (2006), Chou (2007), Hart Wing (2007), Wei et al (2010), Baltajy & Musken (2010) and Wang (2011). Increasing household education expenditures in each province causes increase in their economic growth which contrasts with the result of Emadzadeh (2011) and is in line with the results of Pour Faraj (2003), Ghanbari & Vbaskha (2006), Salmani & Mohammadi (2007), Baskha et al. (2011) and also Bloom & Kening (2000), Bhargava et al. (2000), Jami sen (2003), Pedrik (2001), Bloom et al. (2004), Hoviat (2005), Huang (2009) suggest that the simultaneous disposal and Health Education in the analysis are the factors affecting economic growth. Increased funding for health care can yield investments in training programs in areas such as education, public health and enhance professional compared with the effects of household spending, the coefficient influencing economic growth is lower in household education expenditure. This result can be due to several factors, including the fact that Iran access to free education up to secondary level is available to all citizens and even after that and to the end of higher education, there is possibility to continue free education for a significant proportion of the applicants. So the main share of responsibility for education is on the governments' shoulder. This matter is due to the lack of effectiveness of training, lack of fitness with the needs of lower quality and efficiency of the reasons for reaching this conclusion. The following factors affect the balance of family health (life expectancy) on province's economic growth which is similar to the results of Raeesi (1993), Stronkset al. (1994), Barro & Sala, (1995) Knowles et al. (1995), Bahargava (1997), Bahargava et al. (2001), Bloom et al (2004),

Tallinn (2006) Fanti et al (2011) and Kovari (2013). Wiley (2006) argues that increasing health and health indices in society reducing mortality and increasing life expectancy that encouraged people to make more saving. (Ozcan, Weil, 2000) Coefficient of the dummy variable unlike the result Masonianovang (2012) also expressed unaffected enjoy economic growth of health spending as well.

IMPLICATIONS

- Achieving to economic growth, in addition to adding physical capital, human capital investment is also needed because investment in human resources (including health) can raise the level of expertise and workforce and increase its capabilities, thereby improving product quality increase the efficiency and implementing efficient use of material derived from them.

- Creating to health services access for all groups in society and extending insurance coverage to all people and creating efficiency and adequacy of insurance coverage for the provision of healthcare costs and also raising the state share in the provision of insurance and healthcare costs and preventing the rise in healthcare costs, especially in disadvantaged provinces.

- According to the results of the study, there would be synchronized attention to the health and education that can increase the process of higher growth in provinces.

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