Public Health Expenditure and Economic Growth: Evidence from Pakistan (1972-2012)

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Abstract

The issue health spending has remained a matter of concern for both individuals and governments. This study examines the impact of real public health expenditures on real GDP in Pakistan. Annual time series data over the period 1972-2012 have been used to estimate the health-growth relationship through Johansen co-integration technique. The results confirm the presence of long run positive association between health sector and economic growth validating the role of human capital formation. The study suggests that public intervention in health sector is necessary by enhancing the share of health expenditure in government budget to stimulate the economic growth in Pakistan.

Keywords: Health Expenditures, Economic Growth, Johansen co-integration

JEL Code: H51 O40

1. Introduction

Public health expenditure raises a great matter of concern towards public sector resource allocation and exhibit an enormous variation across the globe. This variation not only depends on the country's income level, but also on social, political, cultural and geographical status of the country. State intervention through public sector resource allocation and health policies indicate the portion of national income that a country devotes to its health sector. Health spending is in fact an investment in human beings that determine the health status of the masses. Investment on health stimulates human and physical capital formation (Bloom and Canning, 2001). Healthy individuals contribute more in the production process by enhancing the productive efficiency of the country.

Health expenditures play an essential role in economic development of a country (Mushkin, 1962). Health expenditures enhance the life expectancy of individuals and overcome disease burden by strengthening food and medicine availabilities in a country. So, the health expenditures upgrade health outcomes in a country by ensuring health facilities at all levels. Healthier labor force is stronger with respect to their mental and physical situation and is capable to produce more output and income. On the other hand, poor health and illness restrict the potential of workers and thus make them absent from work especially in developing world (Strauss and Thomas, 1998). Health is a vital determinant of human capital formation. Human capital formation mostly depends on educational level and health status of societies. In this respect, education has narrowly been viewed as a sole factor of human capital formation and economic growth in empirical studies[1]. The variable of health sector has been

ignored in empirical literature. Health, education and growth related studies showed that health and education are significantly affecting growth (Barrow, 1996).

In rich countries, average per capita health expenditures are above than USD 3000, whereas for poor countries it amounts to USD 30 only. Similarly, some countries allocate more than 12% of GDP to health sector, while other countries only allocate less than 3% of their GDP to health sector (UNDP, 2013). Pakistan stands far behind on way to grow its human resources when compared with its neighbor countries like India and Sri Lanka. Pakistan secures 146th position out of 187 countries in Human Development ranking, compared with India at 136th, Sri Lanka at 92th and Iran at 76th (UNDP, 2013). In Pakistan, number of hospital, hospital beds, registered nurses, physicians and other health sector indicators are lacking behind (Khan, 2003). Pakistan devotes a small percentage of its GDP to health sector. Only 0.7% of GDP on average has been allocated for health sector during the last four decades [Handbook of Statistics on Pakistan Economy, 2010]. High fertility rates in Pakistan always remained a challenging issue for every government during the last four decades. Total fertility rate in Pakistan is 3.3 per women comparing with India having 2.6, Bangladesh having 2.2 and Sri Lanka having 2.3 (ADB, 2013). Pakistan has the highest infant mortality rates of 59 per thousand live births comparing with its other regional states such as India, Bangladesh and Sri Lanka having 47, 37 and 11 respectively. However, the situation is not too much depressed in case of life expectancy in Pakistan having 65.4 years of average life expectancy comparing with India and Bangladesh having 68.9 and 65.5 years (ADB, 2013).

This study contributes in the health economics literature in following ways: Mostly studies on way to establish the relationship between health expenditures and economic growth used the panel data from developed countries. Single-country time series analysis on the issue of health expenditures and economic growth is neglected in empirical literature. This study incorporates this issue in case of Pakistan. None of the previous studies has explained the health system and health structure of Pakistan but this study gives a complete picture of health sector in Pakistan. This study also provides trends in health expenditures and suggests some policy measures.

The study is structured as follows: In section 2, the structure of health in Pakistan along with several trends in health expenditures have been explained. The review of assorted studies on health expenditures and economic growth has been discussed in section 3. Section 4 contains the model specification, data and methodology. Section 5 provides empirical results and discussions. Finally, section 6 offers the conclusion of the study.

