Social Spending, Human Capital and Growth in Pakistan

Submitted by

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CERTIFICATE

This is to certify that this thesis entitled: **"Social Spending, Human Capital and Growth in Pakistan"** submitted by Ms. Ishfana Saddique is accepted in its present form by the Department of Economics and Econometrics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in **Master of Philosophy in Econometrics**.

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DEDICATION

I dedicate my work to greatest

Mua'llam Hazrat Muhammad (S.A.W.W);

my parents and sisters

Acknowledgement

I am utterly grateful to Allah the One who “Taught man which he knew not” (96:5). He bestowed abundant mercy and benevolence on me during this arduous period, since inception up to the fulfillment of the entire task.

Utmost gratitude is due for my respected supervisor, Dr. Ahsan ul Haq; without his tremendous support and encouragement on every single step, I would have been bewildering in the dark. I am indebted to his worthy concern for always providing immediate support. His compassionate and cordial attitude ever steered to motivate me for handling difficult matters confidently.

I thank to all my teachers for providing me their support at various steps.

Words come short to express the gratitude for my great mother. Her role in educating the marginalized being the real incentive, made me observe and understand the strength of crisis. I owe special thanks to my sister Shabana Shaheen, whose support brought me to avail this opportunity. I wish to thank my parents and sisters for giving me the strength in difficult times with their ultimate support in form of prayers, love and confidence in my capabilities.

ABSTRACT

This study is based on the impact of social spending, human capital and growth. In this study main focus on the effects of social spending in social indicator and human capital on economic growth in the case of Pakistan using the time series data from the period of 1975 to 2017. Econometrics technique GMM is apply to finding the results. The estimation results show that there is a significant and positive impact of all the variables of social spending, human capital on growth in Pakistan. There is strong relationship between the variables. Policy recommended that government should focus on health and education capital to increase the economic growth of Pakistan.

Key words:

Social Spending, Health Capital, Economic Growth, Generalized Method of Moment (GMM)

Table of Contents

List of Tables

LIST OF ABBREVIATIONS

Real per capita GDP growth	RGDPG
Investment ratio	IN
Education capital	EDC
Health capital	HEC
UFC Under-5 child mortality (per 1000 live births)	UFCM
Education spending	E Spend
Health spending	HSpend
Population growth	Popg
Generalized method of moment	GMM
Trade openness	Topn
Terms of Trade	TOT
Fiscal balance	FB
Inflation rate	Inf
Governance	Gov
Massachusetts Institute of Technology	MIT
Fertility rate	Frt
Urbanization	Urb
Under 15 population	Popn15
Real per capita GDP	RGDP
School repetition	Qualt

CHAPTER 1

INTRODUCTION

Social expenditure is expenditure that is incurred by the government of a country on combined and social necessities and desires like as pension, provision of health and education, infrastructure development etc. (Akrani, 2011). No doubt, increase in social spending causes an economic growth of a country (Furceri & Zdzienicka, 2012).The studies suggest that government expenditure increase on the social sectors can cause the improvement in the living standard even in underdeveloped countries (walker *e*t al ,2014)

Similarly, human capital is one of the most important aspects that has impact on the growth of economic development. It is creative skills, knowledge and intangible blessing by people that compute growth of economic system. Human capital is the expertise of workers/employee to determine the economic worth. Human capital concede that the ability of all workers in organization are not equal and has been defined as important part to generate wealth and economic growth, especially in underdeveloped countries. (Bjorkman, *e*t al., 1986).

Generally, human capital considered as crucial determinant of economic growth and the importance of human capital accumulation is entirely accepted in the existing exogenous and endogenous growth theories Qadri and Waheed (2011). However still it is questionable that what should be the factors for human capital. It is observe that

there is most of studied exist education or health related indicators are used as proxy for human capital.

Even though the importance of education and health sectors for the economic growth of the country, these factors are still one of the most neglected sectors of the Pakistan economy. In the earlier, several studies has been conducted in which education consider just phenomena of need. Some authors argue that education it's considered necessary condition not sufficient condition in long run development for the country. It is just a factor to compute the economic growth.

There is a large number of literature is available on education impact with growth. There is no consensus among the researcher on education impact with growth. They only explained education is just an important factor country's scenario but they failed to provide sufficient condition. With the passage of time researchers realize the importance of education in the context of economic growth. People can improve their lives by way of education Barro (2002).

Further, Education is just phenomena to check the outcome of any country, not requirement for economic growth. (Mackintosh & Tibandebage, 2004) discussed that inequality, poverty and education has reverse relationship. In the nation of Africa the system of education made according the societal constituents which cause the inequality between them. There is few studies exist in Africa which discuss the significance of education. So Africa is interesting country for understanding the association among education and economic growth.

With the period of time, Mankiw *e*t.al (1992) took the important contribution of education capital using rate of enrolment (at secondary level). Education and health capital are two important factors to measure the human capital. Romer (1998) focused that growth and innovation are drawn from human capital stock. Education has become business and like other businesses, people are trying to get education for prestige. For knowledge based economy there narrative should be changed and we must focus on education for knowledge and its role in the country's economic growth.

Study examine the impacts of social spending with human capital and growth, whereas in view of link among health and education obstruction. Estimates of the study obtain on time series data with period 1975 to 2017 in case of Pakistan.

In this study the organization of econometric methodology is to capture the impact of social spending, human capital, and growth in case of Pakistan in the environment of endogenous growth model. In our study the dependent variable are real per capita GDP, investment ratio, educational capital, and health capital. In this analysis, macroeconomic and institutional control variable fiscal balance, governance, trade openness, and changes in term of trade. The econometric technique is based on time series data in form of simultaneous equations modelling for estimation the economic growth.

