

Do Government Expenditures on Education and Health Lead Toward Economic Growth? Evidence from Pakistan

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ABSTRACT

The centrality of both education and health sectors to derive a country toward prosperity was the motivation to investigate the impact of both government education expenditures and health expenditures on GDP/economic growth rate in Pakistan. The data on modeled variables, GDP growth rate, population, Inflation, private health expenditures, government health expenditures, and government education expenditures, were taken from the World Development Indicators (WDI) and economic survey of Pakistan from 1998 to 2018. The Unit Root Test showed all the modeled variables stationary at level, so ordinary least squares technique was utilized to attain the objectives of the study. The outcomes of the study showed that impact of both government education expenditures and health expenditures on GDP/economic growth rate turned out to be statistically significant and positive. Whereas the impact of private health expenditures, population, and inflation on GDP/economic growth rate was found statistically non-significant. It was suggested to public policymakers to allocate more resources to both the education and health sectors to meet the goal of high economic growth in the country.

Keywords: *Education expenditures, health expenditures, GDP growth rate, fixed effect, random effect.*

Introduction

The health and education sectors play important role to enhance the productivity of the labour force as well as their contribution to national output. Only educated and healthy people can make meaningful contributions to the production and growth of national output. A typical production function indicates a relationship between input and output. Education and health determine the efficiency and ability of input, which ultimately determines the return to scale. Government education and health expenditures improve the access of the population to health and education facilities. Moreover, improved education and health facilities contribute to the economic

development process in two ways; first by improving longevity and skill of labour and second by producing and disseminating knowledge to encourage the development of modern manufacturing technologies and their utilization. Therefore, the facilities in the education and health sector determine the competitiveness of the country. The differences in health and education facilities are the main reasons for the difference in economic performance between developed and developing countries. Developed countries provided greater health and education facilities to its people in the past course of time and now are enjoying greater economic prosperity while, developing nations did not make an investment in the

education and health sector, so these nations are having low skilled labour and the result is backwardness. Most of the literature focused on the determinant of health and education (Ahmed, Creanga, Gillespie, & Tsui, 2010; Ensor & Cooper, 2004) but this study aimed to investigate the association of education and health expenditures with economic development. Pakistan is a developing nation with low national income, and the main challenge of Pakistan is to generate sources within the country to increase the GDP/economic growth rate. The education and health sectors play important role to improve GDP/economic growth rate through the improvement of human capital. Moreover, investment in human beings enables them to perform economic activities efficiently and to earn a better livelihood (Kouton, 2018). Therefore, investment in education and health sectors is considered as a long term investment and enable the country to achieve higher productivity.

Empirical literature concludes that government investment in education and the health sector is necessary for developed and developing nations to achieve higher GDP (Raheem, Isah, & Adedeji, 2018; Tandi, 2013). Moreover, Government expenditures in the education sector increase educational facilities and help to improve the quantity and quality of education outcomes. So far, theoretical literature acknowledges that education increases human capital stock and national income (Barro, 1991; Benhabib & Spiegel, 1994). However, empirical literature produced mixed results about education expenditures and GDP nexus (Barro, 2001; Beine, Docquier, & Rapoport,

2001; Benhabib & Spiegel, 1994). The results are diversified within the range of positive to negative or non-existent effect of education expenditures on GDP. Education is the most considerable and capable tool for poverty reduction, upgrading financial conditions, skillful individuals, enhancing private profit, advancing an adaptable and sound environment, and making the focused economy. McMahon (1998) explained in his study that education was an important tool for reducing poverty and enabled individuals to become financially strong. The government's duty to promote education in Pakistan was pronounced at the National Educational Conference (NEC) in 1947. It was the initial move toward characterizing education approaches and objectives in Pakistan. There have been developed eight national education policies and various commissions and boards have been set up by various governments endeavoring to improve Pakistan's instructive situation (Khalid & Khan, 2006). In each round of policymaking, policymakers highlighted the significance of education, past endeavors, principle issues in the education system, and new plans that are proposed to meet new targets. However, the objectives have stayed subtle up to now.

