

ASSESSING THE CONTRIBUTION OF HEALTH, EDUCATION, AND TECHNICAL TRAINING TO HUMAN CAPITAL AND ECONOMIC GROWTH IN PAKISTAN

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Abstract

This study investigates the impact of education, health, and technical training on Pakistan's economic growth, alongside a review of government policies aimed at achieving sustainable development. The research is guided by three objectives: first, to estimate and analyze the effects of human capital, treated as a flow variable, on economic growth in Pakistan; second, to examine government policies related to health, education, and Technical and Vocational Education and Training (TVET) and their contribution to economic development; and third, to identify policy implications and propose future strategies based on time-series data from 2001 to 2012. The findings indicate that human capital—measured through vocational training, school enrollment rates, patient-to-doctor ratios, labor force participation, and physical capital—exerts a significant positive effect on economic growth. These results underscore the importance of prioritizing human capital development in economic policy and strategic planning to foster sustainable growth.

INTRODUCTION

1.1 Background of the Study

A nation's human capital skills and capacities that reside in people and that are put to productive use can be a more important determinant of its long term economic success than virtually any other resource. This resource must be invested in and leveraged efficiently in order for it to generate returns for the individuals involved as well as for the economy as a whole.

Economic growth which gives welfare to the residents of a nation has been paramount for advanced capitalist economic system which was begun by Adam Smith. As indicated by Adam Smith, economic development relies on capital accumulation, social and technological progression. A well renowned economist Robert Malthus explains economic growth by population theory whereas Schumpeter (1942) highlights growth by technological advancement.

Human capital is focal idea of health, education, skill enhancement, wellbeing and diverse limits of

individuals that can upgrade their abilities and productivity (Todaro, 2002). Human capital implies education, health, on-job training and the skills picked up through social interactions. In more particular term, human capital is described as the aggregation of the inborn capacities, learning, skills that people obtain and create all through their lifetime (Laroche and Merette, 1999). In the current endogenous and exogenous theories of economic growth, human capital accumulation is comprehensively recognized as critical aspect of economic growth [Mankiw et al. (1992), Bergheim, (2005) and Howitt (2005)].

Human capital and economic growth both are interdependent. Moreover, government spending on health, skill development and education is a productive measure. By considering physical and mental capacity of individuals through training, ability improvement, wellbeing, and preparing the level of human capital is assessed (Singh, 1999). The idea of human capital is a dynamic



component of production. People can build capital and develop economic and social associations. Economic growth cannot be achieved if we can't create the skills of our individuals. However, if we need to utilize resources optimistically then capacity building in health, education and skill development are key economic ingredients. Somehow, we may reduce unemployment and improve economic growth (Ali, 2012).

Highly skilled human force in health and education, is a diverse technique for optimum utilization of economic resources. Crucial conditions for economic growth is related to human resource development (Harbinson and Meyers, 1964). However, what is still far from being obviously true is that what elements ought to be considered as human capital. In the vast majority of the studies, education or health related indicators are utilized as a substitute for human capital.

Human capital is a vital component in the determination of economic growth. Human capital empowers labour to deliver high yields (Bergheim, 2005). Human capital increases overall employment opportunities, productivity and demand for labour. Moreover, human capital is basis for optimum usage of physical capital. Higher human capital accumulation in any economy pulls in investment towards the physical capital which thus develops the higher yield ability (Abbas, 2000 and 2001).

The Government of Pakistan has recognized that in order to achieve sustained economic growth and social development, the education, health and skills development sectors must be a political priority. Pakistan's government is taking into account educational outcomes as well as the availability of school infrastructure and facilities to achieve the targets and for this purpose, the government is spending 2% of GDP on education. There are tremendous deficiencies in health facilities as reflected in health sector of Pakistan i.e. 1,099 persons per doctor and 13,441 persons per dentist (Economic Survey of Pakistan, 2014). Challenges of a similar magnitude exist in regard to achieving goals relating to quality and relevance of skilled workers. Pakistan would need to seriously renew its Technical & Vocational Education and Training (TVET) system in order

to achieve sustainable economic growth but at present only 315,000 students are enrolled in 1647 training institutes.

Pakistan's constitution ensures the provision and access to education, health and skill training to its population. Education levels are structured into elementary level, higher secondary level, higher education and technical education and vocational training. The health policy of government of Pakistan is aimed at assessing the availability, functioning and quality of the health care delivery system in the public sector facilities, with a focus on maternal, new-born and child health services. In addition, government is adopting policies for encouragement of private sector in education, health and technical education to fill up gap of deficiencies which are leftover by limitation of government system and resources.

In previous decades, expenditures on health, education and skill development was far less than the required amount of investment to attain sustainable economic growth. As a result Pakistan is ranked among lowest in human capital index. According to the report 2014-15, published by the World Economic Forum (WEF), Pakistan has a Human Capital Index (HCI) score of 52.63 and ranked 113 out of the 122 countries. Pakistan lags behind India and Bangladesh as indicated by report India is ranked 100 and Bangladesh is ranked 99th.

It has been acknowledged that human capital and economic growth indices are interdependent. Increase in income of people can lead towards affordability to spend more on skill development, health and education. In this way enhancing human capital, which will increase productivity and also increase per capita income. Enhanced training, education and health services are additionally vital for enabling people, to withstand economic shocks and reducing vulnerabilities towards poverty. (Khan, 2013).

1.2 Statement of Problem

Pakistan's economy managed to grow by 4.1 percent despite many constraints. Pakistan is a relatively young country with nearly 50 percent of its population below the age of 20 years by mid-2013, the population is estimated to have reached 184 million. Pakistan spends 1.9 percent and 2.6 percent of its Gross Domestic Product on

education and health respectively, with the lowest literacy and enrolment ratio in the region. On the other side, facing problems of school dropouts, unemployment, lower productivity of labour, and lack of health facilities resulting in lower economic growth. In Pakistan, economic growth can be accelerated by considering human capital as key economic factor. Literacy rates, enhanced health, education and technical training facilities are necessary for the economic growth of Pakistan. It will be argued in this research that development of health, education and skills affect the economic growth.

1.3 Research Question

Recent figures show that more than six percent of total population of Pakistan is unemployed. Within six percent of total unemployment rate, youth is the major victim of unemployment. These figures depict a picture of inefficient utilization of human capital. However, this alone cannot provide a clear picture. In order to assess the real phenomenon, a thorough investigation of youth, women and older workers should be made. As these all can contribute to their own well-being as well as of that economy. This investigation should also include the perspective of active and inactive population with respect to their education, health and skills.

In fact, this is the era of disruptive technological, dynamic, knowledge based and globalized economy. In such circumstances, it is difficult to forecast the economic variants and make effective decisions. Current study is trying to capture the complexity of human capital with respect to education, health and technical skills, in order make timely and accurate decisions. The area of human capital is of much importance to be examined as it is not only necessary for productivity but also for proper functioning of civic and political and social institutions.

In this scenario, it will be interesting to conduct a research on human capital and economic growth of Pakistan with special reference to health, education and technical training keeping in mind government policy regarding human capital development.

1.4 Objectives of the Study

1. To estimate and analyse the effects of human capital as a flow variable on economic growth in Pakistan.
2. To review the government policies with special reference to Health, Education, Technical & Vocational Education and Training (TVET) and their contribution to economic growth.
3. To derive policy implications and suggest strategies for the future.

1.5 Hypotheses of the Study

The following hypotheses are to be tested. It is assumed that:

1. Human Capital does not affect the Economic Growth of Pakistan
2. The policies adopted by the government for the development of Human Resource are not conducive

1.6 Significance of the Study

Natural resources play an important role in economic development of a country. Physical capital are inactive and passive factors of economic growth. Enhancement in economic growth is conditional with the use of physical capital in combination with human capital. Human resources of a country can be determined by measuring the size of population, population growth rate, urban-rural distribution and skilled labour. The quality of human capital is significantly related to economic growth. Employment is the outcome of growth process, expansion in economy reduces unemployment and poverty. The efficient and skilled population is measured by the level of education, health standards and mode of technology.

Human capital development has paramount implications for the improvement of society. This is particularly a fundamental situation in Pakistan that, regardless of huge advancement, the indicators of human capital are not adequate. The economic indicators related to the measurement of human resource improvement are not satisfactory in Pakistan i.e. literacy rate and clean water drinking water availability etc. The past major focus area of government investment remained just physical capital and less attention towards human capital. Because of this absence of



policy focus in human capital, today the results are in the shape of higher poverty, unemployment rate, illiteracy and shortage of power. Therefore, to tackle this issue we will explore the effects of human capital on economic growth in Pakistan for the period of 2001 to 2012.

1.7 Organization of the Study

The study consists of the following six chapters. Chapter-1 introduction of study. In chapter-2 review of the relevant literature based on theoretical and empirical literature is summarized. Chapter-3 the policy adopted for the improvement of human capital in Pakistan will be critically evaluated. Chapter-4 describes research methodology, development of econometric model and statistical tools for the analysis. In Chapter-5 data analysis in which discussions on the basis of outcomes obtained. In Chapter 6, recommendations based on the findings of this study is particularised.

LITERATURE REVIEW

2.1 Introduction

Literature review plays an important role in highlighting the essential information relevant to the study. It provides a handy guide to the topic concerned. It is considered as stepping stone in any research study. It gives direction to the study. A detailed review of past and current literature enables us to equip with the knowledge of the data and methodologies previously used for analysis of the topics relevant to the topic under study. This chapter consists of a detailed review of the literature relevant to economic growth and the contribution of different inputs to it.

2.2 Exogenous and Endogenous Economic Growth Theories

Exogenous theories of economic growth are also known as neoclassical growth theories or Solow-Swan growth models. The literature of exogenous growth theories starts from models developed by Solow (1956) and Swan (1956). These theories used neoclassical production function by taking labour and capital as factors of production. Exogenous growth theories are based on the idea that long run rate of growth is exogenously determined. Technological progress, which is one of the most important determinants of growth in

this model, is determined outside the model. These theories hold the view that economic growth is also affected by population growth rate, which is exogenously determined. Cass (1965) and Koopman (1965) extended the neoclassical growth model by introducing consumer optimization but still long run economic growth remained dependent on exogenous technological progress.

The revolutionary theoretical and empirical work of Lucas (1988), Romer (1986) & (1992), Grossman and Helpman (1991), Agion and Hewitt (1992) in 1980s and 1990s laid the foundation of new growth theories or endogenous growth theories. The emergence of endogenous growth theories was actually the extension of neoclassical growth theories. These theories hold the view that policy measures can affect growth rate in an economy. In other words, the growth rate is now determined within the economic growth model or is endogenous. These theories introduced human capital, knowledge and R&D in growth model which are determined within the model. The work of Jones and Manuelli (1990), and Rebelo (1991) along with others is valuable contribution to endogenous growth theories. With the development of new growth theories, many large sample international datasets were introduced.

2.3 Human Capital-Economic Growth Nexus

The neo classical literature mainly begins with the model of economic growth given by Solow (1956). Labour, Capital and technology were taken as factors of production in Solow model. According to this model, a part of output produced is consumed and the rest is saved which is then invested. The very initial form of the model is Where K is Capital and L is labour. The rate of saving is $s(Y_t)$ and Stock of capital is K_t such that the rate of growth of capital (K') becomes equal to the saving rate $s(Y_t)$. Constant returns to scale were assumed to labour and capital when combined, and diminishing returns to scale when used separately. Economy will converge to balanced path at the point where breakeven investment becomes equal to actual investment. Rate of return on capital is low in countries having more capital per worker and this paves way for outflow of capital, which help poor countries



in convergence. Most of the economic growth studies have used the Solow model in different augmented forms. It has been augmented with human capital in form of education, health, R&D, skill development, Innovation and many other variables in literature.

Schultz (1962) concluded that the capabilities of human beings can be improved through investment in human capital. Human capital is personified while it cannot be separated. Whatever capabilities an individual needs, are not naturally endowed, but depends on investment in human capital. Investment in human capital is mostly made through education, on-the-job training, improvement in health of masses and searching information. Investment in human capital has both static and dynamic effects i.e. it increase individual and national income, and accumulate human capital. In absence of education, experienced labour, and lack of information regarding economy, output will fall until their capabilities are raised through investment in human capital.

Weisbrod (1962) examined the role of investment in human capital in United States. The results show that investment in human capital not only leads to technical progress but also provides an avenue for further development. The major forms of direct investment in productivity and people are health, learning and location. Education and health cover largest part of spending in both public and private sector in United States. Investment in education not only expands knowledge and raise productivity but also improve health by increasing life expectancy. The results also show that investment in human capital has both internal & external economies. Internal economies take place in the form of good health of children, informal education at home etc. On the other hand external economies are in the form of good colleagues and neighbours. Education provides individuals better financial return, more financial options and opportunity options. These economies create incentive for public expenditure in human capital. Ashton and Sung (2002) assessed that human capital is valuable in economic growth cycle by animating the development of some key economic element, for example, physical capital, which is seen as basic economic factor for the country. It is

concluded that human capital has positive association with the physical capital development.

