Contribution of Health Outcomes to Economic Growth in Pakistan

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Abstract:
The present study investigates the impact of health on economic growth. Low economic growth is an important issue for underdeveloped countries. Health conditions are miserable in poor countries. We have estimated that how health related factors influence the economic performance of the Pakistani economy. The secondary source of data covering the time series period 1975 to 2010 is employed. We have used the auto regressive distributed lags method (ARDL) to estimate the economic growth. Different variables are used such as gross fixed capital formation, employed labor force, exchange rate, inflation rate, total number of beds in hospitals, health expenditures, total number of dispensaries and total number of registered doctors. The exchange rate has negative effect on economic growth while all other variables are positively related to economic growth. The study concludes that better health facilities contribute more in economic growth and suggest that government should provide good health facilities by increasing the share of health expenditure in budget.

Key words: Economic growth; Health expenditure; Co-integration; ARDL; Pakistan
I. Introduction

The extent of economic growth of an economy is greatly affected by the health of the citizens. Healthy labor force is more productive and efficient, thus resulting in higher levels of production that ultimately raises the national income. This relationship is much more important in developing economies where the existing productivity levels are already low. Poor health conditions, under nourishment, high mortality rate and non-availability of clean drinking water are adversely affecting the economic growth in lower income countries.

Therefore, it is of great interest that the relationship between health outcomes and economic growth should be studied carefully in order to formulate pro-growth policies with special reference to economies like Pakistan. In the present study we have tried to estimate the relationship between the health outcomes and economic growth in Pakistan. Grossman (1972) was the first to construct a model for demand of health for human capital. He made the distinction between health as consumption and a capital good. The consumption good side of health means that people enjoy more when they are healthy while health can also be considered as capital good i.e. people don't spend more days in bed as being ill because that want to have more days to work to perform different market and non-market activities.

There are different factors that affect the economic activity and quality of life in activity e.g. health, social, cultural and environmental factors, genetic endowments, living standards, working conditions etc. It is important to understand how the health condition can affect the economic growth. Health could accelerate the economic growth through the following four channels:

i. By increasing productivity of labor.
ii. By increasing labor supply
iii. By increasing skills due to higher education and training.
iv. By effecting savings and investment.

Labor productivity and labor supply increases with the increase in healthy labor force as healthy person has more time available for work. Physically and mentally healthy workers can handle modern technology much efficiently. The wage levels in an economy are also linked with the productivity; therefore as the productivity of labor increases due to better health conditions, the wage rate also tend to rise. Human capital theory suggests that the level of education increases productivity. It is observed that healthy people usually have more chances to get education as compared to unhealthy workers. It is evident that not only income levels are greatly determined by health conditions but the distribution of this investment between saving and investment is also influenced by the health outcomes.

The rest of the paper is formulated as follows: Second section presents brief literature review while the third section explains the theoretical framework. The data and methodology are presented in section four; whereas, the econometric issues are discussed in section five. Model is developed in section six and results are presented and discussed in section seven. It is followed by conclusion and policy recommendations.
II. Literature review

There are number of studies that have estimated the impact of health on economic growth in different countries. Some of the studies are presented in this section.

Bloom et al. (2001) examined the effects of health on economic growth by using the panel data for 1960-90 for different counties with the help of non-linear regression. In their production function physical capital (labor) and human capital (education, and health) were used as input. The findings showed that health had a positive and significant effect on economic growth. The result also showed that one year increase in a population’s life expectancy leads to 4 percent increase in output. Furthermore, this study identified that the increased government expenditures on health had a large and positive impact on labor productivity.

Rico, et al (2005) studied the impact of health on economic growth. They used capital growth, labor force participation rate, schooling, and life style, environment, and health services as independent variables. They used simple ordinary least square (OLS) method to estimate this relationship. All variables were found to be positively related to economic growth. This study also shows that improved health standards raise the economic growth thus reducing poverty. Similarly, a study by Cole and Neumayer (2006) showed that poor health is one of the major causes of low productivity of labor that ultimately affected negatively on economic growth.