During the last five decades, it has been examined in Pakistan that the education sector experienced extreme negligence by the administration consistently. Pakistan is one of 12 nations on the planet, which spends less than 2 percent of its GDP on education. It has been noticed that during the last few years, accessibility to adequate education facilities reaches to bottlenecks in the achievement of education projects. Not

surprisingly, extensive literature is available on association of trade policies and trade volume with GDP (Dollar & Kraay, 2003). A few studies have discussed the impact of human capital on GDP (Asteriou & Agiomirgianakis, 2001; Devarajan, Swaroop, & Zou, 1996; Nafukho, Hairston, & Brooks, 2004) and reported diversified results. Some researchers have investigated weak and negative associations (Bils & Klenow, 2000) while some have found a strong positive relationship (Goodspeed, 2000). Therefore, this study was conducted to address controversies in literature and to establish a clear verdict about the association of education expenditures and national output. Literature has documented that human capital, measured through education and health expenditures, is a basic element of economic development and frequently (Hanushek, 2013). The endogenous growth model (Barro, 1990) has established that GDP is a function of human capital. Health contributes to human capital which ultimately contributes to economic development: healthier nations are wealthier nations (Hertzman, 2001). Similarly, the health led growth hypothesis explains the importance of health expenditures in GDP. Healthy labour is more able to develop new skills and knowledge to earn long term benefits. Contrarily, the labor force with poor health harms national productivity (Rizk, 2018). Therefore, a 50 percent disparity in economic development between rich and poor nations is attributed to poor health and high child mortality rate in developing nations (Mother, 2005). During the last decade, the world showed critical concerns about fundamental

education and the provision of essential human services. Human capital affects economic development particularly on one hand while on the other hand, it lessens poverty and develops a favorable social and political environment for development. It makes workers more beneficial, more amenable and advances sensible financial arrangements for development. Thus the objective of this study was to investigate the impact of government health and education expenditures on economic growth in Pakistan.

Literature Review

Education and GDP-- Though theoretical literature advocates positive association of education with economic prosperity but empirical literature reported mixed results related to the contribution of education in national output or GDP growth.

Owusu-Nantwi (2015) used a vector error correction (VECM) model to examine the nexus of education expenditures and GDP in Ghana for 1970-2012 and found causality among education expenditures and GDP; education expenditures significantly contribute in GDP and high GDP leads the government to allocate greater resources to education. Similarly, another study (Jung & Thorbecke, 2003) was conducted in Tanzania and Zambia to investigate the contribution of human skill in economic prosperity and found a significant influence of human capital on GDP. Moreover, the study suggested that only a well-defined education system can contribute to poverty reduction and lead the economy toward GDP. Okubal (2005) conducted a study in Uganda to explain education expenditures and GDP phenomenon using vector error

correction from 1962 to 2002. The restudy found co-integration between education and GDP and significant contribution of education expenditures in GDP in the long-run period. However, there is an insignificant impact of education on GDP in the short-run period. Similarly, Hussin, Muhammad, Hussin, and Razak (2012) used the Vector auto-regression model to explain the short-run and long-run relationship between government education expenditures and GDP in the Malaysian economy from 1970 to 2010. The study found long-run association and causality among modeled variables, GDP and fixed capital formation, labour force participation and government expenditures on education. Chandra (2010) conducted a study in India for the period of 1951-2009 to examine the relationship between GDP and education expenditures. Study found that GDP leads education expenditures and education expenditures cause GDP; bi-directional link between modeled variable existed in short-run while some other studies (e.g., Afzal, Malik, Begum, Sarwar, & Fatima, 2012; Barro, 2001; Tamang, 2011) found that increase in education expenditures caused increase in India's GDP while increase in GDP did not causes increase in education expenditures.

