Nexus between Education, Health and Economic Growth in Pakistan

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Abstract

This study determines the growth for Pakistan with the help of the education and health sectors of Pakistan for the period of 1980-2016, using ARDL. Health and education are the most important pointers of human capital. Human capital is the pack of resources, which boosts up individual skills, brings efficiency and always gives a positive outcome in economic growth. The objectives of the following study are to discover the nexuses between education, health, and economic growth for the country of Pakistan. To attain these objectives, the variable of enrollment in primary school has been used for education and a proxy variable of the rate of life expectancy has been using for health in the study. The Time Series data has taken from 1980 to 2016. It is important to know that time-series data has the problem of stationary. So, to check the stationary of the data different techniques are available but we applied ADF and the results provides a mixed result that some variables are stationary at first difference while other is stationary at level. The growth of the country is greatly determined by the level of education and health of the country. The results indicate a long-lasting relationship between the variables of health, human capital, and economic growth for Pakistan.

1. Introduction

The development and the betterment of all countries are aligned with the growth of their economies. Moreover, the people of Pakistan are getting basic needs that are compulsory to live a life. It is the responsibility of the government to enhance the standards of life of the people and do work for the betterment of the country. Growth and development are the two sides of the same coin. Growth of the economy and economic growth is measured nominally and in real term too. The Pakistan economy

is moving and becoming better day by day.

If the people of the country are mentally healthy, they will work better and of course, their productivity is much dependent on their attitudes towards work. Development of the country can only be possible if the countrymen bring structural changes which mean they are going to change their way of living. The development of a country is a natural process, which enhances the style of living for the people. Development involves different phases for example education, health etc. Education is the most important factor that involves both formal and informal education. To differentiate between formal and informal education involves two ways, one is when it is getting through the formal institution and the other is staying at home and studying on own to attain and learn something (Ben-Gal et al., 2014).

To undermine the development and growth of a country, different structural parameters are used; for instance, the health of the country, national expenditures on education and a huge list is available in the literature. The most important factor that determines a country's growth is human capital, which involves the individual skills, attitude towards work, training health condition of individuals and the attainment of basic education (Raggi et al., 2016).

The term human capital emerged in the 1960 and '70s but the idea of the formation of human capital got much importance after endogenous growth theory. Now, the formation of human capital is considered the fundamental objective of a country's growth. As this terminology has many ingredients but education serves a lot. When the productivity of a country deprives which depicting that country labor is not participating in the production, then the need is to discover the causes. Skilled labor trained labor and educated labor is one of the main reasons.

The development of a nation will remain improper if there is no education. Afzal et al. (2012), as Pakistan is labor-intensive country, so an investor will invest when he makes sure that the labor which he is going to hire has proper skills, therefore, education plays two dimensional role one its providing a trained labor in the market secondly it reduces the poverty. Poverty is an indicator that defines the growth of a nation and education is linked with poverty. In Pakistan, one of the most important reason of poverty is the lack of education, as many parents cannot sponsor their children a school because of the do not dot have enough funds to pay the dues.

Many studies are being done and the literature shows various effects on FDI and economic growth. Antwi et al. (2013) examined the negative relationship between FDI and GDP, which was demonstrated by an integration test in Ghana in 1980-2010.

Health is a very important indicator of human capital, according to the Pakistan Economic Survey, government expenditures on health have deprived which is against the policies & rules of WHO.