Akram et al. (2008) showed that human capital played an important role in continuous economic growth in Pakistan by using secondary data and co-integration techniques. They used age dependency, trade openness, life expediency, health expenditures, infant mortality rate, investment percentage of GDP, per capita GDP and secondary school enrollment. This study showed the per capita GDP was the dependent variable and all others were independent variables. Their findings showed that trade openness, health expenditure, secondary school enrollment, investment, life expectancy and mortality rate were positively related to economic growth. They suggest that in Pakistan, people have lower per capita income that is why they spend less on health facilities; therefore, the government must increase the wages of labor to facilitate their life.

Bloom et al. (2010) identified the effect on economic growth of the distribution of labor income from low productivity agriculture to the high productivity industrial sector by using secondary data. They used the ordinary least square method (OLS). They used GDP per capita, investment, trade residual, average year of schooling, life expectancy and working age population as explanatory variables. Their results showed a positive relationship between investment, trade residual, life expectancy, working age population and economic growth and the negative relationship between GDP per capita, average year of schooling and economic growth.

Narayan et al. (2010) investigated the relationship between health and economic growth in five Asian countries by using panel data from 1974-2007. They used investment, exports, imports, education and R&D while using the co-integration technique. They showed that health, investment, exports, education, and R&D had positive impact on economic growth. They also found that imports had a statistically significant but negative effect while education had an insignificant effect on growth.
They suggested that improved the economic growth can be achieved by improving health facilities.

Peykerjou (2011) studied the relationship between health and economic growth in 15 member countries of Organization of Islamic Cooperation (OIC) for 2001-2009. The objective of this study was to examine the effects of different health indexes on the economic growth. The results showed that increase in economic growth in OIC countries was also due to increase in life expectancy. It was also observed in this study that there was a negative relationship between fertility and economic growth in these OIC member countries.

Rehman and Jangraiz (2012) tested a common hypothesis that whether health accelerates economic growth in Pakistan? Growth accounting method, ordinary least squares and Johansen co-integration tests were used in this study for the time period from 1971 to 2008. Ordinary least square (OLS) showed that health, labor and R&D are the basic determinants of economic growth in Pakistan. The Long run relationship between health and economic growth were also confirmed by co-integration test.

Tekabe (2012) studied the impact of school enrollments, the fertility rate (total births per woman), mortality and life expectancy rates on growth in low income countries and sub Saharan African. He found that mortality and fertility rates had influenced economic growth. He also concluded that there was no causal relationship between per capita income and health while there was a bidirectional relationship between per capita GDP and mortality rate. This study also suggested that simultaneity exists between per capita GDP and health.

The brief literature review presented in this section confirms that there is a positive link between increase in health expenditures and economic growth. Furthermore, it can be seen in the review of different studies that even though different methodologies and indicators have been used by different researchers but overall result indicate that health of citizens affect the economic growth positively.

III. Theoretical Framework

This section presents the theoretical framework of this study. Usually Solow is regarded as the benchmark for modern growth models. It takes the basis of the Cobb Douglas production function where endogenous growth model developed by Romar (1986) and Lucas (1988) is useful to understand why developed economies continuously grew in the long run despite the diminishing returns of physical and human capital. (Barro 1996). The basic functional form is given as under:

\[ Q = A K^a L^b \]

In this expression;
Q=total output
A=total factor productivity
L=labor input
K=capital input
\( a \) and \( b \) are the elasticity of capital and labor respectively.

Solow postulates that an increase in capital brings the improvements in output and labor productivity.
The augmented function of Solow model when human capital considers in it is:

\[ Q = K^{a(t)} H^{b(t)} (A_0 L^{1-a(t)}) \]

Where,
- \( K(t) \) = capital at a time \( t \)
- \( H(t) \) = health at time \( t \)
- \( A(t) \) = productivity of augmented labor.

**IV. Data and Methodology**

It is very important to be careful while selecting the variables and appropriate methodology in order to achieve reliable results. The present study examines the impact of health on economic growth in Pakistan during 1975-2010. The data of all explanatory variables are taken from Economic Survey of Pakistan and World Bank development indicators.

