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THESIS AND DEFENSE APPROVAL FORM

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Thesis Title: **EFFECT OF HEALTH ON ECONOMIC GROWTH IN PAKISTAN**

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ABSTRACT

Health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Basic objective of health is to enhance the quality of human life. Healthy people are better able to learn, work and contribute in economic growth. Good health is important to improve the standards of living of a nation. Healthy people prefer to work rather than sit idle. Barro and Lee (1996) analyzed that improvements in health reveals higher growth rate. Similarly Holyachi and Kengnal (2017) found positive relation between health expenditure and economic growth. A number of studies analyzed the impact of education on economic growth. However, the present study has incorporated the various health indicators like life expectancy, infant mortality rate and health expenditure in order to analyze the impact of health on economic growth. The study uses per capita GDP as proxy for dependent variable. The study employs econometric techniques like autoregressive distributed lag model (ARDL) on time series data for empirical analysis. The study found an important impact of various health indicators (life expectancy, infant mortality rate and health expenditure) on the economic growth in Pakistan. A positive effect in terms of life expectancy on economic growth led to an improvement of economic activity through additional years on longevity of the working age population. Expenditure on health was found to exert positive impact on economic growth in the long run. This shows that investment in individual's health is important for a sustainable economic growth of the country.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ADF	Augmented Dickey Fuller
ARDL	Autoregressive Distributed Lag Model
BR	Birth Rate
CSO	Central Statistical Organization
DF	Dickey Fuller
DHS	Demographic Health Survey
ECM	Error Correction Model
EC	Economic Growth
FDI	Foreign Direct Investment
FE	Fixed Effect
GMM	Generalized Method of Moment
GLS	Generalized Least Square
GDP	Gross Domestic Product
GNI	Gross National Income
HE	Health Expenditure
IMR	Infant Mortality Rate
IMF	International Monetary Fund
IFS	International Financial Statistics
K	Gross Fixed Capital Formation
LE	Life Expectancy
NH	Number of Hospitals
NAS	National Accounts Statistics
NFCS	Net Fixed Capital Stock
OLS	Ordinary Least Square
OECD	Organization for Economic Co-operation and Development

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CHAPTER 1

INTRODUCTION

The idea of health should be comprehensively understood to clarify the association between health and economic growth. Health is not just the absence of sicknesses; it is the potential for individuals to build up their abilities.

Investment in health is a welfare enhancing activity. It also represents a major component of human investment. It improves the welfare of citizens. At the same time, such investments improve the productive and earning capacity of individuals and consequently of nations (Grossman, 1972).

Human capital played significant role in increasing the economic growth. Various studies show that healthy and effective workers contribute positively in GDP growth. Human investment and economic growth are interrelated and cannot be separated. Sustainable growth cannot be possible without better human investment. Therefore, increased level of health expenditure and education take to higher GDP growth rate. Education and health are considered important indicators for a country rapid growth. However, labor force with the lower levels of education and poor health status drives the economic growth negatively in the long run (Fogel, 2004).

Improved level of human investment is the input in exploration sectors, which contribute in knowledge that developed new technologies. Consequently, those countries, which spend increased level of expenditure in these sectors take rapid growth in GDP (Barro, 1991).

There are various conceivable purposes behind the positive association between improved expenditure on health and gross domestic product. Primarily higher earnings take to broader allocation for health by government and individual's level. Next, increased expenditure can be recovered by the good health condition. These mentally and physically apt input not only make contribution better in production but also drive income upward (Toor & Butt, 2005).

Contribution of health in economic growth can made be possible through various ways. Comparatively workers, who are mentally and physically fit play more productive part in the production process. Education and better health leads to the stability in economic growth (Alsan, et al. 2006).

Human investment plays a key part in gross domestic product growth. From the traditional growth literature, it is inferred that all those investment which increase the capabilities are included in the human capital. But most of the growth professionals have ignored this part and recently only few studies have considered the relationship of health with economic growth in Pakistan (Akram, et al. 2008).

Health plays role as a moderator between productivity and effective workforce. As improving a man's health will be built by proceeding education and good health. Consequently, health could enhance the spending opportunities in education. Therefore, it makes people for getting education and acquiring more skills, improving the ability to learn. Correspondingly, improving health in society will inspire people to spend further for decreasing infant mortality rate and increasing life expectancy. Because of enhance savings subsequently in the society, physical capital is increased by labor output and GDP development (Peykarjou, et al. 2011).

Healthy people's contribution in GDP is more than those who are not healthy. Most of the people do not want sit idle and waste their time; so, they want to participate in the market activities for higher earnings. Health expenditure level is not satisfactory in Pakistan. Government has to increase the health expenditure in Pakistan (Chaudhary, et al. 2013).

In developed countries, aggregate improved health do not affect economic growth prominently. Further expenses on health do not increase growth in these countries. However in case of developing countries, improved expenditures on health executed central role in rapid economic growth. Health prominence in the economic growth is presented by many studies. Urbanization and literacy were observed to be imperative factors for the assurance of health spending. Health expenditure and per capita income are strongly correlated (Siddiqui, et al. 1995).

Health provision structure of Pakistan comprises of government and private health services. The general health facilities are given by Government at federal, provincial and local levels, through deep-rooted system of the country. Various private health centers and diagnostics laboratories have expanded extensively, providing health facilities in rural and urban territories of the country (PES, 2016-17).

1.1. Statement of the Problem

A few analysts have endeavored to explore the connection among education, health and economic growth in Pakistan. As expenditure on health as proxy for economic growth,

(Akram, Phadda, & Khan, 2008) discovered huge effect of human investment on economic growth. Similarly, Ali et al. (2017) has a parallel outcome that demonstrates the connection between health variables and GDP. This approach of estimating health as human capital is imperative part of human investment. Although health is a vital component of human capital but it needs to empirically break down the influences of different health indicators on economic growth in Pakistan.

However, greater part of the above investigators who attempted to use the ARDL and Johanson's Co-integration Method to analyze the connection between health and economic growth in Pakistan. The ARDL technique for Co-integration is favorable than the Johanson technique. This study has used ARDL technique to analyze the impact of health on economic growth.

1.2. Significance of the Study

Pakistan in the emerging countries has lots of development strength. Thus, it requires progress in specific zones to attain its developmental and economic targets. Particularly, it needs the allocation of human resources properly. Human resources are more useful and important for economic growth. To make it certainty, there is a need to search relationship between health and economic growth enhancement. This topic raised the relationship among them in Pakistan, so the country would be able to manage the parts that ought to be enhance to achieve the economic growth.

1.3. Research Objectives

This study attempt to meet the following specific objectives for the time period of 1980-2016:

- To discover the relationship between health and economic growth in long run in Pakistan.
- To discover the relationship between health and economic growth in short run in Pakistan.

1.4. Research Question

- What is the impact of health on economic growth in Pakistan?

1.5. Hypotheses of the Study

$\mathbf{H_0}$= There is no relationship between health indicators (health expenditure, life expectancy and infant mortality rate) and GDP growth.

$\mathbf{H_1}$ =There is significant relationship between health indicators (health expenditure, life expectancy and infant mortality rate) and GDP growth.

1.6. Delimitations of the Study

Time series data was taken for the time period of 1980 to 2016. The study ignores comparative examination with other countries. With a specific end goal to statistically examine short run and long run relationship between health indicators and economic growth. The data are possessed from various sources, such differed sources of the data may have little effect on the predominance of the outcomes. Correspondingly, those sectors which play role in enhancing the efficiency of health improvement should include in growth.

1.7. Outline of the research

Objective of the research is to investigate the effect of health on economic growth in Pakistan. Foremost problem is recognized from the statement, the impact of health on economic growth. Based on this issue, subsequently, the study is based on six chapters. After the prelude, Chapter Two compromises on the three sections, the first section represent the theoretical framework, section two represent the reviews of studies at international level and last section represents the reviews of studies at national level. Chapter Three, this part compromises the detail history of GDP and selected health variables in case of Pakistan. This part incorporates on the pattern investigation of health and economic growth in Pakistan. Chapter Four, this part incorporates about the data gathered and research technique utilized for the examination. Chapter Five demonstrates the empirical outcomes which assessed with different approaches presented in Chapter four. Such type of system shows the associations among selected variables and gives extra perceptions of health in Pakistan. Chapter six, this part is about the conclusions of the investigation and concludes the entire thesis alongside a few suggestion for future work against the effect of improved health on GDP growth.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

This chapter describes theoretical framework, review of studies at international and national level. Many researcher have made up the studies about the impact of health on economic growth. Most of the researcher confirmed that there is positive and significant relationship between health and economic growth. Few researchers worked in Pakistan to the relevant topic; they included limited number of observation and variables in their studies. Their results were similar with foreign study's results.

2.2. Theoretical Framework

This part of the study describes theoretical framework. Whole work during the 1960s decade related to growth used the Solow growth model (1956), which was the modified model. This model was developed by (Ramsey, 1928). But (Koopmans, 1965) amended in this model by included the role of time path. Those theoreticians worked were extended more lately, nowadays modern growth models are their improved form. These researchers used a neoclassical production function but do not consider human investment as a production factor.

Human capital is similar to physical capital, therefore investing in it equivalent to spending on health, education and increasing abilities of workforce. Subsequently, this leads to economic development (Schultz, 1961); (Becker, 1962).

Several international studies documented the part of human capital in gross domestic product growth in the long run. Healthy people prefer to go to work rather than to sit idle at home. It is less costly to increase economic growth in developing countries by such way (Basta, et al. 1979).

However, Grossman (1972) considered health as physical capital and this is described through a model by him. Subsequently taking the model of Grossman (1972) in other studies were (Barro R. J., 1996) and (Ozcan, Ryder, & Weil, 1998) etc. Latest growth model with modifications were presented by these researchers. Thus researcher kept the human capital through health investment in the growth model and it is possible to show through different ways how health affects economic growth.

Literature supported that health can influence the economic growth. Accordingly this growth has been described by a number of studies. It is concluded by (Barro & Lee, 2001) that improvements in health via increased life expectancy are revealed higher growth rate. Such way is less costly for achieving the economic growth. Developing countries can take such kind of less expensive way by following the developed countries development system. Only in developing countries increased spending on health status brings higher growth rate. Not only health but education is also affecting economic growth, these collectively affect each other. So government should concentrate to both of these areas equally.

Hence, it is contributed in development model by extending the Solow growth model. However, this is revised to cover the rearranged area of human capital. Human capital is discovered vital sectors for development. This neoclassical improved model commonly called Augmented Solow Model. Further sectors included in the model have a remarkable role in development of any economy (Mankiw, et al. 1992).

Since these variations among the countries are fundamental for development and change in perspectives. These strategies are followed by the Barro and Martin 2004. The most essential factor that was included to this opening was the improvement in excitement for people. Enormous and unsurprising enthusiasm for human capital in shaped economies happened into proficient and sound growth. Meanwhile, death rate has declined. There is strong confirmation to help that the educated and healthier workforce in selected countries are more unique both physically and mentally. Because of being more gainful these authorities get higher pay which along these improve their desires for regular supports. On the other hand, the greater part of diseases and poor state of human capital in developing countries are critical for expenditure enhancement. Subsequently, these economies are found endlessly endeavoring to break the savage cycle and social injustice.

2.3. Reviews of Empirical studies

2.3.1. Reviews of empirical studies at international level

Brempong and Wilson (2004) explored the effects of education and health on GDP growth in SSA and Organization of Economic Cooperation nations. Objective of this study was to check the comprehensive association among health, education and gross domestic product growth. The study is based on secondary data. This study was based on 35 years for OECD while 22 years for Sub-Saharan African countries. The study expanded the Solow growth model. The GMM (General Methods of Moment) estimation was used in the study. The study

concluded that health has progressive and noteworthy effect for per head output. Although it increases per head returns, however it decreases the fringe outcome. The study revealed that cross country variances in the stock of health human capital. Present investment in health human capital is positively associated with the growth of per capita income in both OECD and Sub Saharan African countries.

Rico, et al. (2005) presented an empirical study of the impact of health investment on economic growth. Few more variables are contained within growth model to perceive its impact on development of any country. These extensions are the amendment in human capital model, variables included in the model are health provisions, socioeconomic conditions, lifestyles and environment, which would accurately define the impact of health capital on economic growth. The growth model was estimated through panel data analysis, which includes the growth rates of physical capital, labor, education and health indicators. Lately being expressed in their absolute level for the year 1970-80 and 1980-90 with the method of Ordinary Least Square. For capital, data is taken from Penn World Table. Fifteen year data of school education was acquired from the paper of Barro and Lee (2001). Production inputs and health services were significant and have the positive signs. The study concluded that health impact on all determinants used in the study which leads to economic growth.

Qureshi and Mohyuddin (2006) investigated the impact of health status and diseases on economic growth in fifteen developing countries. The aim of the study was to investigate the effect of health and four different types of diseases (Tuberculosis, Diarrhea, Malaria and Hepatitis) on economic growth. The study used the panel data for eighteen developing countries. The sample of the data was in the range of few Arabian and African countries. Those variables used in the study were GDP growth, investment as percentage of GDP, population, tuberculosis, hepatitis, malaria and intestinal infection. The panel data was taken from 1965 to 1990. The data was taken from world health statistics and world department report. The health status catalogs found negative effect on the performance of economy. Tuberculosis and Diarrhea correspondingly found to have an insignificant impact. While the two other diseases, Malaria and Hepatitis, found significant but undesirable impact on GDP along with noticeable rate of enhancement. Ordinary Least Square technique was used for the data analysis. The study explored that hepatitis and malaria are more common in working age population, which have negative effects on both GDP along advancement of economy (GDP). While, diseases like tuberculosis and diarrhea are found less common among the working age population, these have insignificant effect on both GDP and growth rate of GDP. The study

concluded that by reducing the Malaria and tuberculosis, it is expected to increase the level of economy and the growth of GDP.

Kiymaz, et al. (2006) scrutinized the long run association amongst the total health care expenditure and GDP growth rate in Turkey. The data is taken from 1984 to 1998. It was based on annual time series. All the data is obtained from Organization of Economic Cooperation Development statistic departments. Study employed Johansen's multi-variants long run test. The study set up indication of different co-integrating interactions between health expenditure and GDP growth. The study found a single co-integrating association between private health care expenditure and per capita gross domestic product. Accordingly 1 percent increase in gross domestic product would bring change in twenty one point nine percent in overall health costs during total health care expenditure while controlling population growth.

Nixon and Ulmann (2006) investigated the relationship between health care expenditure and health outcomes. This relationship has been checked for fifteen (15) European Union countries. For estimation purpose data was acquired from 1980-1995. Research is based on the secondary data. Variables used in the investigation were gross domestic product (GDP), life expectancy, life style, environment, and infant mortality rate. The model constructed on the panel data. The study used Generalized Least Square (GLS) method to make the results. The results were commonly depend with those of many past studies. The results showed that increases in health care expenditure has significantly associated with improvement in infant mortality rate. The causal relationship was complex because health care expenditure was one of many quantitative and qualitative factors.

Weil (2007) quantitatively surveyed the part of health contrasts play in clarifying income contrasts amongst rich and poor countries. Consequently, to compute the income salary pick up that would come about because of a change in the healthy individuals living in poor countries. Examined the impact of better health in empowering labors to work harder and all the more wisely, holding consistent the level of physical capital and human capital. A main objective of the exploration was to inspect the more extensive inquiry of what determines the level of income. The study was based on panel data. Data was taken from World Development Indicators. Cobb-Douglas production function is used as a basic model which employed in the study. Primary aim of the study was to test the effect of three main indicators of health on income.

Hirnissa, et al. (2008) explored the inter-relationship between military expenditure, education expenditure and health expenditure in eight selected Asian countries namely Malaysia, Indonesia, Singapore, Philippines, Bangladesh, Nepal, Sri Lanka and South Korea. Secondary data used in this study. While the data was taken from 1971 to 2006. Data was taken from Asian Development Bank. Study fulfills all the conditions which are required for ARDL. Thus Autoregressive Distributed Model was used for estimation. Mostly, it use for long run analysis. The conclusion of the study was that there is significant and affirmative relation between health and education.

Mirvis and Clay (2008) determined the relationship between health and economic growth. Most important goal of the study was the assessment of health impact on economic growth. It was a theoretical based study. The study was the conclusion of many national and international studies. The study concluded that better health leads to economic growth in the long run. While for getting the economic growth in long run, it is necessary to invest in health sector in short run.

Nurudeen and Usman (2010) investigated the relationship between public spending and GDP growth in Nigeria. Aim of study was the exploration of health expenditure effect on economic growth in case of Nigeria. Thus study was based on Keynesian growth models and endogenous growth model. Keynesian model stated that government expenditure enhance the economic growth while endogenous growth model shows no assign of significant relationship between public expenditure and GDP growth. Estimation of the study is based on simple Ordinary Least Square. Factors employed in the study were total capital spending, expenditure on defense, agriculture, education, health and inflation. The data was taken from 1979 to 2007. Results of the study showed that all these variables have positive and significant impact on economic growth both in short and long run.

Haldar and Mallik (2010) analyzed the relationship among physical capital investment, investment in education and health on per capita GNP growth in India. The Study used the secondary data from 1960 to 2006. The data is taken from planning commission of India and National Accounts of statistics. The variables used in the study were gross national product (GNP), investment of physical capital, payments for school learning and for health and total enrollment in class 8^{th}. Purpose of the study was to explore the relationship among education, health and economic growth. The study used the co-integration approach as prepared by Johansen and Juselius (1988 and 1990). The percentage of GNP used in education was 3.8

percent in 2005-06 while it was only 0.6 % in 1951-52. Although it is positive progress but sill it needs more progress. The study revealed that there is no relation among these variables in case of selected time. Both human capital and open economy is found to have significant association with GNI, means these factors have constructive role in long term.

Grimm (2011) explored the impact of inequality in health on economic growth in low and middle income countries. The aim of study was to examine that either inequality of health make slow economic growth or not? The variables used in the study are GDP, life expectancy, health inequality, health poverty, total fertility, trade openness and government consumption. The study used the panel data from 1985 to 2007 for sixty two least developed and developing countries. Study assessment based on OLS and 2 Stage Least Square. So as to scrutinize the relation concerning to well-being variation and income. The study investigated a significant as well as comparatively vigorous and adverse influence of health inequality in earning status and wages increment regulatory of life expectancy. The study also found a positive effect of life expectancy on economic growth.

Rasaki and Dauda (2011) examined the relationship between health as a human investment and economic growth in Nigeria. The purpose of the study was to test whether health as a factor of human investment formation affect the growth of the Nigerian economy. Annually time series data was used in the study. The data was taken from 1970 to 2009. The data was obtained from annual government published reports, Nigeria's central bank and WDI. And the data is taken from yearly published reports by the statistic departments, United Nations Aids, data of United Nation, World Health Organization, domestic health polices, United States Bureau of census and International Monetary Fund. The variables used in the study were RGDP total health expenditure, life expectancy, infant mortality rate, total expenditure on education, labor force and GFCF. Johansen Co-integration techniques were used to get the results. The research core variables were health expenditure, life expectancy and infant mortality rate. The results showed that these variables have positive and significant relationship with economic growth in Nigeria intended for selected time period.