2. Health Structure and Trends of Health Expenditures in Pakistan

2.1 Health Structure in Pakistan

The health system of a country is based on the organization, institutions and allocation of resources that generates health outcomes. Health upturn in a society is based on the availability of public health services, individual health caring access and other institutions that can contribute in the provision of health facilities directly or indirectly. Since 1947, health system in Pakistan has passed through different attempts and impediments for the achievement of good health status. The health system of Pakistan is divided into two segments: vertical and horizontal (Nishtar, 2006). In

lieu of vertical segment, different organizations play their role for the provision of health related services. These organizations and department are providing health related facilities. Each of them has is its own structure and policy plans for service deliveries and health betterment. These organizations include Federal Ministry of Health, provincial level health departments, armed forces, private health providers, non government organizations (NGOs) and employee's social security institutions. However, in horizontal existence, Ministry of Health and provisional health departments coordinate with the private health providers for the delivery of health related services. Figure 1 exhibits the health structure of Pakistan.

Figure 1 about here

The government of Pakistan provides health services with the help of a three-tier health services delivery system and public health interventions. Figure 2 depicts the health service provider in Pakistan.

Figure 2 about here

The first tier includes Basic Health Units (BHUs) and Rural Health Centers (RHCs). This tier is responsible for primary healthcare services. The second tier includes Tehsil Headquarter Hospitals (THQs) and District Headquarter Hospitals (DHQs). This tier provides the secondary healthcare services. The third tier offers the services to the sub specialists and other medical staff.

2.2 Trends in Public Health Expenditures

This section shows the trends of public health expenditures in Pakistan. Figure 3 shows the trends in real expenditures during the period 1972-2012. Real health expenditures show a significant variation over time from 79.9 million rupees in 1972 to 823 million rupees in 2007.

Figure 3 about here

During 1980s average health expenditures substantially increased from 178 million to 405 million rupees in 1970s. Average growth rates of health expenditure during 1980s show a sharp increase up to 127% comparing with 1970s. This was due to higher GDP share of health expenditures in this period that remained above 1% in some years. Similarly, average health expenditure varies from 522 million rupees in 1990s to 644 million rupees in 2000s with a 28% growth in 1990s and 23% in 2010s. But in recent years health expenditures are showing a declining trend due to less preference given to health sector.

Figure 4 about here

Figure 4 displays percentage share of health expenditures in GDP over the period 1972-2012. The graph shows a wide variation and declining trend after 1987. In early 1970s the share of health expenditures increases reasonably due to the nationalization policies adopted by the government. After 1977, health expenditures suddenly fall and show a declining trend. In Pakistan only a small part of GDP is allocated to health sector throughout the time. Almost, less than one percent of GDP is given to health sector. The highest share of health expenditures in GDP is observed during 1980s and it remained above 1% in some of the years. This happened only one time in the history of Pakistan. In the last decade, only 0.48% of GDP on average is given to health sector comparing with 0.98% during 1980s.

3. Review of Assorted Studies

Since the pristine work of Newhouse (1977) on health growth relationship, the area of health economics is encouraging the researchers' interest and attention to explore the health-growth mechanism. We have segregated reviewed studies at national and international level:

3.1 Health Expenditures and Economic Growth: International Studies

In this section, we have reviewed the international studies on the health expenditures and economic growth. Newhouse (1977) pointed out that more than 90 percent changes in health expenditures are due to changes in income. The author considered income as the major predictor for health expenditures decisions.

Hitiris and Posnett (1992) evaluated the relationship between GDP and health expenditures along with some other variables like age structure, mortality rates and the government share on health spending. The data set covered 20 OECD countries for the years spanning from 1960-87. The results confirmed the strong positive correlation between health expenditures and GDP with an income elasticity of health expenditures around unity.

Chang and Ying (2006) viewed the link between health expenditures and economic growth in OECD countries. The authors collected annual time series data of 15 OECD states over the period of 1980-1998. The study revealed the chances of convergence between under-developed and developed countries by promoting health and human capital formation in under-developed countries. Health expenditures showed a significant positive impact on economic growth. However, some of the countries which experienced overspending on health showed a little impact on economic growth due to the maintenance of steady state situation.

Sülkü and Caner (2009) defined the impact of population growth and per capita health expenditures on GDP growth in Turkey. The study employed annual time series data for the period of 1984-2006. The authors applied Johnson cointegration approach for the determination of long run relationship among population growth, health

expenditures growth and GDP growth. The findings argued that income elasticity of public health expenditures is less than one in case of Turkey. The study determined private health expenditures a luxury good having income elasticity greater than one.

Baltagi and Moscone (2010) elucidated the long run association between healthcare expenditures and GDP in 20 OECD countries using a set of panel data spanning from 1971-2004. The study applied cointegration estimation for the determination of long run relationship between healthcare expenditures and income per capita. The results declared healthcare expenditures as a necessity good in OECD countries with income elasticity less than one. These results were contrary with other studies which found health expenditures as a luxury good in case of OECD countries.