In most of the previous studies many different variables such as life expectancy, infant mortality rate, investment, per capita GDP, secondary enrollment, trade openness, average year of schooling and working age population have been used to measure the economic growth. In current study the impact of health on economic growth have been estimated by using employed labor force, gross fixed capital formation, exchange rate, inflation rate, total beds, total hospitals, total dispensaries and registered doctors as independent variables.

Table 1 summarizes the independent and dependent variables in the study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description of the variables</th>
<th>Measurement Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>Real Gross Domestic Product</td>
<td>Rupees (millions)</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFCF</td>
<td>Gross fixed capital formation</td>
<td>Rupees (millions)</td>
</tr>
<tr>
<td>ELF</td>
<td>Employed labor force</td>
<td>Percentage of total labor force</td>
</tr>
<tr>
<td>ER</td>
<td>Exchange rate</td>
<td>In percentage</td>
</tr>
<tr>
<td>INF</td>
<td>Inflation rate (CPI)</td>
<td>In percentage</td>
</tr>
<tr>
<td>TBED</td>
<td>Total beds</td>
<td>Total number (thousands)</td>
</tr>
<tr>
<td>HEX</td>
<td>Health expenditures</td>
<td>In million</td>
</tr>
<tr>
<td>DISP</td>
<td>Total dispensaries</td>
<td>Total number (thousands)</td>
</tr>
<tr>
<td>RDOC</td>
<td>Registered doctors</td>
<td>Total number (thousands)</td>
</tr>
</tbody>
</table>

Figure 1 shows the trend of independent and dependent variables in Pakistan.
The above figure shows the trend of health variables and real GDP over last 10 years data (2001-10). The variables used in the above figure are total number of registered doctors, health expenditures, total number of beds in hospitals and total number of dispensaries in Pakistan along with real GDP of Pakistan. The plot illustrates that all the health variables are contributing positively to the national productivity as measured by real GDP.

The definitions of variables are according to the definition by the World Bank Development Indicators.

V. Econometric issues
This section deals with some basic econometric issues like stationarity of data, auto regressive distributed lags model and bound testing procedure. Augmented Dickey and Fuller (ADF) test is used to check the order of integration. ADF test includes the extra lagged length of dependent variable to omit the autocorrelation problem in model. The use of ARDL model should be justified on the basis of ADF test i.e. if all variables are integrated in different orders such as I(0) and I(1) only then auto regressive distributed lags model (ARDL) can be used. Otherwise if all variables are integrated on I(0) then usually simple ordinary least square method (OLS) is used. Whereas, Johanson co-integration technique is used if variables are integrated on I(1). Table 2 presents the results of ADF test.
Table 2: Results of ADF test

<table>
<thead>
<tr>
<th>Variables</th>
<th>At level</th>
<th>At 1st difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept</td>
<td>Intr. &amp; trend</td>
</tr>
</tbody>
</table>
| LNRGDP    | -2.18     | -1.64           | -2.62***  | -3.38       | I(1)***
| LNGFCF    | -0.34     | -3.53***        | -         | -           | I(0)***
| LNELF     | -0.64     | -5.16*          | -         | -           | I(0)*
| LNER      | 0.26      | -2.79           | -2.85***  | -2.84       | I(1)***
| LNINF     | -4.05*    | -3.81           | -         | -           | I(0)*
| LNTBED    | -3.43**   | 0.78            | -         | -           | I(0)***
| LNHEX     | -0.52     | -1.74           | -4.81*    | -4.86       | I(1)*
| LNDISP    | -1.33     | -1.48           | -3.62**   | -3.54       | I(1)**
| LRNDOC    | -3.84*    | -2.89           | -         | -           | I(0)**

Source: Authors’ calculations, the (*, **, *** ) shows the level of significance at 1%, 5% and 10% respectively.