Peykarjou, et al. (2011) investigated that relationship between health and economic growth in Organization of Islamic Conference (OIC) countries. The aim of the study was to investigate the relationship between improved health and economic growth in OIC member countries. Either adult's life expectancy increase GDP growth among OIC members or not? This study was based on fifteen Asian and African countries. The study was based on secondary pooled

data. The data is taken over 2001-2009. Variables which used in the investigation were GDP, life expectancy, fertility rate, infant mortality rate and health expenditure. Hausman test is used for statistical analysis. Results revealed an optimistic and noteworthy connection amongst increase life expectancy and economic growth to these member countries. Results revealed that fertility rate and population growth in OIC member countries decline economic growth. These variables have negative and significant relationship with gross domestic product growth between members of Organization of Islamic Conference.

O and Oluranti (2011) explored the relationship between expenditure of government on human capital and economic growth in Nigeria. Solow model was adopted for this investigation. The data used in the study are taken from 1970 to 2008. Study completed the requirements of Johanson co-integration. It was used for long haul relationship. Data has been taken from United Nation Statistical Division, UNESCO, World Development Indicator and from statistical bulletin. Variables were real GDP, physical capital, total school enrollment, labor forces and spending of health and education, these were used in the study. Government spending has positive relationship with economic growth for the selected time periods.

Sulku and Caner (2011) examined the long-term relationship among per capita gross domestic product, per capita health expenditure and population growth rate in Turkey. The data is taken from 1984 to 2006. Johansen's co-integration test is employed in this research for statistical analysis. Organization of Economic Cooperation Development comes to use for data attaining. GDP deflator and population sample were used to change the data in real terms. Data for these variables were obtained from International Monetary Fund, WDI and OECD. The study found after the estimation income elasticity is less than 1, it shows vitality of health in Turkey. Taking health constant increment in health 8.7 percent leads to ten percent enhancement in each person gross domestic product. On the other hand private expenditure shows enhancement on luxury items because in this case income elasticity is estimated less than 1 percent.

Hossein and Yazdan (2012) investigated the influence of Health expenditure on economic growth in Iran. The study is based on secondary data. This variables used in the study were GDP, health expenditure, gross domestic product, and population growth rate in country. The data was taken from the Iran's Central Bank over 1973-2008. It is taken from Central Bank of Iran. Johansen co-integration method is used for determination the long run association

amongst health costs and economic growth. The model used in the study was vector autoregressive (VAR). Study concluded that health expenditure as a percentage of GDP, % of gross domestic product investment and increased ratio of graduates have significant and encouraging effect by economic growth. Whereas, the rate of population growing non-positive influence on economic development. In developing countries such investment increase the life expectancy in a country like Iran and life expectancy increase the economic growth. Increase in graduates leads to increase in labor force performance and from this way leads to enhance the efficiency of labor. Increase the number of graduates' offers the positive effect on economic growth.

Hansen (2013) demonstrated the association between life expectancy and total factor productivity. The determination of the enquiry is to check the effect of improved health on economic growth in short and long run. The study is based on a cross forty seven counties over forty years data. Study estimated a model by two periods that leads to conclusion. The data used in the study were taken from 1960 to 2000. The variables used in the study were life expectancy, per capita gross domestic product, human assets belongings and health. Tests used in the study were OLS and 2SLS. The results showed that, increased rate of life expectancy had constructive and progressive effects with the economic growth. Whereas, in short-run the relationship of per capita GDP and life expectancy has no relationship. Results revealed that life expectancy increase human capital skills according to neo-classical growth theory.

Saha (2013) analyzed various health indicators impact on economic growth in India. Current estimation of the study observes total factor production evolution growth in the case of India's economy. Gross fixed capital formation used as an input in the existing study while GDP is taken as output. Data was taken from Central Statistical Organization, WDI, National Accounts of Statistics, Reserve Bank of India and economy of India. Study used the conservative growth counting the methodology that estimates the aggregate total factor production development to the frugality of India. Regression valuation showed that life expectancy and fertility rate affect economic growth positively. In economy of India productivity could be increased by investing in human capital.

Kumar (2013) investigated the effect of health care expenditure on gross domestic product designed for 10 countries of Organization for Economic Cooperation and Development. Study aim is to test the relationship amongst health expenditure and economic growth of

OECD countries. The study is based on secondary data which is taken from 1960 to 2007. Gross domestic product and health expenditure are the components which used in existing study. Estimation technique used in the study was SGMM to explore the relationship among health expenditure and gross domestic product of 10 OECD states. Results revealed that earnings resistance of health expenditure was 0.669 percent. It means one percent rise of real gross domestic product per head led to enhance 0.669 percent in real per capita appropriateness expenditure in those states. Granger causality tests were applied for checking the causation among health expenditure and economic growth. The study revealed bidirectional causation among health expenditure and GDP. The study revealed that by increasing the health expenditure in these countries (OECD), economic growth could be increased. The GMM confirmed positivity amongst those estimated variables.

Farag, et al. (2013) explored the results of health expenditure, health results and the title role upright authority. The study used the developed and developing one thirty three states in this study. Data was taken over 1995, 2000, 2005 and 2006. The variables used in the study were real gross domestic product (RGDP), life expectancy, secondary school female enrollment, total fertility rate, work force contribution and ratio of population living in urban areas. Fixed effect model used in the study and data was obtained from WDI and WHO. Study concluded that these variables have positive relationship with economic growth.

Apergis and Padhi (2013) explored the convergence of real per capita productivity and health expenditures through 26 states of India. These states were classified into convergence clubs by the gathering procedure. These states were Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Goa-Daman-Diu, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Pondicherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. The study was based on secondary data. The data was taken from 1980 to 2005. They data was attained from CSO Regulation of India. The factors functioned in study were GDP each one and well-being overheads. Phillips and Sul to check for convergence in a panel of states. In terms of per capita GDP, the observed results proposed that the 26 Indian States did not formulate an equal convergence club. A parallel portrait was presented with respect to health expenditure, implying a possible factor that could be accountable for such a divergence performance.

Keyeke (2013) studied the relationship between public expenditure and Ghana health status. The data used in the study were taken from Ghana Health Service. The data was used in the study were taken from 2001 to 2010. Infant mortality rate is used as a measurement of health status. The statistical technique used in study was Ordinary Least Square (OLS). The outcomes exposed that obtain-ability of doctors and health assurance were the extreme vital factors of healthiness in Ghana. The upshots correspondingly showed the nationwide health strategy as a positive determining factor of health.

Muhammad (2013) investigated the effect of life expectancy on economic growth and health care expenditure in Bangladesh. The aim of the study was to determine the effect of life expectancy on economic growth. The study was based on annual time series data. The data was taken from World Development Indicator (WDI). The data is obtained from 1995 to 2011. The variables used in study were GDP, life expectancy and health expenditure as percentage of GDP. The software used to get results was "Stata". Different techniques were used to get the results. The study estimated the Elasticity of life expectancy on health expenditure and economic growth. The study explored that improved life expectancy has direct effect on economic growth and on health expenditure. Study suggested that government have to increase the per capita income by investing more in health.

Onisanwa (2014) explored the impacts of health on economic growth in Nigeria. Most of the studies incorporated human capital in the growth studies, tends to put great consideration and analyzing the effect of schooling on country's GDP. However on the other side health was ignored. Thus aim of this study is to include health in growth model and make exertion to estimate the relationship between health and economic growth in the long run in Nigeria. Further, it investigated either causality exist among health and economic growth or not. Secondary data was used in the study. Variables used in the study were gross domestic product, life expectancy, health expenditure, fertility rate and gross capital formation. The Co-integration, and Granger Causality techniques were used in analyzing quarterly time series data over 1995-2009. Study originates long-run relationship among GDP and gross fixed capital formation. The study also explored that per capita GDP Granger cause GFCF. The study concluded that long-run relationship exist between health and GDP in Nigeria.

Alvi and Ahmed (2014) investigated the education and health impacts on total factor productivity. The aim of investigation was to investigate the connection between human capital and gross domestic product growth in thirty seven developed and underdeveloped

countries. The Cobb-Douglas production function was used in current study. This study was based on panel data. Annual time series data used in this investigation from 1990 to 2010. Variables used in the study were real gross domestic product, actual investment stock (capital includes machines, infrastructure, buildings, roads and ports etc.), labor force, health (life expectancy), average year of schooling, trade openness and income. Fixed effect and Random techniques were used for estimation purposes. Two-step technique was formed to draw estimation of total factor productivity. Total factor productivity affected positively by the selected health variables. Education has positive effect on economic growth. Existing study concluded the developing world which is lagging behind advanced countries need to increase expenditure on human capital.

Remo (2014) investigated the impact of on health expenditure and economic growth in Nigeria. Aim of the study was to test the long run relationship between improved health status and economic growth. Investigation was based on secondary data for the purposes of estimation. The data is obtained from 1970 to 2010. For gathering data Central Bank of Nigeria, Statistical Bulletin, and African Statistical year books which made by Asian Development Bank facilities are used. The variables used in the study were GDP, GFCF (Gross Fixed Capital Formation), total health expenditure, education and life expectancy. Ordinary Least Square method is used to get the results. The study explored that total health expenditure has very important relationship with economic growth. The study concluded that improved life expectancy, health expenditure, efficiency and output increased the level of economic growth.

Boussalem, et al. (2014) explored the long-run relationship between health care spending and economic growth in Algeria. Secondary data was used in the study from 1974-2014. Gross Domestic Product is used as a proxy of economic growth while other variables are public health expenditure and life expectancy. Data was taken from International Monetary Fund (IMF) and World Development Indicator. Before apply any test, stationary was checked and results revealed that all variables were not non-stationary at 1st difference. So, study used the Johansen's technique to check the long run correlation in health expenditure and economic growth. If long-run relationship exists among variables then an error correction method is also arranged. The study used the Granger causality test to check causality amongst public expenditure on health and economic growth in the long run. Results revealed that long-run association exists among health expenditure and in economic growth. But it is not present in

short run. Results explored bidirectional causation in health spending and economic growth in long-run, while it was not observed in the short run.

Eggoh, et al. (2015) investigated the relationship between human investment and economic growth in selected African countries. Objective of the study was to illustrate relation in health, school enrollment and GDP growth. Recent study was based on panel data. The data is taken over the period of 1996-2010. A number of variables used in the investigation were taken from WDI. Sample size of study was 49 African countries. Other variables are GDP, primary school education, secondary school education, infant mortality rate, health expenditure, FDI, trade openness, GFCF and inflation. Methodology applied on the examination was generalized method of moment (GMM). Results indicated that school and health expenditure has inverse effect on GDP growth for the selected African member countries. Corruption, lack of investment and bureaucracy are the fundament problem in the way development. Investigation concluded that government could improve the health and education sector by increasing the investment in these sectors. The part of the amount of trade is not substantial suggested additional Africa's states. Only with the help of other countries solution is possible to come to economic growth. However inflation level has adversely related with GDP progress in long-haul. But investment and FDI were productive and important relationship with gross domestic product. It is showed that investment and the foreign direct investment were factors through which long run of economic growth could be achieved in these selected African countries.

Boachie (2015) analyzed the impact of health on economic growth in Ghana. The aim of the investigation was to explore the effect of health on economic growth. The study used data from 1982 to 2012. Variables used in the study were life expectancy, GDP, trade openness, foreign direct investment, inflation and gathering of physical assets for investment. Autoregressive distributed lag model were used in the study to find the co-integration. The study revealed that economic growth is significantly driven by health, in the short run and long run.

Cetin and Dogan (2015) investigated the impact of human investment and economic growth by incorporating energy consumption as a vital aspect of making production in Romania. Estimation is applied over the 1980 to 2011. Auto regressive Distribute Lag model is used for co-integration. Johansen-Juselius methods of co-integration were applied for the results. This implied that the occurrence of long-run correlation in chosen variables. The study concluded

that all the factors schooling, usage of energy and economic growth is interrelated positively. Human capital is also contribute to the long run economic growth in Romania.

Ngangue and Manfred (2015) investigated the effect of life expectancy on economic growth in selected developing countries. The aim of the investigation was to investigate the effect of life expectancy on economic growth and improved in 141 developing countries. Study classified these developing countries in 3 classes of low, middle and high income countries. The study was based on panel data. The data was attained from 2000 to 2013. The data was taken from world development indicator (WDI). The variables used in the study were life expectancy, GFCF, gross national income and human investment. Generalized method of moment (GMM) and instrumental variable technique is used to get the relationship between life expectancy and economic growth. Results showed life expectancy had constructive and positive influence on economic growth in low and upper wages countries. However improved life expectancy has not significant relation with economic growth in middle income countries.

Hasnul (2015) investigated the effect of public expenditure and economic growth in Malaysia. Aim of the study was to examine association amongst health expenditure and economic growth which was debated from the decades but it could not come to a proper solution. The study is based on annul time series data. The data used in the study were obtained from 1970 to 2014. Various sources used while taking data, as WDI and ministry of finance of Malaysia database. The variables used in the study were percentage of GDP, trade, fertility rate, life expectancy, education expenditure, labor, population growth and health expenditure. Ordinary Least Square (OLS) technique is used to find the results. The results showed that public expenditure may lead to less economic growth. Government expenditure on development and housing will lead to less economic growth. The study also found that education, defense, healthcare and development spending was not significantly affect economic growth.

Aluko and Oluseyi (2015) investigated the effect of health on Nigeria's GDP growth. Study's aim towards investigate was to influence health and schooling on economic growth in Nigeria. The other aim of the study was to test causality between explanatory variables and gross domestic product (GDP). Human capital was comprised onto health and education. The data was taken from 1980 to 2013. The data was taken through verified sources like World Development Indicator. The selected sectors used in the study were gross domestic product,

life expectancy, fertility rate, infant mortality rate and health expenditure to percentage of GDP. Dependent variable utilized in the study was gross domestic product. Johansen's long-run technique was used for checking the association between health status and economic growth. All the variables rejected the null hypothesis at 1st difference. Johansen technique is used for statistical analysis for the long-haul relationship and VECM to short period of time. Consequences explored that, there exist a statistically significant relationship amongst health and economic growth in Nigeria. Unidirectional causality is find from health to economic growth. Study concluded that investment in short run could increase the economic growth in long run.

Alatas and Cakir (2016) investigated the effect of health and schooling on economic growth in selected 65 countries. Aim of the study was to determine the relationship between human investment and economic growth in those selected countries. Panel data used for the empirical work in the study. Data was taken from 1967 to 2011. The data is obtained from Penn world Table. The variables used in the study were per capita GDP, years of schooling and infant mortality rate. The study was based on Solow growth model. Hierarchical clustering and non-hierarchical clustering technique is used in the study. Hausmann technique is used in the study to test the correlation between the explanatory variables. But study concluded the impact of health and education has momentous and affirmative relation with economic growth but it was negative in less advanced countries. Investment in health and education improved the quality of life which further increases the economic growth.

Waziri, et al. (2016) investigated the impact of HIV/AIDS and life expectancy on economic growth in thirty three SSA countries. The objective of the study was to take into account the effect of life expectancy and HIV/AIDS on GDP growth in these selected SSA countries in long-run. Time series data was used in the study for statistical analysis. It was attained from 2002 to 2012. The data was taken from World Development Indicator (WDI). The variables used in the study were life expectancy, HIV/AIDS, gross fixed capital formation, workforce productivity and GFCF. Thus enquiry used the Generalized Method of Moments (GMM) method. Results explored that HIV/AIDS has significant but negative relationship with economic growth. Life expectancy has significant and positive relation with economic growth. Labor force productivity has significant but negative relationship with economic growth, while economy progress has inverse relation with gross capital formation in these selected countries.

Bedir (2016) analyzed the relationship between improved health and economic growth in selected countries. The study is to test whether there is causality between income and health expenditure. Causality exists or not amongst these chosen variables and it is unidirectional or bidirectional. The study was based on secondary data. Data is taken from 1995 to 2013. Measurement of per capita GDP was constant 2005 PPP. The causality relationship was tested among the variables, using the causality analysis developed by Granger causality test. The observed results specified income's vitality among explained variables. When economic growth occurs, the proportion of healthcare expenditure in total GDP also increases.

Kengnal and Holyachi (2017) investigated the relationship between infant mortality rate, health expenditure and GDP growth of India. The aim of the study was to explore the impact of infant mortality rate and health expenditure on economic growth in India by using the selected variables in short and long run. The other objective was to test the causality. The study is based on secondary data. The data is acquired over 1995-2013. All the data used in the study were taken from World Development Indicator. Variables used in the study were infant mortality rate (IMR), private health expenditure as % of economic growth (PXEXP) and per capita gross domestic product. ARDL technique is used in the study to test the-long run relationship. Bounds test was used to test the long run existence. Vector Error Correction Model was applied to test the short-run relationship. Study concluded that infant mortality, GDP per capita and private health spending were co-integrated. Selected health variables significantly affect the dependent variable. Causation was showed by the methodology of Granger test in short term amongst all variables. Investigation also explored the short and long haul relationship among these three factors with economic growth in India case.

Aboubacar and Xu (2017) investigated the relationship between health expenditures and gross domestic product growth in Sub Saharan Africa. The study used annual time series data for statistical analysis. Data was taken over the period of 1995-2014. Time series data was taken from World Development Indicator. GDP per capita was used as a proxy for economic growth. Primary aim of the study was to find the relationship between health and economic growth. Two step method of Generalized Method of Moments, an ordinary techniques of fixed effect and random effect used in current study. The results showed that health care is a necessary rather than a luxury in Sub Saharan Africa. The findings revealed that there exist a positive and significance association among selected variables. Foreign direct investment, active population and gross domestic savings appear as key determinants of economic growth in the region.

Hakooma and Seshamani (2017) investigated the effect of human capital improvement of economic growth in Zambia. Long run co-integration's estimation was the objective of study. Secondary data is used in this study. Data was taken from 1970 to 2013. Human capital is comprised on health (health related other variables) and education. The variables used in the study were GDP per capita, health expenditure and total secondary school enrollment. The data was obtained from the Ministry of Finance, World Development Indicator (WDI), International Financial Statistics (IMF), Statistical abstracts and economic surveys from the central statistical department on annual bulletins. Augmented Dickey Fuller test is used to check the stationary of variables. Johansen's test was used to check the long-run association. Additional tests used in the study were Vector Error Correction Model and diagnostic tests. Study revealed that government spending on education positively affect economic growth.

2.3.2. Review of empirical studies at national level

Toor and Butt (2005) explored the relationship between health expenditure and GDP growth in Pakistan. Aim of the study was to investigate the determinants of health spending and economic growth in long run. The study is based on secondary time series data. This data was taken from ESP, government of Pakistan finance division and population and housing census report (Government of Pakistan). The study concluded that a socio economic factor has positive and significant impact on health spending. Total public spending is the most significant variable which affects the health status positively. The study also concluded that literacy rate and gross domestic product also has significant with health expenditure in Pakistan. The crude birth rate and FDI were in short run significant relationship.

Khan (2005) scrutinized the effect of human capital on economic growth in Pakistan. For investigation secondary data was used. Data was obtained from International Monetary Fund and WDI. The study contained with these variables: per capita real GDP, inflation, initial pay, adult literacy rate, life expectancy, and average years of schooling. The study used the Cobb-Douglas production function. The data was stationary on level. So Ordinary Least Square (OLS) test was used to check the results. Results revealed that increasing investment and making better institutions quality is the key to achieve high economic growth. Results revealed that higher the investment in education and health higher the economic growth.