Akram (2008) attempted to investigate the association among economic growth and health facilities. Enhanced “health facilities” and “economic growth” has a positive relationship. Diverse sorts of human capital and health extends per capita GDP by growing income of labour sector and afterward this increased income can be reinvestment. Thus increased investment in human capital is made which results as higher per capita income.

Abbas (2000) adopted a cross country analysis growth accounting framework to investigate the impact of human capital on economic growth of two South Asian countries i.e. Pakistan and India. He adopted OLS method for time period of 25 years from 1970 to 1994. Econometric model was used in which dependent variable was GDP, while physical capital, human capital and labour were opted as independent variables. In study, school enrolment levels were taken as a proxies variables for human capital.

Agiomirgianakis et al. (2002) adopted an extensive panel data technique to investigate the contribution of human capital on economic growth. In the analysis, dynamic panel data techniques were used over a period of 27 years having data from 93 nations. The results recommended the presence of a strong positive relationship between economic growth and education. It additionally explained that higher education level had impact on economic growth.

Bosworth and Collins (2003) have analysed the cross country contrast by using growth accounting techniques. They contended that economic growth cannot alone be portrayed by capital factors. In Cobb-Douglas production function $Y_t = A_t f(K_t, L_t)$, it is “A” which is useful for economic growth factor. They assumed that improved economic growth and productivity can be achieved through better higher education.

Mincer (1962) carried out a study about on-the-job training, which estimated its returns and compared it with costs. With formal and informal training, he also considered learning from experience as formal education is end of a preparatory stage for learning occupational skills through performance in labour force. The study revealed that investment in on-the-job training is



mostly in the form of education, which covers a substantial part of US expenditure. According to their findings investment in on-the-job training in medical, apprenticeship, and specialization have approximately same returns as college education. Returns to private investment in formal education were found higher than on-the-job training.

Becker et al (1990) studied human capital, fertility and economic growth assuming endogenous fertility and rising rate of return as human capital stock increases. The rate of return on investment in people is higher than rate of return on children in human capital abundant economies while in human capital abundant economies, it is less than rate of return on children. This study shows close relationship between the human capital and economic growth. Investment in human capital leads to raising level of technological and scientific development, resulting in economic development. This means that accumulation of human capital is an important factor, which leads to economic growth. Investment in human capital, choice of family size, human capital-physical growth nexus and steady state equilibria are the major variables, which help some countries, grow at higher rate than others do.

Naidoo (2004) analyzed the role natural capital in economic growth of a country during the period 1960-1999. The augmented form of Solow model was used by introducing natural capital with other forms of capital. Linear regression models were used to derive estimates. The study used forest as natural capital and the results show that economic growth of more than seventy seven countries of the world was found positively associated with natural capital. The results of this study are in contrast to those studies which emphasize to control deforestation as the results of this paper show that in cross-section of large number of countries the forest clearance lead to accelerate economic growth. The countries with huge initial stock of forest grew slower than those with little forests and the countries which have cleared much of their area by deforestation grew faster than those retaining their stock of forest.

Oketch (2006) examined the role of human capital in economic growth of 47 African countries by using methods of Ordinary Least Square (OLS) and Two Stage Least Squares

(TSLS). Human capital was measured by investment in basic and advanced education as percentage of GDP. The results showed that physical and human capitals are two most important determinants of economic growth in African countries. The causal relationship between human capital and economic growth was found two way. The study recommended increasing investment in human resource development through education for sustained economic growth.

Canlas (2003) used Solow's neoclassical model to study economic growth of Philippines. The results of the study were encouraging. The empirical results supported the views of neoclassical model and all the variables were found in expected direction. The saving and population growth were statistically significant but human capital or education showed insignificant results. It was suggested to raise saving and investment rates and reduce population growth to put Philippines on path of sustained economic growth. Accumulation of human capital along with physical capital be an effective tool in this connection.

Anwar (2008) explored the role of Foreign Direct Investment (FDI) and human capital in long run growth of manufacturing sector of Singapore by using annual data for the period 1980-2005. Singaporean economy is dependent to a great extent on manufacturing sector which is directly related to FDI. The empirical evidence showed that along with FDI, human capital accumulation is significantly associated with development of manufacturing sector which is an important determinant of Singaporean economic growth. Due to small size of economy and low saving rate, the economy is expected to depend on FDI in near future. The appreciable expenditure on R&D and innovation in 1990s provided some support to economy. Private firms are not spending much on human resource development in Singapore. In order to reap the fruits of comparative advantage in human capital intensive goods, the study suggested diversification of exports and enhancing expenditures on skill development, R&D and higher education.



2.4 Education as Human Capital

Abbas (2001) used primary, secondary and higher schooling as proxies for human capital to find its association with endogenous growth in Pakistan and Sri Lanka during the period 1970-1994. The empirical results based on growth accounting exhibited a non-positive impact of Gross school enrolment and economic growth of Sri Lanka and Pakistan in the study period. The overall result have positive impact by opting secondary school enrolment as proxy variable for human capital. The study suggested improving the poor condition of primary education in Pakistan and also continuing improvement in Sri Lanka. The investment in secondary and higher levels of education should go ahead as these levels of education significantly affect the economic growth in the selected countries.

Leeuwen (2007) termed informal and formal education as key variables for human capital. Moreover he also included that cost of health, learning skills and raising a child is also included in human capital. He also pointed out that education role in human capital is far superior than that of health and other factors. By fitting together with this Igun (2006) illuminates human capital as the total standard of skills, knowledge, aptitudes and competencies possessed by the people of a country.

Mankiw et al (1992) examined the consistency of exogenous growth model given by Solow (1956) using a large set of cross-country data for period 1960-85. Education was taken as proxy for human capital. The Cobb Douglas production function used by Solow was extended in this model. SCHOOL was used as proxy for human capital which shows the percentage of working-age population that is in secondary school. The study shows that output is result of not only physical capital and labour but also of human capital. Physical capital accumulation has no externalities and has greater impact on Per capita income as compared to Solow model. The results confirmed the consistency of Solow model empirically. The countries with similar technological level, rate of accumulation and population growth converge in income per capita at slower pace than Solow suggested. This model finds an economy at halfway to steady state in 35 years as compared to Solow's prediction of 17 years. The cross-country

difference in per capita incomes depends on level of saving, education and population growth.

Lucas (1988) developed his theory of economic growth by introducing human capital as a factor of production. He investigated the variations in cross country incomes and incomes within countries. Education a proxy variable was used for human capital in model which is neoclassical growth theory. In his model he tried to elaborate that by spending time in activates increases the output and productivity of human being. Such as time spent on human capital today will increase the capacity in future. By way of human capital increases it also increases physical capital accumulation. It's a point that human capital increases if its returns are higher. It positively affects economic growth.

Barro (1991) modelled the human capital-economic growth relationship for 98 countries for the period 1960-1985. It showed a positive relationship among human capital and economic growth when gross school enrolment were taken as proxy variable for human capital. The real per capita growth rate was found negatively associated with initial level of GDP per capita of 1960. The countries with high human capital were found with lower total fertility and comparatively higher physical capital-GDP ratios. Less developed countries can use techniques used by developed countries in field of human capital. He further said that political instability will lead towards less investment, which will ultimately affect economic growth.

Jorgenson and Fraumeni (1992) analyzed the role of education in US economy during post war period. The growth of education and non-education sectors was aggregated to get a new measure of economic growth for United States. Education was treated as investment in human capital due its lifetime impacts on the receiving person. The study took impact of education on lifetime labour income including time spent outside the market as a measure of educational output. The benefits of education are not only in market but in non-market also. It provides non-market benefits in form of parenting and leisure also. It was observed that the growth rate of US economy slowed down since 1973. Investment in human capital as well non-human capital is



needed in order to bring back the economy on track of rapid economic growth.

Romer (1994) proposed higher investment in kids will bring changes in their life in physical, cognitive and emotional forms. Higher interest in kids will help them in accomplishment of higher learning capacities when contrasted with those youngsters, who get less investment as human capital. As a result it will take along lower earning rate and poor financial capacities. It will also influence the general public in all shape on poor aptitudes, higher crime rate, lower per capita income and more dependent population. The societies which are not capable to invest more in their kids, will have long lasting effect of lower productivity and higher rate of unemployment.

Kocherlakota and Kei (1995) rejected the view of traditional cross-section regression in distinguishing between exogenous and endogenous growth. A simple growth model was developed for this purpose. The model showed that conditioning on initial income can be wrong if technology stocks are allowed to vary across economies. Therefore, to distinguish between endogenous and exogenous growth both initial income and capital levels should be considered. The model insists on the sign of initial capital instead of initial income for this purpose.

Evan (1998) developed a model for endogenous and exogenous growth theories comparison by using panel data. Well educated population, developed countries and least educated and developing countries are found with different growth rates. Empirical results depicted that developed countries and well-educated population comply with exogenous growth. These are 13 and 27 countries respectively. However, 27 countries with least educated population in the era of 1950 experienced endogenous growth. The study also argued that economies with less per capita stock of human capital might be lacking technical knowledge.

Khan (2005) conducted a comparative study of growth performance among Pakistan and some other selected Asian countries, by using the data set of 72 countries extending from 1980 to 2002. The source of data was Barr and Lee (2000) and World Development Indicators (WDI). Different growth factors along with human capital were considered by study to analyse their contribution

to growth performance. Study argued that improvement of education quality and health facilities may improve the productivity of labour force resulting in growth of overall productivity. Health and education were found significant and with positive impact on overall growth performance. On the average, Pakistan was found with high economic growth comparative to a large group of countries having low and middle income per capita. Study further argued that in order to accelerate the economic growth, the institutions human capital should be improved, along with physical capital and investment should be increased.

Lin (2006) studied the Taiwan economy for investigating the impact of human capital on economic growth of country. The study took education as a proxy for human capital and used Cobb Douglas production function augmented form. The data for study extended from 1964 to 2000. Employed population of human capital with average number of formal education was analysed instead of whole population. However, impact of education on economic growth was found different at different level of education. Elementary and Secondary education was found with higher impact on economic growth in comparison with other organization. The study argued that quality of elementary as well as higher education should be improved to enhance the economic growth of the country.

2.5 Health-Economic Growth Relationship

In order to find out the role of rising life expectancy in accelerating human capital investment leading to economic growth, Ozcan et al (2000) developed an overlapping generation model. The study analysed the relationship between mortality and education. The study found that decline in mortality rate enhances the investment in education and leads to increase in life expectancy. As the life expectancy increases, the expectation for return on education also increase, thus leads to high investment in education. On the other hand, rising life expectancy may affect the consumption side economy. The study found rising life expectancy and education as one of major contributors to economic growth.



McDonald and Jennifer (2002) conducted a study and argued that education is not only sufficient as a proxy of human capital. Economic growth performance cannot be only assessed by education as only investment level may change with change in income. Their analysis showed that level of income and investment are inversely proportional to each other. It also concluded that life expectancy is an important factor to economic growth but in macroeconomic context. Their study analyzed the data by excluding health factor and concluded that without health capital the model produces misspecification and biasedness, it infers that health too is a crucial factor for assessing economic growth performance.

Bhargava et al (2001) conducted a study to determine the factors of economic growth. The study used panel data taken from World Development Indicator (WDI) and Penn World Table (PWT). Economic growth was assessed by health factor. Study taken three variables as proxies for health i.e. Adult Survival Rate (ASR), Life Expectancy (LE) and Total Fertility Rate (TFR). Study found different results for developed and developing countries. Significant and positive effect of Adult Survival Rate was found on economic growth for countries like Nigeria, India, Ivory Coast, and Burundi and Burkina Faso. However, negative effect was found for countries like Switzerland, USA and France.

Wang and Yudong (2003) conducted a comprehensive study in China. They examined the determinants of growth performance in China by taking data extending from 1951 to 1999 and by using Growth Accounting Method. Highly accelerated human capital accumulation was found in China. However, human capital contribution to the welfare of state and society and economic growth was found significant and positive during analysis period. Average years of schooling from the age of 15 to 64 years, were taken as proxy for human capital accumulation. Economic growth was also found significantly affected by Total Factor Productivity, even after the reform period in China. Study argued that to keep China on sustained economic growth path, human capital accumulation and total factor productivity growth should be given higher priorities.

Bloom et al (2004) conducted a study and used aggregate economic growth's production function model to investigate the role of health indicator and work experience in economic growth of the country. The study argued that improved health facilities, while keeping work experience as constant have a positive significant and sizeable effect on economic growth. Life expectancy contributed 4% positive change in output during analysis period. Productivity of labour can be enhanced through increasing public expenditures on health facilities and accumulation of human capital. However, study found no significant effect of education and experience in microeconomic studies in comparison with macroeconomics studies.

Rico et al (2005) analysed cross-country panel data to assess the impact of health indicator on economic growth performance by using Solow model with human capital. Ordinal health index was developed from health determinants. In various countries, positive and significant effect of health was found with economic growth of respective country. For achieving sustainable economic growth, study suggested to create high level of masses awareness. However, contribution of health facilities to economic growth was found differently in different countries, due to differences in health facility investment by the said countries. Thus study suggested to increase health investment and should consider it as an important tool for economic policy making.