Table (2) presents the results of ADF test to check the stationarity of variables. The results show a mixed trend of integration as some variables such as the gross fixed capital formation (GFCF), employed labor force (ELF), inflation (INF) and total number of beds in hospitals (TBED) and total number of registered doctors are integrated at level while other variable like the real gross domestic product (RGDP), exchange rate (ER), health expenditure (HEX) and total number of dispensaries are integrated at first difference or first order. As the results from table (2) confirm that the variables are integrated on different orders, therefore it is justified to use ARDL method.

Narayan (2005) has presented the table of bound testing for ARDL model.

\[ T_t = \varepsilon + \sum_{i=1}^{n} \alpha_i T_{t-i} + \mu_t \]

Where \( T_t \) and \( Y_t \) are included in vector \( T_t \). \( Y_t \) represents the dependent variable real gross domestic product (RGDP) and \( X_t \) represents a set of explanatory variables in model. Time is denoted by \( t \).

Vector error correction model (VECM) is given as below:

\[ \Delta T_t = \varepsilon + \beta_t + \lambda T_{t-1} + \sum_{i=1}^{n} \gamma_i \Delta X_{t-i} + \sum_{i=1}^{n} \gamma_i \Delta X_{t-i} + \mu_t \]

The long-run multiplier matrix as:

\[
\Lambda = \begin{bmatrix}
\hat{\lambda}_{yy} & \hat{\lambda}_{yx} \\
\hat{\lambda}_{xy} & \hat{\lambda}_{xx}
\end{bmatrix}
\]

The diagonal elements of the matrix are unrestricted, so the selected series can be either I(0) or I(1). If, \( \hat{\lambda}_{yy} = 0 \) then, \( Y \) is I(1) and if, \( \hat{\lambda}_{yy} \leq 0 \) then, \( Y \) is I(0).
VI. Model Specification

The estimated equation to see the impact of health on economic growth is as follows:

\[
\ln RGDP = \beta_0 + \beta_1 \ln GFCF + \beta_2 \ln ELF + \beta_3 \ln ER + \beta_4 \ln INF + \beta_5 \ln TBED \\
+ \beta_6 \ln HEX + \beta_7 \ln DISP + \beta_8 \ln RDOC + \mu_i
\]

Where,
\(\mu_i\) = disturbance term
\(\beta_0\) = intercept term
\(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8\) = slope coefficients

Whereas, the unrestricted vector error correction model is presenting as below. This is the general ARDL equation;

\[
\Delta \ln(RGDP)_t = \gamma_0 + \sum_{i=0}^{\alpha} \gamma_{i0} \Delta \ln(RGDP)_{t-i} + \sum_{i=0}^{\beta} \gamma_{i1} \Delta \ln(GFCF)_{t-i} + \sum_{i=0}^{\beta} \gamma_{i2} \Delta \ln(ELF)_{t-i} + \\
\sum_{i=0}^{\gamma} \gamma_{i3} \Delta \ln(ER)_{t-i} + \sum_{i=0}^{\gamma} \gamma_{i4} \Delta \ln(INF)_{t-i} + \sum_{i=0}^{\gamma} \gamma_{i5} \Delta \ln(TBED)_{t-i} + \\
\sum_{i=0}^{\gamma} \gamma_{i6} \Delta \ln(HEX)_{t-i} + \sum_{i=0}^{\gamma} \gamma_{i7} \ln(DISP)_{t-i} + \sum_{i=0}^{\gamma} \gamma_{i8} \ln(RDOC)_{t-i} + \\
\gamma_{10} \ln(RGDP)_{t-1} + \gamma_{11} \ln(GFCF)_{t-1} + \gamma_{12} \ln(ELF)_{t-1} + \gamma_{13} \ln(ER)_{t-1} + \\
\gamma_{14} \ln(INF)_{t-1} + \gamma_{15} \ln(TBED)_{t-1} + \gamma_{16} \ln(HEX)_{t-1} + \gamma_{17} \ln(DISP)_{t-1} + \\
\gamma_{18} \ln(RDOC)_{t-1} + \mu
\]

This ARDL equation shows the short run and long run relationship between dependent variable and independent variable. \(\gamma_0\) is the intercept term while, \(\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_6, \gamma_9\) are the short term coefficients of variables and \(\gamma_{10}, \gamma_{11}, \gamma_{12}, \gamma_{13}, \gamma_{14}, \gamma_{15}, \gamma_{16}, \gamma_{17}, \gamma_{18}\) are the long term coefficients of the variables. Whereas, \(\mu\) is the disturbance term and it includes all the ignored variables in the equation.