1.1 Research gap

Previous studies great work has been done related to human capital but only few studies focus on the role of social spending in social indicator in case of Pakistan. Another

issue have been observed that for this purpose different methodology have been used but those methods not capture the feedback effect. It can be observe that social spending and economic growth in context of Pakistan calls for further analysis by using advanced econometric strategy. So this study is conduct to fill up this gap in literature.

1.2 Objectives of study

The purpose of this study is to evaluate the role of social spending on human capital and growth in case of Pakistan. This study contains the following objectives, which are as given below.

- To evaluate the effect of human capital on economic growth.
- To estimate the impact of social spending on human capital and growth.

1.3 Significance of study

Among the developing countries like Pakistan, has low rank in HDI and does not have a reasonable economic growth rate. Investment, education, and quality of institutions are altogether low. This research will explore the role of social spending on human capital that will ultimately enhances the growth performance of the country. One can accomplish long run sustainable development only with the investing on real factors like investing on human beings that are the real assets of the economy. This will lead to help in reduction poverty as well as reduction in inequalities among different parts of a country. We will have a strong focus on higher level of social expenditure as on health and education which will have direct positive impact on individual lives and is indispensable for sustainable economic growth.

1.4 Study Plan

The entire study contains of five chapters. Chapter 1 consist of introduction which involves research gap, objective of the study, significance of study and study plan. Chapter 2 consists literature review that is based on previous literature study. Chapter 3 contains of the Data and Methodology. Chapter 4 description of variable and results discussion. Chapter 5 consists conclusion and recommendation. At the end the chapter of References.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

There exist is number of literature which discussed about the importance of human capital and economic growth. First Adam smith talk about accumulation of human capital and then discuss by Marshal so on. For the purpose to measure the sustainable growth researchers are trying to explicitly offer more recent models. The organization of the literature is as follows

Khan *e*t al (2005) discussed that there are many indicators of economic growth, which can contribute of development of country. But education and health play more crucial part in economic growth. He said that Pakistan is country who is growing fast than other developing countries. In this study variable are used like schooling years as (average), rate of literacy (secondary), enrolment of schooling and the impact on economic growth. Variable were insignificant with economic growth. Conclusion of this study was increase in investment and improving institution are key factor of attaining economic growth. However, there is contradiction among the researchers. Despite of human capital have positive impact in growth, some researchers found that weak relationship between human capital and growth.

Benhabib & Spiegel (1994) used the variable inequality of income, political instability, and factor accumulation for the analysis of human capital effect on growth. The

findings of their result conclude that there is insignificant relationship between human capital and growth. The study conclude that human capital directly effect on domestic produced innovation of technology.

Abbas and Peck (2008) measured the human capital. Gross domestic investment used the indicator as proxy for physical capital human and enrollment rate at higher, secondary, primary level used for human capital. There was constant return to scale for both countries combined the human capital with employment and shown the result. Effect of labor with education level (primary) has positively relate with growth, Influence of labor with (secondary) education level has positively relate with growth and (Higher). Education level has also significantly positive in growth. OLS method has been used for estimation.

Hanushek & Wobmann (2007) analyze role of measurement issue in education. Due to use of unreliable proxies for measurement of human capital, which cause serious miscalculation in the experimental evolution. In this study, they made an effort to reduce measurements error. The main characteristic of this improved measurement of human capital is that it give us the different rate of return from primary, secondary and higher education to show real picture and to check the influence of education count using the quality of education by (measure of cognitive skills). In this study, two type of error had been discussed one is the data recording errors and the other is the use of unreliable proxies for human capital evolution.

Filmer and Pritchett (1999) mentioned that schooling create ratification in the individual level. It's not add their role as a factor of production in economy. The other way might be not remove the error of measurement and even though unnoted of endodeniety.At the end the result insignificant for economic growth.

Barro, (2001) worked in Different indicators such as male enrollment rate, rule of law, trade openness, term of trade, Fertility rate, inflation rate, investment ratio, was used as independent variable and real per capita was used as dependent variable. He defined human capital by role of education. Over all Conclusion of their findings was negative and insignificant were observed in their work.

According to Romer (1989) the observed inferences of the study was; such as science and education are associated among growth of income and total output. It might be possible that the variable of education will insignificant for the growth of output which includes the rate of investment. (Drazen and Eckstein, 1988) estimate the growth rate of cross country through literacy. Measurement error exist in their findings. There is many more literature about that education is correlate with achievements and abilities.

Becker (1964) said that the Asian and china can never achieve the economic growth due to destructive attitude towards business cycle. But Taiwan, japan, Singapore, south Korea and Hong Kong prove it to be wrong; because there was need to provision of good environment in Asia.

Becker (1975) Education is vital pillar of economy. This study was used is determine the return of education's investment in an economy. The main aim of this article is to evaluation the money rate of return to educations sectors. The indicators that was used to analyses human capital are on the job- training, investment in schooling, information and health.

Geargopoulos et.al (2007) analyzed Differences in level of per capita GDP: The role of educational attainment. In this study dependent variable was GDP per capita and independent variables education, openness, business investment, public expenditure. The panel data was used with time period 1999-2006 and 110 observation. In this study the method done by generalized least square. The effect of spending on education was positive with GDP and negative effect with the size of public sector.