Jajri and Ismail (2010) assessed the impact of education on labour quality and GDP for the Malaysian economy and found that only government education expenditures for vocational training and health training had a positive effect on the country's output and per capita income. Contrary Hanushek and Woessmann (2010) found a significant impact on the quality of education GDP in developing nations. The study concluded

that investment in higher education brought a greater impact on GDP. In Contrast, some studies reported the negative or insignificant contribution of human capital in GDP for instance, Devarajan et al. (1996) found no correlation while Temple (1999) confirmed week positive correlation and Levine and Renelt (1992) found no robust correlation among education and GDP. Additionally, Zerihun (2014) used the modern econometric technique like VECM and found significant contributed to government expenditures in the education sector in GDP. Kouton (2018) found no relationship between education expenditures and GDP in Côte d'Ivoire. Thus, we found mixed results about the relationship between education expenditures and GDP, it has created a space for researchers to investigate the impact of education expenditures on GDP. Hence to find whether the government expenditures on education and health lead toward economic growth in Pakistan or not, we undertook the present study so that we could be able to give recommendations to government and policy makers in this regard.

Health and GDP

Ample empirical studies have investigated the nexus of government health expenditures and GDP; for instance, Suhrcke, Pelgrin, Oliveira Martins, and Dormont (2007) investigated the link between health spending and GDP and found that health spending contributes in GDP in multiple ways. Health spending brought technological progress, increased labour force participation, and productivity. The study also found that health spending caused prosperity and prosperity caused health

spending. Becchetti, Conzo, and Salustri (2017) used microdata of European individuals having age above fifty to investigate the influence of health expenditures on health outcomes and found that health expenditures contribution is insignificant in GDP and negatively and significantly affect health outcome. However, the health expenditures brought varied effects on different age groups like elders, females, and the overweight/obese and on different income groups. This study used real per capita income, literacy level, and female participation as a control variable while investigating the impact of health expenditures on health outcomes. Boachie and Ramu (2015) estimated the impact of health expenditures on health status using OLS and Newey-west estimation techniques. The study found that as health expenditures increases it would cause decrease in the infant mortality rate in Ghana. Similarly, Kousar, Zafar, Sabir, and Sajjad (2019) investigated the factors affecting child mortality by using the ARDL modeling technique and found that public health expenditures had a long-run association with child mortality. Kulkarni (2016) used the fixed-effect model to analyzed health input, health output, and GDP per capita in emerging economies of BRICS. The study found health outcomes affected positively to GDP per capita and it also decreased child mortality. Kim and Lane (2013) analyzed the impact of public health expenditures on infant mortality in developed countries and found that government health expenditures decreased the child mortality rate and increased the chances of survival at birth. Similarly, Bein,

Unlucan, Olowu, and Kalifa (2017) investigated the relationship between health expenditures and health outcomes in selected East African countries and found that health expenditures negatively affected neonatal and child under-five death rate while positively affected life expectancy in male and female. Moreover, Byaro and Musonda (2017) conducted a study in Tanzania and Deluna Jr and Peralta (2014) in Philippine about the relationship between public health expenditures and health outcomes and showed a negative association between health expenditures and child mortality. Therefore, overall the literature concerned about the association between health expenditures and health outcome and largely neglect the association of health expenditures with the GDP.

Research Questions

The following research questions were empirically tested in this study.

Do government health expenditures affect GDP?

Do education expenditures affect GDP?

Do private health expenditures affect GDP?

Data and Methodology

For an empirical analysis, the study used time series data for GDP/economic growth rate, government education expenditures, and government and private health expenditures taken from World Development Indicators (WDI) and economic survey from the years 1994 to 2018. This study used widely accepted theoretical and empirical measurements for modeled variables like GDP, government and private health expenditures, and government education expenditures. This study used inflation and population as

control variables to test the impact of government and private health expenditures and government education expenditures on GDP.