After regressing ARDL equation, we apply the Wald test (F-Statistics). The Wald test (F-Statistics) is used to establish the long run relationship between dependent and independent variables.

The Null Hypothesis is given as follows
\[
H_0 : \gamma_{10} = \gamma_{11} = \gamma_{12} = \gamma_{13} = \gamma_{14} = \gamma_{15} = \gamma_{16} = \gamma_{17} = \gamma_{18} = 0
\]
(No long run relationship exist)

And Alternative Hypothesis as
\[
H_1 : \gamma_{10} \neq \gamma_{11} \neq \gamma_{12} \neq \gamma_{13} \neq \gamma_{14} \neq \gamma_{15} \neq \gamma_{16} \neq \gamma_{17} \neq \gamma_{18} = 0
\]
(A long run relationship exist)
If the calculated value of F-Statistics is greater than the tabulated value then the null hypothesis is rejected and consequently alternative hypothesis is accepted and vice versa.

The long run relation between dependent and independent variables is shown by the following equation.

\[
\ln RGDP_t = \alpha_0 + \sum_{i=1}^{\delta} \alpha_i \ln(RGDP)_{t-i} + \sum_{i=0}^{\gamma} \alpha_{3i} \ln(GFCF)_{t-i} + \sum_{i=0}^{\delta} \alpha_{4i} \ln(ELF)_{t-i} + \sum_{i=0}^{\gamma} \alpha_{5i} \ln(INF)_{t-i} + \sum_{i=0}^{\delta} \alpha_{6i} \ln(TBED)_{t-i} + \sum_{i=0}^{\gamma} \alpha_{7i} \ln(HEX)_{t-i} + \sum_{i=0}^{\delta} \alpha_{8i} \ln(DISP)_{t-i} + \sum_{i=0}^{\gamma} \alpha_{9i} \ln(RDOC)_{t-i} + \mu_i \ldots (2)
\]

In this equation the lag term of real gross domestic product (RGDP) is included in order to adjust the data.

\[
\Delta \ln(RGDP)_t = \gamma + \sum_{i=0}^{k_1} \gamma_i \Delta \ln(RGDP)_{t-i} + \sum_{i=0}^{k_2} \gamma_i \Delta \ln(GFCF)_{t-i} + \sum_{i=0}^{k_3} \gamma_i \Delta \ln(ELF)_{t-i} + \sum_{i=0}^{k_4} \gamma_i \Delta \ln(INF)_{t-i} + \sum_{i=0}^{k_5} \gamma_i \Delta \ln(TBED)_{t-i} + \sum_{i=0}^{k_6} \gamma_i \Delta \ln(HEX)_{t-i} + \sum_{i=0}^{k_7} \gamma_i \Delta \ln(DISP)_{t-i} + \sum_{i=0}^{k_8} \gamma_i \Delta \ln(RDOC)_{t-i} + \lambda (ECM)_{t-i} + \mu_i \ldots (3)
\]

Equation (3) shows the short run relationship between dependent and independent variables. In short run equation the error correction term lagged (ECM) \(t-1\) is added to adjust the results.

Error correction model (ECM\(t-1\)) shows the short run effect on X and Y variable, long run effect on X and Y variable and the speed of adjustment.

\[
\Delta P_t = \gamma + \delta \Delta X_{t-1} + \lambda (ECM)_{t-1} + \varepsilon_t \ldots \ldots (4)
\]

Equation (4) shows the error correction term (ECM\(t-1\)). In this equation, \(\delta\) is showing the short run effect and \(\lambda\) is showing the speed of adjustment. The error correction is showing the disequilibrium value. The coefficient of error correction is -3.4243, which shows the speed of adjustment from disequilibrium to equilibrium. The time period is calculated \((1/3.4243=0.29)\), its mean 3 months.