Abbas & peck (2008) explore stock of human capital and health expenditures as a percentage of GDP used as proxies for human capital. Stock of human capital measure through the secondary enrolment data .The estimation technique was by co-integration Johnson (1991) on time series data of Pakistan. The findings of this study was expenses of education and spending on health are greater but returns from these factors are low.

Akram et.al (2008) explained that education becomes most of the attention in human capital and there is less work done on health care and its effects on the economic growth. It plays a very strong role in national output. After realization focus was set on health and its impacts on the economy. When there is a developed health sector it rises the life expectancy in that region and also reduces the deaths at birth. With the reports

of World Bank it does conform that good health measures increases the life expectancy. Then the focus is shifted towards Pakistan and explains that health care was never their priority and due to that reason Pakistan always ranks very low among all countries on the human development index. A less work done was only restricted to urban areas. The first result showed that there is a positive relationship between health expenditure and GDP. The other result showed negative relationship of fertility rate with the economic growth.

Alexious (2009) this study examine the relationship between government spending and economic growth. Granger causality approach have been used for estimation the results. In this study five variable capital formation, development assistance, private investment, trade openness and population growth were used for government spending, first four have positive and population have negative relationship with economic growth. Education spending with human capital have negative impact.

Fattoki (2011) this study explore the human capital constraint in South African economy. Human capital constraint the inadequately educated workforce and labor market distortions was used. Dependent variable output per worker and the independent variable manager's education, production worker's education, labor regulations, training, compensation production workers, compensation managerial workers completion, location. Conclusion of this study was higher education of manager's was positively related with dependent variable. Production of worker's education have positively related to dependent variable.

Sankay et al (2010) this study examine the independent variables real capital expenditures on education, real recurrent expenditure on education, real capital stock labor force and total school enrollment and dependent variable is real gross domestic product. The method of ADF was used for long run relation with economic growth. The result shows that government expenses on education is nor absolutely on growth of country.

Qadri and Waheed (2011) investigate their analysis with several variables like, investment GDP ratio, gross domestic investment enrolment rate at primary level and the value multiplied with indicator of health. Use standard cobb-Douglas production function. In standard cobb-Douglas production function the dependent variable was real GDP growth. The estimation of the model has been used through ADF of Philips Peron. They found the similar result in the context of Pakistan the conclusion of this study was human capital is positively related to economic growth in long run.

Cervellati (2014) used the method of regression for estimation of data set. This study obtain that growth rate was low with human capital, due to measurement error and existence of outlier

Chani et.al (2011) in this study variable has been utilize for analysis applied total fertility rate, female education, female labor force participation and urbanization for estimation. Secondary school enrolment of females used proxy for female education and population as % to total population was used as urbanization. Statistical technique

has been used ARDL bound test approach to cointegration for conclusion. The findings of this study was there long run relationship exist between variables.

Amir et.al (2012) GDP applied as dependent variable and used other explanatory variable capital like as gross domestic investment, employment level , enrolment rates used as proxy variable for human capital.in this study technology parameter used as dynamic where technology was function of the ratio of two variable imports and gross fixed capital formation and expenditures on research and development. This work was based on the method of Phillips Perron (PP) and Augmented Dickey Fuller (ADF) tests for investigate conclusion .Johnson cointigration was also applied for investigate long run relationship. The conclusion of this study was that positive effect between human capital and economic growth.

Imran et.al (2012) study applied co-integration and Granger Causality to investigate the relationship between human capital and economic growth. The indicators of human capital were used real public expenditures on education and health. Debt service payment was also include and gross fixed investment was used as proxy for physical capital to investigate the results of this study. The findings of this study was that there is long term relationship holds between GDP and social spending in Pakistan.

Jalil & Idrees (2013) examined the endogenous growth theory. They defined the human capital accumulation by different level of education. Conclusion of this study was same as previous literature exist like education have positive impact on economic growth of Pakistan. More investment in education sector will lead to economic growth.

Pelinescu (2015) focused on the three type of growth, first one is smart growth, sustainable growth and inclusive growth. He found their results from econometric models extended by Mankiw, Rommer and Weil (1992) known as MRW models, They conclude from their finding spending on education negatively relate with GDP per capita.

Afzal et.al (2013) has done their estimates by simultaneous equation modeling, ordinary least square method. The several variables like enrollments rate, marital status, attainment of education, assets of household and health status used explanatory variable. Conclusion of this study indicate weak relationship with GDP growth. The suggestion government expenses should increase in education sectors which are crucial aspect of economic growth.

Afridi (2016) estimated primary enrolment, Infant mortality rate and birth rate. Dependent variable is GDP per capita. The cointegration techniques was used for investigation the economic growth. This work is also based on ARDL and VECM models. This study conclude that there is positive relationship with human capital and economic growth.

Ahsan & Haque (2017) has been used GDP per capita as independent and average years of schooling used indicator of human capital. log of initial GDP per capita, gross capital formation as a percentage of GDP, population growth, trade openness (trade/GDP), financial development and government size was utilize as control variable. Dynamic

panel threshold model developing by Kremer et al. (2013) in order to identify development threshold in the relationship between capital and economic growth.

2.2 Conclusion

As literature showed although great work has been done related to human capital but only few studies focus on the role of social spending in social indicator in case of Pakistan. This study is conduct to fill up this gap.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Theoretical background

The economics of growth is one of the most important topic of study in both theoretical and empirical economics. There are two main models which are the neoclassical growth model and endogenous growth model. The purpose of these model are try to incur the sources of long run growth in economy Romer (1986). The Solow Sawan model present by Solow Sawan (1956). The functional form of standard Solow-Swan model of growth is based on the aggregate production function of Cobb-Douglas type. Which have two inputs labor and capital.