Long run causality between health indicators and economic growth of the country was analysed by Hartwig (2009). The study used Granger-Causality test for analysis purpose by using the data of 21 rich countries. However, the results of study were quite astonishing. It does not find any evidence of causing economic growth by health indicator or life expectancy, totally contrary to most of studies conducted on the said area. Moreover, study given three reason behind no causality between health and economic growth. Firstly, it might be possible that relationship only exist in short run. Secondly, the study might have used too long time lags to find out Granger-Causality. Thirdly, there might be the possibility that the people in countries considered for analysis, view health facility as of matter of welfare instead of investment perspective.



2.6 Human Capital and Physical Capital

Bazo and Rosina (2008) analysed the effects of investment in human capital on Physical capital in Spanish economy during 1980-2000. The study used the methodology based on duality theory. The study suggested that the methodology based on duality theory make it possible to find out direct and indirect effects of human capital on economic growth as compared to traditional approaches, which introduce human capital as input in production function. The results showed the direct effects of Spanish worker's education on their productivity. Each additional year of worker's education brought 19% increase in stock of physical capital in Spanish economy during the past two decades. Returns to physical capital would have been much lower in case of lower investment in human capital. The study concluded that improvement in human capital accumulation makes investment in physical capital more attractive as higher skills of workers. Siddiqui (2009) used panel data of sixty four countries for the years 1996 and 2004 to explore the priority of expenditure in physical capital and expenditure on human development strategies. The study used Ordinary Least Squares (OLS), Two Stage Least Squares (TSLS) and dummy variable approach, fixed and random effect approaches for estimation. The empirical results for different regions were different. Random effect results show variation in human development strategies across individual countries. The study concluded that productive expenditure is prioritized in most cases in human development strategies. The study suggested on the basis of empirical results that Pakistan should focus on investment in physical capital instead of education and health to achieve the desired status in the region as well as in the world.

Bils and Klenow (2000) explained that countries having higher enrolment rate in schools can attain a higher per capita income. Productivity can be increased by achieving higher enrolment at school. Analysis have affirmed that education and growth have a long run and noteworthy association. They proposed that enhanced productivity can be achieved through advancement in education and furthermore economic growth will be influenced.

Khalil *et al* (2007) examined the significance of institutions in overall development of OECD countries using a fixed-effects panel model. It was concluded that both legal and economic environment can explain economic growth. The study recommended economic freedom and enforcement of strong property rights to create environment for sustainable economic growth.

2.7 Human Capital and Labour Force Participation

Bound *et al* (1999) worked on relationship between health status and labour force participation at older stage of life. The aim was to explore how health shocks at various times bring changes in labour force participation in form of exit, job change or other form. The model focused on existing as well as lagged values of health in order to examine the effects of declining health on labour force participation or labour force behaviour. The results show that health is equally important determinant for both male and female labour force participation. Withdrawal from work is result of declining health conditions. About half of labour at older age exit work due to poor health and those who continue working apply or try to apply for disability insurance.

Jacobsen (1999) explored the trends in United States labour force participation of both sexes, male and female. The study found that women participation rate increased from 18% in 1890 to 60% in 1997. The high female labour participation brought about a change in the structure of the socio-economic life of the Americans. The study concluded that major causes of increase in female labour participation rate was due to increase in overall demand for labour, demand for women labour force in some specialized professions, increase in women education, changes in family composition and fall in male wages. The male participation fell due to change in sectoral demand for labour and increasing participation of female.

Pelkowski and Mark (2004) examined the effects of health problems on labour force. The effects on employment, working hours and wages were taken. The impacts of transitory and eternal diseases were estimated by using Ordinary Least Square (OLS) and fixed effects methods. Other variables of study were education, marital status and race of labour force. The results show that health problems affect male and female labour



force variously. Current permanent health evils negatively affect average hourly wages of labour force. Women are affected badly as compared to male by permanent health problems. Temporary health hazards showed modest impact on wages or working hours of labour force. The undesirable effects of permanent health conditions are at top when male labour force is in 40s and female are in 30s.

Lin (2004) divided higher education in four disciplines in Taiwan to examine the effect of higher education on three sectors of economy during the period 1965-2000. The higher education was divided into humanities, Science, social sciences and education and treated as factor of production. International degree holders were not included in the study. The results show that three out of four disciplines have positive and significant effect on output level in Taiwan during the study period. The results show that one percent increase in higher education brings 0.19% increase in real output. Various forms of higher education showed various types of effects on real output in the study area. The humanities didn't fit the labour force need and natural sciences played most important role in economic growth.

Cai (2010) used simultaneous equation model to analyse the health-labour force participation relationship. The two stage and full information maximum likelihood methods were used for estimation. The study confirmed the positive and significant impact of health on male and female labour force participation. The reverse effects were found different for both male and female labour force. Labour force status reverse effects are negative and significant in case of male labour but positive and weakly significant for female. The reverse effects in case of male reject the common view that the labour which is out of labour force may overstate the health conditions to justify their nonparticipation.

Summary

This chapter reviewed the theoretical and empirical literature concerning the human capital, its different forms, and its impact on economic growth. The chapter explained the initial theories of economic growth, the exogenous and endogenous growth theories in detail. It also explained basics of economic growth studies. The

review of literature shows that there are many determinants of economic growth. Apart from the traditional factors of production, capital and labour, human capital became an integral part of economic growth literature in recent decades.

The review of the literature shows that human capital has been used in different forms. The literature regarding the human capital in form of education is rich. There are also studies relevant to health and economic growth nexus. Appropriate few studies have used the health and education both as human capital in economic growth literature. Recently, a new source of growth has been identified known as Skill Development. A number of studies in developed countries have used skill developments determinants of economic growth but such examples are rare especially in the study area. Interestingly, no study has so far used all forms of the human capital known as Education, health and technical training as determinates of economic in the study area.

The literature sheds light on the essence of different factors as contributor to economic growth. These include health, education, technical and vocational skill. In the light of literature, current study identified the gap in the context of Pakistan and examines some important factors those are health, education, technical and vocational skill. Study examines the impact of health improvement, education and skills on economic growth of country and hence add to the body of literature in the context of Pakistan.

THE POLICY ADOPTED FOR THE IMPROVEMENT OF HUMAN CAPITAL IN PAKISTAN

3.1. Introduction

In this chapter several policies adopted by the government for the improvement of Education, Health and Technical Training sectors is elaborated in detail. As we know that during the past era several policies have been practised by different governments in order to achieve sustainable economic growth. This will provide sound basis for exploring the human capital-economic growth nexus. In depth profile of economic growth, education, health, & technical training polices which promoted human capital in Pakistan, will empower us to find the detailed

overview of Pakistan economy, which will provide a sound base for improvement and development of upcoming policies regarding human capital and economic growth.

3.2 Historical Background

Pakistan, is situated in the North-Western part of the South Asian subcontinent, got independence from the British on August 14, 1947 after the subdivision of the Indian subcontinent. The total land area of Pakistan is about 796,000 square kilometres. Pakistan is comprised of the provinces of Punjab, Khyber Pakhtunkhwa (North West Frontier), Balochistan and Sindh and the Federally Administered Tribal Areas (FATA) of the north and northwest. Each province is divided into administrative divisions, districts, tehsils and talukas. Islamabad is the capital of Pakistan, which lies in the northern part of the country at the bottom of Margalla hills near Rawalpindi, is a well-planned city which was constructed beginning in the 1960s

3.3 Population of Pakistan

The total population in Pakistan was estimated at 189.9 million people in 2015, according to the latest census figures. Looking back, in the year of 1960, Pakistan had a population of 45.9 Million people. The population of Pakistan represents 2.56 percent of the world's total population which arguably means that one person in every 39 people on the planet is a resident of Pakistan. The problem of over-population becomes even more serious in context of the developing country like Pakistan. Pakistan will turn into the fourth most crowded country of the world in 2050 if the population growth is not controlled.

This implies in the up and coming years Pakistan will have a massive burden on its limited resources due to population growth. Sustainable economic growth achievement is necessary to provide resources that will be spent on education, health, skill development and infra structure to fill the needs of growing population. There is a rising trend of urban population since the independence of Pakistan. In 1998 it is 32.5 percent which is almost 36 percent of the total population.

Table 3.1 Province/Agency Wise Population Distribution of Pakistan

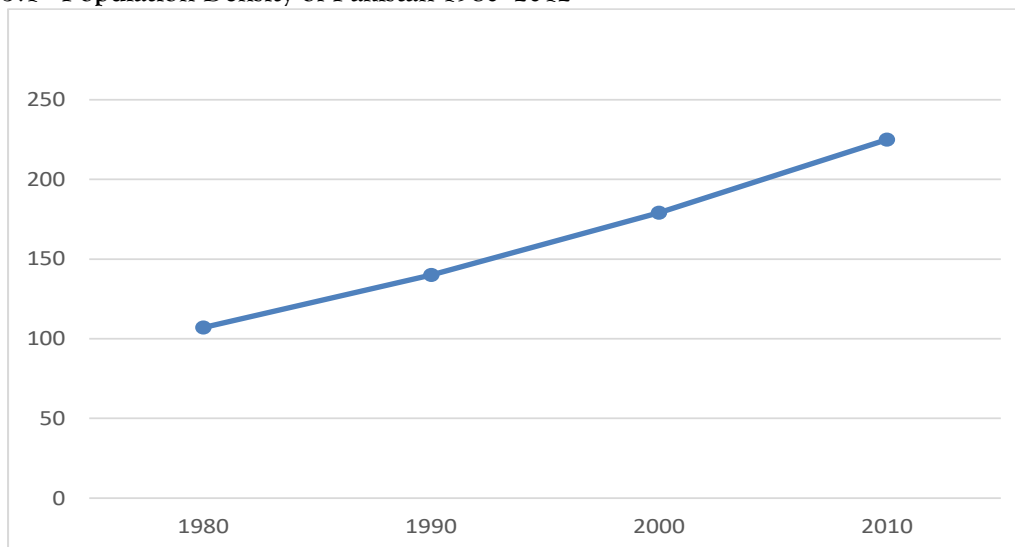
Year	Population (Millions)						
	Pakistan	Punjab	Sindh	Khyber Pukhtunkhwa	Baluchistan	FATA	Islamabad
1951	33.74	20.54	6.05	4.56	1.17	1.33	.095
1961	42.88	25.46	8.36	5.73	1.35	1.85	0.11
1972	65.31	37.61	14.16	8.39	2.43	2.49	0.24
1981	84.25	47.29	19.03	11.06	4.33	2.20	0.34
1998	132.35	73.62	30.44	17.73	6.57	3.18	0.81

Source: Population Census Organization of Pakistan

Table 3.1 shows that Population of Pakistan was only 33.74 million in 1951, while there was a skyward trend which touched 132.35 million in total by the end of 1998 according to population Census report. Admitting on micro side Punjab is the most populous province with a population increase from 20.54 million to 73.62 million between 1951-98. however areas wise Balochistan

is largest provinces of Pakistan but its population is only 6.78 million. Similarly Khyber Pakhtunkhwa (NWFP) and FATA population is approximately 21 million, though Sindh stands behind Punjab with total population of 30.44 million. Likewise, the same tendency is observed in capital city Islamabad, its population sharply increased from 1981-998 by 0.47 million.

Figure 3.1 Population Density of Pakistan 1980- 2012



Source: World Bank Economic Indicator

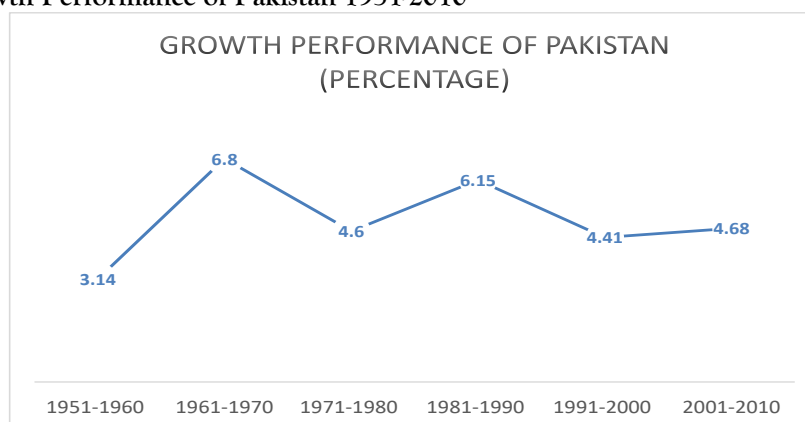
In figure 3.1 it is evident that Pakistan's population density almost doubled between 1980 and 2010. In 1980 it was 107 which increases to 140 after one decade. Likewise trend was observed during 1990 to 2000. As it is apparent from the figure that by the end of 2010 Pakistan population density was 225, which is doubled over by comparing it with data of 1980.