Haider and Butt (2007) investigated the way of causality between health expenditure and GDP growth in Pakistan. The study was to check either co-integration exist in health expenditures and economic growth or not. Other thing was to investigate in the study, either

there is causality between health expenditure and gross domestic product or not. So study was to investigate the elasticity parameter. The study is constructed on secondary data series. The data was collected over the period of 1972 to 2005. Annual time series data has been taken from Pakistan Economic Survey (PES). ARDL technique is used to check the long run relationship. Maximum lag order was 3 used in the ARDL. The study used the Error Correction method for checking short-run relationship between health expenditures and GDP growth. Results revealed that appropriateness of health spending rose more than GDP. The study suggested that increasing the health expenditure, it will affect the GDP positively. Results concluded the strong indication for Pakistan's people income elasticity. Thus for health status expenses, it was more than one.

Khan, et al. (2008) analyzed the co-integration association amongst health and GDP growth. Johansen technique for long run and short-run is used in current study. Hence data of all the variables were taken from 1972 to 2006. The variables used in the study are population growth, free trade, populace for single bed, education, allotted life expectancy, infant mortality rate. However health expenditure negative relationship with country GDP. Growth model with amendment by included health in it proved positive impact on GDP growth. Before applying any test, stationary was checked. Results revealed that all the variables were stationary at first difference. Results revealed that there is granger causality among life expectancy, population per bed and infant mortality rate caused economic growth. However health expenditure has not causality relation with economic growth. Long-haul results revealed health variables played vital part in determining economic growth. Total health human capital variables played satisfied and noteworthy role in long-run. However, results explored in short run inverse but weighty connection among health variables and GDP growth in Pakistan.

Asghar, et al. (2011) analyzed the role of human investment and economic growth in Pakistan. The aim of the study was to investigate the relationship between human capital and economic growth in Pakistan. The study was based on secondary data. Variables used in the study were gross domestic product, investment as GDP percentage, health expenditure GDP ratio, educational expenditure, unemployment ratio, literacy rate, CPI and per capita income. Secondary data is obtained from 1974 to 2009. The data was taken from PES, WDI and IFS. Johansen and Juselius long-haul method was used in the investigation for long run. For exploring causality, causality and Toda-Yamamoto causality technique were used. The study analyzed that positive impact of health and economic growth for Pakistan the selected time

period. However, Pakistan expenditure on education and health was fewer as % of gross domestic product. Study concluded constructive association amid human capital and fiscal progress for selected time periods to Pakistan. This indicated that public expenditure of human capital and economic growth and public services should be given greatly importance for supporting economic growth in Pakistan.

Khattak and Khan (2012) found the relationship between expenditure on health human capital and GDP growth in Pakistan. The data was taken from 1971 to 2008. Secondary data is used in the study for statistical analysis. Study obtained the data from State bank, WDI and Pakistan economic survey. The study used three tests and these are Growth Accounting, Ordinary Least Squares plus Johansen's Co-integration. OLS showed health, labor, research and growth are primary factors for Pakistan's economy advancement. Additionally health indicated requisite sector for research and development, schooling and per head income. Co-integration affirmed the objectives of the enquiry that health has weight age effect on country's economy.

Raza, et al. (2013) explored the impact of health on economic growth in Pakistan. Basic purpose of study was to take into account those problems in health sectors that decrease the economic growth. The study was based on secondary data. Set of data series has occupied from Statistical Bureau of Pakistan and World Development Indicators. Other supportive variables in the study were life expectancy, fertility rate, infant mortality rate, population per bed, health spending and gross domestic product. The data of all the variables were obtained from 1980 to 2012. The study used Ordinary Least Square (OLS) and Granger Causality technique. The results showed that life expectancy, fertility rate, investment on health sectors has positive relation with per capita GDP. Health expenditures have also positive but insignificant impact on GDP growth. Whereas infant mortality rate and population per bed have non-positive relationship with gross domestic product growth.

Javed, et al. (2013) determined the relationship between human capital development and economic growth in Pakistan. Basic aim of assessment was to check long haul relationship between health and education on economic growth of Pakistan. The study is based on secondary data. Data for estimation was taken from 1978 to 2008. The data was obtained from Pakistan economic survey, Pakistan State Bank and Bureau of Statistics. The variables used for estimation in study were GDP, expenditure on health, spending on school knowledge getting, primary plus secondary school enrollment, total investment and labor force. All the

variables were taken in log form. Johansen techniques were cast off in study to investigate the long-run relationship which was based on Maximal Eigen value and Trace test. The study explored that health expenditure has significance and productive relationship with gross domestic product in Pakistan for long-run structure. It stated that improved health enhances the GDP growth in Pakistan. The payouts upon health has too significant and constructive liaison with Pakistan economy growth during long-period. Primary school enrollment has significant and progressive combination with economy growth in petite and long-haul. The study revealed that primary school affect economic growth more than the secondary school enrollment.

Afzal & Sarwar (2013) analyzed the education, labor force healthiness and GDP growth association. The major goal of the study was to find these two variables impact on economic growth. These sectors are valuable for any country. The data was obtained from 1971 to 2010. The study examined the long haul association and the causation amid secondary enrollment, health, food stuff price rises and economic growth in Pakistan case. Toda Yamamoto gave the concept of Autoregressive Distributed Lag Model and causation in 1995. ARDL formation typically was used for co-integration. Estimation showed the inverse relationship between food stuff and economic growth. However education exhibited encouraging connection with economic growth in short and long run. However, causation was occurred bidirectional connection among food stuff with country's economy. On the other hand education has bidirectional relation with foodstuff.

Arshad and Munir (2015) analyzed the relationship between factor accumulation and economic growth in Pakistan. Annual time series data was used in the present study. The data used in the study is taken for the time of 1973-2014. Variables used in the study were health expenditure and average year of schooling, physical capital per worker and GDP per capita. The data employed in the study were taken from Bureau of Statistics, World Development Indicators and Pakistan Economic Survey. Augmented Dickey Fuller assessment is developed for stationarity. Level, first and second is the stages of stationary with none, trend and intercept. Appropriateness method was ARDL to test long-run relationship between per head gross domestic product and explanatory variables. But before it F-test employed to check the long run. The study concluded that there was a long-run relationship between human capital stock and per capita income in selected countries. Human capital improves the labor efficiency by knowledge and skills which leads it to economic growth.

Afridi (2016) investigated the relationship between human capital and economic growth in Pakistan. Aim of the study was to investigate the relationship between human capital and economic growth in Pakistan. Study is based on secondary data. The data is taken over the period of 1972-2013. The data is obtained from the World Development Indicator. The variables in the investigation were gross domestic product, primary enrollment (PE), infant mortality rate (IMR), birth rate (BR) and physical capital (PC). For co-integration between the human capital and GDP growth Autoregressive Distributed Lag approach is used in the study. Bond test has employed to investigate the long-run relationship among the variables. Test explored the long haul existence. Result revealed that investment on physical capital and birth rate has positive as well as significant effect on GDP growth. It is confirmed that increasing share of investment led to GDPs growth. While in short run it shows insignificance association. It is revealed that increase investment in short run can increases the economic growth in the long run.

Khan and Khattak (2016) reviewed different national and international studies which emphasized the role of health on GDP growth. Aim of this study is to get the results of all related studies. The study revealed that majority of the study use the life expectancy, infant mortality rate, health expenditure and population per bed to estimate the effect of health on economic growth. Researchers conclude that health expenditure positively affects economic growth.

Ali, et al. (2017) investigated the relationship between increased investment and economic growth in Pakistan. The study was based on secondary data. The data was taken quarterly basis. The data was obtained from 1990 to 2014. The data was taken form world development indicator and Pakistan economic survey. Variables used in the study were real gross domestic product, public spending on health, labor force participation rate, GFCF and education expenditure. First difference confirmed the stationarity of the data. Johansen Co-integration test is applies for the estimation. This technique was used to find co-integration. This work determined the long run association among selected variables employed in this study. Expenditure on health and education contribute in GDP growth positively. Testing the causation among variables with economic growth, granger causality technique is used. Results concluded that there was bidirectional causality among the education and health with economic growth.

2.4. Conclusion

Theoretical framework, national and international reviews were presented above sections. Which based approximately all studies on health or human investment impact on GDP growth. Variables used in different studies were also varying roundabout in every study. Methodologies and techniques were not similar in this investigation. These were depend on type of study. Researcher constructed the result from these reviews that human capital affect any country's GDP. But in case of various countries, its effect is changed. In developing country this effect is more while in developed country stimulus varies.

CHAPTER 3

TREND ANALYSIS OF HEALTH AND ECONOMIC GROWTH IN PAKISTAN

3.1. Brief History of Economic situation in Pakistan

Pakistan's development depends upon political stability, peace and improvement of precise strategies. With this, social sector improvement is also necessary for economic growth of Pakistan. Economic development depends on the quality of government and outside dazes to the structure. Pakistan's economic condition was not very well after getting the freedom. The country GNP was mostly relying on agriculture business. It took time to convert its dependence from agricultural sector to industrial sector. This sector was too weak in the initial period. In the period of 1960 to 1970 most of the economy was converged to industrial sector (PES, 1976-76).

The growth of industrial development was 23% in the first plan. Lack of food in 1950 due to the weak rural sector, it constrained the government to take long term loans for buying the sustenance grain. The government succeeded to lessen the difference between farming and industrial sector in 1960. It was the first five year plan which brings the agriculture growth from 1 % to 3.7 %. The development of this sector not only develops agribusiness but it also developed the industrial sector (SBP, 2010).

In the time of 1960, Pakistan's economic growth was the role model for other developing countries. Numerous countries wanted to imitate the economic growth of Pakistan, South Korea was one of them, they copied second five year plan. Pakistan's per capita income was greater than South Korea at the time of 1960 (Maddison, 2001).

It was seen that during the 1965, Pakistan was getting improvements in the industrial sector day by day and reliance on foreign aid was also decreased. Pakistan's exchange rate was getting better. The Growth of GDP was 6.8 percent annually. However, the broad stream of outside loans helped in expanding the economic growth. Although the time of 1960s accelerated the economic growth through agriculture and industrial sector but the role of private and the social sector was neglected during this period (PES, 1989-90).

3.1.1. Decade of 1970s

In 1972-73 per capita income was increasing. While it was less in 1970 to 1972, but which declined to 3.1 percent at that time. In 1975-76, it was evaluated to gone up by 2 percent a

year ago. The per capita income was evaluated at Rs.564 contrasted with Rs.517 in 1971-72. It increased to Rs.564 in 1974-75. This demonstrated the rising pattern of per capita income (PES, 1975-76).

International economy is badly affected by different factors; those rooted elements also caused Pakistan's GDP. In 1975, it was expected that economy constructs opportunities for investors. Annual Plan targets of output could not accomplished. Sluggish trade performance was also the reason which led Pakistan gross domestic product to economic deficit. Despites of those unexpected contrary growth, development was seen with positive situation. Although during the decade of seventy export and growth not measured the Plan targets accurately. But planned investment and output were anticipated on government resources. Continuously growth has been shown in population increment which consider vital for the irrigation system of Pakistan. Improved health contributed greatly in economic growth (PES, 1975-76).

The pace of Pakistan's population was four fold in 1972 by comparing to 1955. And it was predicted that it would be twice after the coming four years. Improvement was always seen in per capita income in Pakistan except in 1971. Pakistan's total wealth in the field of health was 1360 registered doctors, 88 nurses and 13769 hospital's bed. Population was more than 3.2 Crore. Everything was less in the country included health facilities. Infant mortality rate was 235 per one thousand. Deficiencies of all such made the health sector poor. Three main sectors were in need to tackled, first one was medical personal facilities, as most of the population lived in rural areas. Improvement in the medical facilities was the other challenge for country to tackle. The next challenge was budget. Medical colleges were increased to 7 while on the other side number of registered doctors led to 14862. The strength was 5075 and dentists were 439. Besides all those 87 rural health basic units were opened (PES, 1975-76).

Through previous few years, fluctuations in Gross National Product growth have been marked. Low rate was counted; it was 0.1 and 1.4 percent in 1970-71 and 1971-72 respectively. But soon after one year 7.4 % was calculated. Separation of East Pakistan was the reason of that less growth rate. Next few years after division gave political stability, which pushed the economy steadfastly to development. The other sector, health is also considered with other social and economic conditions in the country. Income per capita was low, total population of the country was 7.2 Crore. Most of the population lived in rural area, ratio was more than 70 percent in these areas. Unsatisfactory health provision created hurdles in the way of economic growth (PES, 1976-77).

The small-pox eradication program has been started to eliminate the disease since 16th of October, 1974. No incident of small-pox has been described after concentrated actions and investigation measures. These measures are quiet lasting with the aim of deliver medical services in the towns. Programs of health training were announced on different status. Vaccination movements were reinforced in order to control small-pox, tuberculosis and additional transmissible sicknesses. Consideration was also rewarded to the formation of specialized health organizations like hubs for tuberculosis resistor, maternity and child care and psychological well-being. In the field of sanitation plans for the providing of safe-drinking water and sewerage removal were familiarized. So as to control the quick growth of population, family planning program has to start in the country as early as possible (PES, 1976-77).

The time of 1970s was not very easy for various types of human capital and for economic growth. Pakistan's economy was struck in a trouble during that period. Pakistan was dragged into war by India in 1971. That divided Pakistan into two pieces. Government strict decisions regarding economic policies and oil crisis decreased the growth of development. Zulfiqar Ali Bhutto brought industrial sector, insurances agencies, local banks and all educational sectors in the circle of nationalization in 1973 (Abbasa, et al. 2008).

The political instability comes to an end after the division of Pakistan in 1971. The new government accepted accountability by breaking down the economic problems. For example, putting the economy to right track, control the high inflation and to resolve the issues of agricultural and industrial sector. Individual savings were less and the fiscal deficit was 7.65 percent annually in that time (SBP, 2010).

The general circumstances are strongly identified with the general economic growth and social circumstances in the country. Per capita income was too much low during the 1970s. It creates unique problems after giving health facilities in that situation. An adequate number of existing doctors were para medical staffs and other issues during providing the health facilities. After taking the freedom, Pakistan stuck in with lots of issues especially in the health sector. Pakistan was almost free from all those things which were compulsory for health services. There were only 1360 certified doctors and 13769 hospitals beds for round about 32 million people. It showed that one doctor was for 23500 populations and there was only one bed for 2324 people (PES, 1975-76).

Bhutto government gave full attention to this problem. It was the basic task for the government to decrease the difference between urban and rural health facilities. Non-accessibility of medicines at cheap rates and basic health facilities to common single man were the objectives of government. These areas were in need of special attention. Extraordinary endeavors were made for enhancing the capabilities of doctors, other Para medical staffs including medical students and other basic health facility providers. Health sector has given main importance by providing financial resources. Federal government spending on health sector was 5.8 million in 1970-71 which enhanced to Rs.355 million in 1975-76. Health spending in 1970-71 was Rs.3.5 of per capita which rose to Rs.14.36 in 1975-76. Health spending as percentage of GNP was 0.47 % in 1970-71 which increased to 0.92 in 1975-76 (PES, 1975-76).

The economic regaining started in 1977-78 and sustained in 1978-79. The prominent feature of better-quality enactment through the year is a noteworthy growth in the productivity of goods. The development level was at 6.2 percent in gross domestic product during 1979-80, giving an average of 6.4 percent for the three years. In 1977-80 population was more than doubled. This abruptly differences with the annually development of 3.7 percent throughout 1970-77, that gone an irrelevant margin over populations growth. Whereas on the other hand country is devoted to a sensible standard of living for the public and given them with satisfactory sustenance, accommodation, appropriate health services, education and employment. Because of great birth-rate, numerous associated problems like rising reliance portion, short labor-force contribution, scarcities of nutriment, wellbeing and education provisions have persist in the country. Per capita GDP at constant factor charge has revealed a stable growing tendency (Pakistan Economic Survey, 1977-78).

The annual economic growth was 4.2 percent during 1977-80. The Annual Growth spending of Rs.717 million was increased to ease the recognition of the annual plan purposes. Moreover, the private sector has been certified some financial and fiscal inducements to inspire private investment in this part (PES, 1979-80).

Throughout the world health services and social services demand expanded. The current health services are not adequate despite the increased health facilities. Health providing facilities were in need of special attention like other economic sectors. While burden on the demand side. While further demand for medical facilities were rising day by day. All this is

due to increasing population of the country. Perceiving the significance of fifth five year plan was design to give importance to health sector (PES, 1980-81).

Open reserve funds were low since major fiscal short fall and this remains at 7.6 % and 5.9 % of GDP annually. This was because of huge spending on social sector, production subsidy and spending on government sectors. The tremendous spending on public sector leads to slow economic growth due to less income. The gap of fiscal deficit was filled by taking loans from internal and external sources (State Bank of Pakistan, 2010).

The current account short fall was 5.2 % of GDP annually. The shortage was caused by gigantic imports payments and less getting from the export. Therefore, government got the help from Middle East countries, as they welcomed the Pakistani workers in their country. These worker's remittances helped in the balance of payment a lot and workers are still working there from decades (SBP, 2010).

The key features of the time of 1970s are as under:

- Separation of East Pakistan
- Policy of nationalization
- Great short fall of balance of payments
- Small trend of saving in country
- Huge fiscal deficits

3.1.2. Decade of 1980s

The health sector growth program for 1980-81 was organized in the Fifth-Plan objectives. Annual Development Program (ADP) increased expenditure to Rs.942.458 million in 1980-81, 13.2 percent increase over the provision of Rs.832.535 million and 37.9 percent over the reviewed disbursement of Rs.683452 million in 1979-80. The aims of the fifth-plan were to provide well stability amongst services for city and rural zones, assimilation of different program with overall wellbeing facilities of health and combination of growth under-taken in greater health education (PES, 1980-81).

Generally, after thirty-five years of stormy situation, Pakistan was no-longer amid the poorest countries in the world. The strength and flexibility of the economy was baseless from the past six-years. Not only abundant development proportion accomplished the price steadiness from six years but also the development rates were achieved by a slight growth 4.9 percent to 7.4 percent for a gross domestic product. Through the year 1982-83, 5 million kids were

sheltered counter to avoid able sicknesses, 8000 birth employees were skillful and 2 million cases of diarrhea were cured. The immunization and diarrheal regulator exertion was 5 times the previous time. Health segment was allotted an amount of Rs.6, 600 million over the fifth Plan for growth of the health services. The annual plan portions bring the entire share to Rs.4, 867 million which was 3.6 percent of the whole plan expenditure. The operation of the plan provision has assessed at 94.4 percent (PES, 1983-84).

In seventh five year plan, GDP growth was expected to achieve 5.8 percent annually but Pakistan's annual GDP growth was 5.2% in 1989-90. Similarly, it was 4.8 percent during last year. In 1989-90 per capita income at market prices was assessed to Rs.8190, which demonstrates the growth of 9.6 % from previous year. Growth of 1.8% in per capita Gross National Product is calculated during 1989-90. This happened due to the depreciation of rupee in exchange of dollar. Rupee was depreciated from 19.22 to 21.30 in 1989-90. Pakistan's economic growth was better from the member of all South Asian Association Countries (SAARC) in 1989-90. Growth rate of Pakistan was 6.6 % while growth rate of India, Bangladesh and Sri Lanka were respectively 4.6 %, 3.8 % and 4.6 %. Pakistan's gross national product in terms of US$ was higher than these countries, as in above countries it was 300 and 160 US$ (PES, 1989-90).