Mehrara and Musai (2011) evaluated the casual relationship between GDP, health expenditures and oil revenues using a panel data of 11 selected oil exporting countries. The data set covered annual time series observations from 1971-2007. The findings argued strong causality from GDP and oil revenues to health expenditures but no reverse impact from health expenditures to GDP was observed. The study concluded no significant involvement of health expenditures in economic development of oil exporting countries.

Wang (2011) studied the causality between healthcare expenditures and economic growth in a perspective of developed and developing countries. The study used panel data of 31 countries spanning from 1986-2007. The empirical methodology was divided into two parts; the panel estimation and the quintile estimation. The panel regression findings determined positive role of health expenditures on way to economic growth. However, quintile regression results were

comparatively different in developing and developed countries due to short run variations in growth. According to the findings, health expenditures were inversely related with GDP growth in both types of countries but their impact was observed less in countries falling under low income category.

Wisniewski and Roe (2011) developed the way through which health expenditures stimulate economic growth in Sri Lanka. For this purpose the researchers utilized annual time series data during the period 1990-2006. The research interest was to build a channel for economic growth through health expenditures. The study formalized that labor would allocate some of their income for health improvements by making decisions under inter temporal budget constraint. By forgoing consumption and spending on health would augment labor efficiency that would cause capital deepening and thus stimulating economic growth in Sri Lanka. The empirical results revealed that expenditures on health augment labor productivity in Sri Lanka. Labor productivity further accelerates capital accumulation and results economic growth in Sri Lanka.

Maitra and Mukhopadhyay (2012) investigated the role of public health and educational expenditures in economic growth of Asia and Pacific region over the period of 1981-2001 by employing cointegration and panel error correction methods. The findings revealed that the impact of health and educational expenditures on GDP was not uniform across the nations.

Hossein and Yazdan (2012) captured the impact of health expenditures on economic growth in Iran. The researchers analyzed the time series data for the period 1970-2011 by applying Johnson cointegration and vector autoregressive estimation. The results

confirmed the presence of co-integration and long run relationship between health expenditures and economic growth.

Elmi and Sadeghi (2012) determined the short run and long run association between health expenditures and economic growth in developing countries from 1990-2009. For the sake of analysis, panel data of 20 developing countries on annual basis were used. The research methodology was Granger causality test. The results showed positive impact of economic growth to health expenditures but no feedback effect from health spending to economic growth in short run context. However, the findings favored the existence of long run association between health expenditures and economic growth in developing countries.

Ogungbenle et al. (2013) determined the connection between life expectancy, public health spending and economic growth in Nigeria by using Vector Autoregressive method over the period of 1977-2008. The findings determined the absence of bi-directional causal link between government health expenditures and life expectancy in case of Nigeria. The research results favored the link between economic growth and government health spending.

Mahumud et al. (2013) examined the relationship between life expectancy, health expenditures and economic growth in Bangladesh The study used multiple regression analysis for annual time series data varying from 1995-2011. The findings supported life expectancy as the source of economic growth which was influenced by both health expenditures and GDP.

3.2 Health Expenditures and Economic Growth: International Studies

In this section, we have reviewed the national studies on the health expenditures and economic growth. A few studies have been found for Pakistan. Hussain et al. (2009) investigated the long run relationship between GDP and health expenditures in Pakistan. The study observed annual time series data during the period of 1980-2004. The study argued the absence of long run association between health expenditures and GDP.

Akram et al. (2008) stated long run relationship between health status and economic growth in Pakistan. The study considered life expectancy and infant mortality rate as health index. The study used time series data varying from 1972-2006. The study applied co-integration estimation, Granger Causality test and error correction technique. Co-integration findings confirmed the significant role of health status in economic development of Pakistan. The study concluded that per capita income is strongly associated with health and human capital outcomes in Pakistan.

Aurangzeb (2003) viewed the relationship between economic growth and health expenditures in Pakistan. The authors obtained annual time series observations during the period of 1973-2001. The authors used augmented Solow growth model for analyzing the impact of health expenditures on GDP. The results showed positive and significant impact of health expenditures on GDP in short run and long run.

The review of literature concludes that health is an important factor of human life and is pre-requisite for economic growth. Therefore, health expenditures play an imperative role to improve health status

and human capital. Improvements in life expectancy, child mortality, infant mortality and death rates upgrade the health of population. Healthy individuals of a country engage themselves in productive efforts and thus directly increase the productivity.