3.4 Economic Growth of Pakistan

Sixty years of Pakistan has witnessed impressive as well disappointing economic growth. In spite of high population growth, per capita income quadrupled and level of poverty reduced due to rapid growth. Agrarian economy also took pace to

be converted in production structure. However, there was also a factor of disappointment. Among the developing economy, Pakistan stood as one of the worst nation as per societal structure. Human development index ranked Pakistan as 134th out of 177 nations. Rural Urban differentiations, gender inequalities and income disparities further worsened the situation and emerged as major hindrance to economic growth. Due to this phenomenon, Pakistan is lagging behind the East Asian economies, especially in comparison with its rival neighbour India, in economic growth. According to the reports of Global competitiveness, Indian economy ranks 48th while Pakistan stands at 92nd position (Human Capital report 2016).

Figure 3.2 Growth Performance of Pakistan 1951-2010



Source: State Bank of Pakistan (2012)

First four decades of Pakistan's existence proved as impressive years of economic growth. In that era, growth rate was 6% per annum, per capita

income doubled with decrease in level of poverty from 46% to 18% and inflation rate also remained low by late 1980s, as per statistics given by State Bank of Pakistan. Pakistani economy



performed brilliant in the decades of 1950s, 60s, 70s and 80s. In spite of civil military transitions of government and wars, the growth rate was consistent and progressive until 1990s.

1990s decade was considered as regressive decade. The economy lost consistency in economic growth and plummet to as low as 3%. Poverty rate boosted to 33% with double figure inflation rate. The remaining part of character was played by foreign debt, which reached to nearly entire GDP of Pakistan, US war on terror and natural calamities in Pakistan.

3.5 Human Capital Profile in Pakistan

Pakistan is among the countries which have rich human capital resource. In order to attain sustainable economic growth employing human resource can play a key role. Human capital can be effectively exploited by equipping it with skills, refining health conditions and providing them appropriate education. Government of Pakistan adopted and implemented different policies for education, health and skill development.

This segment of the chapter provides a brief overview status of education, health, and skill development in Pakistan.

3.5.1. Education

Human capital development and economic sustainability can be derived through investment in education. Education is a key factor to human and economic development of a country. Global market mechanism, intensive competitiveness, dynamic technological changes, human capital development, culture, faith, traditions, civilization and faith all these are affected by education system and reflected in policy responses. Thus a society may determine the pace of dynamic change by focusing on education sector.

Pakistan has a positive approach towards education based on religious and cultural values and as well as requirement of economic growth. Irrespective of gender, cast, creed and race, State offers equal opportunities to attain education to everyone. Education sector is focused by Pakistan time to time. It is aimed to provide basic education free to every citizen in minimum time period.

Pakistan emerged on the map of the world on 1947, it had a near to the ground education

profile however soon the requirement for improving literacy ratio was felt and much has been accomplished from that point forward. It is considered as a critical apparatus to know the rate of the general population who can read and write in nation, was low at the time of year of freedom. It was just 16 % in 1947. The administration of Pakistan at present is considering every possibility for the improvement basic education facilities for masses.

3.5.1.1 The Structure of Education System in Pakistan

In Pakistan, the education system was adopted from colonial authorities. Education sector in Pakistan has been subdivided into various stages or levels. This comprises of elementary and secondary levels of schooling, Intermediate or college and university levels. Education profile of Pakistan is discussed below in detail

The parliament of Pakistan given approval of 18th amendment to constitution of Pakistan in April 2010. This amendment made provinces more autonomous. The power of decision in so many sectors including social, economic and education transferred to provinces. However, federal government still prevails the Ministry of Education and Trainings and Standards in Higher Education (MET & SHE). This ministry coordinate with foreign educational sectors and provide a guidance to provinces for improvement in higher education. The Higher Education Commission, a department of federal government deal with policies of higher education in Pakistan. However, universities are given with autonomy to make decisions within polices of HEC.

Public sector school system is the largest education service provider in Pakistan. School system in Pakistan consists of 12 academic years. It starts from primary level and ends with grade 12 known as Higher Secondary School Certificate (HSSC). Some of school systems starts with pre-primary also called as nursery. However, nursery is not considered with budgetary purpose and examination processes.

One third of total primary schooling system has been covered by private sector educational institutions. Private schools education sector uses diverse type of curricula. Mostly taught courses are Oxford University Press publications and

Cambridge International Examination system. However, some schools also held international examination system i.e. A and O level. These schools are normally equipped with well trained staff, latest technology equipment, dynamic tools, well-furnished and up to international standard classrooms, campuses and facilities. In Pakistan, there is another stream of purely religious education, known as "Madaaris". Madaaris are governed and managed by local communities through charity and donations. These institutions offer free education with free boarding and lodging facilities.

As mentioned above, there are different streams of education systems in Pakistan, with different style, curricula and mode of providing education. This created inequalities in the quality of education and reflections of behavioural traits, led to economic and social disparities. Most of the children living in less developed areas of country and belonging to low income family, prefer public sector schooling. Such schooling system is free of cost but considered as less facilitated, understaffed, lacking physical resources and thus leading to poor education. Number of primary, middle and secondary schools in Pakistan are 146185, 42147 and 29874 respectively. Out of which public sector schools are 75%, private

schools are 10% and remaining 15% consist of informal basic education schools and "Madaaris" (NEMIS, 2012).

a). Primary and Secondary Education

The education structure in Pakistan starts from pre-schooling stage to level XII. Following education level are discussed below:

- a. Kachi (Pre Primary) Schools
- b. Primary level Schools
- c. Middle Schools
- d. Secondary Schools
- e. Higher Secondary Schools

Schools from Pre-primary to Primary level are up to grade V, while middle schools are up to grade VIII in Pakistan. These schools are one of the major slice of schools network in Pakistan. The secondary stage of education starts after grade-VIII and it consists of two grade 9th and 10th. In Pakistan, secondary education is delivered by the secondary schools around the country. At the time of liberation there were only 62,000 pupils enrolled in 6800 high schools of Pakistan (State Bank of Pakistan various sources). This number increased with each passing day.

Table 3.2 Primary School Enrolment in Pakistan

Year	Primary Schools (Thousands)			Middle Schools (Thousands)		
	Male	Female	Total	Male	Female	Total
1981	3,692	1,782	5,474	1053	359	1412
1986	4,729	2,365	7,094	1394	516	1910
1991	7,162	3,475	10837	1970	842	2821
1996	8,825	5,702	14,527	2335	1270	3605
2001	10,242	6,893	17,135	2304	1455	3759
2006	10074	7710	17757	2131	2191	4322
2011	11780	9230	21010	2718	2379	5097

Source: State Bank of Pakistan (2011-12), Economic Survey of Pakistan (various Issues)

Table 3.2 demonstrates that there has been reliable expansion in primary and middle levels school enrolment in Pakistan. The increase in enrolment trend is witnessed gender wise at all levels. The cumulative enrolment in primary schools increased from 5.4 million to 11.7 million from 1981 to 2011 which is almost doubled.

While gender gap in school enrolment at primary level is reduced positively. Which is one of the major outcome of government policies. If we look at middle level 5.09 million enrolment was recorded in total. Noticeably there is a sharp trend of school dropout at 60% which is pretty high in the region.

Secondary level of education starts after middle Level or grade VIII, it consist of two Grades i.e IX

and X. Pakistan’s secondary schooling levels are mostly covered by Public sector Secondary school or higher secondary schools. After independence Pakistan has very low density of school. In 1947 there were 6800 high school with total enrolment of only 62000 students (State Bank of Pakistan 2005). This number expanded with every passing

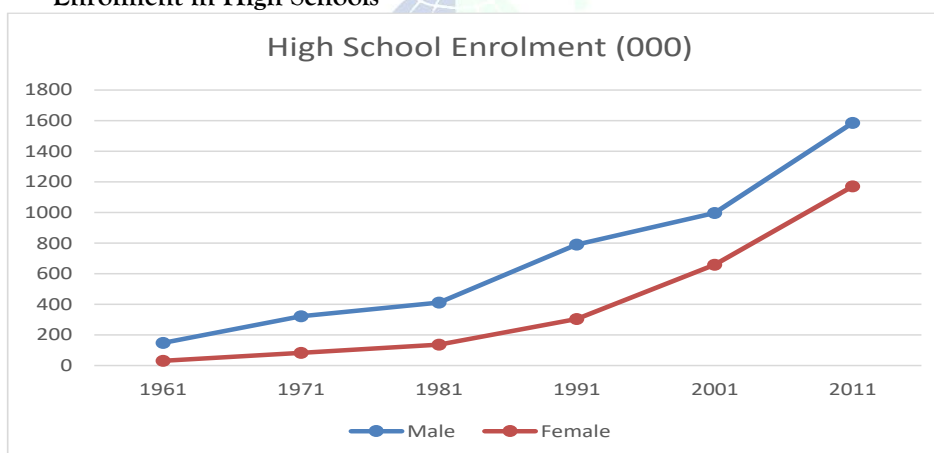
day. Increase in Capacity of existing schools and building new schools has expanded coverage of schools. Thus enrolment increased up to 549000 in 1980, it showed an upward trend, and by end of 2011 it is 2756000. It is also observed that male and female education gap is decreasing with passage of time.

Table 3.3 Enrolment in High Schools

Year	Enrolment in High schools(000)		
	Male	Female	Total
1961	149	31	180
1971	322	83	405
1981	412	137	549
1991	790	304	1094
2001	997	659	1656
2011	1585	1171	2756

Source: State Bank of Pakistan (2011-12), Economic Survey of Pakistan (Various issues)

Figure 3.3 Enrolment in High Schools



Source: State Bank of Pakistan (2011-12), Economic Survey of Pakistan (Various issues)

b). College Education Structure

Now a days, the world has turned into a global village. This is the age of disruptive innovation through applied sciences and dynamic technology. The progress of a nation and high level of living standards depend on the factors like level of technology and science. Pakistan is a population with increased number of youth, who can benefit from higher education privileges and can contribute to country’s progress.

Collage level education is likewise given by some of schools called Government Higher Secondary Schools (GHSS) and colleges having a system spread over all areas. The school/colleges level begins following 10 years of school education and its terminal stage is 14 years of education. Strikingly, now 16 years of education is given by Colleges as a portion of the universities level education. Presently the degree program is being begun in college, which will supplant the customary 2 year BA/B.Sc.

Table 3.4 Colleges Enrolment in Pakistan

Year	Enrolment in colleges		
	Male	Female	Total

1970-71	168512	53870	222382
1980-81	256048	109448	365496
1990-91	504246	251003	755249
2000-01	501809	410540	912349
20010-11	1292899	583730	1876629

Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

Table 3.4 indicates that enrolment in collages progressively increased with period from 1971 to 2011. In 1971 it was 222382 in total. But it

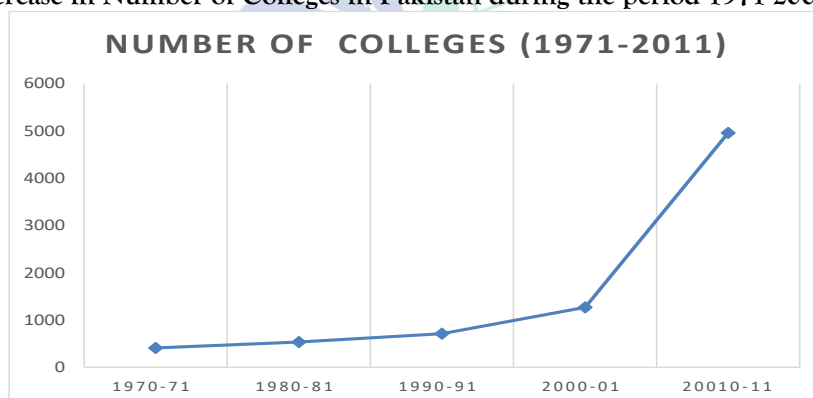
increased in in 1991 it was almost three times of 1971, by the end of 2011 it touched 1876629 out of total 583730 were female. Increase in last decade enrolment is due to awareness campaign by governments and other related organizations.