**Bound Test for Co-integration:**

Bound test for co-integration shows the long run relation between variables with the help of the Wald test. The results show the long run relationship exists with variables.

The results of bound testing for co-integration are summarized in table (3).
Table 3: Results of Bound Testing for Co-integration

<table>
<thead>
<tr>
<th>Equation</th>
<th>F-Statistics Calculated</th>
<th>Upper Bound Critical Value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnRGDP/lnGFCF,lnELF,lnER,lnINF, lnTBED,lnHEX,lnDISP,lnRDOC</td>
<td>6.91 [0.0031]</td>
<td>4.43 (99%)</td>
<td>Co-integration exist</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations, Note: Computed F-statistic: 6.91 (Significant at 1% marginal values). Critical Values at $k = 9 - 1 = 8$ is cited from Pesaran et al (2001), Case v; unrestricted intercept and unrestricted trend. The numbers in parenthesis shows the probabilities of F-statistic.

Narayan (2005) is a classical source of critical value of bound testing but up to maximum 7 parameters. In this study 8 parameters have been used therefore Pesaran et al (2001) is used to check the critical value of bound testing.

The descriptive statistics are represented in table (4).

Table 4: Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>J.B.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>59128.36</td>
<td>28320.76</td>
<td>0.41</td>
<td>2.12</td>
<td>2.16</td>
<td>0.33</td>
</tr>
<tr>
<td>GFCF</td>
<td>512204.7</td>
<td>660292.6</td>
<td>1.58</td>
<td>4.27</td>
<td>17.53</td>
<td>0.02</td>
</tr>
<tr>
<td>ELF</td>
<td>31.60</td>
<td>7.85</td>
<td>0.28</td>
<td>2.01</td>
<td>1.95</td>
<td>0.37</td>
</tr>
<tr>
<td>ER</td>
<td>32.31</td>
<td>21.81</td>
<td>0.58</td>
<td>1.96</td>
<td>3.65</td>
<td>0.16</td>
</tr>
<tr>
<td>INF</td>
<td>10.24</td>
<td>5.69</td>
<td>1.36</td>
<td>4.37</td>
<td>14.02</td>
<td>0.09</td>
</tr>
<tr>
<td>TBED</td>
<td>75135.39</td>
<td>22975.87</td>
<td>-0.22</td>
<td>1.53</td>
<td>3.50</td>
<td>0.17</td>
</tr>
<tr>
<td>HEX</td>
<td>17946.03</td>
<td>20593.50</td>
<td>1.58</td>
<td>4.78</td>
<td>19.77</td>
<td>0.01</td>
</tr>
<tr>
<td>DISP</td>
<td>4023.86</td>
<td>613.86</td>
<td>-0.17</td>
<td>1.48</td>
<td>3.63</td>
<td>0.16</td>
</tr>
<tr>
<td>RDOC</td>
<td>64399.94</td>
<td>43874.92</td>
<td>0.23</td>
<td>1.81</td>
<td>2.41</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations

The value of kurtosis shows that the variables are leptokurtic or a platy kurtic. Health expenditure (HEX), gross fixed capital formation (GFCF), and inflation rate (INF) have a high peaked or Lepto-Kurtic distribution. All the other variables are Platy-Kurtic.

The Jarque-Bera (JB) test of normality provides combined results of skewness and kurtosis. Jarque–Bera (JB) test of normality shows that the computed ‘p’ value of gross fixed capital formation, exchange rate, inflation and health expenditure are zero or very low, so it is not normally distributed. All other variables are normally distributed.