Adding third input human capital in neoclassical growth model

$$Y\,(t) = A * (t)^{\alpha}\ L(t)^{1-\alpha}$$

Adding third input human capital in neoclassical growth model

$$Y\,(t) = (t)^{\alpha} * H(t)^{\beta} * (A(t)L(t))^{1-\alpha-\beta} \qquad \text{(A)}$$

Y denote the output, H denote the human capital and K physical capital, L labor supply, A denote technology, $and\ \beta$ are the elasticities in output. Suppose variables of right side according to the following time path

$$K(t) = S_k(t)A(t)^{1-\alpha-\beta}K(t)^{\alpha}h(t)^{\beta} - (n(t) + d)K(t)$$

$$K(t) = S_k(t)A(t)^{1-\alpha-\beta}K(t)^{\alpha}h(t)^{\beta} - (n(t) + d)K(t) \quad (1)$$

$$h(t) = S_h(t)A(t)^{1-\alpha-\beta}K(t)^{\alpha}h(t)^{\beta} - (n(t) + d)h(t)$$

$$A(t) = g(t)A(t)$$

$$L(t) = n(t)L(t)$$

Y=Y/L is output, k=K/L and h=H/L physical capital and human capital respectively, S_k rate of investment in physical capital, S_h rate of investment in human capital and n population growth, g is rate of technological change and d is depreciation rate.

The property of decreasing return to scale ($\alpha + \beta < 1$) solution of these equation incurred by steady state values of k^*, h^*

$$lnk^* = \ln A(t) + \frac{1-\beta}{1-\alpha-\beta} lns_k\,(t) + \frac{\beta}{1-\alpha-\beta} lns_h(t) - \frac{1}{1-\alpha-\beta} \ln(g(t) + n(t) + d)$$

$$lnh^* = \ln A(t) + \frac{\alpha}{1-\alpha-\beta} lns_k\,(t) + \frac{1-\alpha}{1-\alpha-\beta} lns_h(t) - \frac{1}{1-\alpha-\beta} \ln(g(t) + n(t) + \ d) \ldots(2)$$

Substitute above two equation in production function and taking log for steady state output in terms of per capita. The path of steady state output can be written as

$$lny^*(t) = l\ln A(t) + \frac{\alpha}{1-\alpha} lns_k\,(t) + \frac{\beta}{1-\alpha} lnh^*(t) - \frac{\alpha}{1-\alpha} \ln(g(t) + n(t) + \ d) \ldots. (3)$$

$h^*$is unobserved, the relationship with human capital can be recognized through differential equation in (1) and substituting the rate of investment through equation (2)

$$\frac{dln\frac{k}{A}}{dt} = (n+g+d)e^{-(1-\alpha)\frac{k}{k^*}}e^{\beta ln\frac{h}{h^*}}$$

$$\frac{dln\frac{h}{A}}{dt} = (n+g+d)e^{aln\frac{k}{k^*}}e^{-(1-\beta)ln\frac{h}{h^*}} \quad (4)$$

The solution of ln h is following

$$lnh(t)/(A(t))) = \Psi(\ln(\ h^*(t)/A(t)) + (1-\Psi)\ln(\ h(t-1)/A(t-1)) \quad (5)$$

In which Ψ is function of (α, β) and (n+ g +d). Rearranging equation (5)

$$lnh^*(t) = lnh(t) + \frac{1-\Psi}{\Psi}\Delta\ln(h(t/A(t)) \quad (6)$$

Replace lnh^* in equation (3), we incur steady state output as like function of rate of investment and human capital. The transitional growth dynamics can be written as

$$\frac{dln(y(t)/A(t)}{dt} = \lambda(\ln(y^*(t)/A(t)) - \ln(y(t)/A(t))) \quad (7)$$

Where

$\lambda = (1-\alpha-\beta)\ (g(t)+n(t)+d)$

Substitute the expression for * and h^*into the solution of this differential equation yields the following

$$\Delta lny(t) = -\phi(\lambda)\ln\big(y(t-1)\big) + \phi(\lambda)\frac{a}{1-a} lns_k(t) + \phi(\lambda)\frac{\beta}{1-a} lnh(t) +$$

$$\frac{1-\Psi}{\Psi}\frac{\beta}{1-a}\Delta lnh(t) - \phi(\lambda)\frac{a}{1-a}\ln(g + n(t) + d) + \left[1 - \frac{\phi(\lambda)}{\Psi}\right] g + \phi(\lambda) lnA(o) +$$

$$\phi(\lambda) gt \qquad (8)$$

G is unobservable, growth equation can be written as

$$\Delta ln(t) = a_0 - \phi lny(t-1) + a_0 lns_k(t) + a_0 lnh(t) - a_0 n(t) + a_0 t +$$

$$b\Delta lnh(t) + \varepsilon(t) \qquad (9)$$

Further in our study divide human capital into two component which is education capital, health capital, EDC and HEC respectively.

Suppose that education capital and health capital with respect to time.