Table 3.5 Number of Colleges (1971-11)

Year	Number of Colleges
1970-71	411
1980-81	533
1990-91	711
2000-01	1268
20010-11	4956

Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

Figure 3.4 Increase in Number of Colleges in Pakistan during the period 1971-2008



Source: State Bank of Pakistan (2012), Economic Survey of Pakistan (Various Issues)

It is vibrant evident that after 1971 Pakistan has made noteworthy advancement by providing sound base for collage levels studies. In 1971 there were 411 colleges. Identical trend is observed till 2001. After 2001 due to policies of government to meet the goals of MDG by the end of 2016, a sharp upward trend is observed .by the end of 2011 there were 4956 college in Pakistan which cover up to degree level education.

c). Higher Education

Level of higher education is one of the indicators of economic and social progress. Pakistan has shown a rapid progress in higher education in previous few years. More than 137 public and private sector universities are operating in Pakistan and playing their role in higher education and social responsibility. Federal government has established Higher Education Commission for governance of higher education in the country. The government has increased spending of higher education. The commission has established international research and development standard and implemented to all

public and private sector universities in Pakistan. Thus inequalities in higher education between public and private sector has been reduced to minimum. Current condition of higher education in Pakistan reflects a considerable progress in the area, however, still there is capacity to develop the sector more and bring higher education to international standard. It will not only develop the human capital but will also lead to improve the living standard and economic growth in turn. At the time of inception of Pakistan, the population was estimated about 35 million. Since then the population of Pakistan increased at

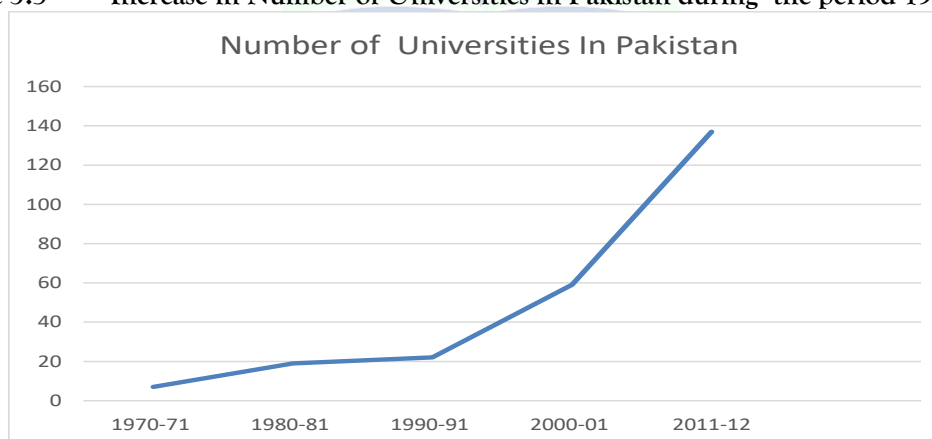
increasing rate and population reached to 180 million in 2012. Almost 25 million out of total the population are university going students aging from 18 to 25. This portion of population put an opportunity as well as a challenge in front of concerned authorities. However, if these 25 million higher education students are handled properly from college to university and to adjusting them accordingly in government machinery and other productive sectors of economy, can lead the nation to the path of progress, prosperity and economic development.

Table 3.6 Number of Universities and Enrolment in Pakistan

Year	Number of Universities	Enrolment in Universities		
		Male	Female	Total
1970-71	7	13354	3703	17057
1980-81	19	35575	7113	42688
1990-91	22	50190	11667	61857
2000-01	59	174504	101770	276274
2011-12	137	584156	521,151	1,105,307

Sources: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

Figure 3.5 Increase in Number of Universities in Pakistan during the period 1971-2011

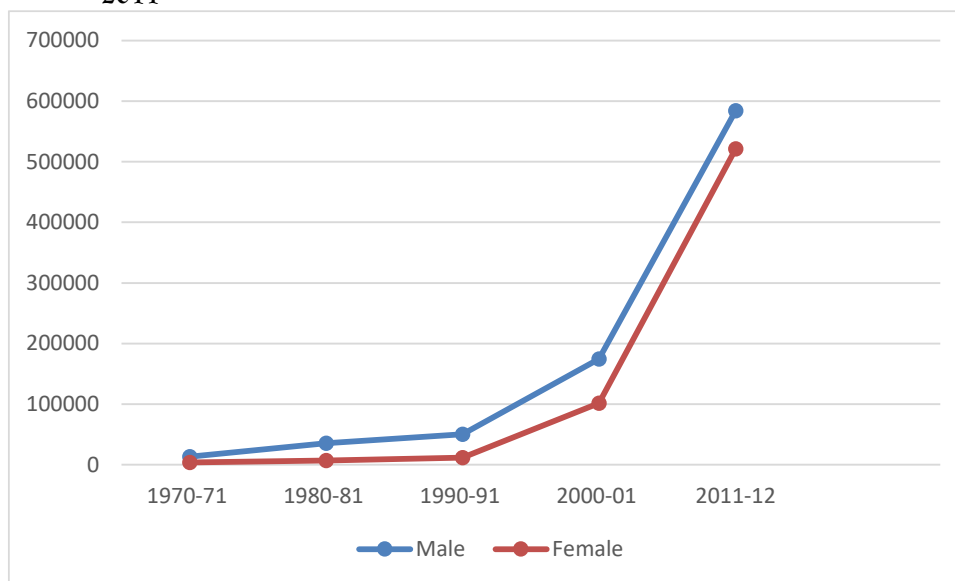


Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

Above table and figure is indication that policy adopted by government of Pakistan during 2001-11 has change the dynamics of the higher education scenario. In 1971 number of higher

education institutes and universities was only 7, which was lowest in the region. In order to achieve MDG goals a policy shift was adopted to increase number of higher education institutes and unvisited thus number of Universities were increased up to 137 by end of 2011.

Figure 3.6 Male and Female enrolment in Universities of Pakistan during the period 1971-2011



Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

3.5.2 Health

Pakistan's health profile is characterised by high population growth, infant, child and maternal mortality rates; communicable diseases account for 50% of total deaths, while 25% are attributed to non-communicable ones, including cancer, diabetes and hypertension (National Health Policy 2010).

There is, however, a silver lining: Government initiatives have increased access to clean drinking

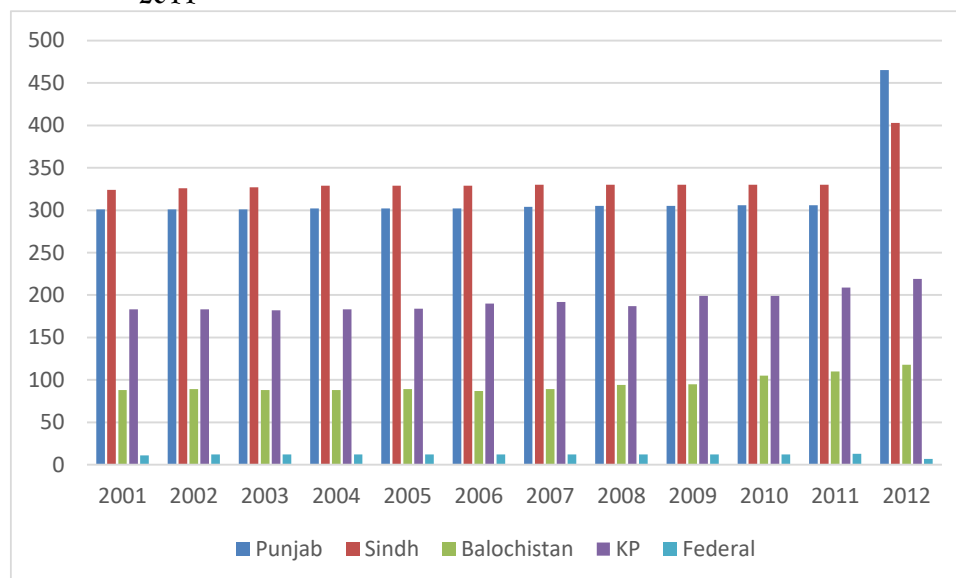
water for 91% of the urban population, and adequate sanitation facilities for 72% (2010-13), while the number of people suffering from obesity and diabetes are among the lowest in the world.*Additionally, infrastructural improvements in government hospitals are the single most important development in the last decade. Public hospitals cater to thousands of patients, particularly road accident and crime-related victims, who are often not admitted to private hospitals. It is evident from the following table and figure

Table 3.7 Number of Hospitals in Pakistan

Year	Punjab	Sindh	Balochistan	KP	Federal	Total
2001	301	324	88	183	11	907
2002	301	326	89	183	12	911
2003	301	327	88	182	12	910
2004	302	329	88	183	12	914
2005	302	329	89	184	12	916
2006	302	329	87	190	12	920
2007	304	330	89	192	12	927
2008	305	330	94	187	12	928
2009	305	330	95	199	12	941
2010	306	330	105	199	12	952
2011	306	330	110	209	13	968
2012	465	403	118	219	7	1212

Sources: Statistical bureau of Pakistan 2012

Figure 3.7 Male and Female enrolment in Universities of Pakistan during the period 1971-2011



Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

Laboratory services in government hospitals have improved with installation of CT scan, MRI and Nuclear Cardiac Imaging equipment. These services are provided at subsidised rates, while ultrasonology, echocardiography and radiology are free for in-patients. However, expansion and better maintenance of these facilities, as well as better hygiene standards, is an immediate requirement.

Health plays an important role in human development. Healthy population is an asset for a country because it pushes up the efficiency of labour. Good health helps in human capital accumulation and is itself an important form of human capital. Poor health affects school enrolment, employment level and labour force participation rate which negatively affects the economic growth. Health reforms are vital part in

human development. Steady population growth is an advantage for a nation since it provides labour force for work. Population is itself an essential type of human capital. It is a fact that poor health facilities effects school enrolment, less skilled labour availability which ultimately effect economic growth.

3.5.2.1 Health Expenditure

Since Pakistan is a developing country, that's why most of its Health sector expenditure is funded by government. Pakistan's outgoings GNP share to health sector is 0.5% of total (Economic Survey of Pakistan, 2011-12). Health sector main source of finances is from public sector organizations. In the same way provision of health structure is also a fundamental obligation of public sector in Pakistan.

Table 3.8 Health Expenditure in Pakistan

Period	Health expenditure as percentage of GDP
1961-65	0.492
1965-70	0.416
1971-75	0.478
1975-80	0.712
1981-85	0.762
1985-90	1.054
1990-95	0.788



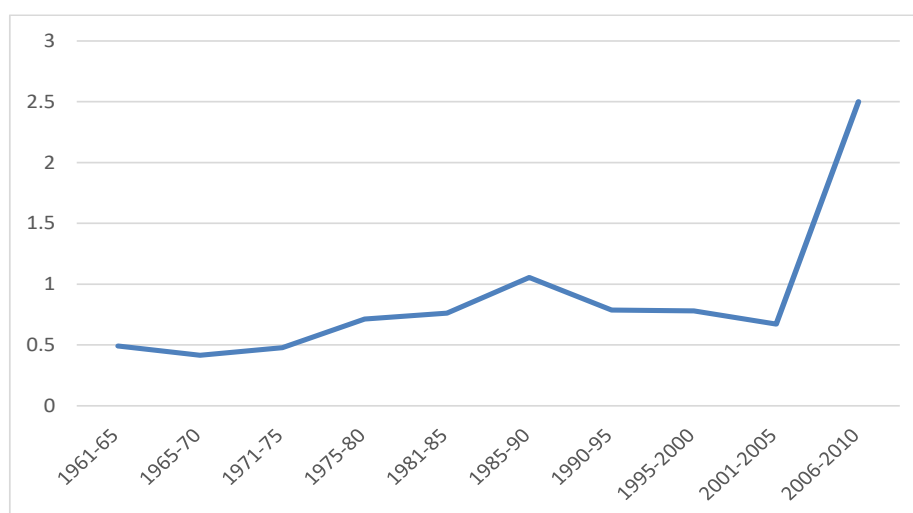
1995-2000	0.780
2001-2005	0.672
2006-2010	2.5

Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

Pakistan witnessed variations in health expenditure since independence. The health overheads in GDP of Pakistan was on average 0.492 % during the period 1961-65 improved to 0.762% of GDP during the period 1981-85. The health expenditure as a percentage of GDP

remained higher during the period 1986-90 which was on average 1.054 % of GDP per annum (State Bank of Pakistan, 2005). It again fell to 0.54% of GDP during the period 2006-08. The health expenditure as percentage of GDP, average annual Health expenditure and per capita expenditure of Pakistan is given in the following table.

Figure 3.8 Health Expenditure of Pakistan 1965-2010



Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

3.5.3 Skill Development

Skills development is vital to the achievement of economic growth, social development, poverty reduction and a stable and cohesive society. The economic fundamentals of the country are strong – large and diverse resources, a young population and a favourable location close to large regional markets. Emerging macro-economic policies are designed to achieve sustained economic growth of at least seven percent a year.² but growth will depend on increasing exports; raising productivity to improve international competitiveness; investing in energy and infrastructure; developing new technologies and economic sectors and attracting foreign investment. A better skilled workforce will be an asset and contribute to growth; a lack of skills will hamper and frustrate development. Training provision must be linked,

therefore, to industrial and economic policies to meet the demands of a changing economy.