VII. Results and Discussion

Auto regressive distributed lags method (ARDL) has been used in order to measure the relation between health indicators and economic growth in Pakistan from 1975 to 2010. We also discussed the results of all the explanatory variables in the short term time period as well as long term time period. The value of coefficient shows the one unit increases in gross fixed capital formation due to a 0.003 unit increase in economic growth and it is statistically insignificant. At the same time, the one unit increase in health expenditure due to 0.07 units increase in real growth, but it is statically significant and one unit increase in exchange rate due to -0.25 units decrease in real growth and it is statistically significant. The value of coefficient shows the one unit increases in employed labor force due to a 0.14 unit increase in economic growth and it is statistically significant. The value of coefficient shows the one unit increases in inflation rate due to
0.03 unit increase in economic growth and it is statistically significant. The value of coefficient shows the one unit increases in total beds in hospitals due to a 0.09 unit increase in economic growth and it is statistically significant. The value of coefficient shows the one unit increases in the total number of dispensaries due to a 0.04 unit increase in economic growth and it is statistically insignificant. The value of coefficient shows the one unit increases in the total number of registered doctors due to a 0.16 unit increase in economic growth and it is statistically significant.

Table-5: Long run Model

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio [Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNGFCF</td>
<td>.003</td>
<td>.014</td>
<td>.238 [.816]</td>
</tr>
<tr>
<td>LNELF</td>
<td>.141</td>
<td>.051</td>
<td>2.748 [.021]</td>
</tr>
<tr>
<td>LNER</td>
<td>-.254</td>
<td>.012</td>
<td>-19.854 [.000]</td>
</tr>
<tr>
<td>LNINF</td>
<td>.028</td>
<td>.003</td>
<td>8.992 [.000]</td>
</tr>
<tr>
<td>LNTBED</td>
<td>.085</td>
<td>.034</td>
<td>2.448 [.034]</td>
</tr>
<tr>
<td>LNHEX</td>
<td>.055</td>
<td>.008</td>
<td>6.613 [.000]</td>
</tr>
<tr>
<td>LNDISP</td>
<td>.040</td>
<td>.031</td>
<td>1.283 [.228]</td>
</tr>
<tr>
<td>LNRDOC</td>
<td>.161</td>
<td>.011</td>
<td>14.447 [.000]</td>
</tr>
<tr>
<td>C</td>
<td>6.877</td>
<td>.373</td>
<td>18.421 [.000]</td>
</tr>
<tr>
<td>T</td>
<td>.036</td>
<td>.003</td>
<td>10.627 [.000]</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations (Microfit 4.1)

In our estimation, the gross fixed capital formation has positively impacted on economic growth because the value of new added final goods can be high to improve the economic growth. Gross fixed capital formation (GFCF) is the main component of gross domestic product (GDP). Health expenditures and real GDP are also positively related because people spending, high in health so diseases become reduced and people participation high in economic growth activities. Inflation rate and economic growth are positively related because prices can be higher and producer profit increase in stored things. In our country economic growth, improve due to increase in health facilities such as increase the no. Of dispensaries and also increase the no. of registered doctors.
Table-6: Short Run Results
ARDL(2,2,2,1,2,0,1,2,2) selected based on Schwarz Bayesian Criterion
Dependent variable is dLNRGDP
34 observations used for estimation from 1977 to 2010