National Health policy intended to enhance the current health facilities both in government and private sectors. This policy aimed to provide conceivable and fundamental health facilities to the whole population within short time periods. Sufficient steps were taken by the government to eradicate the drug hazards. However, the increasing population and shrinking the distance between urban and rural increased the demand of doctors and hospitals. Expenditure on health is not sufficient in Pakistan. Expenditure on health was decreasing from 1987-88 to 1989-90, as it were 1.02, 0.91 and 0.86 of GNP. In Pakistan both government and private sectors are providing health services but private sector kept focus just on urban area. Government of Pakistan has provided different kinds of subsides to the private sector for expanding their services to the rural sectors too. By opening the small business finance corporation, government tried to urge the private doctors to start their own private clinics in urban and rural area. Health sectors were expanding in Pakistan consistently. In 1989 one doctor was available for 1790 people, however, in 1987 and 1988 one doctors was available for 1880 and 1973 persons respectively. In 1989, one hospital bed was for 1640 people and one nurse was present for 3.3 hospital beds. One dentist was available for 56900 persons while one dentist was giving his services for 59873 in 1988 (PES, 1989-90).

The time of decentralization was started form 1980s to 1995. A few agreements were signed with International Monetary Fund and World Bank while starting the privatization. Those agreements gave the long term loans and returning easy installments. For backing the loan of 16 million US$, Pakistan made agreement with US, it was the part of agreement. The exchange rate approach was updated in 1982. Pakistani rupee was depreciated to 20 percent and managed exchange rate plan was displayed. Long term loan facility agreement were the remarkable success of Pakistan in 1988 with IMF. Besides this trade openness, tax reforms and financial reforms were also the part of agreement with IMF (SBP, 2010).

The key features of this era were.

- Enhance per capita income
- Astonishing GDP development
- Little deficit in current account
- Increased health expenditure
- Increased number of hospitals

3.1.3. Decade of 1990's

The administration contained a country wide system of health provision. The setup consists of 778 hospitals, 4,095 dispensaries, 470 rural health cares and 4, 52 basic health units (BHU). All those provide free checkup facilities and free fundamental medications. Hospitals were subsidized. A substantial health set-up occurs in the non-government sector; however it mostly focused on urban regions. At contemporary there was one doctor for 2,111 people, one dentist for 3,497 and one hospital bed for 1, 53 peoples. And there were 4 hospital beds for one nurse. For the period of year Child Survival and primary health care program provided free facilities. Its elementary goal was to decrease child and teen mortality, malnourishment and death rate because of diarrheal illnesses. Government obliged distinctive programs to progress the nutritious position of less income persons. The per capita nourishment consumption was augmented from 2,453 calories every day in 1991-92. Program Social Action was implemented through 1992-93. Its objectives were to address the abandonment of elementary social amenities in synchronized and rigorous way. It stressed on the necessity of basic education, basic health, sustenance, family scheduling, rural water supply and hygiene (PES, 1992-93).

The aggregate expenditure on health was Rs.12.78 billion 1994-95. Per capita GDP expenditure on health was Rs.1000 each year. On the preventive side, 76 million kids were

protected from assassin illnesses. The Social Action Program was planned to define the neglect of elementary social facilities in a corresponding and intensive way. It has scheduled over a five year time prospect. It would comprise entire price of $ 8 billion for 1993-98 (PES, 1994-95).

After affected the output, though of development series in 1992-93 but gross domestic product raised only by 2.3 %. Pakistan's economy has stayed on earlier growth comes apart. Per capita gross domestic product at constant factor budget increase to Rs.4191 presenting a development of 1.8 % beside a lesser surge of 0.5 % in 1993-94. Per capita income at current values rose to Rs.14650 in 1993-94. The entire cost on health is planned at Rs.16.35 billion. The accomplishment goals for 1995-96 was diverse from a smallest of 62 % to the extreme 100 %. The average achievement rates was 80 % due to the growing progress exertion activities like creation of 119 innovative services, up-gradation of 290 remaining services and the adding of 1700 hospital beds (PES, 1994-95).

Per capita income at steady factor increased to Rs.4349 expanding in 1995-96. It increased to 16623 at current prices in 1995-96 from 14691 in 1994-95. Per capita growth was increased 13.2 % to 16 % annually. In 1992-93 the growth rate of per capita income was 7.2 percent. In terms of US$, it rose in 1989-90 from 377 to 495 in 1995-96 (PES, 1995-96).

Number of growth indicators have significant impact on economic growth in 1995-96. GDP growth has noticed to 4.4 % in 1994 and 6.7 percent in 1995. Although the pace is slow rather it was growing. Special attention was given to the human capital improvement. Most of the steps were taken to enhance the capabilities of human capital. Total budget was dragged to 16.35 billion rupees. Plans which were made for those sectors and it were achieved eighty percent. Literacy rate was counted to 37.9 percent in male and 23 % in female. Numerous steps were taken to increase this low level literacy rate. Free and compulsory education at primary level was started in 1995. Total GNP'S 2.5 percent was spend on education sector. Per capita income was 4349 rupees per head and it was increased to Rs.6623 in 1995-96. Declining tendency was noted in the crude death rate in Pakistan from 1988 to 1992. Infant mortality is the very important indicator of health. Although in total infant mortality tendency was decreasing. It comes to 101.8 overall. But it was noted 112.7 in rural areas (PES, 1995-96).

Health services in Pakistan are deficient and extensive segment of the population. Most part of the health is provided by the government. Although private sector is also played their role

especially in urban area. Health expenditure as percentage of GNP was increasing from 1960 to 1990. As it was 0.4 percent of GNP in 1960 while it rose to 0.8 percent in 1990. The greater part of the concentration was moved to urban areas. Government started Social Action Programs, the basic aim of these programs were to provide health facilities in rural areas. Life expectancy was same with contrast to other Asian developing countries. In 1996 life expectancy in Pakistan was 63 per 1000 (PES, 1996-97).

The time of 1998-99 was the most hard for Pakistan because after testing the nuclear atoms, a number of restrictions were imposed on Pakistan. All those efforts which were made to stabilize the Pakistan economy feel shock. Pakistan faced the economic sanctions which de-track the Pakistan's economic growth. This led Pakistan to decrease its expenditure every filed especially social sectors. In spite of troubles of macroeconomic sectors caused by outside stun the economy of Pakistan performed well in 1998-99 when crisis hit the East Asian economies. Only the economy of Pakistan was much better comparing to other Asian economies. The real GDP enlisted an unassuming development of 3.1 % in 1998-99 at against 4.3 % year ago. Still Pakistan was behind from its target which was 6 % (PES, 1998-99).

Pakistan has the most astounding per capita income growth which is uppermost in South Asia except from Sri-Lanka. But in case of health indicators, Pakistan is far behind to few South Asian countries. Due to lack of health expenditure, shortage of doctors and other health facilities led Pakistan health framework weaken. Despite the fact that Pakistan make terrifying number of health specialists, they prefer private sector. Every government tried their best to adjust their own persons in health ministries. Bribery, landlordism and increased number of illiterate are also those factors in Pakistan which fail to build up a more viable and effective health structure. The government of Pakistan delivered two health policies in 1997 and 1998 with extensive objectives. The main characteristics were decentralization, group contribution in running government provisions and cooperation public and private sectors (Abbasi, 1999).

In current account less enhancement were found, which was 5.9 % of GDP in 1990 while it was 2.8 % in 1980. In spite of this, current account stayed negative in the light of economic short fall and depreciation of the currency. Income inequalities and misused of resources which led to damage the improved health status in the country. This leads to increase the rural poverty; this demonstrates the Human Development Index (SBP, 2010).

Government has begun the tasks to enhance the social segment and to improve the health facilities, education and clean drinking water. Human Development Index demonstrated that abatement in this area drive Pakistan for beneath from India and Bangladesh in 1990. Nuclear test of 1998 led Pakistan to various kinds of restrictions. Worker's remittances were lessened in view of freezing foreign currency accounts (SBP, 2010).

Vital features of the 1990's were:

- GDP growth rate was diminishing to 4.45 percent on average during the decade.
- Revenue dropped, fiscal deficit expanded and public spending upgraded step by step.
- To welcome and encourage of the private investors, numerous facilities were declared.

3.1.4. Decade of 2000s

Pakistan was persistently attaining the level of growth in the shortest possible period of time, dropping poverty and inspecting social disparities. The Social Action Program was primarily launched to recover four significant sectors: primary education, basic well-being services, family planning, rural water supply and sanitation. The first stage of SAP designed in 1993-94 and was finalized in 1996. Human capital growth which is the invention of education and enhancements in health nourishment. Progress in education and by initial economic growth to additional people helped to decrease income disparity. The improved health of elegant people stimulates them to make more investment in their education and well-being. Education improvement and health services directly affect the income disparity. Access of one poor to well-being services is imperative both for growing their income and for rising existing standard. Therefore, primary health care is adopted the second by elements of the social action programs. Inventive and innovative structures were started to implement the program. The whole objective was to vanish the hurdles in the way of health improvements (PES, 2000-01).

There were fluctuations in the Pakistan economy. It still converge to upward day by day from more than twenty years with annual growth rate at 5 %. While, improvement is needed for economic growth. Pakistan's economy was low than other South East Asia, for instance Singapore, Malaysia and Thailand. In the couple of decades, it was seen that the pace of development was expanded. It was expected that Pakistan economy will catch up other countries growth. Pakistan's economic growth rate was dropped to 3 % in the second part of the 1990's decade; economic growth rate was less than population growth (Khan, 2005).

The economy of Pakistan has accumulated in 2004. The growth rate of the economy was 8.4 % in 2004, the pace of growth was less only from China. The rank of Pakistan was 134th as stated by the Human Development Index in 2002, while it was 138 in 2003. Dishonesty and fraud are the other factors that are hurdles in the way of health plan execution. According to Transparency International report, the number of Pakistan is 129 out of 145 in corruptions. These ranked are determined by a simple formula, those countries whose number is near to 10, they are not corrupt, while those countries which are near to one, they are called most corrupt. Pakistan score were 2.1 out of 10. It is the corruption which utterly affected by the health sector which leads to the lack of health policy implementation. Such as, dishonest staff in the health sectors and health centers buys out of date medication. They demand bribery and illegal's shares while taking the below standard health tools and kits etc. This plays the role of hurdles for the health policies implementation. It leads to low quality health provision (Khan, et al. 2005).

At the time of 1960s, Pakistan economy was considered the role model for other developing countries. Several countries were eager to replicate the economic planning of Pakistan. South Korea copied the second five year plan of Pakistan. South Korea's per capita income was less than Pakistan during the 1960. But in the year of 2006, the per capita of GNI in South Korea was $22990 and Pakistan's $2410, utilizing purchasing power parity (WDI, 2007).

Health is the important concern to recover the existing standard and the decrease public and income disparity. In the Pakistan life expectancy was short at 44 years in 1960. Different governments have taken many steps to improve the quality of health. According to world health indicator life expectancy was 62 years in 2006. Improvement has been added in the ratio of life expectancy in Pakistan but pace is rather slow (Akram, et al. 2008).

Health was considered the main determinant of human capital, therefore government kept it into account from 2008-09. Because these were the key factor which accelerates the economic growth and social sectors of the country. In spite of different improvement from the few decades in the country but health is that sector which still needs the special attention of government. Pakistan stands in need of advancement in economic and social sector for diminish the problem of diseases. In 2007 the ratio of infant mortality was 73 for each 1000 live birth. In spite of the fact that it diminishes but it was as yet higher than the other Asian countries. In India, it was 54 and in China it was 19 per 1000. The primary sector which spend on health in Pakistan was government. It spends 0.5 % of its GNP on health sector.

Government has increased its budget on health sector from Rs.60 billion to Rs.74 billion in 2008-09 (PES, 2008-2009).

The start of 2000s was highlighted by outward oriented economic strategies concentrating on expanding the exports and more integration in the foreign markets. This economic rebuilding was continued from 1990s to 2000. To decrease the fiscal deficit difficult judgments like, enhancing oil rates, decreases subsidies and sales tax imposition were made; these were the part of IMF's 3 years conditions for decreasing poverty and enhancing economic growth (SBP, 2009).

Economic Survey of Pakistan exhibited that 0.75 % of Gross Domestic Product expenditure comes for health sector. Government tried to boost-up the welfare of society's populations. Most of the programs of wellbeing are operational in Pakistan, these are vertical and horizontal. Appointing ladies health workers for widening the health programs, Malaria regulator program, teenager health plans and cancer treatment plans are the part of central government vertical systems. Besides all these, government of Pakistan launched the Hepatitis eradication program and food plus food nutrition's effectiveness. Government of Pakistan signed the agreement for taken steps to achieve the Millennium Development goals of 2005 (PES, 2005-06).

After the denationalization the most attracting sectors were telecommunication, banking and the energy sector. To build the trust of foreign investors, liberalization of foreign exchange and currency devaluation were occupied, which prepared the stock markets more fascinating for investors. In the time of war against terrorism, Pakistan reported to be the part of the alliance forces that supported the economy in number of ways. Reciprocal and multilateral debts were rescheduled by the alliance countries. Restrictions imposed in setting of various time in 1990's were picked up which fetched a tremendous amount of grants of about $1.5 billion every year during the 1st half of the decade. Some of external debt was washed out. The amount of remittances improved significantly. All this made the Pakistan economy well. It decreases the fiscal deficit and reduces the government borrowings through low interest rate and foreign investment. It was the first time foreign reserve reached on the peak and it enhanced the exports of Pakistan. The industry of banking started to grow and steps were taken to draw in white collar class by number of consumer finance plans (SBP, 2010).

Pakistan also received assistance of $6 million from World Bank, during the year 2006-2009, for infrastructure development. Increased to 19.42 % of remittances was observed as the

amount of remittances was increased to $ 5.493 billion during the year 2007 as compared to $ 4.6 billion during the year 2006. Exports were 17.11 billion and imports were of $ 30.5 billion, during the year 2007 (SBP, 2010).

The population of Pakistan was increasing day by day, but on the other hand health facilities also boosting up. However, that was less than population growth. Government of Pakistan took many steps to decrease that gap. Government made a policy of 2009 to start facilitate those communities which remained out of health facilities. Different preventive programs launched in the country. Those police primary was to eliminate the poverty and primary health care gap between poor and rich class (PES, 2008-09).

Health is vital for human capital; subsequently it remained the focus point of consideration of the administration in 2008-09. The government has taken a few steps to satisfy its sense of duty regarding address the issues of health services needs of the general population of Pakistan. This has required reformulating national health policy to give, effective, impartial and standard health provision at the entryway of the population. This health plan of 2009 has concentrated on preventive projects focusing on poor impeded groups of the people. The development planned in the policy has tended to insufficiencies in basic and secondary health provisions. This national health plan of 2009 was concentrated on health division speculation as a major aspect of destitution mitigation, an accords need to basic and secondary health provision (PES, 2008-09).

In the year 2007, Pakistan experienced the deficit of trade and the amount deficit reached to $ 13.58 billion and $14.125 billion respectively. Deficit came to $7.016 billion in 2008. However, in the year 2008, decreases in worldwide prices and stabilization endeavors from government brought about diminishing external deficit. However, large scale economic circumstances stay unsteady with high inflation and variances in foreign exchange rate. Unstable circumstance and lacking plan measures made the stabilization relatively worse (SBP, 2009).

The period of worldwide money related crisis appears to end in 2008, while, the compromise procedure required some time. The time of 2008-09 was the time of economic stagnation for Pakistan economy. However, the deficit was low at 5.1 % of GDP as result of sharp decrease in imports and enhances the labors remittances, while both inflow of foreign capital and foreign direct investment decreased. Income rate decreased gradually to 1 % of GDP. In this time tax income also decrease to 8.8 % of GDP (SBP, 2010).

It was the expansionary fiscal policy and foreign loans that enhanced the high economic growth in Pakistan. But on the other side, Pakistan's economy heavily depends upon foreign investment and loans which make it weak for internal and external shocks. It was also the reason of currency devaluation and economic crisis. The year 2010 observed improvement in global economic crisis. International economies start recovering and positive growth was observed in many countries. However, Pakistan's economy remained stagnant with increasing fiscal imbalance due to high inflation, increasing government borrowing, huge amount of money creation to meet the government expenditure and political and law and order situation. The importance of human capital was neglected in Pakistan for a long time. Thus, the country was confronting hyperinflation, poverty, monstrous unemployment, fiscal deficit, overwhelming debt and illiteracy. In the position of Human Development Index Pakistan's number was 125 out of 178 (UNDP, 2010).

Government increased budget for health services from 0.74 as percentage of GDP in the time of 1980s to 0.89 as percentage of GDP in 1990s. In spite of increasing the expenses on health as proportion of Gross Domestic Product during the time of 2000, it went down to 0.58 percent. In 2009, it was observed 0.53 percent of GDP (PES, 2009-10).

Lately health related agreement made by the government has proved as a proficient, successful and unequal. The contract has found most gainful for the Pakistan's economy. Reforms made in the Pakistan economy has damage the health sector a lot. As resources scarcity and lack of health experts which take to slow improvement in health sector. But after starting to provide health facilities with the cooperation of private sector it proved much better for the health sector of Pakistan. Though private sector has essential role in the Pakistan health sector but still there is need of some special reforms in private sector (Shaikh, et al. 2010).

3.1.5. Current Scenario

The majority of Asian economies have ascended because of free trade. Open economy expanded their share in other economies. The proportion of youth is than other world and youth always play the role of fuel for any economy. It is important for any emerging economy. But the problem is their accurate use, how to get benefit from their abilities in the presence of scarce resources. Pakistan's economy has encountered with basic change, especially in social sectors, it will lead to improve GDP in upcoming years (PES, 2011-12).

For both genders in Pakistan the average rate of life expectancy is forty nine, fifty years for male while forty nine for female. In 2008, it was expanded to 67 years for genders, 67 for female and 66 for males. The better human development confirms by the life expectancy of that country. Trend of life expectancy in Pakistan was much better. But it is grasped into various health issues, as less number of population beds, less number of registered doctor, less expenditure on health and large number of infant mortality rate. The ruling government was persistently endeavoring to adopt such policies to solve the issues of social sectors. But due to weak policies of health related, it could not get their goals (Naeem, et al. 2012).

The ratio of life expectancy in underdeveloped countries were just forty years in the time of 1950s, children under the age of 5 pass away ratio was 20 in every 100 kids in 1990s. Pakistan was gotten improvement, which rose from 40 to 63 years. By comparing the life expectancy of Pakistan with other countries shows not satisfactory improvement in Pakistan (Raza, et al. 2013).

The health provision in Pakistan exhibits an exceptionally inadmissible circumstance. It determined that from the past 6 decades, there is excessively short consumption on health. Expenditure on health stayed between the 0.5 to 1.24 percent of GDP from 1970 to 2007. Outlay on health as ratio of gross domestic product during the period of 2010 was 0.23 which was far below the health spending of other countries (Raza, et al. 2013).