4. Model Specification, Data and Methodology

4.1 Model

This study attempts to establish the link between public health expenditure and economic growth in Pakistan by pursuing Solow (1956) growth model that assumes a continuous production function linking output to inputs of capital and labor. The general Solow model is presented below:

RGDP = f (L, K) **(1)**

We have augmented the Solow growth model to test Newhouse (1977) hypothesis for Pakistan. Extended Solow growth model is presented as under:

RGDP = f (L, K, $\boldsymbol{X}$) **(2)**

Here, RGDP is real gross domestic product (the dependent variable), L is the employed labor force, K is the real gross fixed capital formation and $\boldsymbol{X}$ is the vector of other variables i.e. real health expenditures and real workers' remittances. In economics, Cobb-Douglas production function is extensively used to characterize the input-output relationship. We also have selected Cobb-Douglas form which is engraved as:

$$RGDP = \alpha_0 ELF^{\alpha_1} RGFCF^{\alpha_2} RHE^{\alpha_3} RREM^{\alpha_4}$$ **(3)**

The econometric model is given as:

$$RGDP = \alpha_0 + \alpha_1 ELF + \alpha_2 RGFCF + \alpha_3 RHE + \alpha_4 RREM + \mu_t$$ **(4)**

To estimate the above model appropriately, we have to take its natural log. Finally, we have drawn the following specification to be estimated:

$$LRGDP = L\alpha_0 + \alpha_1 LELF + \alpha_2 LRGFCF + \alpha_3 LRHE + \alpha_4 LRREM + \mu_t \quad \textbf{(5)}$$

Where α_1, α_2, α_3 and $\alpha_4 > 0$

The parameters of the model measure the elasticities of output with respect to respective independent variables and α_0 is the efficiency parameter.

4.2 The Data and Methodology

Variable	Description of Variables	Source	Definition
LRGDP	Log of Real Gross Domestic Product (in million rupees)	World Development Indicators	The market value of final good and services produced within boundaries of the country in one year adjusted for inflation.
LELF	Log of Employed Labor Force (in million persons)	Pakistan Economic Survey (Various Issues)	Number of persons who are on job out of labor force.
LRGFCF	Log of Real Gross Fixed Capital Formation (in million rupees)	Handbook of Statistics on Pakistan Economy	(i) Private sector investment measured by commodity flow, expenditures and financial approaches (ii) Public sector investment made by public sector enterprises, autonomous and semi autonomous

			and general government
LRHE	Log of Real Public Health Expenditures (in million rupees)	Handbook of Statistics on Pakistan Economy	Total public sector expenditures on health out of total public expenditure
LRREM	Log of Real Workers' Remittances (in million rupees)	Handbook of Statistics on Pakistan Economy	Flow of income earned by domestic persons across the border.

5. Empirical results and Discussions

5.1 ADF Results

Time series analysis faces the problem of non-stationary. There are several testing procedures to identify the unit root in time series data. One of the most reliable tests is ADF test that is developed by Dickey and Fuller (1986). We have employed ADF test to check the stationary and Table 1 displays the results of ADF test.

Table 1 about here

Table 1 shows the results of ADF test applied at level and first difference form. The null hypothesis in both cases considers the presence of unit root in the data. In level form, null hypothesis is not rejected at a 1 % level of significance and all the variables confirm the problem of unit root by considering intercept, trend and no intercept and no trend. Thus ADF test confirms the existence of unit root in level form and describes that all the variables are integrated of order I (1). As all the variables are on stationary at first difference, so we are employing Johansen-Juselius co-integration technique.

5.2 Co-integration Results

After checking stationary in data, the next step is to estimate the relationship. Johansen methodology is applied to find the long run

relationships. The results of Johansen co-integration are shown in Table 2.

Table 2 about here

Table 2 shows the results of calculated trace statistics and critical values at a 5% level of significance. The trace test confirms the presence of more than one co-integrating vectors. The null hypothesis in trace statistics states no co-integration between the variables. Trace statistics sturdily rejects the hypothesis of no co-integrating relationship at a 5% level of significance. This confirms the existence of co-integrating vectors and long run relationship between the variables. Likewise, trace statistics strongly reject the hypothesis of one co-integrating vector at a 5% level of significance. So, there is the possibility of more than one co-integrating vectors. However, trace test does not reject the null hypothesis of two co-integrating vectors at a 5% level of significance. So, trace test suggests no more than two co-integrating vectors and long run relationships.

Table 3 about here

Table 3 shows the results of maximum Eigen values at a 5% level of significance. The calculated maximum Eigen value at zero rank is greater than the critical value and the null hypothesis of no co-integration is rejected at 5 % level of significance. So, there is a possibility of one co-integrating vector based on maximum Eigen test.