The variables, their descriptions, how they are measured and their data sources are given in Table 1.

Table 1
Variables' Description and Data Sources

Variables	Description	Measurement	Data Source
GDP	Gross Domestic Product	GDP Growth Rate (%) / Economic Growth Rate	WDI
HPR	Private Health Expenditures	Private Health Expenditures (% of total health expenditures)	WDI
HPB	Public/Government Health Expenditures	Public/Government Health Expenditures (% of GDP)	WDI
EXE	Government Education Expenditures	Government Education Expenditures (% of GDP)	WDI
INF	Inflation	Inflation Rate	WDI
POP	Population	Population Growth Rate	WDI

Empirical Model

$$\Delta GDP = \alpha + \beta_1 HPR + \beta_2 HPB + \beta_3 EXE + \beta_4 INF + \beta_5 POP + \varepsilon_0$$

Where,

GDP = Gross Domestic Product (dependent variable)

HPR= Private Health Expenditures (explanatory variable)

HPB= Public/government Health Expenditures (explanatory variable)

EXE= Government Expenditures on Education (explanatory variable)

INF = Inflation (explanatory variable)

POP = Population (explanatory variable)

all variables are taken into a log form

ε_0 = Random term

Results and Discussion

This study attempted to test three main research questions regarding effect of government expenditures on health and education and private health expenditures (private expenditures on education were not included in the model because of the non-availability of accurate data on private education expenditures).

ensure the stationarity of each series. Augmented Dickey-Fuller test ensures that no variable is integrated at order two or higher. Moreover, stationary time series produce reliable results to suggest policies and help to choose the appropriate method for empirical analysis. Results reported in Table 2 show that all variables are stationary at level; so ordinary least square (OLS) method is appropriate for analyzing the impact of education and health expenditures on GDP.

Unit Root Test

To avoid spuriously (non-sense) or misleading relationships, this study used the Augmented Dickey-Fuller (ADF) test to

Table 2
Unit Root Test: Augmented Dickey-Fuller

Variables	Statistic	Stationary at
LNGDP	-5.604*	I(0)
LNHPB	-3.119*	I(0)
LNHPR	-4.057*	I(0)
LNEXE	-7.395*	I(0)
LNINF	-4.624*	I(0)
LNPOP	-3.346*	I(0)

• Significance at less than 5%: Note LN means Log Natural
The ADF unit root test check the null hypothesis, presence of unit root; the significance value for all series is less than 0.05; so we accepted the alternative hypothesis of no unit root.

Table 3

Descriptive Statistics

	LNGDP	LNHPB	LNHPR	LNEXE	LNINF	LNPOP
Mean	1.391346	-0.422175	4.262870	0.862399	2.095909	18.98688
Median	1.511483	-0.412420	4.240933	0.907787	2.025318	18.99428
Maximum	2.036965	0.013349	4.387963	1.010229	3.214512	19.13180
Minimum	0.474177	-0.714622	4.160279	0.608580	-0.915697	18.77375
Std. Dev.	0.482859	0.176305	0.061746	0.121640	1.024371	0.102171
Skewness	-0.631092	0.776614	0.349291	-0.769229	-1.783800	-0.427867
Kurtosis	2.508298	3.914662	2.387996	2.537128	6.470268	2.445924
Jarque-Bera	1.070346	1.895322	0.503163	1.505644	14.44947	0.606248
Probability	0.585568	0.387647	0.777570	0.471035	0.000728	0.738508
Observations	24	24	24	24	24	24

Table 3 shows a summary of statistics for all variables used in this study. The results indicate that only LNHPB has a negative mean while all other variables have positive mean ranges between -0.422175 and 18.98688. Similarly, the value of the standard deviation for all variables is between .061746 and 1.024371. Moreover, the results indicate that skewness values show that data of public/ government and

private health expenditures are positively skewed while the data of inflation and population is negatively skewed. This study used Jerqa Bera's (1980) test to check the null hypothesis of normality and found that all variables have insignificant probability value except inflation. So, the study concludes that data for all variables is normally distributed except inflation