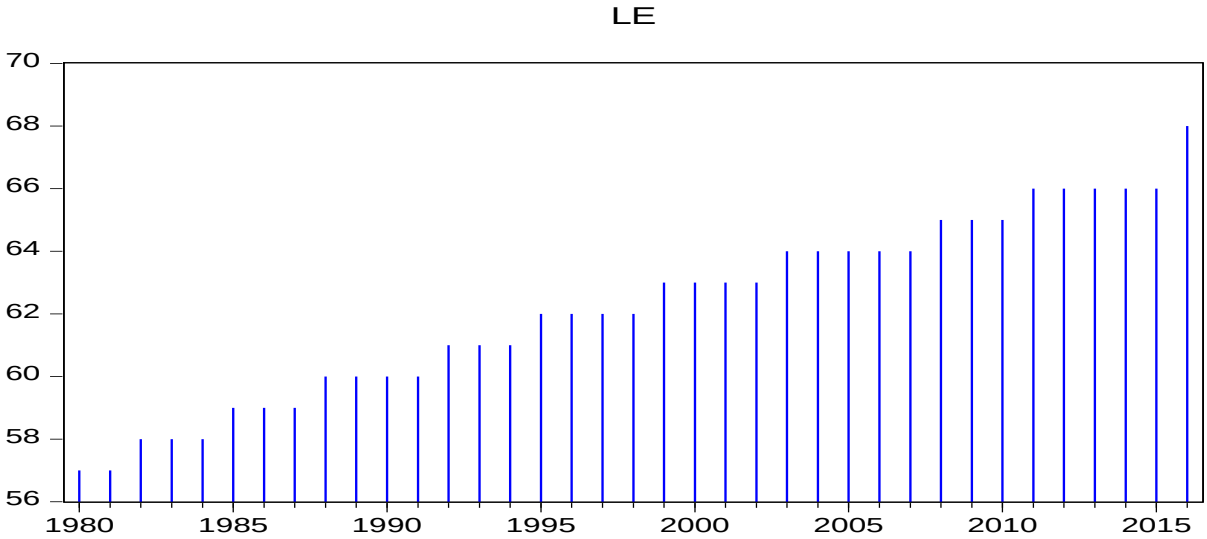
In compatibility of the eighteenth modification to the constituents of Pakistan, the responsibility of well-being facilities providing have given to the provinces. The role of central government has-been decreased. Just Planning and Development Division playing its role in it. As it plays role in the collaboration with the regions in providing health services. International health organization also plays its role through planning and development. Federally health related programs have additionally been lapsed to the provinces. Therefore, Council of Common Interest (CCI) called a gathering on the request of provinces on 28 April 2011. It was decided in the meeting that federal government will also finance the health sector of the provinces. So, national health programs keep on being funded by the central in the post federalization situation to 2014-15 (Ramzan, 2014).

Table 3.1. Trend in health indicators from 1985 to 2015

Years	Total at birth Life Expectancy (Years)	Infant Mortality Rate (per 1000 live births)	Health Expenditure, total (% of GDP)
1985	59	115	0.86
1990	60	106	0.89
1995	62	97	0.85
2000	63	88	058
2005	64	80	0.49
2010	65	74	0.23
2015	66	66	0.76

Source: WDI and Economic survey of Pakistan

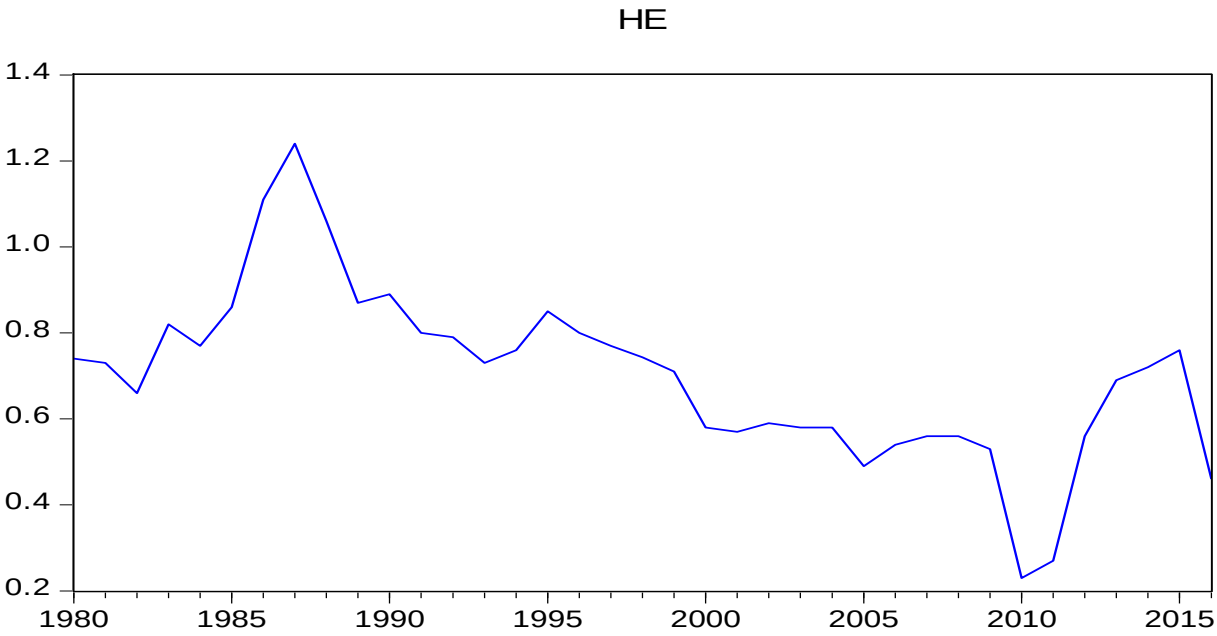
Figure 3.1. Trends of life expectancy in Pakistan



Source: WDI

In the growth of population Pakistan's number comes in the top of the list countries. Average growth rate of population has been counted 1.2 percent in the world while it was 2 percent measured in Pakistan (World Bank, 2016). The general life expectancy at birth was expressed at 63 for both genders in the 2000 however, in 2016 it is 66.

Figure 3.2. Trends of health expenditure in Pakistan

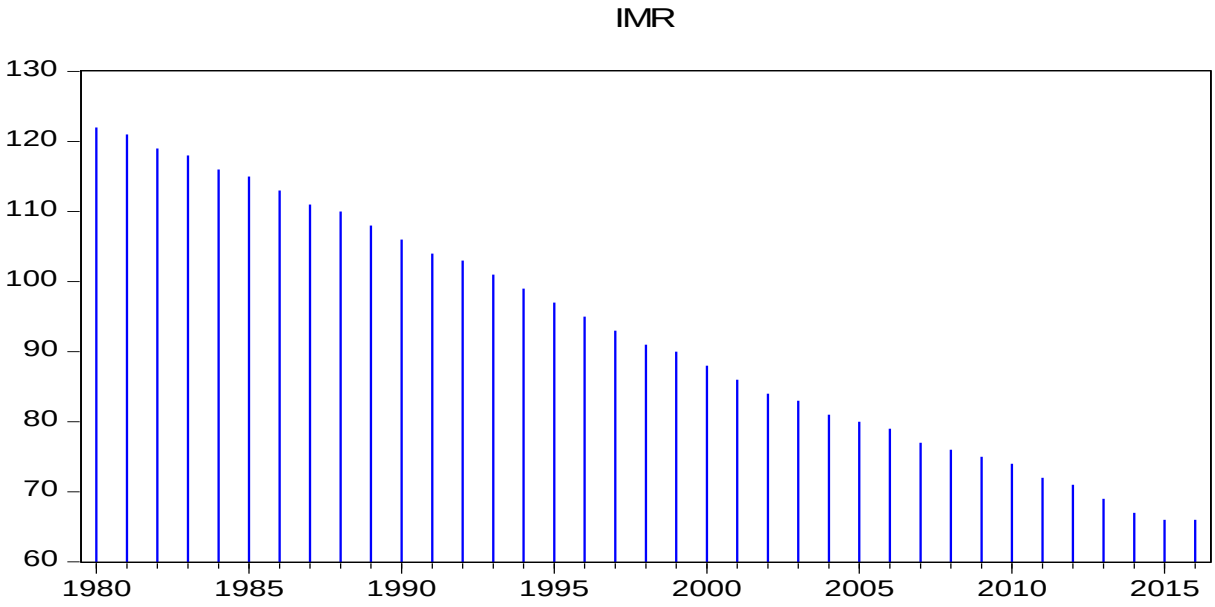


Source: Economic Survey of Pakistan

Pakistan's aggregate spending on health as percentage of GDP comes round about similar from 1980s. Just three time it cross the figure of 1 percent of GDP in 1986, 1987 and 1988. Except these three years expenditure on health remains below 1 percent of total GDP of Pakistan. The part of the health services in the financial plan has not changed significantly. The ratio of health spending demonstrates the low level picture of health standard. Per capita health spending is too less while comparing with the World Health Organization criteria of 60 $. This little ratio of spending is the cause of increasing number of ailments. The health provision for ladies and kids are extremely low and cause a problem during birth. These are the duties of governments to give appropriate services and to control child death rate when it increases to the astonishing level in the country.

Pakistan is among those countries which have less per capita income. Pakistan's health sector is not well because it always remains in the crisis. More spending in health is actually the improvement of human services. The main troubling issue for health policy implementer in Pakistan is expenditure of health on over population. Most of the people in Pakistan has not the ability to spend on health, which they need the most. Share of health costs in Pakistan over 2000s decade was 0.6 to 1.19 percent. Out of this budget, 5.1 to 11.6 percent of this amount was spent on research and development sectors (Punjani, 2014).

Figure 3.3. Trends of infant mortality rate in Pakistan



Source: WDI

Improvement in health, such as decreases in infant mortality rate has a remarkable ability to advance economic growth in Pakistan. Effective health is an imperative aspect in the financial and public growth manner in that it increases the proficiency of labor. Above table shows that infant mortality rate was 123 in 1979 but now it is 62 in 2016 in Pakistan.

The pattern of essential health indicators in Pakistan has been on a right track from the last twenty years. While, the pace of enhancement and the health results comes up short when compared Pakistan to other regional neighbors. Pakistan at current has one of the most reduced life expectancy alongside a moderately with abnormal level of maternal mortality proportion. Unfortunately, Pakistan is among those countries which still affect from the disease of polio and tuberculosis. Due to lack of facilities in health sector in Pakistan, number of those diseases is still present in the country which is eradicated from the world. They do not exist in the world except in Pakistan and few others least developed countries. The public expenditure on health is just 0.7 % which not only far from the target set by the WHO but it also much low in perspective of other South Asian countries. World Health Organization set the criteria of health spending 5 percent of GDP. Because of poorly spending of the government in health sector, private sectors comes in front line and started to serve the country. Nowadays private sector role in health sector is like the back bone. Private sectors kept focus on quality, that's why 70 % of the population of Pakistan tried to consult private doctors in spite of public doctors. Only those persons go to government hospitals which could not bear the expense of private hospitals (PES, 2015-16).

For making better the situation and health, Pakistan made contract with the United Nations in 2000 for attaining the eight Millennium targets. Pakistan became the pioneer country among other after making the agreement, which tried to make the health sector strong through both private and public struggle. This association was among the Pakistan, UNDP, Civil Society and non-government contributors in all over the world. They served their services in most part of the Pakistan, especially in the field of health. Besides this, Pakistan has taken steps to diminish the rate of infant mortality and maternal mortality by support of the overseas fund. But still most of the sectors have numerous shortcomings and difficulties which are right now looked by the Pakistan health authorities. The past studies demonstrated that, health provision flourished however vast areas have still weak administration like insufficiency of resources and inaccessibility of female staff. The sound arrangement of health cannot occur without help of political organizations. Pakistan abrogated the straight involvement in the health sector by federal government, now responsibility hand over to the provinces. In Pakistan there are massive inconsistencies in accessibility of health administration in rich and poor sectors. Greater part of the people faces unemployment. Larger part of the general health services are not giving pleasant care. Therefore most part prefer to go for private hospital which are extreme costly. However, government spent 0.75 % of gross domestic product on health services in 2005 keeping in the mind the end goal to make its population more advantageous. The poor must choose the option to pay the health cost whether they can manage the cost or not (Kurji, et al. 2016).

It is the per capita income which demonstrate the real picture of economic growth. It is verifiably an obvious which generally used as indicator of economic growth which takes the level of gross domestic product progress of the country. By comparing the per capita income one can judge the living standard of the people of a country. Increased per capita means better the standard of living. It is ascertained as GNP divide by the total population of the country. Improvement has been seen in per capita income while taking as a dollar. The growth rate was observed 6.4 % in 2017 while it was 1.1 percent in 2016. Enhancement has been seen in per capital income from 1531 $ to 1629 $ in 2017. Fundamental contributing elements for the ascent in per capita income are higher real GDP growth. While it was observed that increment in per capita income led to decrease the growth of population and appreciation of Pakistani rupee (PES, 2016-17).

Health and development is a fundamental right of each person, as it exist, in the law of Pakistan and in the law of international world. From the past few decades, a pull of war has

been started either nominal economic growth leads to real growth or not. Now a days, the ratio of one doctor is for 1584 population, one dentist for 10658 and one hospital bed for 1584 persons in Pakistan. However, Pakistan contains 1201 hospitals, basic health units (BHU) of 5518, rural health centers 683 and the aggregate accessibility of hospitals beds are 123394. In spite of the necessary steps which are taken by the government, number of issues are still present like, rising population growth, not proper distribution of health and trade deficit in the country, lacking of health workforce and the poor quality of health services. Despite of the sluggish spending of health from last few decades but improvement is observed. The government of Pakistan is spending 0.5 to 0.8 as percentage of GDP from the last few years. This rate is not as much satisfactory as the WHO set, not to spend less than 6 percent of GDP to give basic life services. Although these spending were expanded in 2014 and 2015 but is recorded to 13% growth in health expenditure. As indicated by the World Bank report, in 2017 Pakistan's per capita health spending still needs more attention because it is far below the standard determined by the World Bank. Pakistan has indicated change in the Infant Mortality Rate (IMR) of 62 for each thousand from 66 in 2015. The enhanced growth of population portrayed health profile in Pakistan. In most of the other countries, despite of the huge investment in health, the pace of economic growth did not increase (PES, 2016-2017).

A very disappointed situation of health services is shown in Pakistan. Minor extent of expense from past seven decades is declared the reason of this poor health conditions. Expenditure on health as percentage of GDP persist dispirited, as its share was 0.23 to 1.24 % during 1980-2016. In FY 2016 health portion was just 0.46 % in GDP that appearance less while likening with different emerging nations. Anxiety condition of health is seen in Pakistan. Larger number of population lives in rural areas of Pakistan. Health sector is divided into two parts private and governmental. Private investors preferred investing in urban areas, they constructed hospitals there. Government somehow provided facility in rural areas but their quantity and quality outdated. Among the South Asian countries Pakistan's infant death rate is greater than other countries. Health sectors has too much space of betterment, it is the need of time to take steps for this sector heartedly (PES, 2016-17).

3.2. Conclusion

In terms of the purchasing power, Pakistan's economy is on number 24 among other countries, while in terms of GDP it comes on 42nd in the world. Pakistan is not a develop country, but it is in the list of emerging economies. Due to increasing rate of population

growth and political instability, Pakistan's economy faced several problems. By making the right decisions of the government since 2000s, it put Pakistan's economy to right track which led to economic improvement. Pakistan's medical services managed chiefly by the private divisions. Approximately, private sector has eighty percent contribution in providing the services in the health sector. In 2011 health responsibilities were given to the provinces. In Pakistan's healthcare services providing by the government and private sector. Pakistan's health provision framework incorporates very slowly from the last five decades but it gradually goes to betterment. But still there is space to take solid steps for getting best output in the shape of human resource, so government have to keep health sector in their preferences.

CHAPTER 4

DATA AND METHODOLOGY

4.1. Introduction

The study is based on the secondary data for the time period from 1980-2016. The data on outcomes in terms of economic development include data on economic growth, health expenditure, infant mortality rate, life expectancy, gross fixed capital formation, trade volume, general government final expenditure as percentage of GDP and secondary school enrollment. The data is collected from WDI and Economic Survey of Pakistan (various issues). The data is available on annual basis. It is possible to observe the impact of health on per capita Gross Domestic Product. GDP per capita is implied for economic growth as proxy. The infant mortality rate is defined as deaths under the age of per 1,000 live births. Including both the education and health indicators are relatively better measure of human capital than using either education or health indicators separately.

Augmented Dickey Fuller (ADF) test is applied to check the stationarity of the variables. Auto Regressive Distributed Lag Model (ARDL) is used for long run and short run impact of health on economic growth. Pesaren and Shin (1995) and Pesaran and Shin (1999) acquainted a new co-integration technique named ARDL method.

The sections are organized into the following: The 4.1 unit represents the introduction of this chapter, 4.2 presents the description of the variables, section 4.3 shows the model specification and section 4.4 represent the estimation techniques.

4.2. Data sources and measurement of variables

Data used in this study is time series during the period of 1980 to 2016. Data sources and construction of all the explanatory and explained variable is available in Table 4.1.

Table 4.1. List of the variables and sources

Variables	Abbreviation	Measurement	Data Source
Dependent variable			
GDP Per capita	PGDP	Constant 2010 US$	World Development Indicator (WDI)
Independent variables			
Health Expenditure	HE	(% of GDP)	Economic Survey of Pakistan (Various issues)
Life Expectancy	LE	total (years)	WDI
Infant mortality rate	IMR	Rate	WDI
Gross fixed capital formation	GFCF	% of GDP	WDI
Trade volume	TS	% of GDP	WDI
General government expenditure	GGE	% of GDP	WDI
Secondary school enrollment	SSE	% growth	WDI

Health expenditure is used as indicator for health position. Barro's (1996) and other researchers used life expectancy, health expenditure and infant mortality rate as proxy for health. The study's health expenditure, life expectancy and infant mortality rate as an indicator for health. Total health expenditure is the summation of private and public sector expenditure on health. Expenditures on health is taken as a percentage of GDP. Life expectancy illustrates the total period of time an individual hopes to stay alive. Life expectancy depicts individual's entire number of year that he would expect to stay alive, if the selected time period of infant mortality remain same throughout his life.

Life expectancy illustrates the total period of time an individual hopes to stay alive. Life expectancy depicts individual's entire number of year that he would expect to stay alive.

Infant Mortality rate is the new-born babies passed away rate, before to reach at the age of one year, per one thousand live child births. Ali, et al., (2012) used infant mortality rate as a proxy for health. Infant mortality rate means that all those children who die before to reach at the age of one year (WDI, 2010).

Gross fixed capital formation comprises of expenditures on additions to the fixed assets of the economy and net changes in the level of inventories. Fixed assets comprise land developments (fences, ditches, drains and so on), plant machinery and equipment purchases; and the construction of roads, buildings, hospitals, railways tracks making, schools structures, offices, production and work in progress. This proxy is used by Abbas and Peck (2008) in their study on similar topic.

Trade volume or trade in services is the sum of service exports and imports divided by the value of GDP, all in current U.S. dollars.

General government final consumption expenditure (formerly general government consumption) includes all government current expenditure for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditure that are part of government capital formation.

Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Secondary education completes the provision of basic education that began at the primary level, and aims at lying the foundations for lifelong learning and human development, by offering more subject or skill-oriented instruction using more specialized teachers.