According to the world health organization benchmark, Pakistan must spend on health sector almost 6% of its GDP while Pakistan is spending only 0.5 to 0.6 per cent of its GDP on health which is far lesser than other countries like India and Siri Lanka. During the last fiscal year, the total expenditures were increased by 13%, while in 2016-2017 the expenditures decreased to 9%.
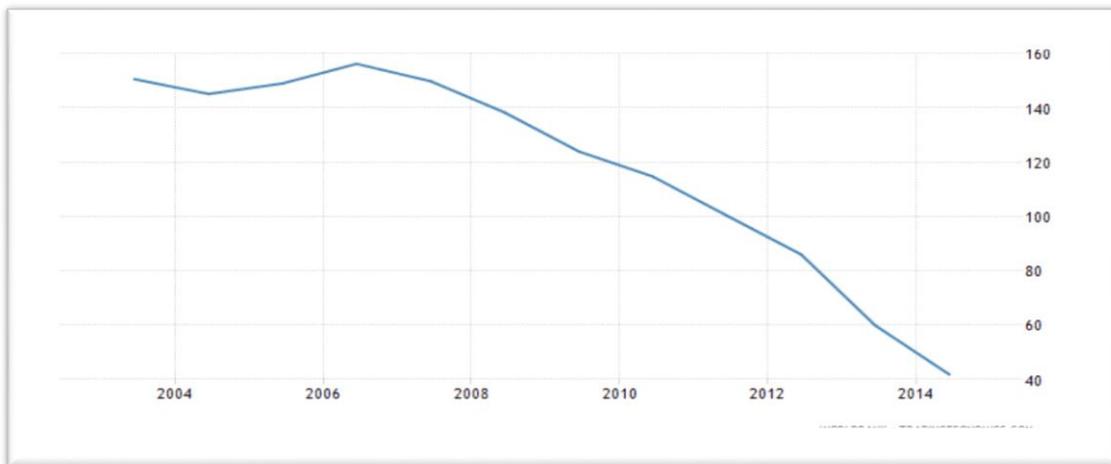
2. Literature Review

Abdouli and Omri (2020) investigated the links between the Human Capital and Economy Growth and other indicators as well in the great region of the Mediterranean by using the data set of 1990 to 2013 using different OLS and fully modified OLS Methods and found that Human Capital have a strong positive relationship with the Growth of the Economy.

Ali et al. (2016) investigated the effect of human capital on economic growth by taking education as a necessary tool while health has been given importance and have been used as an element of human capital. To measure economic growth, different parameters are established and used but to rely on the measures of per capita income which is not necessary to measure the economic growth, services are also important. Education is the necessary tool to assess the growth of the economy. By keeping the importance of education in human capital. The data period is from 1974 to 2014 in the case of Pakistan economy to examine the effect of this variable of economic growth. Time series data used different econometric techniques ARDL, ADF and unit root techniques is applied the results confirms the direct and positive linkage.

Afridi (2016), determined the nexus between human capital and economic growth for Pakistan. Human capital determines the potentialities of the people. Skilled labor force, infant mortality and birthrate are considered a most important factor, which determines the human capital. To describe this relation different variables used i.e. enrollment in primary schools, infant mortality, birth rate and gross capital formation. The time for which the data has been collected is 1973-2013. The findings of this study confirm that the development of the country is only possible when we increase spending on the most affecting human capital factors which are health and education.

Eggoh et al. (2015), investigated that the nexus between education and economic growth for a very huge sample of 49 countries of Africa. The data of formatted variables were collected from the year 1996 to 2010. The econometric techniques are applied to find out the relationship among variables and the results are evidence of human capital stock has a positive outcome to growth. Furthermore, the study suggests that the efficiency of public investment in education and health should jointly grow.

Kazmi et al. (2017), worked on the effect of the variable of human capital on the variable of economic growth by considering formal education as a primary element to explore the nexus between the variables of human capital and economic growth, in the case of Pakistan. By applying various econometrics techniques, it revealed that there exists a long term relationship between these variables. This study suggested that one should invest on the education sector so that a skilled labor force could be generated.

Razvi and Chakraborty (2016), answered the question that either economic freedom causes its effects on major health indicators or not in the case of India. this study it is stated that the health indicator is the most recognized tool to judge the human capital of the country, both the public and private sector should jointly work for the betterment of the health department. The penal data for 20 different states of India collected and it is admitted that economic freedom lessening the rate of maternal mortality and infant mortality.

Benhabib Spiegel (1994), explored "the role of human capital in economic development evidenced from aggregate cross-country data". The study answered the very basic question that how or in which ways education affects the productivity of different individuals. The Cobb Douglas production function is implemented to find out the fact. The tests showed positive impacts of human capital.

Abbas and Peck (2008), have also worked on these variables of human capital and the growth of the economy of Pakistan. Johnson cointegration technique is applied. The study evidenced the fact that higher productivity of secondary school education as compared with OECD economies is quite lesser as compared with Pakistan. Moreover, it denied one aspect of the endogenous theory of growth. Cross-country data has been used of five different states. Moreover, the focused agenda of the study was to find a comparative analysis of the variable of human capital and economic growth, and the result showed human capital positively affect economic growth.