5.3 Long Run Results

Johansen co-integration measures long run relationship between the variables. The dependent variable real GDP is used as a proxy of economic growth. The independent variables are employed labor force (ELF), real gross fixed capital formation (RGFCF), real public

health expenditures (RHE) and real worker's remittances (RREM). All the variables are in log form so the parameters of the Johansen co-integration provide percentage changes in dependent variable with respect to percentage changes in independent variables. Table 4 gives the results of long run relationship based on Johansen co-integration.

Table 4 about here

Labor is an important factor of production and is commonly employed in almost all types of production process. A large labor force means a large number of workers and a greater productivity. More labor employment generates more output in a country (see for example Chang and Ying, 2006). Efficient and healthy population remains busy in more working hours and positively affects output. However, in labor surplus countries it is noticeable whether this surplus of labor is potentially increasing output of the country or not. This depends on effective managerial and administrative skills of the people and on the available productive system of a country. This study incorporates the contribution of employment in economic growth of Pakistan. The variable employed labor force (ELF) captures the impact of employed people on real GDP in Pakistan. The results display that the employed labor force is positively affecting real GDP in the long run. The positive sign of employed labor force suggests that a one percent increase in employed labor force generates 4.42 percent increase in the real GDP. The results are statistically highly significant and are consistent with growth theories. The growth theories support the positive association between employed labor force and output. There are many views on that show the positive correlation between labor and economic growth. Firstly, most of the growth models also explain positive link

between labor and economic growth. For example, traditional neoclassical growth theories support labor and capital accumulation for economic growth (see for example; Solow, 1956). According to the Solow model, increase in labor quantity and quality through growth in population and human capability along with physical capital accumulation through saving and investment results growth. Secondly, the structural transformation theory of Lewis postulates the process of economic development through shifting labor from traditional rural sector to more sophisticated urban industrial sector. This process of generating employment opportunities for rural workers causes to increase the output of manufacturing sector and results economic growth in developing countries (Lewis, 1954). These theoretical justifications support the positive correlation between employed labor force and GDP and consistent with the following studies (See Bakare and Sanmi, 2011; Abbas and Peck, 2007; Wisniewski and Roe, 2011; Cole and Neumayer, 2006).

Capital accumulation in a country occurs when a nation saves a portion of its income and invests this amount for further production. New equipments, machines, materials and new factories augment the capital stock of a country and expand output levels. The direct injection of productive investment further accelerates growth in social and economic infrastructure like electricity, health, education and communication along with some less direct ways of investment such as improvement in irrigation system and use of improved fertilizer in agriculture productivity. This study attempts to find the possible link between capital stock and real GDP in Pakistan. Real gross fixed capital formation (RGFCF) is used as a proxy of investment. The finding shows a negative relationship between

RGFCF and RGDP in Pakistan. The coefficient of RGFCF measures the elasticity of RGDP with respect to variations in investment. The inverse sign indicates that a 1% increase in RGFCF leads 0.089% decline in RGDP. The findings are statistically insignificant. These results are also not in line with macroeconomic theories as theories suggest a positive association between investment and output[2]. Contrary to this theoretical base of positive association between capital stock and economic growth, there may be several reasons behind the negative sign of RGFCF. Firstly, the reason may be the less productive physical capital in Pakistan. This idea is developed in endogenous growth theories developed by Lucas (1988) and Romer (1990). These theories highlighted the importance of complementary investment on social sector along with physical capital accumulation. These theories argued, lack of infrastructure, education, health and other necessary research and development achievements as the reason behind less productive capital in developing countries and as a result developing countries experience lower levels of output[3]. Secondly, another stream of thought is the "coordination failure" behind lower productivity. This thought is explained by the theory of "big push" pioneered by Rosenstein-Rodan, (1943) and the theory of O-Ring pioneered by Kremer, (1993). According to these theories, circular causation among different economic agents results coordination failure that in turns leaves all the agents worse off in equilibrium. This possibility may occur even if all the persons are well informed about the equilibrium. As a result, agents are unable to coordinate their behaviors and firms do not train workers due to the fear of workers transfer to other firms at a slightly higher wage. No one is trained and unskilled labor remains unable to employ the existing

capital efficiently. This lack of efficiency also restricts the worker to apply modern technology in production process and output is affected. Beyond these theoretical justifications, the result matches with literature as some empirical studies found negative correlation between capital stock and GDP (see for example; Ahmad et al; 2013, Nowbutsing, 2012; Khathlan, 2012; Kakar et al, 2011).