EDC (t) = EDC (t-1) + $\Delta E(t)$

HEC (t) = HEC (t-1) + $\Delta HE(t)$

Suppose s_k=IN and n = Popg so (9) become

$$\Delta ln(t) = a_0 - \phi lny(t-1) + a_1 lnIN(t) + a_2 lnhHEC(t) - a_4 Popg(t) + a_{54} t +$$

$b_1 \Delta lnHE(t) + b_1 \Delta lnEDC(t) + \varepsilon(t)$ (10)

Adding matrix of control variable E in above equation

RGDPG =f (IN, EDC, ΔEDC, HEC, ΔHEC, E)

3.2.1 Econometric Methodology

In this study the organization of econometric methodology is to capture the impact of human capital, social spending growth in case of Pakistan. In our study the growth equation which selected to estimation is in the framework of neoclassical growth model, with separate variable investment ratio, health capital, education capital some additional macroeconomic and institutional control variable to capture governance. The econometric technique is based on time series data in form of simultaneous equations modelling for estimation the economic growth. At the end governance is explicitly including in all equations.

Equation of growth (Baldacci *e*t al., 2008).

The growth equation which selected to estimation is in the form of neoclassical growth model. Suppose, there is association among main stock and rise in human capital with growth of real (GDP) the real per capita GDP

$RGDPG_t = \phi_{1t} + \propto_{11} l(Inc_{t-1}) + \propto_{12} Popg_t + \propto_{13} IN_t + \propto_{14} EDC_{t-1} +$

$\propto_{15} HEC_{t-1} + \propto_{16} EDC_t + \propto_{17} \Delta HEC_t + \sum_{m=8}^{n} \propto_{1m} E_t^m + \varepsilon_t$ ..... (I)

IN =Investment ratio which quantified through private and public gross capital formation of GDP (in percent), when ratio of investment rise then the physical capital stock rise.

EDC= Education capital

HEC= health capital

E= macroeconomic and institutional control variable.

Education capital stock in which proxies were included i.e. enrolment rate of composite, primary and secondary. ΔEDC denote change the education capital. Romer (1986) focused that growth and innovation are drawn from human capital stock.

Health capital stock and ΔHEC denote change in health capital. The facts and figures of mortality and morbidity are not accessible. The log of under 5 year age child mortality is used as proxy for stock of health capital.

Popg= growth rate of total population

Control variable are included that is fiscal balance, change in TOT, inflation and trade openness.

ε_t = Error term

RGDPG= growth of real GDP (per capita)

ϕ_t=period specific effect

Equation of investment

Investment is direct input to growth in the equation of growth was measure. The equation of investment building on models used through (Baldacci *e*t al., 2008).

$IN_t = \phi_{2t} + lo(Inc_{t-1}) + \propto_{22} popg_t + \propto_{23} EDC_t + \propto_{24} HEC_t + \propto_{25} FB_t +$

$\propto_{26} Inf_t + \propto_{27} Gov_t + \varepsilon$ ..... (II)

Where macro variable discussed in growth equation.

Equation of education

$EDC_t = \phi_{3t} + l(Inc_t) + \propto_{32} Popn_t 15 + \propto_{33} HEC_t + \propto_{34} Urbp_t + \propto_{35} Qualt_t +$

$\propto_{36} ESpend_t + \propto_{37} ESpend_{t-1} + \propto_{38} ESpend_t * Gov_t + \propto_{39} ESpend_{t-1} *$

$Gov_{t-1} + \propto_{310} Fem_t + \varepsilon_t$ ..... (III)

This equation discuss the exact influence of education spending on education, i.e.

Proxies through composite, primary and secondary school enrolment.

- Higher income level will lead the education demand.

- Health capital, the healthy people in the country will afford investment in education.

- School repetition rate used proxy for quality indicator higher repetition rate indicate low quality of education Gupta *e*t,al, (2003).

- Gender equality, investment in girl's education will bring insignificantly greater return than investment in boy's education, especially in developing countries.

Equation of health

$$HEC_{t=}\phi_{4t} + \propto_{41} l(Inc_t) + \propto_{42} Frt_t + \propto_{43} Urb_t + \propto_{44} HSpend_t +$$

$$\propto_{45} HSpend_t * Gov_t + \propto_{45} Fem_t = \quad \text{..... (IV)}$$

3.2.2 Estimation Technique

GMM Method

The ARDL bounds test approach presented by Pesaran and Shin (1999) and extended by Smith (2001). ARDL method works only a single reduced form equation Pesaran & Shin (1999).

The GMM technique developed by Arellano and Bond (1991). The superiority of this method is that it points out the econometric problems affected by unobserved effects and endogeneity of the independent variables in lagged dependent variable models. This methodology allows the relaxing of strong erogeneity of the explanatory variables by allowing them to be correlated with current and previous realizations of the error term.

There are some advantages of GMM such as. The assumption of normality is not require. (ii) It can permit for heteroskedasticity of procedure and (iii) also can calculate the equation's parameters.GMM can tackle different statistical problem. Same time GMM gives the solution for different problem such as over identification, endogeneity bias and panel heterogeneity bias, it gives strong evaluations. The GMM valuation are used to handle the endogeneity of independent variable through choosing parameter approximations might be there is association in the instruments variable and residuals of the equation are near to zero. No doubt, if the residuals are not autocorrelated the lagged dependent variable must be associated with the residuals (Jamil & Ahmad, 2014). The generalized method of moments (GMM) has become an important estimation procedure in many areas of applied economics and finance. GMM is greatly more flexible since it only requires some assumptions about moment conditions.

3.3 Description of variables

In this section we discuss about the variables that are used in our analysis of social spending, human capital and growth in Pakistan. These variables have been selected for their relative importance on theoretical and empirical way.

3.3.1 Real per capita GDP Growth

GDP per capita is gross domestic product divided by midyear population. Gross domestic product is the Sum of gross value plus tax and minus subsidies. (World Bank national accounts data)**.**In this study the real per capita GDP is used for measurement of economic growth in case of Pakistan. It is dependent variable in the annually growth rate in percentage (OECD). Real per capita GDP growth rate is drawn by per capita GDP divide GDP deflator.