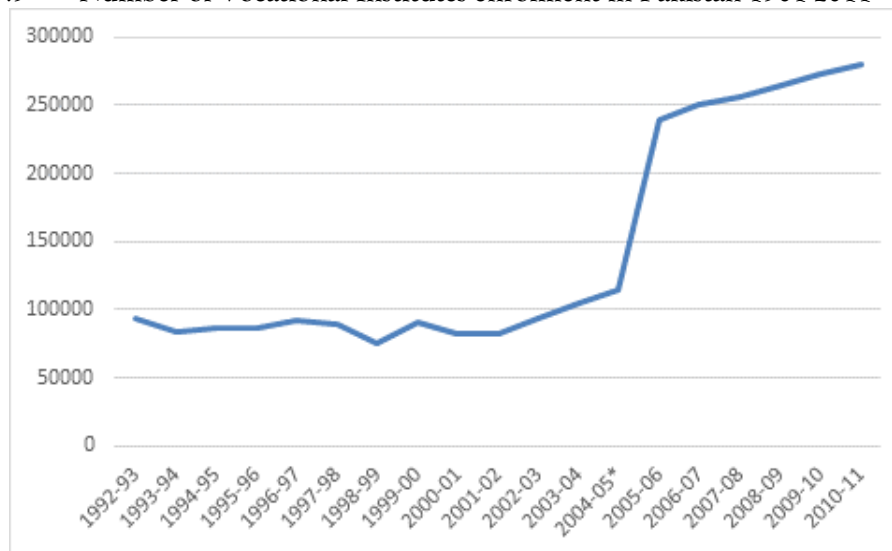
In 1947, the population was 33 million. It is now nearly 184 million; the median age is 22 years and 60 per cent of the population is under 30 years of age. Although population growth cannot be predicted precisely, it is likely that by 2050 the working age population will double from its present 110 million, and the age group 15-49, which was 96 million in 2010, will top 180 million by 2050. If this young population is in productive work, and is trained to internationally recognised standards to enable jobs to be found overseas, the potential benefits are considerable. Wealth will be generated through production, trade, the provision of services, tax revenues and remittances from overseas workers. This demographic dividend provides a unique opportunity to transform the economy. Alternatively, there will be economic and social costs if the ambitions of young people are not addressed.

Although rich in natural resources, Pakistan's greatest asset is its human capital. Pakistan need to do more to equip young people, those in jobs and those seeking work with the skills to contribute to the country's economy, to contribute to their communities and to foster individual talent. In an increasingly competitive world, a more highly skilled workforce is required if national economic and social policy goals are to be achieved. Pakistan's decline in productivity and exports is to be reversed.

Government is committed to increasing access to, and the quality of, basic education. In fact TVET Policy document demonstrates so clearly, as a nation we must build the skills that are necessary

to make the country more efficient and competitive, both at home and overseas. The Government of Pakistan has stoic resolve and commitment to ensure the implementation of the TVET policy, encouraging technical and vocational education for national and international labour markets. Vocational education is controlled by the Pakistani Technical Education and Vocational Training Authority. This body strives to re-engineer the process in line with national priorities, while raising tutoring and examination standards too. Gross enrolment in vocational institutes can be observed in the following figure.

Figure 3.9 Number of Vocational Institutes enrolment in Pakistan 1901-2011



Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

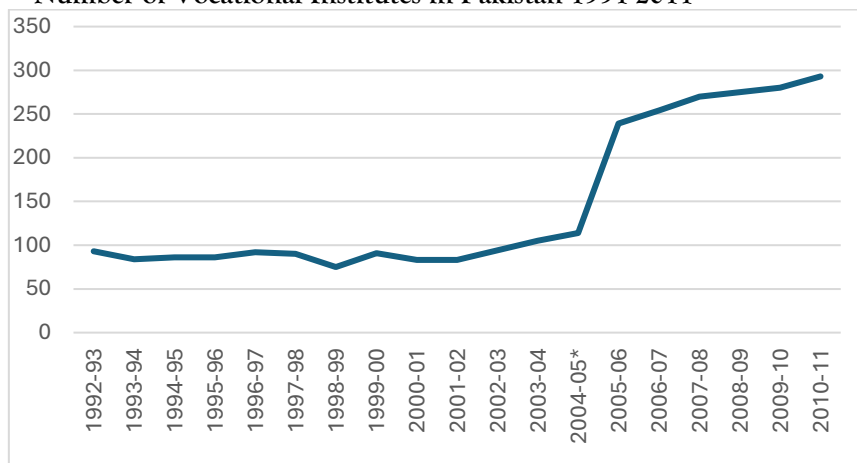
Pakistan inherited a system of Technical Vocational Education & Training (TVET), which was incompatible with requirements. The TVET was built upon low base over a period of five decades. The period 1980-90 witnessed a major expansion in the system while the period 1991-2000 marks qualitative improvement, initiation of women training programmes in non-traditional trades and involvement of employers more intimately in vocational training planning and administration. This period also saw establishment of Technical Education and Vocational Training Authority (TEVTA) in Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan.

Realizing the importance of the challenges in TVET (Institutional and Informal sector) and the issues of quality, relevance and governance, the Government of Pakistan established National Vocational and Technical Education Commission (NAVTEC) in 2006 (now National Vocational & Technical Training Commission-NAVTTTC) to provide policy direction for Technical Education & Vocational Training to meet National and International demand for skilled manpower. In order to provide framework for the purpose the NAVTTTC developed "National Skills Strategy (NSS), 2008-2012" in consultation with all the stakeholders and on the basis review of the relevant documentation on the subject.

The strategy aims at achieving three main objectives:

- Relevant skills for Industrial and Economic Development
- Improving Access, Equity and Employability
- Assuring quality for skills development

Figure 3.10 Number of Vocational Institutes in Pakistan 1991-2011



Source: State Bank of Pakistan (2005), Economic Survey of Pakistan (Various Issues)

The study secondary data have been collected from different authentic sources. Sources are given below:

METHODOLOGY

4.1 Introduction

This chapter discusses the methodology used to find the Impact of Human Capital on Economic Growth of Pakistan. A good research must have well developed methodology, tools and techniques in order to make the analysis sound and concrete. The secondary data is collected for dependent variable i.e. Gross Domestic Product and independent variables (three proxy variables) i.e. Health, Education, and Technical Education & Vocational Training to analyse Impact of Human capital on Economic Growth of Pakistan. The techniques opted for estimation of econometric models is phased in chronological orders. In first phase, to analyse each descriptive analysis is used. While in second phase the time series data is analysed for unit root problem for this purpose stationary test has been opted. In the third phase impact of human capital on economic growth has been analysed by developing two econometric models to test hypothesis.

4.2 Data Collection and Analysis Methodology

In this research study, the impact of human capital on economic growth of Pakistan have been analysed. Secondary data during the time period 2001-2012 have been used to test the hypothesis.

- I. Government of Pakistan-“Economic Survey of Pakistan”
- II. NAVTTC and GIZ-“Study on Access, Equity and Employability”, (Punjab, KPK and FATA)
- III. World Bank-“World Development Indicators”
- IV. Government of Pakistan- “Federal Bureau of Statistics”
- V. UNDP-“Human Development Reports”, (various issues)
- VI. Government of Pakistan-“Social Indicators of Pakistan”
- VII. WEF-“Human Development Index 2014”

4.2.1. Data Analysis Methodology

To run the regression models, first the ADF test for stationarity has been applied. After Augmented Dicky Fuller test, the OLS techniques have been adopted to estimate the models by using GRETLE Software to calculate the impact of human capital on economic growth of Pakistan.

Augmented Dicky Fuller: The data comprised on dependent and independent variable is of time series nature. The time series data normally pertains the problem of stationarity. In order to

check whether the data is stationary or not? The Augmented Dicky Fuller Test is used.

4.3 Analytical Technique

Analytical techniques is opted to reach the main objectives of the study. The study used time series regression analysis to analyse the effect of human capital on Gross Domestic Product.

Here, human capital proxies are combined as factor to evaluate the impact on economic growth. Moreover Human Capital peroxide as TVET, School and University enrolment combined with labour force, Gross expenditure by government on economic growth of Pakistan. The econometric model is following:

$$EG = \beta_0 + \beta_1HCV + \beta_2HCE + \beta_3HCH + \beta_4LF + \beta_5PK + \mu_i \quad \dots (I)$$

Where,

EG = GDP Constant

HCV= Gross Enrolment of TVET Students

HCE= Gross Enrolment of Primary, Middle, High Schools and University

HCH=Patient per Doctor

LF= Labour Force

PK= Gross expenditure by Government

μ_i = error term

Similarly in second growth model will be used in this research study to find the impact of Human capital on economic growth. Whereas Gross Domestic Product constant as (EG) (a proxy for economic growth) is the dependent variable, on the other hand Physical Capital (PK), Labour Force (LF), Human Capital as Patient per Doctor (HCH) will be used as independent variables.

$$EG = \beta_0 + \beta_1HCH + \beta_2LF + \beta_3PK + \mu_i \quad \dots (II)$$

Where,

EG = GDP Constant

HCH=Patient per Doctor

LF= Labour Force

PK= Gross expenditure by Government

μ_i = error term

To find out impact of Human capital as Skill Development effect on economic growth of Pakistan we will opt the following OLS model

$$3EG = \beta_0 + \beta_1HCV + \beta_2LF + \beta_3PK + \mu_i \quad \dots (III)$$

Where,

EG = GDP Constant

HCV= Gross Enrolment of TVET Students

LF= Labour Force

PK= Gross expenditure by Government

μ_i = error term

In this research study to find out the impact of Education as Human capital on the Economic Growth is analysed by opting an OLS models, in which proxy variable for Economic Growth (EG) is GDP constant, while depended variables proxies are, Gross education enrolment (HCE), Physical Capital (PK), Labour (L)

$$EG = \beta_0 + \beta_1HCE + \beta_2LF + \beta_3PK + \mu_i \quad \dots (IV)$$

3.4 Hypotheses Formulation

Acceptances or rejection of Hypothesis to be tested in this research study.

Given hypothesis to be tested for first regression model. It is assumed that

3. Human Capital does not affect the Economic Growth of Pakistan
4. The policies adopted by the government for the development of Human Resource are not conducive

3.5 Justification of Hypotheses

Justification of hypotheses is argued below

3.5.1 Identification, Definition and Measurement of Variables

In this study it is required to introduce the variables opted in the study before going on to Empirical estimation. The variables which have been taken under consideration are Gross Domestic Product as "GDP", Physical Capital as "PK", Labour as "L" and Human Capital as "HC".

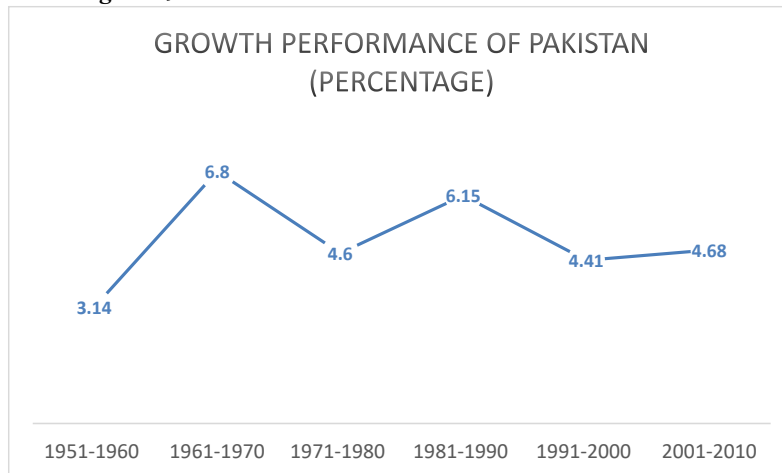
a). Gross Domestic Product

The Monetary value of all the final goods and services produced within a country in a specific period of time. However it can be estimated on annual, quarterly and decade basis. Moreover in order to calculate GDP, consumption (private and public), investment, government expenditure are added up with imports minus exports that occur within the geographic boundaries of a country.

In this study GDP as constant is used as proxy variable for economic growth. It is recommended by most of the economist to measure the economic growth by Gross domestic Product. It has been used as proxy variable for economic growth by Asteriou and Agiomirgianakis (2001),

Bloom et al (2000), Bhargava et al (2001), Barro (1991) and Borensztein (1998).

Figure 4.1 Growth Performance of Pakistan 1951-2010



Source: State Bank of Pakistan (2012)

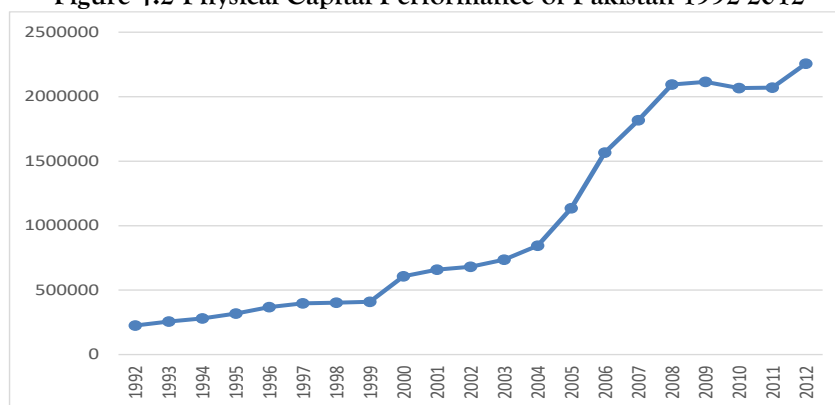
Source: Author's Computation from the data taken from State Bank of Pakistan (2012)

b). Physical Capital:

Physical capital is part of the production process, what economists call a factor of production. It includes things like buildings, machinery, equipment and computers. Physical capital isn't the land or the raw materials that are used and turned into goods and services; those are natural

resources. People with knowledge or education that help produce things; they're called human capital. Physical capital is the machinery, buildings and computers that helped turn the raw materials into finished products or services. It is all of the equipment and all of the other physical things that a business owner or company invests money into when they want to produce something. In this study Physical capital is measured by proxy variable Gross Fixed Capital Formation denoted by "PK".