4.3. Model Specification

Following from the health growth literature, effect of health on economic growth was studied within the framework of the ASM guided by (Mankiw, Romer, & Weil, 1992), (Knowles & Owen, 1997) and (Bloom, Canning, & Sevilla, 20001). It is supposed that growth in output emerges from input combination and technology. This study used a "Cobb Douglas production" function.

$$Y = AK^{\alpha}L^{\beta}e^{\varphi he+\mu t} \quad (1)$$

As stated by Grossman (1972; 2000) and (Bloom, Canning, & Sevilla), the effect of health on economic growth: A Production function approach (2004), health stock and education make it possible, how much time a worker spend in economic and not economic actions. The employee's earning depends on its health status and knowledge. For this understanding equation (2) can be written as:

$$Y = AK^{\alpha}e^{\varphi he+\mu t} \quad (2)$$

At represent the technological advancement that describes GDP growth is not recorded by changes in physical capital. As to Hansen (2013), it is assuming that technology develops by the GDP growth.

The term related to error is taken by μ_t and is presumed to be normally distributed with constant variance and zero mean where t denotes time periods.

$$lny_t = \beta_0 + \alpha lnhe_t + \varphi lnimr_t + \beta_1 lnle_t + \beta_2 lngfcf_t + \beta_3 lnts_t + \beta_4 lngge_t + \beta_5 lnsse_t + \mu_t$$

lny = Natural logarithm of GDP per capita at time t.

lnhe = Natural logarithm of health expenditure at time t.

lnimr= Natural logarithm of Infant mortality rate at time t.

lnle= Natural logarithm of life expectancy at time t.

lngfcf = Natural logarithm of gross fixed capital formation at time t.

lnts = Natural logarithm of Trade volume at time t.

lngge= Natural logarithm of General government expenditure at time t.

lnsse = Natural logarithm of secondary school enrollment at time t.

β_0= Intercepts

t = 1, 2, 3…37; periods (1980-2016)

μ = error term.

4.4. Unit Root test

The formulation of the data sets for further statistically examinations are also important to check the stationary properties of all series prior the co-integration. Hence the co-integration analysis to be valid required further investigation as to whether the order of integration of the variables of interest is similar. First, the stationary properties validated prior conducting the co-integration test. Most frequently used tests in number of studies are Augmented Dickey Fuller-developed by Dickey and Fuller in 1979 and 1981. Others tests are followed in most of researches are Phillip Perron. This test first developed by Perron in 1987 but later with further embellishments this test is presented by Phillips and Perron in 1988. Phillips showed in his study that Durban Watson tends to zero, while running the regression on variables. In

opposition non-stationary arises in time series variables when constant mean and constant variance ensures.

4.4.1. The simple Dickey-Fuller (DF) test

Dickey and Fuller (1979, 1981) developed a technique formality test for non-stationarity. The important vision of them was to test or calculate the non-stationarity data which comes same to testing for the presence of a unit root. Thus the obvious is the following which is based on the simple AR (1) model of the form:

$y_t = \phi y_{t-1} + \mu_t$ ---------- (1)

We observe at this point if ϕ is equivalent to 1. Then$H_0: \phi = 1$, and is $H_1: \phi < 1$.

We can obtain a changed type of the techniques by deducting y_{t-1} from right hand side and left side of the equation number one (1).

$$y_t - y_{t-1} = \phi y_{t-1} - y_{t-1} + \mu_t$$

$$\Delta y_{t-1} = (\phi - 1) y_{t-1} + \mu_t$$

$\Delta y_{t-1} = \gamma y_{t-1} + \mu_t$ ---------- (2)

Here $\gamma = (\phi - 1)$. While in case of null hypothesis $H_0: \gamma = 0$ and other hypothesis is $H_0: \gamma < 0$, now $\gamma = 0$ and next y_t tracks a perfect random-walk model in the study.

Two other regression equations that may be applied for testing for the presence of a unit root (Dickey & Fuller, 1979). The first covers constant in the random walk procedure for example in the next equations:

$\Delta y_{t-1} = a_0 + \gamma y_{t-1} + \mu_t$ ---------- (3)

The very main situation, since initial these processes show positive tendency in the sequence while $\gamma = 0$.

Second situation is more over permitted that there is non-stochastic trend according to time in model, it is presented here:

$\Delta y_{t-1} = \alpha_0 + a_2 t + \gamma y_{t-1} + \mu_t$ ---------- (4)

Assessment through Dickey and Fuller for unit root shows the, t statistics of the coefficient of the dependent variable y_{t-1} in 1 of the 3 models (1, 2 or 3). These tests are not though has a

straight ‘t’ dissemination and to apply the different critical statistics that are initially considered by Dickey and Fuller.

The test has concern in all the cases whether γ = 0. Dickey Fuller method of t-value is the *t* statistic for the dependent variable. In case of the DF numerical value is less in entire terms than the critical value, we accept the alternative hypothesis of a unit root and get result wherey_t is in a stationarity procedure.

4.4.2. Augmented Dickey-Fuller (ADF)

In order to remove autocorrelation, Dickey and Fuller made addition in their test technique, proposed and augmented version of the test which contains further lagged terms of the explained variable, lag size on these additional terms is whether established by the Schwartz Bayesian Criterion (SBC) or Akaike Information Criterion (AIC), or further understandingly by the lag length essential in the error term. These equations can give the 3 imaginable themes of the Augmented Dickey Fuller process:

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=1}^{p} \beta_i \, \Delta y_{t-1} + \mu_t \quad \text{---------- (1.1)}$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=1}^{P} \beta_i \, \Delta y_{t-1} + \mu_t \quad \text{---------- (1.2)}$$

$$\Delta y_t = \alpha + \gamma y_{t-1} + \alpha_2 t + \sum_{i=1}^{P} \beta_i \, \Delta y_{t-1} + \mu_t \quad \text{---------- (1.3)}$$

Dissimilarity among these three regressions regards the presence of the deterministic basics α_0 and $\alpha_2 \, t$.

Hypotheses

H_0*:* Non-stationarity or Unit root present

H_1*:* Stationarity or Unit root does not exist

While t statistics is fewer than ADF critical value then we reject the alternative hypothesis. Which indicates unit-root presence, it means, non-stationary existence comes true. Hence taking first difference of these variables and restrain whether after enchanting firstly difference that becomes unit root free or not. Certainty of t statistics comes more than the critical value, then variable is unit root free, assent the alternate hypothesis which means stationarity could not exist.

4.5. Co-integration

Long run information can be accessed through co-integration. Idea of long run is ratified by the Granger in 1979 and Granger 1981, given tests and estimation method to evaluate the presence of long-run association among selected parameters within a dynamic measurement. Co-integration contains this stationary linear combination of variables which are discretely non-stationary but integrated to an order I (d). Long run idea is presented in econometrics that show the occurrence of equilibrium between selected economy time-series that come together over long time. Consequently, co-integration founds a stronger statistical and economic base for empirical Error Correction Model (ECM) that determine short run and long run results in selected variables. It is compulsory to examine the co-integration relationship to found a model empirically meaningful in the long run. If there comes no co-integration in selected variables, it becomes issues to carry on work with variables.

4.5.1. Autoregressive Distributed Lag Model (ARDL)

To address the above-mentioned problem study used the ARDL technique, established by Pesaran and Shin, 1995 and (Pesaran, Shin, & Smith, 1999) to characterize the effect of health estimates on GDP progress (Asteriou & Hall, 2007).

For simplicity let us assume ARDL (1, 1). The equation will be:

$$Y_t = \beta_0 X_t + \beta_1 X_{t-1} + \mu \quad \text{..... (1)}$$

Subtracting Y_{t-1} from both sides of the equation gives us:

$$\Delta Y_t = \beta_0 X_t + \beta_1 X_{t-1} + (\rho - 1) Y_{t-1} + \mu_t \quad \text{..... (2)}$$

By letting (ρ-1) = δ, following equation will become:

$$\Delta Y_t = \beta_0 X_t + \beta_1 X_{t-1} + \delta Y_{t-1} + \mu_{t-1} \quad \text{..... (3)}$$

$\Delta X_t = X_t - X_{t-1}$, Thus $X_t = \Delta X_t + X_{t-1}$

Substituting X_t into equation (3), we can write as:

$$\Delta Y_t = \beta_0 \Delta X_t + \beta_0 X_{t-1} + \beta_1 X_{t-1} + \delta Y_{t-1} + \mu_t$$

$$\Delta Y_t = \beta_0 \Delta X_t + (\beta_0 + \beta_1) X_{t-1} + \delta Y_{t-1} + \mu_t \quad \text{..... (4)}$$

Let $\Phi = \beta_0 + \beta_1$. This gives:

$$\Delta Y_t = \beta_0 \Delta X_t + \Phi X_{t-1} + \delta Y_{t-1} + \mu_t$$

$$\Delta Y_t = \beta_0 \Delta X_t + \delta Y_{t-1} + \Phi X_{t-1} + \mu_t$$

$$\Delta Y_t = \beta_0 \Delta X_t + [\delta Y_{t-1} + \Phi X_{t-1}] + \mu_t \quad \text{..... (5)}$$

Multiplying the term $[\delta Y_{t-1} + \Phi X_{t-1}]$ by $\frac{\delta}{\delta}$ will give us:

$$\Delta Y_t = \beta_0 \Delta X_t + \delta[Y_{t-1} + (\frac{\Phi}{\delta})X_{t-1}] + \mu_t \quad \text{..... (6)}$$

Thus, the error correction model can be written as:

$$\Delta Y_t = \beta_0 \Delta X_t + \delta[Y_{t-1} - \alpha X_{t-1}] + \mu_t \quad \text{..... (7)}$$

Where, $\alpha = -\left(\frac{\Phi}{\delta}\right) = -\frac{\beta_0+\beta_1}{\delta}$ and $\delta = (\rho - 1)$

Therefore we can write the error correction model in the following form:

$$\Delta Y_t = \beta_0 \Delta X_t + (\rho - 1)\left[Y_{t-1} - \left(\frac{\beta_0+\beta_1}{\rho-1}\right)X_{t-1}\right] + \mu_t$$

$$\Delta Y_t = \beta_0 \Delta X_t + \delta ECT_{t-1} + \mu_t \quad \text{..... (8)}$$

Where,$\delta = \rho - 1$ is the error correction parameter that measures the speed of adjustment.

$\left[Y_{t-1} - (\frac{\beta_0+\beta_1}{\delta})X_{t-1}\right] = ECT_{t-1}$ is the error correction lagged by one period.

Adding an intercept and time trend we can write our ECM model in the following form:

$$\Delta Y_t = c + \gamma_t + \beta_0 \Delta X_t + \delta ECT_{t-1} + \mu_t \quad \text{..... (9)}$$

Therefore, following the ARDL approach proposed by Pesaran and Shin (1997, 1999) and Pesaran, Shin and Smith (2001). The following model is specified in order to determine the long run co-integration relationships between variables.

$$\begin{aligned}\Delta LnPGDP_t = {} & \beta_0 + \lambda_1 LnPGDP_{t-1} + \lambda_2 LnHE_{t-1} + \lambda_3 LnGFCF_{t-1} + \lambda_4 LnTS_{t-1} \\ & + \lambda_5 LnGGE_{t-1} + \lambda_6 LnSSE_{t-1} + \beta_1 \sum_{i=1}^{n} \Delta LnPGDP_{t-i} + \beta_2 \sum_{i=0}^{n} \Delta LnHE_{t-i} \\ & + \beta_3 \sum_{i=0}^{n} \Delta LnGFCF_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta LnTS_{t-i} + \beta_5 \sum_{i=0}^{n} \Delta LnGGE_{t-i} \\ & + \beta_6 \sum_{i=0}^{n} \Delta LnSSE_{t-i} \\ & + e_t \quad \text{..... (10)}\end{aligned}$$

$$\Delta LnPGDP_t = \beta_0 + \lambda_1 LnPGDP_{t-1} + \lambda_2 LnIMR_{t-1} + \lambda_3 LnGFCF_{t-1} + \lambda_4 LnTS_{t-1} + \lambda_5 LnGGE_{t-1} + \lambda_6 LnSSE_{t-1} + \beta_1 \sum_{i=1}^{n} \Delta LnPGDP_{t-i} + \beta_2 \sum_{i=0}^{n} \Delta LnIMR_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta LnGFCF_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta LnTS_{t-i} + \beta_5 \sum_{i=0}^{n} \Delta LnGGE_{t-i} + \beta_6 \sum_{i=0}^{n} \Delta LnSSE_{t-i} + e_t \ldots \ldots (11)$$

$$\Delta LnPGDP_t = \beta_0 + \lambda_1 LnPGDP_{t-1} + \lambda_2 LnLE_{t-1} + \lambda_3 LnGFCF_{t-1} + \lambda_4 LnTS_{t-1} + \lambda_5 LnGGE_{t-1} + \lambda_6 LnSSE_{t-1} + \beta_1 \sum_{i=1}^{n} \Delta LnPGDP_{t-i} + \beta_2 \sum_{i=0}^{n} \Delta LnLE_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta LnGFCF_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta LnTS_{t-i} + \beta_5 \sum_{i=0}^{n} \Delta LnGGE_{t-i} + \beta_6 \sum_{i=0}^{n} \Delta LnSSE_{t-i} + e_t \ldots \ldots (12)$$

$\lambda_{1,} \lambda_2, \lambda_3, \lambda_4, \lambda_5$ and λ_6 are the coefficients that measures long run relationships.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the coefficients that measures short run relationships.

e_t is an error term and n denotes lag length of the auto regressive process.

t is the time trend of the model.

To test whether there is a long run equilibrium relationship between the variables; bounds test for co-integration is carried out as proposed by Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001). The hypothesis are shown below:

H_0: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0$. That means there is no long run relationship among the variables.

H_1: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 \neq 0$. That means there is a long run relationship among the variables.

The F-statistics is used to test the above hypothesis. The critical values of the F-statistics for this test are available in Pesaran, Shin and Smith (2001). They provide two sets of critical values namely the upper bound values and the lower bound values. If the computed F-statistics is higher than the appropriate upper bound of the critical value, the null hypothesis of no co-integration will be rejected. If it is below the appropriate lower bound, the null hypothesis cannot be rejected, and if it lies within the lower and upper bounds, the results would be inconclusive.

The next step is to estimate the error correction model that indicate the short run dynamic parameters (adjustment parameters that measures the speed of correction to long run equilibrium after a short run disturbance). The standard ECM is as follows:

$$\Delta LnPGDP_t = \beta_0 + \beta_1 \sum_{i=1}^{a} \Delta LnPGDP_{t-i} + \beta_2 \sum_{i=0}^{b} \Delta LnHE_{t-i} + \beta_3 \sum_{i=0}^{d} \Delta LnGFCF_{t-i} + \beta_4 \sum_{i=0}^{e} \Delta LnTS_{t-i} + \beta_5 \sum_{i=0}^{f} \Delta LnGGE_{t-i} + \beta_6 \sum_{i=0}^{c} \Delta LnSSE_{t-i} + \delta ECT_{t-1} + \mu_t \ldots \ldots (13)$$

$$\Delta LnPGDP_t = \beta_0 + \beta_1 \sum_{i=1}^{a} \Delta LnPGDP_{t-i} + \beta_2 \sum_{i=0}^{b} \Delta LnIMR_{t-i} + \beta_3 \sum_{i=0}^{d} \Delta LnGFCF_{t-i} + \beta_4 \sum_{i=0}^{e} \Delta LnTS_{t-i} + \beta_5 \sum_{i=0}^{f} \Delta LnGGE_{t-i} + \beta_6 \sum_{i=0}^{c} \Delta LnSSE_{t-i} + \delta ECT_{t-1} + \mu_t \ldots \ldots (14)$$

$$\Delta LnPGDP_t = \beta_0 + \beta_1 \sum_{i=1}^{a} \Delta LnPGDP_{t-i} + \beta_2 \sum_{i=0}^{b} \Delta LnLE_{t-i} + \beta_3 \sum_{i=0}^{d} \Delta LnGFCF_{t-i} + \beta_4 \sum_{i=0}^{e} \Delta LnTS_{t-i} + \beta_5 \sum_{i=0}^{f} \Delta LnGGE_{t-i} + \beta_6 \sum_{i=0}^{c} \Delta LnSSE_{t-i} + \delta ECT_{t-1} + \mu_t \ldots \ldots (15)$$

$H_1: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 \; and \; \beta_6$.. Coefficients represents the short run dynamics of the model.

ECT_{t-1} represents the error correction term lagged by one period. The error correction term is derived from the corresponding long run model whose coefficients are obtained by normalizing the equation.

4.6. Conclusion

Firstly, in this chapter we apply Augmented Dickey Fuller (ADF) to check the stationarity of the variables. After verification of stationarity, the second step is to check the co integration with the help of ARDL short run and long run. Various diagnostic tests are used to check the stability of the model in short run and long run.

CHAPTER 5

EMPIRICAL RESULTS

5.1. Introduction

Current section describes empirical results and their interpretation. Time series data set is used in the study. It is the basic requirements to assess stationarity of each variable. Engle and Granger (1987) is used to proposed that if the time series data does not become stationary at that point the basic assumption of null hypothesis is accepted, the results of the test will be spurious. Literature of the different studies proposed different significant and proficient approaches to deal with non-stationary and spurious results (Gujarati & Porter, 2009). The results of different variables fulfill the requirement of Autoregressive Distributed Lag Model. Thus current study completes the requisite conditions of ARDL model. For empirical findings, E-views 9 is used in the study.

After completing the estimations, Cumulative Sum of Recursive Residual and CUSUM SQ techniques were accomplished for keen-sighting the stability in constructed model. This test is cogitating apt for model's stability. Sometimes structural break-out occurs, this test make easy its understanding.

The framework of prevailing part is premeditated in this way: Section 5.1 shows introduction, Section 5.2 Presents the summary of descriptive statistics, Section 5.3 Presents the Correlation Matrix, Section 5.4 depicts the results of ADF Unit root test results, section 5.5 represents the Optimal Lag Length Criterion, Section 5.6 considers the co-integration between health and economic growth and short run relationship. Last section 5.7 of this chapter consists of diagnostic tests.

5.2. Correlation Matrix

Correlation matrix tells about the relationship among the variables pair wise. It is used in the present study. Correlation matrix express the strong association in all variables. Coefficient of correlation matrix illustrates the correlation of variable but sign represents the direction of the correlation concerning the variables. Table 5.1 shows the result of the correlation.

Table 5.1. Correlation Matrix

	lnPGDP	lnHE	lnIMR	lnLE	lnGGE	lnGFCF	lnTS	lnSSE
lnPGDP	1							
LnHE	0.2077*	1						
lnIMR	-0.248*	0.152*	1					
LnLE	0.1363*	-0.070*	0.1464*	1				
lnGFCF	0.4932*	0.2055*	0.251***	-0.2*	1			
LnTS	0.5075*	-0.094*	0.1485*	0.327*	-0.01*	1		
LnGGE	0.2184*	0.3123*	0.1782*	-0.28*	0.258	0.0335	1	
lnSSE	0.2165*	0.1829*	0.0320*	-0.25*	-0.006	-0.0966	0.258	1

*Source: Estimated by author, using E-views 9 version. * (**) *** point out that reject the null hypothesis at 1%, 5% and 10%.*

Correlation matrix demonstrates the association and strength of association between the variables. Coefficients depict the connection of the variables. However sign shows the way of the association among the variables. Table 5.1 portrays all the association between variables. The diagonal matrix tells about the relationship of a variable with itself. The upper correlation matrix table depicts that there is a positive and negative like feeble and strong association between the variables. It is found; there transpire a positive association amongst health expenditure and economic growth. Infant mortality rate has inverse relationship with economic growth. While infant mortality rate has positive relationship with health expenditure. Life expectancy, secondary school enrollment gross fixed capital formation, trade and general government expenditure have positive relationship with economic growth. Infant mortality rate, secondary school enrollment, gross fixed capital formation and general government expenditure have positive relationship with health expenditure. But life expectancy and trade volume have negative relationship with economic growth. Life expectancy, secondary school enrollment, gross fixed capital formation, trade volume and general government expenditure have positive relationship with infant mortality rate.