Afzal et al. (2010) presented an investigation on the long run and the short run among the school education and the growth of the economy of Pakistan. They have to use the data of time series for the period of 19970 to 2008 has been picked to find out this linkage and it is admitted an inverse relation between schooling and poverty which exhorts positive impacts of school education on economic growth. Moreover, this has been found that inflation has retorted the growth of the country.

Faisal et al. (2011) contributed to the literature by analyzing the relation between education and the indicator of human capital that is health and discuss how these variables cause an effect on the growth of the country. The study is accompanied by Pakistan and the time series data has been taken from the world development indicator for the period of 1978 to 2010.

To investigate the causal relationship between the variable of different econometrics techniques has been applied and the result provides evidence of the existence of the long-run relationship between the variables and thus it supports the previous studies as well.

Asghar et al. (2012) provided a study by estimating the linkage among the human capital which is measured by the proxy of the variable which measures individual development that is education and another variable is used that is health. The study is conducted for Pakistan and the data is driven from 1978-2010. The econometrics test

is applied to deal with time-series data, which ADF PP and causality test. The result is quite significant and admitted the long-run relationship between the variables. Granger causality results provide this evidence that there exists a long-run relationship between the variable.

Ranis et al. (2000), investigated the development by comparing the most important factor of development which is education and health cross country data has been taken and tried to compare these variables, the strong relationships exist that determine the growth of the country.

Philip and Martin (2003) surveyed on the linkage between education and growth and it is added that if the level of education is increased among people the living standard of the people. This also changed the sense of improvement in their consumption pattern and if the lifestyle is compared with the people of 1800 it is different. It is also concluded that as long as education level is compared between the people the standard of living or earning of the people is more than the people who have low-level education.

Bloom et al. (2004), conducted a study to undermine the growth in the pattern of the health of the human. As the health is most affecting variable in the labor force. A healthy person actively and efficiently take the part in the economic activity to measure these different variables are also used as a proxy like life expectancy and the findings make it more obvious that the best health of the working force has a positive effect on the growth of the economy of that country.

Bhargava et al. (2001) investigated developing countries by taking the penal data. These countries selected for a reason that level of growth in these is very low and to find out the reason for this low level of increase in growth of that country different indicators of health are selected, such as adult survival rate. By taking the penal data, the results provide evidence that the health of labor force in developing countries is the major cause of a gradual slow level of growth.

Frimpong and Adu (2014), investigated the impact of human growth on economic growth in Sub-Saharan Africa. The results show that there are negative effects on human health on economic growth. The Solow growth model has been used to test the relationship between human health and economic growth. For this purpose, data is taken from the period 1970-2010. In addition, HIV / AIDS control, which is widespread throughout the region, provided similar results, indicating that the effect of the heath was far from ideal.

Katrakilidis et.al (2016), said strong reliability between economic activity, environmental degradation, and health quality in Greece during the 1960-2012 period. Various methods of integration with the Granger causality test used in the paper. The result shows that there are strong side effects, which seem to flow from income to CO_2 and rapid death.

3. Theoretical Framework

The objective of this study is to determine the type of relationship between economic growth and Human capital in the country of Pakistan. Human capital is measured through many variables but the variables that are used in this study is education and health. For education, the proxy variables that are used are enrollment in primary

schools. For healthy life expectancy is used as a proxy, while gross fixed capital formation is also selected as an independent variable while GDP is a dependent variable.

$$Y = a + a1Edu + a2Le + a3\,Gfk$$

where,

Edu= education

Le=life expectancy

Gfk= gross fixed capital

4. Data

The gross domestic product is a measure of money that measures the value of all the finished goods and complete services produced in a specified year. It calculates the total production of goods and services in a country in a particular year of the country, in this study, the GDP of each person acts as a variation that depends on him, this representative is borrowed from Afzal et al. (2010).

For education, the data of the total number of students who get enrolled in primary schools have been taken, it is then divided by the total number of population, at the age of (5 to 10) years.

The variable which is used as a proxy for health is life expectancy and this variable provides a statistical mean which is expected to live and it depends on the base and current year.