Real per capita GDP = per capita GDP /GDP deflator.

3.3.2 Education Capital

It is important variable in our study for capture the influence of human capital on growth of Pakistan. Education capital is an effective vehicle for producing the required skills to maintain economic growth. The benefits of education range from human to economic, social and cultural. In Pakistan, there is sufficient rise in the average level of education (PJCSS).The indicators that used in our study to measure the education capital composite enrolment. Composite enrolment rate is incur by rate enrolment rate at primary and secondary level education. Enrolments rate are essential indicator for

estimation of education capital. Romer (1986) focused that growth and innovation are drawn from human capital stock.

Education capital = primary enrolment rate + Secondary enrolment rate

3.3.3 Health Capital

The other important focus variable is health capital. It is defined as probability per

Hundred baby will die before age 5(UNICEF, WHO, World Bank, UN DESA

Population Division) at www.childmortality.org.The facts and figures of mortality and morbidity are not accessible. The log of under 5 year age child mortality is used as proxy for stock of health capital.

Infant health play important role while defining the outcome of health in late life Agénor, P. R. (2018).healthy child done their work better than weak child, this is way to promote knowledge of health Agénor (2018).due to improve the health cause improvement in education by Foulkes (2004).

3.3.4 Education Spending

It is contains spending supported by transfers from universal bases. These are government Expenses on schools, institution of higher education and other public and private educational institutions OECD (2018). In this study education spending are worked as direct effect on education. Government education spending are used as explanatory variable measure as percent of GDP.

3.3.5 Health Spending

The definition of health spending is that final consumption of health care goods and services OECD (2018). Public expenses on health care through internal way. It is individual's expenses in the care of health status in percent of GDP. In our study the government spending on health in measure of GDP used for health spending. Healthy people do work better than ill people and have the healthy strong mind. Baldacci (2003) used proxy life expectancy for health of labor force. The result of the study was health is positive effect on the growth of country.

3.3.6 Investment Ratio

Investment ratio is another important variable in our study to capture the impact of growth in economy. Investment ratio is to divide net profit by total assets (ROI, Entrepreneur).In this study Investment ratio which is quantified through gross capital formation measure as percent of GDP, when ratio of investment rise then the physical capital stock rise (Baldacci *e*t al., 2008). Gross capital formation contains of country's fixed assets expenses plus inventories (OECD).

3.3.7 Fiscal Balance

Fiscal balance is most essential determinant of macro variable.it is government amounts that has incur from revenue including tax and minus spending. Government Balance is positive when government expenses small than its revenue. Balance is negative if expenses more than revenue.it is in the ration in % of GDP (focus-economics). Fiscal balance is construct as follows

Fiscal balance= government revenue – government expenditure

3.3.8 Governance

"Governance consists of the tradition and institution by which authority in a country is exercised. This include the process by which government are selected, monitored and replaced; the capacity of government to effectively formulate and implement sound policies; and respect of citizen and state for the institutions that government, economic and social indicator"

Governance= rule of law + corruption +political stability +regulatory quality + government effeteness+ voice accountability

Table 1. List of Variables with Definition and Data Sources

Variables	**Definition**	**Source**	**Sample Period**
Real per capita GDP growth (in percent) (GGDP)	GDP per capita is gross domestic product divided by midyear population. Sum of gross value plus tax and minus subsidies (World Bank national accounts data)	WDI	1975-2017
Investment ratio (in percent of GDP)	Is to divide net profit by total assets. (ROI, Entrepreneur ASIA Pacific)	WDI	1975-2017
Primary school enrollment rate (in percent)	Is ratio of total enrollment without age (UNESCO)	WDI	1975-2017
Secondary school enrollment rate (in percent)	Is ratio of total enrollment without age (UNESCO)	WDI	1975-2017
Composite Enrollment Rate	It is primary plus secondary enrollment	WDI	1975-2017
Under-5 child mortality (per 1000 live births)	probability per hundred baby will die before age 5 (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org	WDI	1975-2017
Education spending (in percent of GDP)	Expenditure on schools, universities and other public and private educational institutions OECD (2018), Education spending.doi:10.1787/ca274bac-en (Accessed on 22 July 2018).	WDI	1975-2017
Health spending (in percent of GDP)	Estimation the final consumption of health care goods and services. OECD (2018), Health spending. doi:10.1787/8643de7e-en (Accessed on 22 July 2018)	WDI	1975-2017
Population growth (%)	is the exponential rate of growth of midyear population from year t-1 to t and is based on the de- facto definition (Eurostat: Demographic Statistics, U.S.Eurostat: Demographic Statistics)	WDI	1975-2017
Trade openness (in percent of GDP)	sum of exports and imports of goods and services (OECD National Accounts data files)	WDI	1975-2017

Changes in terms of trade	Is the ratio of export prices to import prices (Reinsdorf, M. B. (2010). Terms of trade effects: Theory and measurement. Review of Income and Wealth, 56, S177-S205.)	WDI	1975-2017
Fiscal balance	in Difference b/w government revenue	WDI	1975-2017
Inflation rate	Overall increase in CPI (FOCUSECONOMIC)		1975-2017
Governance			1975-2017
Fertility rate (per 1000 people per year)	number of children born per woman if she live up to the end of their childbearing age (Eurostat: Demographic Statistics, U.S.Eurostat: Demographic Statistics)	WDI	1975-2017
Share of under-15 population (in percent)		WDI	1975-2017
Urbanization (share of urban population)(Urb)	people living in urban areas (World Bank staff estimates based on the United Nations Population Division's World Urbanization Prospects: 2014 Revision.)	WDI	1975-2017
School repetition rate (in percent)	the number of enrolled student in the same grade as in the previous year (UNESCO Institute for Statistics)	WDI	1975-2017