5.3. Descriptive Analysis

Descriptive exploration of eight variables employed in research is show in Table 5.2. This result is attained by the E-views 9 version. It depicts the measures of all the variables. Descriptive analysis is used to examine the data quantitatively. The statistics represent the mean values of the data and mean values of the earlier trend in the variables. Descriptive analysis makes it easy for the examiner to calculate the trend of the variables. Normal data cannot present the complete understanding about the trend values. Descriptive analysis makes

data more accurate in understanding. Descriptive analysis used in this study is presented in Table 5.2.

Table 5.2. Statistical Analysis of Selected Variables

	lnGDP	lnHE	lnIMR	lnLE	lnGFCF	lnTS	lnGGE	LnSSE
Mean	6.72	-0.38	4.51	4.13	2.78	1.92	2.40	3.26
Median	6.72	-0.32	4.52	4.13	2.81	1.89	2.38	3.28
Maximum	7.04	0.2	4.80	4.19	2.96	2.33	2.82	3.80
Minimum	6.32	-1.47	4.19	4.04	2.53	1.55	2.05	2.83
Std. Dev.	0.20	0.33	0.19	0.05	0.11	0.19	0.19	0.27
Probability	0.46	0.00	0.270.30	0.35	0.16	0.51	0.88	0.50
Sample	37	37	37	37	37	37	37	37

Data for the time series is implied for this study from 1980 to 2016. Whole data set contains thirty seven observations. The standard deviation is a rate that is utilized to measure the amount of difference of a set of data. The statistical mean refers to the mean or average that is used to derive the central tendency of the data. The mean is also used to calculate the standard deviation. All variables mean are oscillating from -0.38 to 6.72. The analysis depicts the mean of gross domestic product per capita ratio is 6.72, with a smallest value of 6.32 and a supreme value of 7.04. Then health expenditure as percentage of GDP per capita mean value -0.38, while smallest and supreme values are -1.47 and 0.2 respectively. Life expectancy mean value 4.13 yet least and extreme values are respectively 4.04 and 4.19. Infant mortality rate mean value is 4.52 while minimum and maximum values are 4.19 and 4.80 respectively. Mean value of secondary school enrollment is 3.26, while smallest and greater standards are in range of 2.83 and 3.80 respectively. Mean value of trade is 1.92, lower and higher values are 1.55 and 2.33. Mean value of government expenditure is 2.40, while its highest and lowest values are 2.05 and 2.82. The average, minimum and highest values of gross fixed capital formation are 2.78, 2.53 and 2.95.

5.4. Results of Unit Root Test

Primary aim of the investigation of unit root is to test stationarity. Either unit root is present in selected variables or not? Thus, these stationarity decide the technique which apply in the study and to determine long run relationship. ADF test is used on preference basis for it.

Table 5.3. Unit Root Test

Variables	T-Statistic	Critical Value	P-Value	Integrated Order
PGDP	-3.289564	-2.948404	0.0231**	I(1)
HE	-3.78238	-3.544284	0.0296**	I(0)
IMR	-16.6984	-1.950394	0.0000*	I(0)
LE	-5.22757	-5.227571	0.0008*	I(0)
GFCF	-5.321071	-1.950687	0.0000*	I(1)
TS	-4.0052	-2.9810	0050*	I(0)
GGE	-4.7737	-1.9506	0.0000*	I(1)
SSE	-4.6117	-1.9506	0.0000*	I(1)

, **, * illustrates acceptance of alternative hypothesis, 1, 5 and 10 percent significant levels consistently. These measurements of "ADF" are established on the Schwarz Information Criterion (SIC). Results are occupied, using the E-views version, 9.*

Few other tests are also usable in E-views 9 version for Stationarity: (Phillips & Perron, 1988), Point Optimal and Ng-Perron (1995) and Elliott-Rothenberg-Stock (1996). But ADF test is common to check as stationary test. In the Augmented Dickey Fuller test for unit root, null hypothesis indicates that variables would have unit root on level, with intercept and trend and with none. If null cannot reject at this level. Then, there is another option to make variables stationary that is to take variables with 1st difference and null hypothesis rejection occurred only if calculated value come greater than critical values. Table 5.3 indicates that GDP has unit root at level. It becomes stationary at first difference. Health expenditure, infant mortality rate and life expectancy are stationary at level. Trade volume is stationary at level. While secondary school enrollment, grass fixed capital formation and general government expenditure are also stationary at first difference.

As some variables are unit root free or stationary at first difference I(1) at same integration level and some explanatory variables are stationary of unit root free at level I (0). Findings of unit root are mix so majority of time series data analyst agree that appropriate technique is ARDL.

5.5. Optimal Lag Length

Lag length criteria often used to avoid serial correlation issue. The study used annual time series data based on Akaike Information Criterion. Results are shown in the Table 5.4, optimal lag would be 3. Most often Akaike Info Criterion (AIC) and Schwarz Criterion are used but in this study we used AIC because it is good for such kinds of data sets.

Table 5.4. Statistics of Lag Order Selection Criteria

Lag	Log-L	LR	FPE	AIC	SC	HQ
0	347.6636	NA	1.58e-19	-20.58567	-20.22288	-20.4636
1	571.0427	324.9151	1.13e-23	-30.24501	-26.97991	-29.1464
2	676.7481	102.5022	1.93e-24	-35.77261	-26.60519	-30.6974
3	900.2511	108.3651*	2.13e-27*	-42.43946*	-33.36972*	-39.387*

* Shows lag order taken by various criterions

5.6. ARDL Bound Test for Co-integration

There are number of studies which explored the existence of long-run relationship among economic variables. Bounds test estimated result are given in the Table 5.5.

Table 5.5. Bounds Test for Co-integration Analysis (Infant Mortality Rate)

K	95% Level		90% Level		F-Statistic
	Upper bound	Lower bound	Upper bound	Lower bound	
5	3.79	2.62	3.35	2.26	5.2409

Above the Table 5.5 presents the calculated F-statistic to take best lag length in illustrative test. Upper and lower bound values are 3.79 and 2.66 one-to-one by Pesaran et al. (2001) at 95% level. Calculated values are presented in above table which is 5.2409 which is higher than both smaller and larger value at 95 percent and 90 percent. It certifies the rejection of null hypothesis theory. So, summarization comes in favor long-haul association present in variables.

Table 5.6. Bounds Test for Co-integration Analysis (Life Expectancy)

K	95% Level		90% Level		F-Statistic
	Upper bound	Lower bound	Upper bound	Lower bound	
5	4.25	3.12	3.79	2.75	5.0486

Above the Table 5.6 presents the calculated F-statistic to take best lag length in typical test. Upper and lower bound values are 4.25 and 3.12 one-to-one by Pesaran, et al. (2001) at 90% level. Computed values are shown in above table which is 5.0486 which is higher than smaller and greater value at 95 percent and 90 percent. It justifies the rejection of null

hypothesis theory. So, summarization comes in favor long-haul association in chosen variables. It means that co-integration exist.

Table 5.7. Results of F-Statistic for Testing the Existence of Long-run Relationship (Health Expenditure)

K	95% Level		90% Level		F-Statistic
	Upper bound	Lower bound	Upper bound	Lower bound	
5	4.25	3.12	3.79	2.75	5.4516

K represents the regressors however F-statistic and its extreme bonds are displays in table. Test becomes inconclusive when F-statistic values come between lower and upper bound limit. But greater F-statistic value from both of these values means accept the alternative hypothesis. But less than critical bound value means, cannot reject null hypothesis.

Above the Table 5.7 shows the calculated F-statistic to take best lag length in estimated test. Upper and lower bound values are 4.25 and 3.12 one-to-one by Pesaran et al. (2001) at 95% level. Computed values are shown in above table which is 5.4516 which is higher than both lesser and greater value at 95 percent and 90 percent. It justifies the rejection of null hypothesis theory. So, summarization comes in favor long-run relationship in selected variables.

Table 5.8. Long Run Results (Infant Mortality Rate)

Regressors	Coefficient	Standard Error	t-Ratio	Probability
LNIMR	-0.0503	0.1005	-10.4431	0.0000
LNGFCF	0.1630	0.0749	2.1749	0.0382
LNTS	0.0850	0.0322	2.6389	0.0134
LNGGE	0.0802	0.0378	2.1190	0.0431
LNSSE	0.0435	0.0553	0.7858	0.4386
C	10.5352	0.04938	21.3368	0.0000

** (**) *** represent significance at 1, 5 and 10 percentages level correspondingly.*

There exist a negative relationship between infant mortality rate and economic growth. Negative sign indicates inverse relationship. The infant mortality rate variable is highly significant at 1% level. It means that 1 percent increase in infant mortality will decrease GDP by 5 percent. It is an important variable of health status. This result is similar with that given by Khan, et al. (2008) and Afridi, et al. (2016) in Pakistan. Result shows that increasing infant mortality rate will decrease the economic growth in long run. Falling infant mortality

rate has important implication for the economic growth. Less infant mortality rate affect mother's health positively and she will contribute efficiently in productivity.

Gross fixed capital formation has positive relationship with economic growth. This variable is significant at ten percent level. Coefficient shows that one percent increase in gross fixed capital formation leads to 16.3 percent increase in GDP. Akram, et al. (2008) and Ali, et al. (2017) have found that investment or gross fixed capital formation has been an important driver of economic growth in Pakistan. More so, gross fixed capital formation leads to technical progress in an economy thereby promoting the benefits associated with large scale production and increase specialization within the economy. Furthermore, when capital formation leads to adequate exploitation of natural resources and the establishment of different types of industries, level of incomes increase permitting the numerous wants of people to be satisfied. Thus promotes economic welfare of citizens and acts as an indicator of economic development.

Another important determinant of economic growth is volume of trade. Volume of trade has positive relationship with economic growth. This indicator is significant at 5 percent level. One percent increase in volume of trade will cover 8.5 percent increase in GDP. Arthur (2015) and Boachie, et al. (2015) found that volume of trade is significant contributor to economic growth in developing countries. Volume of trade has positive effect via lower consumer prices and increased availability of products.

General government expenditure has positive relationship with economic growth in long run. This variable is significant at 5 percent level. Coefficient shows that one percent increase in general government expenditure increase economic growth to 8 percent. Government expenditure constitutes a significant proportion of national income and changes in the direction of expenditure can have an extensive effect on the real incomes of the lowest income groups consequently the poor. Increase the consumption of specific goods and services of the poor in the society has the capacity of transferring and redistributing income.

Secondary school enrollment has positive and insignificant relationship with economic growth. This could be attributed to brain drain. Most educated people leave the country after their education to seek greener pastures abroad and thus leaving less number of skilled labor for productive activities, hence the low growth effect of education is observed. Another effect that may also make this variable insignificant is the low investment by the government in education. Result revealed that one percent increase in secondary school enrollment will

increase economic growth by 4.35 percent. The findings of this research concerning the long run positive impact of the education and health are consistent with the endogenous growth theories. Which argue that improvement in human capital leads to productivity improvement that enhances the output level. The findings of this research is also similar to the finding of Akram, et al. (2008).

Table 5.9. Long Run Results (Life Expectancy)

Regressors	Coefficient	Standard Error	t-Ratio	Probability
LNLE	0.9652	0.5527	1.7464	0.0969
LNGFCF	0.0874	0.0508	1.7216	0.1014
LNTS	0.0343	0.0159	2.1638	0.0434
LNGGE	0.0388	0.0222	1.7459	0.0970
LNSSE	0.0807	0.0281	2.8686	0.0098
C	1.8159	2.2404	0.8105	0.4277

Life expectancy has positive and significant relationship with economic growth. Coefficient indicates that increasing life expectancy by a year increase the productivity of workers and that boosts economic growth by 0.9652 unit in the long run. An increase in life expectancy may have positive or negative effects on per capita economic growth. On the one hand it may increase the productivity of available resources, e.g., by improving health of workers. On the other hand, higher life expectancy may to an increase in population that may depress per capita economic growth.

Gross fixed capital formation has positive relationship with economic growth. Coefficient shows that one percent increase in gross fixed capital formation leads to 8.74 percent increase in GDP. Akram, et al. (2008) and Ali, et al. (2017) found that investment or gross fixed capital formation has been an important driver of economic growth in Pakistan. The result of this variable is similar with Arshad and Munir (2015). More so, gross fixed capital formation leads to technical progress in an economy thereby promoting the benefits associated with large scale production and increase specialization within the economy. Furthermore, when capital formation leads to adequate exploitation of natural resources and the establishment of different types of industries, level of incomes increase permitting the numerous wants of people to be satisfied. Thus promotes economic welfare of citizens and acts as an indicator of economic development.

Another important determinant of economic growth is volume of trade. Volume of trade has positive relationship with economic growth. This indicator is significant on 5 percent level. One percent increase in volume of trade will increase 3.43 percent in GDP. Arthur (2015) and Boachie, et al. (2015) found that volume of trade is significant contributor to economic growth in developing countries. Volume of trade has positive effect via lower consumer prices and increased availability of products.

General government final expenditure on purchases of goods and services has positive relationship with economic growth in long run. This variable is significant at ten percent level. Coefficient shows that one percent increase in general government expenditure increase economic growth to 3.88 percent. Government expenditure constitutes a significant proportion of national income and changes in the direction of expenditure can have an extensive effect on the real incomes of the lowest income groups consequently the poor. Increase the consumption of specific goods and services of the poor in the society has the capacity of transferring and redistributing income.

Secondary school enrollment has positive and significant relationship with economic growth. This variable is highly significant at one percent level. Result revealed that one percent increase in secondary school enrollment will increase economic growth to 8.07 percent. The findings of this research concerning the long run positive impact of the education and is consistent with the endogenous growth theories which argue that improvement in human capital leads to productivity improvement that enhances the output level. The findings of this research is similar to the finding of Akram, et al. (2008).

Table 5.10. Long Run Results (Health Expenditure)

Regressors	Coefficient	Standard Error	t-Ratio	Probability
LNHE	0.0093	0.0150	0.6213	0.5396
LNGFCF	0.1533	0.0546	2.8049	0.0092
LNTS	0.0586	0.0256	2.2869	0.0303
LNGGE	0.0587	0.0295	1.9899	0.0568
LNSSE	0.0490	0.0360	1.3631	0.1841
C	5.5583	0.1543	36.0217	0.0000

** (**) *** represent significance at 1, 5 and 10 percentages level correspondingly.*

Health expenditure has positive relationship with economic growth. Health expenditure as percentage of GDP with probability value 0.5396 explains that it is not significant. There may be two effects. One is that the increase health expenditure may increase economic growth. Secondly, if the health expenditure is not properly allocated to provide health services to the people, it may inversely effect the economic growth. These two effect cancel each other and the resulting effect may be though positive but insignificant. Result reveals that one percent increase in health expenditure leads to 0.93 percent increase in economic growth. This result is relevant with Khan, et al. (2008) and George, et al. (2013). They described that including health expenditure in the model enhances insignificant but positive relationship with economic growth. Musgrove (1996) concluded that health expenditure is not significant in ascertain GDP per capita in developing countries.

Gross fixed capital formation has positive relationship with economic growth. This variable is highly significant on one percent level. Coefficient shows that one percent increase in gross fixed capital formation leads to 15.33 percent increase in GDP. Akram, et al. (2008) and Ali, et al. (2017) have found that investment or gross fixed capital formation has been an important driver of economic growth in Pakistan. More so, gross fixed capital formation leads to technical progress in an economy thereby promoting the benefits associated with large scale production and increase specialization within the economy. Furthermore, when capital formation leads to adequate exploitation of natural resources and the establishment of different types of industries, level of incomes increase permitting the numerous wants of people to be satisfied. Thus promotes economic welfare of citizens and acts as an indicator of economic development.

Another important determinant of economic growth is volume of trade. Volume of trade has positive relationship with economic growth. This indicator is significant at 5 percent level. One percent increase in volume of trade will increase 5.86 percent in GDP. Arthur (2015) and Boachie, et al. (2015) found that volume of trade is significant contributor to economic growth in developing countries. Volume of trade has positive effect via lower consumer prices and increased availability of products.

General government expenditure has positive relationship with economic growth in long run. This variable is significant at ten percent level. Coefficient shows that one percent increase in general government expenditure increase economic growth to 5.87 percent. Government expenditure constitutes a significant proportion of national income and changes in the

direction of expenditure can have an extensive effect on the real incomes of the lowest income groups consequently the poor. Increase the consumption of specific goods and services of the poor in the society has the capacity of transferring and redistributing income.

Secondary school enrollment has positive but insignificant relationship with economic growth. This variable is insignificant. This could be attributed to brain drain. Most educated people leave the country after their education to seek greener pastures abroad and thus leaving less number of skilled labor for productive activities, hence the low growth effect of education. Another effect that may also make this variable insignificant is the low investment by the government in education. Result revealed that one percent increase in secondary school enrollment increase will increase economic growth to 4.9. The findings of this research is also similar to the finding of Akram, et al. (2008).

Table 5.11. Short Run Results (Infant Mortality Rate)

Regressors	Coefficient	Standard Error	t-Ratio	Probability
D(LNPGDP(-1))	-0.1381	0.2169	-0.6368	0.5338
D(LNPGDP(-2))	-0.3265	0.2113	-1.5450	0.1432
D(LNPGDP(-3))	-0.3801	0.1938	-1.9619	0.0686
D(LNIMR)	-0.5525	0.1243	-4.4449	0.0001
D(LNIMR(-1))	-0.0919	0.4117	-0.2231	0.8265
D(LNIMR(-2))	0.8833	0.4167	2.1195	0.0511
D(LNGFCF)	0.0857	0.0451	1.9007	0.677
D(LNGFCF(-1))	0.0171	0.0488	0.03499	0.7313
D(LNGFCF(-2))	0.1945	0.0531	3.6601	0.0023
D(LNTS)	0.0446	0.0163	2.7373	0.0106
D(LNGGE)	0.042	0.0224	1.8831	0.0701
D(LNSSE)	0.0229	0.0306	0.7469	0.4614
LNSSE(-1)	-0.0059	0.0360	-0.1625	0.8731
LNSSE(-2)	-0.1215	0.0338	-3.5953	0.0027
CointEq(-1)	-0.526	0.1094	-4.8047	0.0000

** (**) *** indicated at 1%, 5% and 10% significance level correspondingly. Δ is the lag operative. Lag extent particular constructed on AIC criteria.*

Infant mortality rate has highly significant but negative relationship with economic growth. Coefficient of this variable is -0.5525. Negative sign indicates the inverse relationship of

IMR with gross domestic product per capita. It means that 1 percent increase in infant mortality rate will decrease to 55.25 percent in GDP. Result shows that increasing infant mortality rate will decrease the economic growth in short run. Falling infant mortality rate has important implication for the economic growth. Less infant mortality rate affect mother's health positively and she will contribute efficiently in productivity.