Table 4

Regression Analysis

Dependent Variable: LNGDP

Variable	Coefficient	Std. Error	t-Statistic
LNHPR	-0.592	0.832	-.7115
LNHPB	0.337*	.1262	2.674
LNEXE	0.492*	.0130	37.846
LNINF	-0.324	0.206	-1.572
LNPOP	-.195	.0827	-0.2357
C	69.04	139.2388	0.495857
R-squared	0.322139		
Adjusted R-squared	0.251524		
F-statistic	5.760366		
Durbin-Watson stat	1.779105		

Discussion

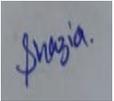
The results reported in Table 4 show a positive and significant association between government expenditures on education and GDP. Results indicate that as government expenditures on education increase, economic growth will also increase. Results indicate that a 1% increase in government education expenditures will cause a 49% increase in GDP/economic growth rate. Results are consistent with Musila and Belassi (2004) and Urhie (2014). Results indicate that government expenditures on education is crucial for GDP growth in Pakistan. Pakistan is a developing country and allocates a minor budget on education, so the literacy rate is also low. Results suggest that without improving the education sector, it is difficult for Pakistan to achieve the goal of higher economic growth. Education facilities can be improved if the government allocates a significant portion of the budget for education development. Public/ government health expenditures show a positive and significant impact on GDP. Results indicate that as the government increases health expenditures, it will generate greater health facilities and better health standards will be achieved. Therefore, the study implies that an increase in health expenditures increases human quality to work better (Kousar, Zafar, Sabir,

& Sajjad) and they play a better role in the GDP growth of the country. Consequently, we can conclude that public health expenditures indirectly affect GDP, so efficient and corruption-free institutions are necessary to translate increased health expenditures in people’s lives which would promote human capital and ultimately improve GDP/economic growth rate (Badri & Badri, 2016; Piabuo & Tieguhong, 2017). If the people of any country have greater education and health facilities then the country will be on the way fair way to progress. It has been observed that educated and healthy people can make more contribution to economic activities. The result of this study is consistent with Mandiefe and Chupezi (2015) who found a significant relationship of public/ government health expenditures on GDP and contradicted with Bloom, Canning, and Sevilla (2004) who found a negative and significant association of health expenditures and economic development. Private health expenditures show a negative and insignificant relationship with GDP. The results indicate that due to low per capita income in Pakistan, people spend a small quantity of money on their health facilities. Therefore, negligible private health expenditures did not bring any change in GDP (Erçelik, 2018).

Conclusion and Policy Suggestions

This paper attempted to examine the impact of education and health expenditures on GDP in Pakistan using the old model. The results revealed that education and health expenditures played an important role in the development of Pakistan as results confirmed that both public/ government health and education expenditures had positive effects on GDP. However, private health expenditures was insignificant to affect GDP due to negligible contribution of private sector in this regard. This study concludes that Pakistan can achieve high GDP/economic growth rate by reviewing its policies regarding the provision of education and health facilities. The government should target to increase investment in the education and health sectors to increase economic growth through human capital. This study suggests that the government of Pakistan should allocate 13 percent of its annual budget to the health sector as per the recommendation of the world health organization. Thus, policymakers should utilize the modern technology and services of professional personnel in the education and health sectors to meet the challenge of the modern era through a high GDP/economic growth rate.

Author's Acknowledgement

Author Name	Author's contribution	Signature
Shazia Kousar	Carried out statistical analysis and finalized the findings of the study	
Dr. Syeda Azra Batool	Wrote introduction and literature review section (Corresponding author-1)	
Prof. Dr. Syeda Shahida Batool	Contributed in literature, discussion and conclusion (Corresponding author-2)	

Mahwish Zafar
 Conceived the idea and helped in data extraction from WDI, reference management



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