Health is a capital good and investment on health improvement increase individual's efforts to earn more income. Public health expenditures determine the availability of medical facilities in a country that in turn improves health level of its people. Healthy individuals in a country directly impact the productivity with their efficiency. This study mainly investigates the role of real health expenditures (RHE) to stimulate RGDP in a long run context. The result confirms positive long run association between real public health expenditures and real GDP in Pakistan. The coefficient of health expenditures (RHE) measures the elasticity of RGDP with respect to real health expenditures. The results are highly significant and demonstrate that a 1% increase in real health spending leads to a 0.77% increase in RGDP. Real health expenditures determine health status of population that in turn causes human capital formation and thus economic growth. Health and growth relationship is a reciprocal one. There are several possible ways through which health expenditures can result economic growth. Firstly, health expenditures upgrade the structure of health system and improve the quality of health services. Health services augment the quality of human resources for now and in future (Mushkin, 1962). Improved human resource works more efficiently and more output is produced. Secondly, health expenditures also raise the quantity of human

resources in the future by enlarging working life of individuals and individuals spend more time in economic activities (Karyadi and Scrimshaw, 1979). Thirdly, health expenditures can also improve the productivity of human resources by providing better food nutrition. (Aziz, 1995 and Croppenstedt and Muller, 2000). Fourthly, growth theories[4] favor the role of human capital formation for persistent economic growth in developed countries. These theories permit increasing return to scale in production process by assuming that investment in human capital generates external economies and stimulates productivity and performance of individuals that offset diminishing returns to other factors of production (See, Galor and Zeira, 1993). Our result are consistent with the above mentioned justifications and empirical literature also support this positive link between health expenditures and economic growth (See Abbas and Peck, 2007; Elmi and Sadeghi, 2012; Hossein and Yazdan, 2012; Sülkü and Caner, 2009; Wisniewski and Roe, 2011 and Akram et al., 2008).

Over the last three decades, workers' remittances have remarkably increased and became an important source of foreign inflows in developing counties especially Pakistan[5]. An important empirical question is whether remittances also participate in long term economic growth. This study attempts to answer this question in case of Pakistan. Pakistan falls among the top 15 remittances recipient countries in the world with inflows 9.7 billions of dollars (Khathlan, 2012). This study investigates the relationship between real workers' remittances (RREM) and RGDP in Pakistan during the last four decades. The coefficient of workers' remittances measures the long run elasticity of GDP with respect to workers' remittances. The

negative sign suggests that a 1% increase in RREM leads to a 0.38% decline in RGDP. The results are highly statistically significant. The major reason behind this inverse relationship may be the typical attitude of recipients that results more conspicuous consumption rather than investment. Most of the foreign remittances are used to purchase luxuries product in Pakistan that fuels inflation in the country. There may be other reasons behind of this negative relationship. Firstly, given the compensatory nature of workers' remittances it is reasonably possible that household receives these payments with high marginal consumption. Secondly, if these payments are permanent in nature then recipients increase consumption only. This attitude can positively affect individual's welfare but it may not effectively influence the overall economy. Thirdly, less developed financial system also effect individual investment behavior and prevent the recipient person to invest. The more developed financial system of a country and the more incorporated a country is with other world financial markets; the lesser are the chances that workers' remittances will not stimulate investment and GDP. Fourthly, remittances may inversely impact labor force participation rate because these payments are perceived as transferred payments. If recipient households consider these payments as labor income then a moral hazard problem can arise. This problem diverts the financial resources towards more consumption and leisure and households decrease their labor efforts. Due to these all reasons workers' remittances can inversely impact GDP in a country. This inverse relationship also confirms the findings of other empirical studies (See for example Ullah et al., 2013; Jawaid and Raza, 2012; Barajas et al., 2009).

Table 5 about here

5.4 Error Correction and Stability Condition Results

Table 5 shows co-integrating vector and error correction results to show the stability condition[6] for error correction analysis. If this sum is less than zero then stability condition is justified. There are two stages of stability condition. First stage is regarded as the necessary stage that requires the sum of the product of coefficient must be negative. Second stage requires that the sign of the product of individual parameters negative. Error correction verifies the significance of variables. The significant variable can be regarded as the source of correction for any data discrepancy in the long run. The variables RGDP, ELF, RGFCF and RREM are found insignificant but real health expenditure is found to be a significant variable suggesting that any data discrepancy problem will be corrected by the variable RHE. The variable RHE is justified by the stability condition that corrects any disturbance in the data in the long run.