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio [Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>dLNRGDP1</td>
<td>1.144</td>
<td>.251</td>
<td>4.545 [.000]</td>
</tr>
<tr>
<td>dLNGFCF</td>
<td>.061</td>
<td>.027</td>
<td>2.555 [.038]</td>
</tr>
<tr>
<td>dLNGFCF1</td>
<td>.081</td>
<td>.029</td>
<td>2.779 [.013]</td>
</tr>
<tr>
<td>dLNELF</td>
<td>.100</td>
<td>.107</td>
<td>.929 [.366]</td>
</tr>
<tr>
<td>dLNELF1</td>
<td>.083</td>
<td>.072</td>
<td>1.157 [.263]</td>
</tr>
<tr>
<td>dLNER</td>
<td>-.515</td>
<td>.064</td>
<td>-7.947 [.000]</td>
</tr>
<tr>
<td>dLNINF</td>
<td>.018</td>
<td>.003</td>
<td>4.748 [.000]</td>
</tr>
<tr>
<td>dLNINF1</td>
<td>-.034</td>
<td>.006</td>
<td>-4.892 [.000]</td>
</tr>
<tr>
<td>dLNNTBED</td>
<td>.292</td>
<td>.116</td>
<td>2.505 [.023]</td>
</tr>
<tr>
<td>dLNHEX</td>
<td>.157</td>
<td>.032</td>
<td>4.911 [.000]</td>
</tr>
<tr>
<td>dLNDISP</td>
<td>-.424</td>
<td>.128</td>
<td>-3.310 [.004]</td>
</tr>
<tr>
<td>dLNDISP1</td>
<td>-.230</td>
<td>.121</td>
<td>-1.900 [.074]</td>
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<tr>
<td>dLNDOC</td>
<td>-.449</td>
<td>.115</td>
<td>-3.905 [.001]</td>
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<tr>
<td>dLNDOC1</td>
<td>-.652</td>
<td>.181</td>
<td>-3.600 [.002]</td>
</tr>
<tr>
<td>dC</td>
<td>23.549</td>
<td>3.324</td>
<td>7.083 [.000]</td>
</tr>
<tr>
<td>dT</td>
<td>.125</td>
<td>.018</td>
<td>6.882 [.000]</td>
</tr>
<tr>
<td>ecm(-1)</td>
<td>-3.424</td>
<td>.485</td>
<td>-7.055 [.000]</td>
</tr>
</tbody>
</table>

ecm = LNRGDP -.0034055*LNGFCF -.14197*LNELF + .25465*LNER .028902*LNINF -.085356*LNTBED -.055722*LNHEX -.040324*LNDISP -.16189*LNRDOC -6.8773*C -.036660*T

Source: Authors’ calculations (Microfit 4.1)

This table shows the short run results. In this table is shows the most significant short run relationship between dependent and independent variables. The health expenditure increases one unit change due to a -0.06 unit decrease in economic growth. All explanatory variables are highly significant exclude employed labor force. In long run inflation rate is positively related to economic growth but in short run inflation is negatively related to economic growth but it is significant.

Stability test:
We estimate the CUSUM stability test in auto regressive distributed lags method (ARDL) to show the stability of the data. Our variables, data are stable because the cumulative sum of recursive residuals CUSUM graph is within the limits of 5% significance level and cumulative sum of square of recursive residuals CUSUMSQ graph is also within the limits of 5% significant.
Stability Test for Model: $[\ln RGDP \mid \ln GFCF, \ln ELF, \ln ER, \ln INF, \ln TBED, \ln HEX, \ln DISP, \ln RDOC]$ 

**Plot of Cumulative Sum of Recursive Residuals**

The straight lines represent critical bounds at 5% significance level.

**Plot of Cumulative Sum of Squares of Recursive Residuals**

The straight lines represent critical bounds at 5% significance level.

Source: Authors’ calculations (Microfit 4.1)

**VIII. Conclusion**

Good health not only has positive effects on the individual’s household also on the economy of the country as whole. Here good health means “a person who is free from sickness and injury have good health”. Better health plays an important role in the development of the country. Better health improves the productivity, efficiency and human capital.

Health level of Pakistan affected by population largely. Pakistan is a developing country and as we know the biggest phenomenon of developing country is high military
expenditure. The army gets a large share of budget and gives only 2 percent of the
education its severe situation. And its thinking point that a country who gives the 2
percent of its education system, how much it gives to the health sector?

From the World Bank statistics we are able to know less than 1 percent; Pakistan
gives to its health sector. In this short budget the health facilities which provide to the
public sector is not enough and also low quality vise. Therefore, different disease attacks
and health level going too poorly. Even after a long time of independence, it failed to
cover the polio. 27 percent new born babies are underweight and up to 75 percent babies
born at home without any professional doctor. Government focus on urban sector
therefore rural sector ignores. A rural sector already poor, but this ignores plays a
negative role on the health level.

**IX. Policy Suggestions:**

i. We suggest that to improve the economic growth can provide the health facilities.
   To improve the child health and nutrition effect to improve the economic growth.

ii. An adequate number of health care workers should be trained and deployed,
    especially at the lower level facilities.

iii. The government should increase the share of health sector in a budget.

**References**

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