Figure 4.2 Physical Capital Performance of Pakistan 1992-2012



Source: Author's Computation from the data taken from State Bank of Pakistan (2012)

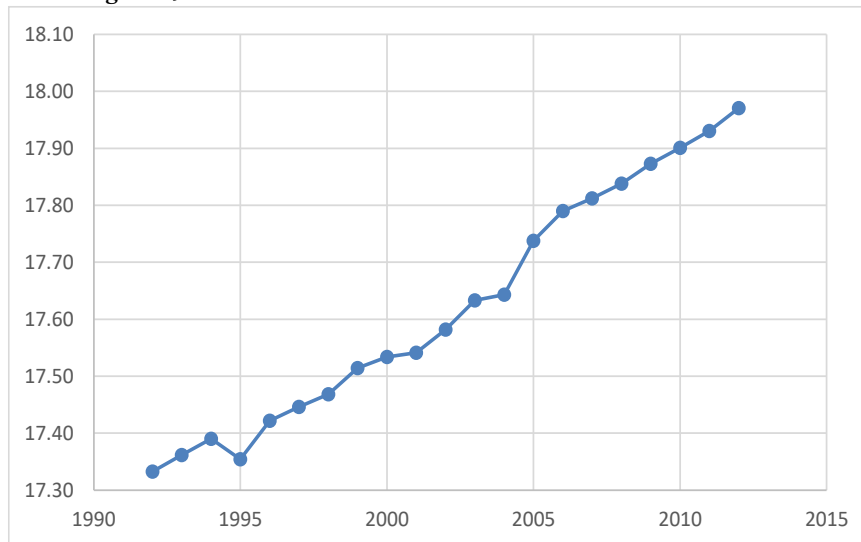
c). Labour:

The aggregate of all human physical and mental effort used in creation of goods and

services. Labour is a primary factor of production. The demand and supply of labour force in an economy settles the employment ration and economic growth. It is an important variable in the study. Gross Labour Force will be used as a

variable to study the effect of labour on our econometric model.

Figure 4.3 Labour Force Performance of Pakistan 1992-2012



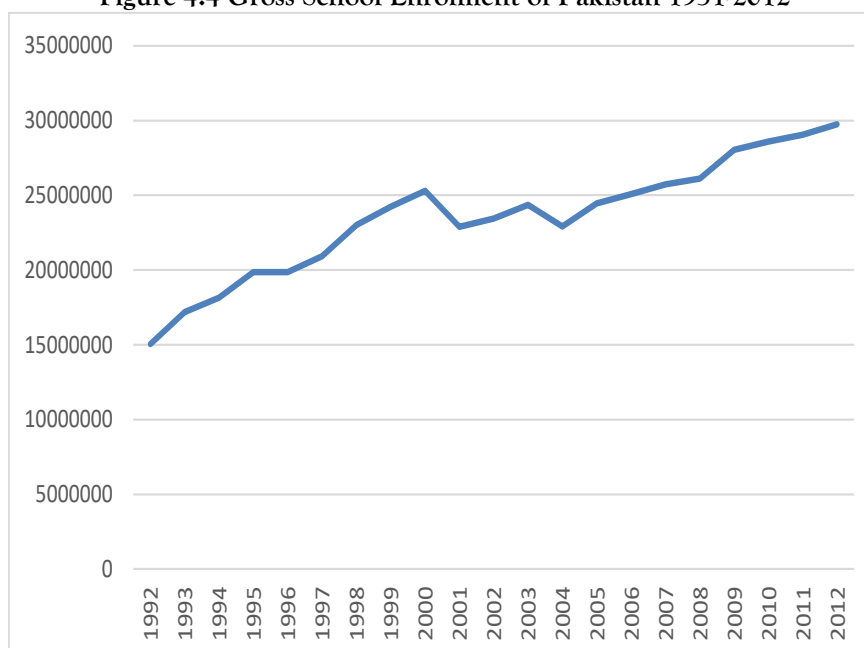
Source: Author's Computation from the data taken from State Bank of Pakistan (2012)

d). Human Capital:

Human Capital is education, experience and abilities of an employee which have an economic value for employers and for the economy as a whole. Education, Health and Skills are widely used in connection with economic growth. In

education enrolment, average years of education, primary, secondary and higher school levels as well as higher education is considered as Human capital is used by Agiomirgianakis (2001), Abbas (2001), Barro (1991), Canlas (2003), and McMahon (1998). In this study gross enrolment in schools, colleges and universities data as a proxy variable for education in this study.

Figure 4.4 Gross School Enrolment of Pakistan 1951-2012

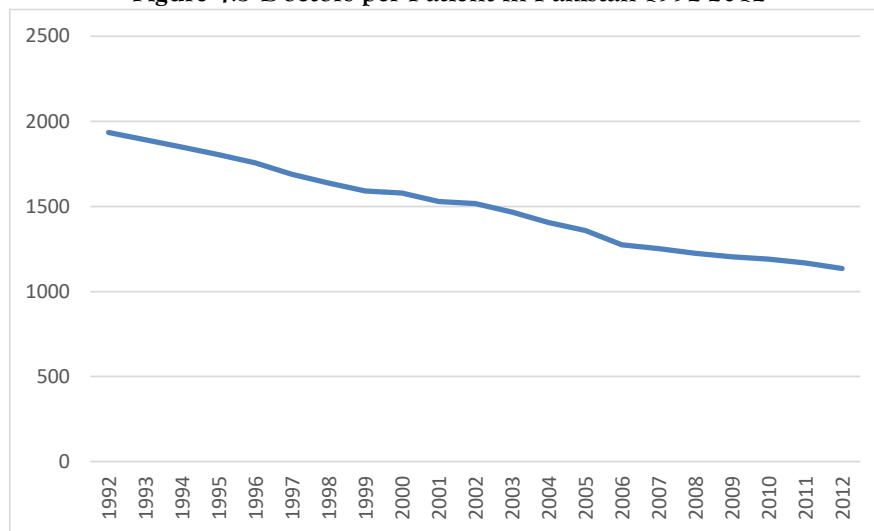


Source: Author's Computation from the data taken from State Bank of Pakistan (2012)

Health as human capital have been only a small fraction of those on education and training. In fact, most of the economics literature on health discusses ways to improve the delivery of health

care services. Health sector is enabling efficient utilization of human skills. Health indicators which are recommended by researchers are doctors per bed, life expectancy and infant mortality rate etc. In this study we will use life expectancy as proxy variable for health sector.

Figure 4.5 Doctors per Patient in Pakistan 1992-2012

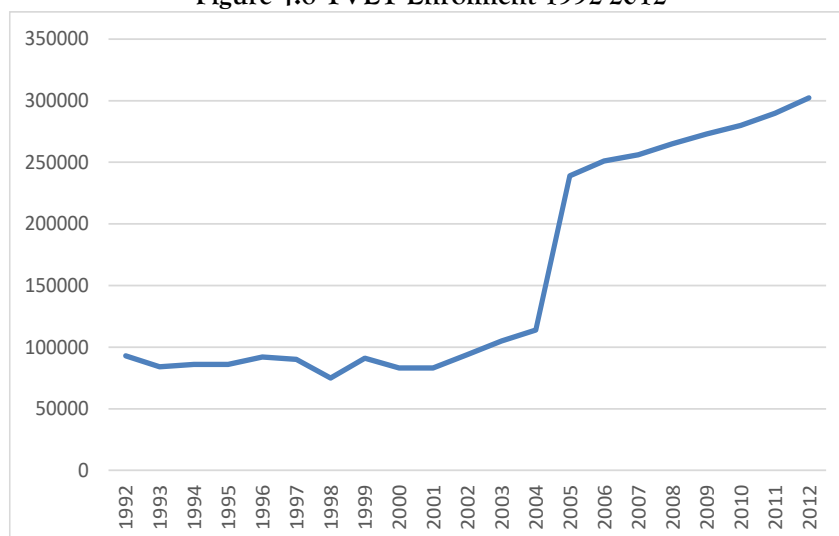


Source: Author's Computation from the data taken from State Bank of Pakistan (2010)

TVET refers to a range of learning experiences which are relevant to the world of work. The learning experiences may occur in a variety of learning contexts, including educational institutions and work places. As we know that there is a statistically and economically positive effect of the quality of education on economic growth which is far larger than the association between quantity of education and growth. An

education system thus includes formal and non-formal programs. In non-formal programs TVET is playing a major part in the development of a country. Highly skilled workers are backbone of our industrial system which is mostly dependent on human intensive investment. Moreover, to narrow the gap of poverty, technical training is most effective tool in current global challenges. In this study we will use data of technical and Vocational school enrolment as proxy variable for human capital.

Figure 4.6 TVET Enrolment 1992-2012



Source: Author's Computation from the data taken from State Bank of Pakistan (2012)

e). Human Capital and Economic Growth

Inherited and acquired abilities by individuals are different in general, but only the acquired abilities can create difference among countries in race of economic progress and wellbeing. Human capital deals with developed capabilities which can be in formal and informal education, training and experience. As accumulation of human capital produces corresponding national aggregates economic growth. Human capital and physical capital is regarded as a factor of production. It implies the contribution of human capital is greater than the volume of physical capital in economic growth.

The focus on human capital as a driver of economic growth for developing countries has led to undue attention on school attainment. Developing countries have made considerable progress in closing the gap with developed countries in terms of school attainment, but recent research has underscored the importance of cognitive skills for economic growth. This result shifts attention to issues of school quality, and there developing countries have been much less successful in closing the gaps with developed countries. Without improving school quality, developing countries will find it difficult to improve their long run economic performance.

In era of intensive competition and dynamic technology, education is considered as a

fundamental requirement for every country. The level of education in a country, has been used as an indicator of political, social and economic development. Not only an individual can find better opportunities for bright future but an economy can develop a skilled and relevant human capital for economic activities and growth. Knowledge, skill and expertise for certain area can be acquired through education, thus leads to increase in human capital productivity and improvement of living standard of masses. Moreover, this phenomenon creates new sources of earning and helps of accelerate economic growth. Literature highlighted different aspects to be reviewed while assessing education level. It includes age, gender, marital status, geographical location, parents' education level and profession, ethnicity, income, language, religious affiliations etc. One of the most debated factors is the socioeconomic status differences among those main constituents which contribute to success of students.

Human capital is one of the factor of production along with physical capital. Larger amount of factors of production leads to higher productivity and thus higher economic growth. It can be concluded that human capital is a requisite as well a constraint to economic growth, when it is in abundance or scare. Human capital development, irrespective of geographical locus, can generate worldwide economic growth. However, alarming population growth has not eliminated to economic growth as hypothesized by Malthus.

Indeed, demographic transition is highly associated with economic growth of a certain region. Human capital serves as an indicator to economic growth and demographic changes.

RESULTS AND DISCUSSION

5.1 Introduction

5.2 Descriptive Statistics:

TABLE 5.1: Descriptive Statistics

Variable	Mean	Median	Minimum	Maximum	Std. Dev.
l_EG	29.1729	29.1245	27.8177	30.6589	0.86126
l_HCE	16.9339	16.9805	16.5159	17.1422	0.16448
l_HCH	7.29721	7.32383	7.03439	7.56735	0.17337
l_HCV	11.8242	11.4511	11.2252	12.6188	0.55285
l_LF	2.86912	2.86687	2.85258	2.88872	0.0119
l_PK	27.3529	27.2459	26.1402	28.4446	0.80456

Source: Researcher's own calculations.

Table 5.1 shows descriptive statistics of the data for analysis after taking log of variables to normalize the data. EG, HCE, HCH, HCV, LF, PK, stand for Gross Domestic Product, Human Capital Gross School enrolment, Human Capital Patient per Doctor, Human Capital Vocational Enrolment, Labor Force, Physical Capital, respectively. All the variables included in analysis, have no negative values. Hence mean, median and standard deviation for the variables are also in showing positive values.

This chapter includes a series of analyses tables and their results based on models developed in chapter 4 of this study. It consists of description of the data, stationarity tests for each variable and regression analysis result. The models are calculated by using statistical software GRETLE.

5.3 Test of stationarity (Augmented Dicky Fuller Test)

The data set includes one dependent variable and five independent variables, from 2001 to 2012. It is analysed that time series data have problem of stationarity in general, so the data set was checked for stationarity first and every variable found as non-stationary (Mahmood, 2012). However, by taking first difference of each variable, these variables became stationary. The tests after taking differences are given as

TABLE 5.2: Statistics of First Difference, [I (1)]

Variables	t statistics	Level of Significance at 5%	Probability	Remarks
l_EG	-4.14714	0.05	0.005192	stationary I(1)
l_HCE	-4.97984	0.05	0.000022	stationary I(1)
l_HCH	-4.11662	0.05	0.00090	stationary I(1)
l_HCV	-4.24182	0.05	0.004264	stationary I(1)
l_LF	-1.63563	0.05	0.004643	stationary I(1)
l_PK	-3.15395	0.05	0.0393	stationary I(1)

Source: Researcher's own calculations.