Gross Fixed Capital Formation (GFCF) means an increase in the carrying amount of tangible assets (investments are excluded from disposal) during the measurement period. It does not account for the use (depreciation) of fixed currency, nor does it include the purchase of land.

If we are interested to know about the level of development of a country at individual level education is a most important factor which paves the way out. It calculates at the individual level the total enrollment of the country's population in primary schools. Education becomes the cause of individual development so does the economic prosperity can be predicted as the number of developed people increased it ultimately increase the growth of the economy.

In this study, four variables are used among which GDP is dependent and it is determined by education, health, and capital. The table of descriptive statistics shows various results like standard deviation, maximum and minimum of the variables. The detail of the variables is mentioned in Table 1.

Table 1: Descriptive Statistics

	LGDP	LE	GFK	EDU
Mean	11.0313	62.0358	16.1582	71.1470
Median	11.0365	62.2200	16.4987	61.9987
Maximum	11.3576	66.4810	19.2354	97.7096
Minimum	10.6377	56.9720	12.5206	49.1366
Std. Dev.	0.20558	2.84503	1.66956	16.2993

5. Results

The Unit root testing is used to check the shape of the data if the data is not stationary then it will provide sporous results so before any further results and discussions, the stationarity of data is checked by different test the most commonly used test is ADF.

If the probability value is less than 0.05 then the data is stationary or if the value of t statistics is greater than 1 then the data is also stationary. According to this criterion, we dealt with the null hypothesis Null hypothesis: data is not stationary**.**

Table 2: Results of Unit Root Test

Variables	Status	t-stat	Prob.
GDP	I (1)	-3.5753	0.0115
LE	I (1)	-3.2605	0.0901
EDU	I (1)	-5.9041	0.0001
GFK	I (1)	-5.2042	0.0008

The bound test is used to know that determine whether a combination is present or not, if the value of f statistics is greater than the upper bound values then it confirms that there exist cointegration exists, and by cointegration, it means that there exists the long-run relationship between the variables. The results are shown in Table 3.

Table 3: Results of Bound Test

Test Statistic	Value	K
F-statistic	6.626099	3
Critical Value Bounds		
Significance Level	Lower Bound	Upper Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89

1%	4.29	5.61

Before we are going to apply techniques on data to find out the results the description of using that technique may sufficient. It is a known fact that the conventional methods of estimation give a long term relationship among the variable the ARDL provides both long-run and short-run relationship between the variables. The ARDL is free from the restriction that it can only be applied when all the variables are station at level or first difference. ARD can be applied if the variables are stationary at I (0), I (1) or maybe the mixture of both. However, if a variable is stationary at I (2) then the technique may not be appropriate to deal with such variables because the value of f statistics will be high, and coefficients also show the greater value.

Moreover, different variables that are using in the study may adopt different lags that were impossible in standard co-integration techniques. Providing more specificity, the ARDL technique provides the result for limited observation about 30 to 80

Table 4: ARDL Results

Variables	Short Run Results		Long Run Results	
	Coeff.	Prob.	Coeff.	Prob.
GDP	0.5215	0.0768		
Edu	0.0015	0.0165	-0.0069	0.2314
Gfk	-0.0003	0.1252	0.0158	0.0826
Le	0.6710	0.0284	0.1426	0.0178
C	-0.5813	0.7390	1.7913	0.6209
R-square	0.9954		0.7654	

6. Conclusion

This study conducted to explore the relationship between education and health and the economic growth of Pakistan. The Time Series data has been taken from 1980 to 2016. It is important to know that time-series data has the problem of stationarity. so, to check the stationarity of the data different techniques are available but I applied ADF and the results provide a mixed result that some variables are stationary at first alteration while others are stationary at other different levels. This study can be used while formulating the policies regarding the health of the nation, regarding the human capital and thus formulating the policies of economic growth. The country growth is greatly determined by the level of education and health of the workforce of the particular country. Education and health are the main indicators of human capital, and for country growth, human capital is the topmost important. In Pakistan, the expenditure on health is greatly less as compared with other developing countries. It is also reported by the world health organization that Pakistan is spending about 0.8 % of its GDP on health which should be increased at least 6%. There is a gradual increase in education as the data has picked for enrollment in primary schools. If we increased our spending on education and health the long-term positive effects will be

achieved.

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