6. Conclusion

This study mainly aimed to examine the role of health expenditures for economic growth in Pakistan. The study has used controlled variables such as employed labor force, capital formation and workers' remittances along with health expenditures. A long run relationship has found by utilizing co-integration analysis using time series data over the period 1972-2012. The variables real public health expenditures and employed labor force are found positively related with real GDP in Pakistan while the variables real workers' remittances and real gross fixed capital formation are found negatively related with real GDP. The study suggests that in order to achieve high growth rates in Pakistan investment in human beings is

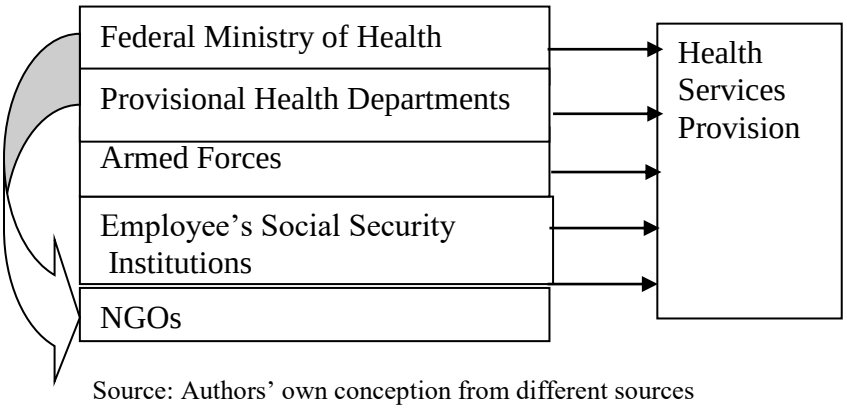
too much important. More government fund allocation to health sector improves the basic health deliveries and upgrades the health standards. Better health in turn, directly affects labor productivity, builds human capital in economy, and ultimately results with high economic growth.

Footnotes

1. See for example Whalley and Zhao, 2010; Khan, 2005 and Abbas and Mujahid-Mukhtar, 2000.
2. See Smith, 1776, Ricardo 1821, Harrod, 1948 and Domar, 1947.
3. See for example: Romer, (1986); Lucas, (1988) and Barro, (1996).
4. See Harrod, (1947); Domar, (1947); Romer, (1986) and Lucas (1988).
5. See Pakistan Economic Survey (2012-13;2013-14).
6. Stability condition is defined as the sum of the product of co-integration vector and error correction coefficients.