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

This chapter is consist of five sections. In Section 4.2 is related about descriptive statistics. In this part we have present descriptively analysis about the variable like real per capita GDP growth rate, investment ratio, composite enrollment rate, Mortality rate under age five per 1,000 live births, population growth, inflation rate, trade openness, income in log real GDP (per capita), fertility rate, urban population, health spending, governance, population less than age 15, education spending and fiscal balance. In section 4.3 is about models estimation and their result discussion in which we have estimate simultaneously four equation by using generalize method of moment (GMM).In model 3 GDP growth rate is dependent variable. In model 4 investment ratio is dependent variable. In model 5 education capital is dependent variable and Section 6 about that health capital is dependent variable.

4.2 Descriptive Statistics

In this section we have presented descriptive analysis of our data from the period 1975 to 2017. Descriptive statistics which provide brief description the characteristic of data set. It include average value of data (mean) which known as measurement of central tendency, standard deviation (SD) is measure of dispersion or scatter the observation from average value. It is measure to check the variability of data from central tendency

Real GDP per capita growth show that the average value is 0.11. Standard deviation is measure of dispersion or scatter the observation from average value. S.D is 0.15. Composite Enrollment rate in the table average value is 96.18 with standard deviation

24.79. This study show enrollment rate declined over the period of time. In the period of 1980 to 2016 enrollment rate of elementary and secondary (private, public) decrease 96 to 96 % (NCES). Mortality rate under age five per 1,000 live births table show that the mean value is 2.08 and S.D is 0.11. Mortality rate decreases with the period of time. Population growth. Population growth significantly increasing with the period of time. The average value of Growth rate of Pakistan is about 2.59. Inflation rate is vary with the different period of time. Inflation rate is the cost of average consumer index purchasing the commodities. The maximum average value of inflation is 20.90451 in the time interval 1975-1979.The average value is 8.44. Trade openness of the economy have average value 32.98 and S.D is 3.61.

Fertility rate of Pakistan are decreasing over the period of time. In the five year interval 1985-1989 fertility rate is lowest, according to the survey, the information of survey data mislead the actual figures of fertility rate. In-fact Pakistan's fertility rate increased according 1981 survey. Average value is 5.16.

Urbanization the number of urban population increasing with increasing of time period. This increase of population is due to increase in income of people. People move to urban areas because of facilities are more as compare to rural areas. The average value of urbanization is 32.45.

Health spending the average value of health spending are increasing with over the period of time. In the period of 1995-1999 the stability ratio is less. The reason behind this less stability is government dismiss at that period of time and political uncertainty, changings in policies. Due to the Western economic sanctions imposed in reaction to Pakistan's nuclear tests on 28 May 1998.

Table 2. Descriptive Statistics

	Mean	**SD**	**Min**	**Mix**
Real per capita GDP growth	0.11	0.15	-0.3	0.64
Investment	17.74	1.61	14.12	20.82
Education capital	96.18	24.79	66.09	143.82
Under-5 child mortality	2.08	0.11	1.87	2.25
Population growth	2.59	0.49	1.99	3.36
Inflation rate	8.44	4.15	2.53	20.90
Trade openness	32.98	3.61	24.76	38.91
Fiscal balance	4.01	1.50	1.46	6.59
Income	2.62	0.11	2.39	2.79
Education spending	2.41	0.31	1.84	3.02
Health spending	2.61	0.42	1.43	3.34
Fertility rate	5.16	1.15	3.48	6.61
Share of under 15 population	40.44	3.09	34.78	43.13
Urbanization	32.45	3.74	26.34	39.70
Female education	9.35	4.19	3.38	22.29
Governance	1.89	0.68	1.02	3.59
Term of trade	68.63	17.40	45.68	107.06

The average value of health spending is 2.61. Governance the average value of governance continuously increasing over the period of time.in the period of 2010-2014 average value is 1.800744 and S.R is 0.271021, which is stable period of time. The reason of stability is

Nawaz Sharif come into the government, economic growth increased, revenues increased, overall economy improved.

Population less than age 15 the average value of young people are decreasing over the period of time. The mean is 2.08. Education spending the average value of government expenditure on education is 2.41. Term of trade the average value of term of trade is 68.63. Fiscal balance the average value of fiscal balance is 4.01. Investment is quantified through gross capital formation. The average value of investment is 4.01. The average value of income is 4.01in Table2

4.3 Econometric Model

As discussed in the methodology, four equations are simultaneously estimated using generalized method of moment and the results are presented in tables given below. The results of growth equation, investment equation, education and health are presented in Table3-Table6 respectively. The table3 the results of growth equation are presented.