Above are the Augmented Dicky Fuller tests of stationarity for every variable after taking log and first difference through Gretle Software. The Asymptotic p-values for all variables are 0.005192, 0.000022, 0.00090, 0.00426, 0.00464, and 0.0393 respectively. The Asymptotic P-value for every variable is less than significance value 0.05, which indicates that variable are stationary at first difference.

5.4 Empirical Results

The empirical results and their interpretations of four models are given for each model as follows.

5.4.1. Model-1

A general expression for the first model which represents effect of Human capital (HCV, HCE, HCH) on economic growth (EG),

$$EG = \beta_0 + \beta_1 HCV + \beta_2 HCE + \beta_3 HCH + \beta_4 LF + \beta_5 PK + \mu_i \quad \dots (1)$$

Dependent variable: ld_EG

TABLE 5.3: Human Capital Effect on Economic Growth

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
Const	0.156795	0.0309311	5.0692	0.00017 ***
ld_HCV	0.0146497	0.0271126	-0.5403	0.049746**
ld_HCE	0.0331502	0.171126	0.1937	0.084918*
ld_HCH	0.33532	0.617149	1.6776	0.1156
ld_LF	-0.825117	3.03926	-2.7149	0.01676**
ld_PK	0.23949	0.100082	2.3929	0.03129**
Mean dependent var	0.142063	S.D. dependent var		0.048563
Sum squared resid	0.029707	S.E. of regression		0.046065
R-squared	0.897025	Adjusted R-squared		0.910248
F(5, 14)	6.438066	P-value(F)		0.002637
Log-likelihood	36.74213	Akaike criterion		-61.48427
Schwarz criterion	-55.50987	Hannan-Quinn		-60.318
Rho	0.241907	Durbin-Watson		1.408788

Source: Researcher's own calculations.

Interpretation

Above are the results of model 1, using dependent variable EG (Economic growth) and independent variables HCV (Gross Enrollment of TVET as proxy variable for Technical Training), HCE (Gross School enrolment as proxy variable for Education), HCH (Patient per doctor as proxy variable for Health), LF (Labour Force), PK (Physical capital). Ordinary Least Square is used for finding the results through GRETLE software. Results show positive coefficient for constant, HCV, HCE, HCH and PK, however, negative for LF. Coefficients of constant, HCV, HCE, LF and PK are significant. Model shows that independent variables are bringing 89% change in dependent variable (R-Squared 0.897025). The model is good fit as the P-value of T-test statistic is highly significant (0.002637).

Results indicate that Economic growth is positively related with Technical training, Education, Health indicator and physical capital. However, labour is negatively correlated with Economic growth. It can be concluded that 1 % increase in Vocational training, school enrolment, health indicator and physical capital bring 1%, 3%, 33% and 23% increase respectively, in economic growth of the country. Moreover, 1% increase labour force bring 82% decrease respectively in economic growth of the country.

5.4.2 Model 2

In this model economic growth as dependent variable while Proxy variables for health, labour force and physical capital is used as independent variable, the model is following

$$EG = \beta_0 + \beta_1 HCH + \beta_2 LF + \beta_3 PK + \mu_i \dots \dots (II)$$

Dependent variable: ld_EG

TABLE 5.4: Human capital as Health Effect on Economic Growth

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
ld_HCH	-0.58851	1.06106	-2.4396	0.02596 **
ld_LF	0.82738	12.2218	0.4768	0.63958
ld_PK	0.327835	0.172926	1.8958	0.07512 *
Mean dependent var	0.142063	S.D. dependent var		0.048563
Sum squared resid	0.109058	S.E. of regression		0.080095
R-squared	0.75681	Adjusted R-squared		0.7282
F(3, 17)	17.63475	P-value(F)		0.000018
Log-likelihood	23.73734	Akaike criterion		-41.47467
Schwarz criterion	-38.48747	Hannan-Quinn		-40.89154

Rho	0.525437	Durbin-Watson	0.948711
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Source: Researcher's own calculations.

Interpretation

Above are the results of model 2, using dependent variable EG (Economic growth) and independent variables HCH (Patient per doctor), LF (Labour Force), PK (Physical capital). Ordinary Least Square is used for finding the results through GRETLE software.

Results show positive coefficient for LF and PK, however, negative for HCH. Coefficients HCH and PK are significant. Model shows that independent variables are bringing 75% change in dependent variable (R-Squared 0.75681). The model is good fit as the P-value of T-test statistic is highly significant (0.000018).

Results indicate that Economic growth is positively related with labour force and physical

capital. However, Health indicator is negatively correlated with Economic growth. It can be concluded that 1 % increase in labour force and physical capital bring 82%, 32% increase respectively, in economic growth of the country. Moreover, 1% increase in Health indicator brings and 58% decrease in economic growth of the country.

5.4.3 Model 3

To find out effect of technical training on economic growth, following model is used:

$$EG = \beta_0 + \beta_1 HCV + \beta_2 LF + \beta_3 PK + \mu_i \dots (III)$$

Dependent variable: Id_EG

TABLE 5.5: Human capital as Technical Training Effect on Economic Growth

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
Id_HCV	0.217853	0.0850701	-2.5609	0.02025 **
Id_LF	0.330041	20.0209	1.6485	0.11761
Id_PK	0.523944	0.188563	2.7786	0.01287 **
Mean dependent var	0.142063	S.D. dependent var		0.048563
Sum squared resid	0.127498	S.E. of regression		0.086602
R-squared	0.715689	Adjusted R-squared		0.682241
F(3, 17)	49.30875	P-value(F)		0.00000
Log-likelihood	22.17508	Akaike criterion		-38.35016
Schwarz criterion	-35.36296	Hannan-Quinn		-37.76703
Rho	0.317121	Durbin-Watson		1.347753

Source: Researcher's own calculations.

Interpretation

Above are the results of model 3, using dependent variable EG (Economic growth) and independent variables HCV (Vocational training), LF (Labour Force), PK (Physical capital). Ordinary Least Square is used for finding the results through GRETLE software.

Results show positive coefficient for HCV, LF and PK. Coefficients HCV and PK are significant. Model shows that independent variables are bringing 71% change in dependent variable (R-Squared 0.715689). The model is good fit as the P-value of T-test statistic is highly significant (0.000000).

Results indicate that Economic growth is positively related with vocational trainings,

Labour force and physical capital. However, Vocational training is negatively correlated with Economic growth. It can be concluded that 1 % increase in Vocational training, Labour force and physical capital bring 21%, 33%, 54% increase respectively, in economic growth of the country.

5.4.4. Model 4

In model 4, Human capital is replaced by gross school enrolment which is proxy variable for education. In this model EG is depended variable while rest of the variables are in depended. It is indicated in the following model:

$$EG = \beta_0 + \beta_1 HCE + \beta_2 LF + \beta_3 PK + \mu_i \dots (IV)$$

Dependent variable: Id_EG

TABLE 5.6: Human capital as Education Effect on Economic Growth

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
Id_HCE	0.481745	0.34116	1.4121	0.067597*
Id_LF	0.601432	14.2138	1.2383	0.23242
Id_PK	0.500552	0.151671	3.3003	0.00423 ***
Mean dependent var	0.142063	S.D. dependent var		0.048563
Sum squared resid	0.13378	S.E. of regression		0.08871
R-squared	0.701681	Adjusted R-squared		0.666585
F(3, 17)	17.53211	P-value(F)		0.000019
Log-likelihood	21.69413	Akaike criterion		-37.38825
Schwarz criterion	-34.40106	Hannan-Quinn		-36.80512
Rho	0.413766	Durbin-Watson		1.143977

Source: Researcher's own calculations.

Interpretation

Above are the results of model 4, using dependent variable EG (Economic growth) and independent variables HCE (Gross school enrolment), LF (Labour Force), PK (Physical capital). Ordinary Least Square is used for finding the results through GRETLE software.

Results show positive coefficient for all the variables that are HCE, LF and PK. Coefficients of HCE and PK are significant. Model shows that independent variables are bringing 70% change in dependent variable (R-Squared 0.701681). The model is good fit as the P-value of T-test statistic is highly significant (0.000019).

Results indicate that economic growth is positively related with Gross school enrolment, Labor force and physical capital. It can be concluded that 1 % increase in Gross school enrolment, Labour force and physical capital bring 48%, 60% and 50% increase respectively, in economic growth of the country.

SUMMARY, CONCLUSION AND POLICY RECOMMENDATION**6.1 Summary**

This chapters includes conclusions based on previous chapters. It also contains recommendations and suggestions which will be useful for policy making and further research. The study was constructed on some objectives and the study concludes with accomplishment of objectives. The study started with first chapters which entails introduction, objectives, significance, hypothesis and organization of study. Second chapter is of literature review, in this chapter a wide range of literature was reviewed to

establish a link between in economic growth and Human Capital. The neo classical literature mainly begins with the model of economic growth given by Solow (1956). Labour, Capital and technology were taken as factors of production in Solow model. The chapter explained the initial theories of economic growth, the exogenous and endogenous growth theories in detail. It also explained basics of economic growth studies. The review of literature shows that there are many determinants of economic like health, education, skills, etc.

Chapter 3 describes on methodology used to find the Impact of Human Capital on Economic Growth of Pakistan the OLS techniques have been adopted to estimate the four models .In chapter 4 which is focused on policies adopted by government of Pakistan. A brief review of policies in education, health and skill development are examined. As we know that during the past era several policies have been practised by different governments in order to achieve sustainable economic growth. This chapter provided sound basis for exploring the human capital-economic growth nexus.it was concluded that further improvement in education, health and skill development is necessary to uplift socio economic life of ordinary people.

6.2 Findings of Study

The central purpose of this study was to analyse the impact of Education, Heath and Technical Training on economic growth of Pakistan. This study also entails the policy review of government policies which are adopted to achieve sustainable economic growth. This study is based on three



objectives. First objective of study is to estimate and analyse the effects of human capital as a flow variable on economic growth in Pakistan. The second objective was linked to government policies with special reference to Health, Education, and Technical, Vocational Education and Training (TVET) and their contribution to economic growth. Likewise to find policy implications and suggest strategies for the future.

The study tried to estimate the effect of human capital on economic growth of Pakistan. The study divided the analysis in four models to estimate the actual impact of human capital on economic growth.

The study used EG (economic growth) as dependent variable with HCV (gross enrolment of TVET as proxy for technical training), HCE (proxy for education) HCH (proxy for health), LF (proxy for labour force) and PK (proxy for physical capital).

The result of first model indicates that technical training, education, health and physical capital move positively with economic growth. It suggests that enhancement in technical trainings, education level, health facilities and physical capital cause economic growth of the country. However, model 1 also suggests that the increase in labour force of country cause negative change in economic growth of country.

The model 2 of the study excluded proxy for technical training and proxy for education. The result of model indicated that labour force and physical capital contribute positively to economic growth of country. However, increase in patient per doctor decrease the economic growth.

Model 3 of study excluded health proxy and added technical training proxy to model 2. The results indicated that vocational training, labour force and physical capital contributes positively to economic growth of country.

In model 4 of study, human capital is replaced with gross school enrolment which is proxy for education. The result indicated positive relationship of education, labour force and physical capital with economic growth of the country.

The overall results can be concluded that human capital has positive impact on economic growth of the country. The human capital whether proxied by vocational training, gross enrolment in schools,

patient per doctor, labour force or physical capital, has a significant impact on economic growth of the country. Hence these variables should be given special value while devising economic policy and planning for economic growth of the country.

Policy Recommendations

Access is the most common issue in all segments of education, health and TVET at primary level, so are the dropouts. Policies and programmes should be devised to address these issues. Moreover inappropriate physical facilities and inadequate staffing is also a major concern. Most of the institutions in public sector suffer from lack of electricity, water and sanitation facilities. Improvement of basic/physical facilities is required. Role of private sector and joint ventures: Private sector has attained an important position in the education at all levels. The boys and girls who are unable to get admissions in public sector institutions join private institutions. It is therefore important that schemes/programmes are devised to assist the private sector and explore ways and means to make joint ventures for facilities expansion and quality improvement.

Market based curriculum needs to be adapted at all level of education.

School dropouts are important to be focused. It is recommended to establish special wing in education departments to cope with school dropouts.

Government should focus on investment friendly policies to attract short and long term private investments in human capital sector.

Technical education must be job oriented, relevant and in extended trades than those offered at the present by public sector TVET institutions. Competencies based skills training be introduced in technical institutions.

Trade testing and certification needs improvement. Skills recognition certificates be standardized in order to facilitate and enhance domestic & overseas employment.

Health sector suffers from inadequate facilities and poor quality of services. Physical facilities be improved and expanded.

Added administrative and financial support needs to be provided for infant health care, disease



prevention programmes and mother child health care programmes.

Requisite funding be provided for operational expenses of health services and hospitals.

The gender gap should be addressed through appropriately designed advocacy programme to bring women in the main stream of economic development.

Independent monitoring and evaluation is essential. For this purpose third party monitoring and evaluation consultants needs to be appointed to avoid delays in programme/policy implementation.

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