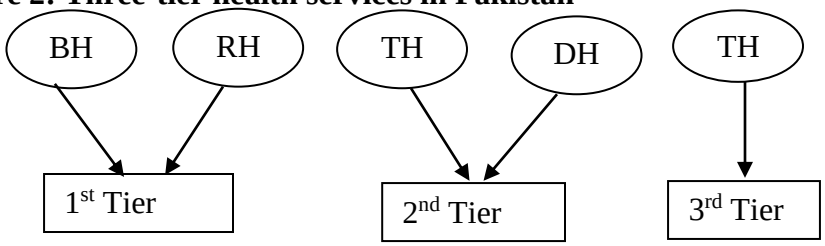
Figures

Figure 1: Health Structure in Pakistan

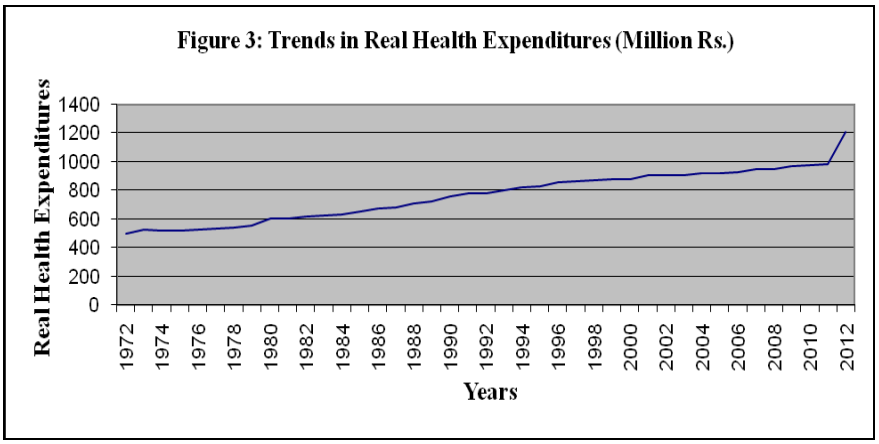


Source: Authors' own conception from different sources

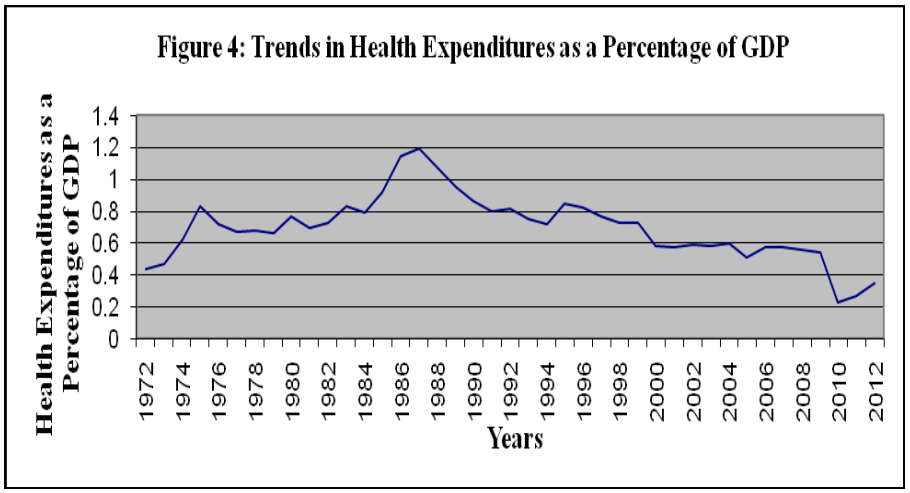
Figure 2: Three-tier health services in Pakistan



Source: Authors' own conception from different sources



Source: World Development Indicators



Source: Economic Survey of Pakistan (2012-13)

Tables

Table 1: *ADF Test Results on Level and First Difference*

Variables	Level						Remarks
	Intercept	Lags	Trend	Lags	None	Lags	
LRGDP	-0.89	0	-1.67	0	-1.94	0	I(1)
LELF	0.95	1	-1.84	1	2.61	1	I(1)
LRGFCF	-3.06	0	-1.99	0	2.45	0	I(1)
LRHE	-2.61	0	-2.87	0	1.25	0	I(1)
LRREM	-1.43	1	-1.93	0	1.89	1	I(1)
Critical values: 1% = -3.1050, 5% = -2.8991, 10% = -1.6117							
First Difference							
	Intercept	Lags	Trend	Lags	None	Lags	
LRGDP	-6.95	0	-6.77	0	-2.63	3	I(0)
LELF	-8.65	0	-8.75	0	-2.63	3	I(0)
LRGFCF	-5.76	0	-6.28	0	-5.25	3	I(0)
LRHE	-6.33	0	-6.50	0	-6.21	3	I(0)
LRREM	-4.82	0	-4.73	0	-4.62	3	I(0)
Critical values:1% = -2.6256,5% = -1.9496, 10% = -1.6115							

Source: Authors' calculations

Table 2: *Unrestricted Co-integration Rank Test (Trace)*

Rank	Eigen value	Trace statistic	Critical value	P-value
0	0.824268	136.7521	88.80380	0.0000
1	0.505626	68.93909	63.87610	0.0176
2	0.443041	41.46506	42.91525	0.0693
3	0.228867	18.63978	25.87211	0.3025
4	0.195913	8.503873	12.51798	0.2132

Source: Authors' calculations

Table 3: *Unrestricted Co-integration Rank Test (Maximum Eigenvalue)*

Rank	Eigen value	Maximum Eigen value	Critical value	P-value
0	0.824268	67.81298	38.33101	0.0000
1	0.505626	27.47402	32.11832	0.1663
2	0.443041	22.82529	25.82321	0.1185
3	0.228867	10.13590	19.38704	0.6043
4	0.195913	8.503873	12.51798	0.2132

Source: Authors' calculations

Table 4: *Long Run Estimates of RGDP Equation*
Dependent Variable: LRGDP

Variables	Coefficients	Standard errors	t-statistics
C	1.882937	-----	-----
LELF	4.421999	0.44699	9.89294
LRGFCF	-0.089184	0.32423	-0.27507
LRHE	0.777440	0.22212	3.50002
LRREM	-0.387875	0.05258	-7.37658

Source: Authors' calculations

Table 5: *Stability Condition of Long run Results*

Variables	C.I vector	E.C Coefficient	C.I coefficient*E.C Coefficient	Remarks
LRGDP	1	0.045603	0.045603	Insignificant
LELF	-4.422	-0.00038	0.00132	Insignificant
LRGFCF	0.089184	0.128365	0.01143	Insignificant
LRHE	-0.77744	0.683603	-0.53145	Significant
LRREM	0.387875	-0.025942	-0.10062	Insignificant
Overall Stability -0.57372				

Source: Authors' calculations

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