Gross fixed capital formation has positive relationship with economic growth. This variable is not significant. Coefficient shows that one percent increase in gross fixed capital formation leads to 8.57 percent increase in GDP. Akram, et al. (2008) and Ali, et al. (2017) have found that investment or gross fixed capital formation has been an important driver of economic growth in Pakistan. More so, gross fixed capital formation leads to technical progress in an economy thereby promoting the benefits associated with large scale production and increase specialization within the economy. Furthermore, when capital formation leads to adequate exploitation of natural resources and the establishment of different types of industries, level of incomes increase permitting the numerous wants of people to be satisfied. Thus promotes economic welfare of citizens and acts as an indicator of economic development.

Another important determinant of economic growth is volume of trade. Volume of trade has positive relationship with economic growth. This indicator is highly significant at 1 percent level. One percent increase in volume of trade will increase economic growth by 4.46 percent. Arthur (2015) and Boachie, et al. (2015) found that volume of trade is significant contributor to economic growth in developing countries. Volume of trade has positive effect via lower consumer prices and increased availability of products.

General government expenditure on final goods and services has positive relationship with economic growth in long run. This variable is significant on ten percent level. Coefficient shows that one percent increase in general government expenditure increase economic growth to 4.2 percent. Government expenditure constitutes a significant proportion of national income and changes in the direction of expenditure can have an extensive effect on the real incomes of the lowest income groups consequently the poor. Increase the consumption of specific goods and services of the poor in the society has the capacity of transferring and redistributing income.

Secondary school enrollment has positive and insignificant relationship with economic growth. Our variable is insignificant. This could be attributed to brain drain. Most educated people leave the country after their education to seek greener pastures abroad and thus

leaving less number of skilled labor for productive activities, hence the low growth effect of education. Another effect that may also make this variable insignificant is the low investment by the government in education. Result revealed that one percent increase in secondary school enrollment increase will increase economic growth by 2.29 percent. The findings of this research concerning the long run positive impact of the education and health are consistent with the endogenous growth theories which argue that improvement in human capital leads to productivity improvement that enhances the output level. The findings of this research is also similar to the finding of Akram, et al. (2008).

Table 5.12. Short Run Results (Life Expectancy)

Regressors	Coefficient	Standard Error	t-Ratio	Probability
D(LNPGDP(-1))	0.2087	0.1462	1.4273	0.1669
D(LNPGDP(-2))	0.3129	0.1929	1.6224	0.1183
D(LNLE)	0.9470	0.5646	1.6774	0.1098
D(LNGFCF)	0.0857	0.0568	1.5093	0.1477
D(LNTS)	0.0337	0.0.0146	2.3098	0.0323
D(LNGGE)	0.0381	0.0238	1.5969	0.1268
D(SSE)	0.0792	0.0319	2.4859	0.0224
CointEq(-1)	-0.9811	0.1716	-5.71669	0.0000

Table 5.12 shows the results of error correction representation of the selected ARDL model. The estimated result shows that estimated lagged error correction term is negative and significant, suggesting that error correction is happening in the model. The coefficient of Error Correction term is -0.9811, suggesting that approximately 98% of disequilibrium in previous year is corrected in the current year.

Life expectancy has insignificant relationship with economic growth. Coefficient shows the positive relationship between life expectancy and economic growth in short run. The variable is insignificant. It may be due to the two reasons. On one hand life expectancy increases the longevity of working age population would increase the economic growth. The other effect is that the productivity of working age population may decrease with age. These two effect cancel each other and the resulting effect may be though positive but insignificant. Coefficient indicates that increasing life expectancy by a year increase the productivity of workers and that boosts economic growth by 94.7 unit in the short run.

Gross fixed capital formation has positive relationship with economic growth. This variable is insignificant. Coefficient shows that one percent increase in gross fixed capital formation leads to 5.57 percent increase in GDP. Akram, et al. (2008) and Ali, et al. (2017) have found that investment or gross fixed capital formation has been an important driver of economic growth in Pakistan. More so, gross fixed capital formation leads to technical progress in an economy thereby promoting the benefits associated with large scale production and increase specialization within the economy. Furthermore, when capital formation leads to adequate exploitation of natural resources and the establishment of different types of industries, level of incomes increase permitting the numerous wants of people to be satisfied. Thus promotes economic welfare of citizens and acts as an indicator of economic development.

Another important determinant of economic growth is volume of trade. Volume of trade has positive relationship with economic growth. This indicator is significant at 5 percent level. One percent increase in trade volume will increase 3.23 percent in GDP. Arthur (2015) and Boachie, et al. (2015) found that trade volume is significant contributor to economic growth in developing countries. Volume of trade has positive effect via lower consumer prices and increased availability of products.

General government expenditure has positive relationship with economic growth in short run. This variable is not significant. Coefficient shows that one percent increase in general government expenditure increase economic growth to 3.81 percent. Government expenditure constitutes a significant proportion of national income and changes in the direction of expenditure can have an extensive effect on the real incomes of the lowest income groups consequently the poor. Increase the consumption of specific goods and services of the poor in the society has the capacity of transferring and redistributing income.

Secondary school enrollment has positive and significant relationship with economic growth. Result revealed that one percent increase in secondary school enrollment increase will increase economic growth by 0.792 percent. The findings of this research concerning the long run positive impact of the education is consistent with the endogenous growth theories which argue that improvement in human capital leads to productivity improvement that enhances the output level. The findings of this research is also similar to the finding of Akram, et al. (2008).

Table 5.13. Short Run Results (Health Expenditure)

Regressors	Coefficient	Standard Error	t-Ratio	Probability
D(LNGDP(-1))	0.1212	0.2118	0.5727	0.5783
D(LNGDP(-2))	0.1913	0.1638	1.1675	0.2677
D(LNGDP(-3))	0.1783	0.1459	1.2218	0.2473
D(LNHE)	0.0070	0.0105	0.6636	0.5126
D(LNHE(-1))	0.0457	0.0139	3.2655	0.0075
D(LNHE(-2))	0.0259	0.0129	2.0056	0.0701
D(LNGFCF)	0.1153	0.0549	2.1023	0.0450
D(LNTS)	0.0442	0.0163	2.6995	0.0118
D(LNTS(-1))	0.0495	0.0199	2.4785	0.0307
D(LNTS(-2))	0.0502	0.0247	2.0357	0.0666
D(LNGGE)	0.0143	0.0274	1.6104	0.1189
D(SSE)	0.0369	0.0287	1.2863	0.2093
D(LNSSE(-1))	0.1273	0.0366	3.4719	0.0056
D(LNSSE(-2))	0.0731	0.0477	1.5321	0.1537
CointEq(-1)	-0.7524	0.1587	-4.7403	0.0001

** (**) *** indicated at 1%, 5% and 10% significance level correspondingly. Δ is the lag operative. Lag extent particular constructed on AIC criteria.*

Table 5.13 shows the results of error correction representation of the selected ARDL model. The estimated result shows that estimated lagged error correction term is negative and significant, suggesting that error correction is happening in the model. The coefficient of Error Correction term is -0.7524, suggesting that approximately 75% of disequilibrium in previous is corrected in the current year.

Health expenditure has not significant but positive relationship with economic growth. This result shows that as public health expenditures are very little so they fails to put a significant impact on economic growth. It means that 1 percent increase in health expenditure will increase to 0.7 percent GDP in short run. Health expenditure has little effect on economic growth in short run. There may be two effects. One is that the increase health expenditure may increase economic growth. Secondly, if the health expenditure is not properly allocated to provide health services to the people, it may inversely effect the economic growth. These two effect cancel each other and the resulting effect may be though positive but insignificant.

Gross fixed capital formation has positive relationship with economic growth. This variable is significant on 5 percent level. Coefficient shows that one percent increase in gross fixed capital formation leads to 11.153 percent increase in GDP. Akram, et al. (2008) and Ali, et al. (2017) have found that investment or gross fixed capital formation has been an important driver of economic growth in Pakistan. More so, gross fixed capital formation leads to technical progress in an economy thereby promoting the benefits associated with large scale production and increase specialization within the economy. Furthermore, when capital formation leads to adequate exploitation of natural resources and the establishment of different types of industries, level of incomes increase permitting the numerous wants of people to be satisfied. Thus promotes economic welfare of citizens and acts as an indicator of economic development.

Another important determinant of economic growth is volume of trade. Volume of trade has positive relationship with economic growth. This indicator is significant on 5 percent level. One percent increase in volume of trade will increase 4.42 percent in GDP. Arthur (2015) and Boachie, et al. (2015) found that trade volume is significant contributor to economic growth in developing countries. Volume of trade has positive effect via lower consumer prices and increased availability of products.

General government expenditure has positive relationship with economic growth in short run. This variable is insignificant. Coefficient shows that one percent increase in general government expenditure increase economic growth to 1.43 percent. Government expenditure constitutes a significant proportion of national income and changes in the direction of expenditure can have an extensive effect on the real incomes of the lowest income groups consequently the poor. Increase the consumption of specific goods and services of the poor in the society has the capacity of transferring and redistributing income.

Secondary school enrollment has positive and insignificant relationship with economic growth. Our variable is insignificant. This could be attributed to brain drain. Most educated people leave the country after their education to seek greener pastures abroad and thus leaving less number of skilled labor for productive activities, hence the low growth effect of education. Another effect that may also make this variable insignificant is the low investment by the government in education. Result revealed that one percent increase in secondary school enrollment increase will increase economic growth by 3.69 percent. The findings of this research concerning the long run positive impact of the education and health are

consistent with the endogenous growth theories which argue that improvement in human capital leads to productivity improvement that enhances the output level. The findings of this research is also similar to the finding of Akram, et al. (2008).

5.7. Diagnostic Tests

To verify the assessed long-run fundamentally diagnostic tests are undertaken. The testified results in table 5.14 shows no auto correlation. Hence relationship between the variables are verifiable or valid.

Table 5.14. Diagnostic Tests

Breusch-Godfrey Serial Correlation LM Test			
F Statistic	0.5046	Prob. F (2, 16)	0.6130
Obs* R-squared	2.0175	Pro Chi Square (2)	0.3647
Heteroskedasticity Test: ARCH			
F Statistic	0.0754	Prob. F (1, 31)	0.7855
Obs* R-squared	0.0801	Pro Chi Square (1)	0.7772
Normality Test			
Jarque-Bera	0.9323	Probability	0.6274

Source: Authors calculation

The diagnosis test is carried out to check for the problems of serial correlation, Heteroscadcity and normality. The validity of the parameter estimated is supported from diagnostic test that there is no heteroscadcity and serial correlation. Errors are normally distributed. Hence, the relationship between the variables is verifiable or valid.

The study based on time series data diagnostic test for auto correlation. However it demonstrates the table value of F-statistics at on fraction and the probability rate i.e. 0.6130 is larger than 0.05. Consequently, study accord alternative hypothesis which states auto correlation is not present in current work (Wooldridge, 2010). Study confirms the above test results. Primary variables of study are health expenditure as percentage of GDP, infant mortality rate and life expectancy.

5.7.2 Stability Test

This test is thought to be better and very appropriate for time series data as it can be used even if we are assured about the structural change that might have happened. CUSUM and CUSUMSQ figures are displayed in 5.1 and 5.2 in turn. As CUSUMSQ are keep in critical boundaries at five percent of significance. CUSUMSQ not crosses perilous line that reveals

existence and stability of the assessed variables. This is a symptom of the stability of estimated factors.

Figure 5.1. Design of Cumulative Sum of Recursive Residual

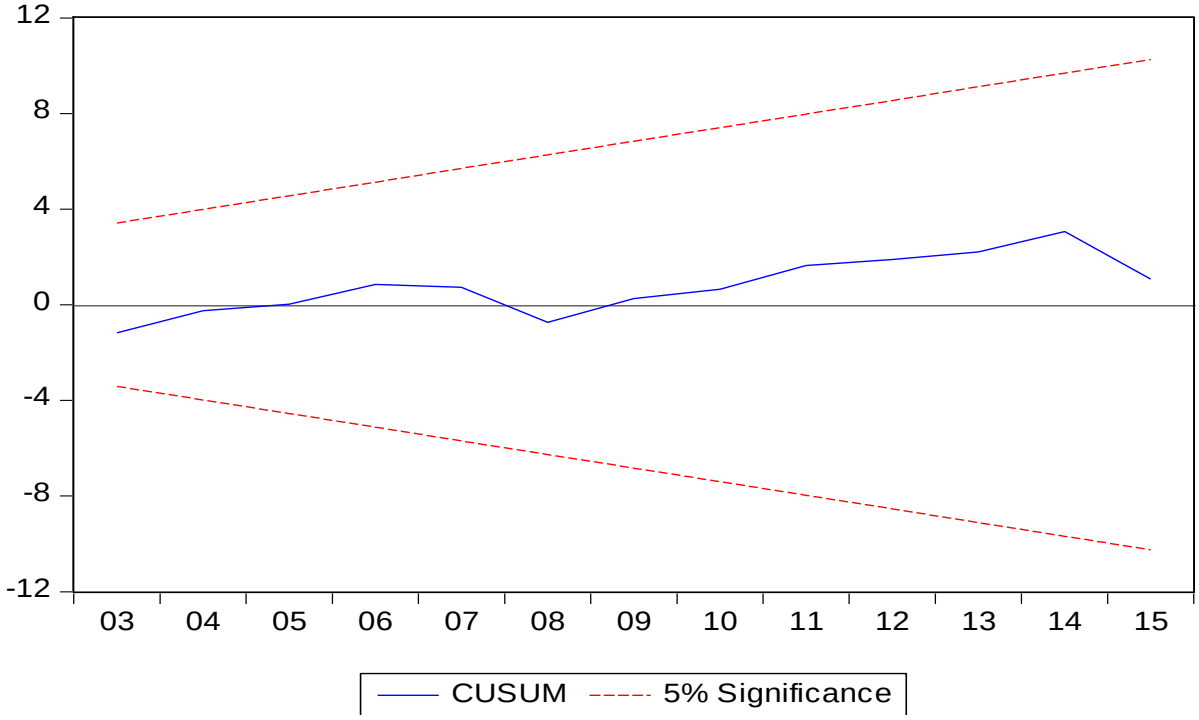
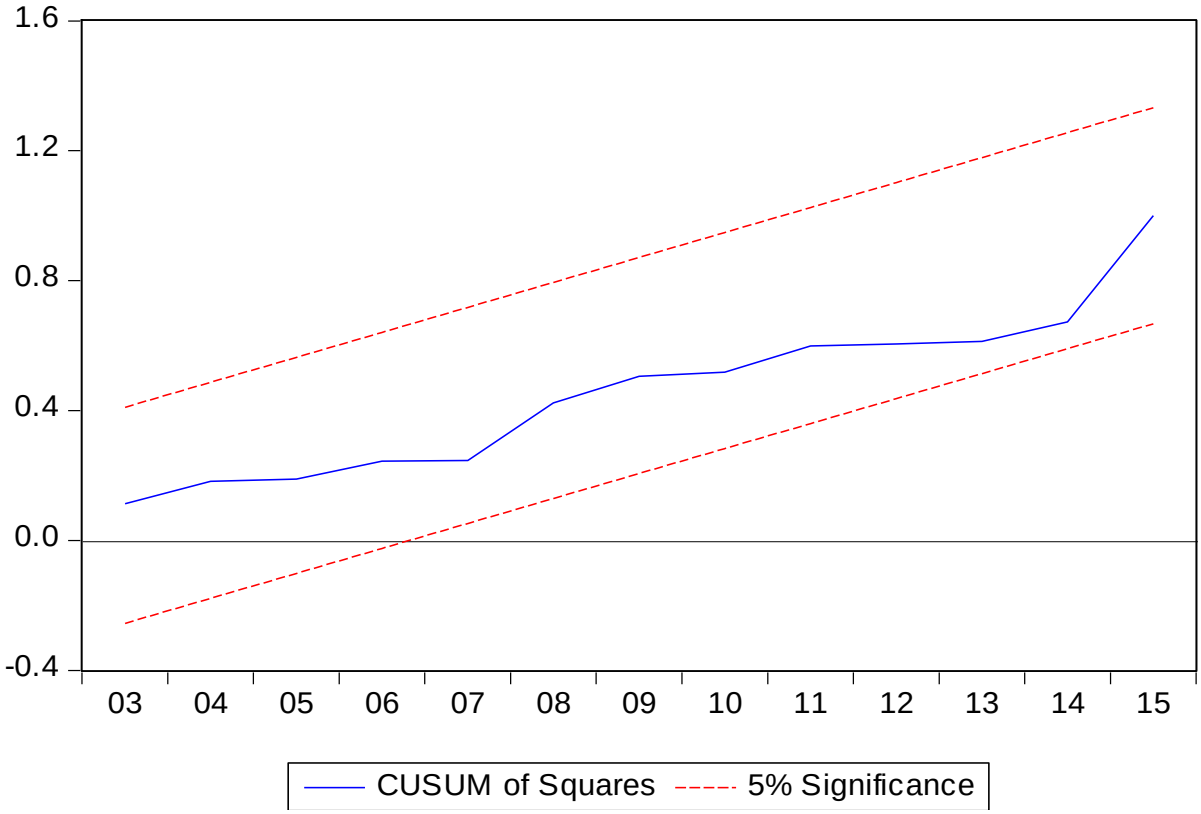


Figure 5.2 Design of Cumulative Sum of Square of Recursive Residual



CHAPTER 6

CONCLUSION AND PLAN IMPLICATION

The study is undertaken to examine the effect of health on economic growth in Pakistan from 1980 to 2016. This investigation depends on gross domestic product, health indicators (health expenditure, infant mortality rate and life expectancy), secondary school enrollment, gross fixed capital formation, trade volume and general government expenditure. Augmented Dickey-Fuller test was used to check the stationarity of data. Some variables were stationary at level and some were stationary at first difference. Aim behind unit root-test was to confirm data series that are not spurious. The essential assumption of ARDL technique to deal with co-integration i.e. none of the variable is I(2) and dependent variable should be I(1). Along these lines ARDL test is used to examine long run relation between variables. F-statistics demonstrates the confirmation of long-run relationship between the variables in the study. Diagnostic test shows that there is no serial correlation issue found in the variables.

The statistical examination indicates certain connection between health indicators and economic growth in Pakistan. The health expenditure and infant mortality rate are the important determinant in the long run and short run. Therefore these variables fill as an essential accelerator of economic growth and development. Life expectancy, secondary school enrollment, gross fixed capital formation, trade volume and general government expenditure are also significant determinants of growth. Expenditure on health and life expectancy has positive relation with economic growth both in the short-run and long run. The consequences of our investigation reveal that long run economic growth could be enhanced expressively while the proportion of government spending on health services rises.

The observational outcome gives some huge consequence to Pakistan economy. The great health is vital for the long run economic growth. The most enthusiastic finish of this study is that better health promotes positive economic growth. Findings of this study is similar to Raza (2013), Afridi (2016), Khan et al. (2008) and Rehman and Jangraiz (2012).

Policy implications

- The government needs to focus on the human health in order to improve the economic growth of the country.
- Government needs to increase the health expenditure and allocate the resources to health sector in more efficient way in order to improve the efficiency of health sector.
- Government may work to reduce the infant mortality by focusing on the health of both mother and infant, so the productivity of mother may increase.

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