The below table show t-statistics in parentheses. We start our regression estimates result through GMM technique. Results shows that Education capital in lag t-statistic is 3.78 and coefficient is 0.008.Which indicate one percent increase in education capital will cause to increment 0.008 percent in education capital. Education capital have significant positive contribution in real per capita GDP growth. Changes of education capital t-statistic is 2.43 and coefficient is 0.006. These results show that changes of education capital and education capital both are positively significant effect on GDP growth rate. (Belgrave and Craigwell, 1995), (Iqbal and Zahid, 1998), Birdsall *e*t al. (1996) and (Carter *e*t al., 2013) incurred positive association in education and output of growth. Health capital in lag have t-statistics is 1.96 and coefficient is -16.25. Health capital is significant but

negatively effect on growth. Changes in health capital t-statistic is 0.45 and coefficient is -7.066.It indicate insignificant effect on growth. Kosempel (2004) estimate adult survival rate proxy for health and also found that insignificantly negative relationship between health and economic growth. Caselli *e*t al., (1996) use indicator life expectancy for health and found negative and insignificant impact of growth. (Sachs &Warner 1997) also found negative coefficient of life expectancy which is -5.4.

Table 3. Growth Equation

Independent variable	**Coefficient (t-Stats)**
LOG(INCOM(-1))	-9.047 (1.97)
Population growth	-0.085 (0.43)
Investment	0.02 (1.48)
Education capital(-1)	0.008 (3.78)
Health capital(-1)	-16.25 (1.96)
Changes (education Capital)	0.006 (2.42)
Changes (Health Capital)	-7.066 (0.45)
Fiscal balance	0.02 (1.12)
Inflation rate	-0.007 (1.37)
Trade openness	-0.009 (1.22)
Change (term of trade)	0.002 (1.46)
Governance	-0.001 (0.07)
C	31.12 (1.91)

The absolute value t statistic in the parentheses

The result of above table of education capital and health capital are significant impact on real GDP growth. So, we found that education capital and health capital are contribute the economic growth. Income in lag t-statistic is 1.97 and coefficient is -9.047

Investment ratio have positive association with growth.one percent increase in investment ratio will cause 0.01 percent increment in real per capita GDP growth of country. Inflation rate have negative impact on economic growth. Governance have negative effect on GDP and other rest of variable are insignificant impact on growth. The Table 4 results of Investment equation are presented.

Table 4. Investment Equation

Independent Variables	**Coefficient (t-Stats)**
LOG(INCOM(-1))	14.90 (0.52)
Population growth	6.13 (1.77)
Education capital	-0.01 (0.51)
Health capital	384.55 (1.92)
d(term of trade)	0.02 (1.82)
Trade openness	0.003 (0.06)
Fiscal balance	-0.01 (0.06)
Rate of Inflation	0.04 (0.57)
Governance	-0.16 (0.51)
Constant	11.39 (0.50)

The absolute value t statistic in the parentheses

Results show that health capital have significant effect on investment ratio to GDP. The t-statistic of health capital is 2.01 and coefficient is 389.35. Health capital have positively

significant impact on investment ratio to GDP. The t-statistic education capital is 0.71 and coefficient is -0.02 which, indicate that education capital has insignificant influence on investment ratio to GDP. Inflation rate has positive and insignificant impact on investment ratio. Inflation rate has t-statistic 0.63 and coefficient 0.04. Seoud (2014) also found that inflation rate has positive and significant impact on national saving. (McClain &Nichols .1994) found that inflation rate and investment ratio has positive impact. They said that income level will effect on inflation rate. Governance t-statistic is 0.51 and coefficient is -0.16.which show that Governance has adverse relationship with ratio of investment to GDP. Trade openness t-statistic is 0.06 and coefficient is 0.003.trade openness of the economy has positive impact on investment ratio to GDP. Changes of term of trade have also positive impact on investment ratio. Fiscal balance have insignificant negative impact on investment ratio.

The below Table 5 results of education equation are presented. Results show that education spending t-statistics 2.32 and coefficient is 18.08.So education spending have significant positive impact on education equation. One percent increase in education spending of GDP will cause to increase in education capital 18.08 percent. Health also effect on education equation. The t-statistic of five child mortality rate is 2.63 and estimate coefficient is 997.1.Health capital have positively significant impact on education equation. Income is also important determinant of education equation. The person who have more income he will also more income in education. Income estimated coefficient is 535.72 and t-statistic is 14.72.income is also positively significant impact on education equation. Female education have significant but adverse impact on education capital. Population under age below 15 year have estimate coefficient 0.99 is insignificant positive

impact on education equation. Urbanization statistics is 8.43 and coefficient is -65.54. Urbanization have significant adverse relationship with education equation

Table 5. Education Equation

Independent Variables	**Coefficient (t-Stats)**
Current Income	535.72 (14.72)
Population under age below 15 year	0.99 (0.94)
Health capital	997.1 (2.63)
Urbanization	-65.54 (8.43)
Repetition rate in primary level	-1.50 (1.52)
Spending in education	18.08 (2.32)
Spending in education (-1)	-1.24 (0.27)
Spending in education *governance	9.14 (2.69)
Spending in education (-1)*governance	1.32 (0.72)
Female education	-0.23 (2.74)
Constant	-443.73 (14.52)

The absolute value t statistic in the parentheses

The below Table 6 results of health equation are presented. Results show that health spending has significant impact on health capital. Health spending t-statistics is 1.92 and coefficient is 0.06. Other rest of variable are insignificant. Income coefficient is 0.11 and t-statistic is 0.65.Income is statistically insignificant positive impact on health equation. Fertility rate has estimated coefficient is 0.05. Fertility rate is positive but insignificant impact on health equation. Urbanization has positive impact on health equation. Female education have adverse relationship with health equation.

Table 6. Health Equation

Independent Variables	**Coefficient (t-Stats)**
Current income	0.11 (0.65)
Fertility rate	0.05 (0.84)
Urbanization	0.01 (0.59)
Health spending	0.06 (1.92)
Health Spending*Governance	0.0006 (0.71)
Female education	-0.0007 (1.91)
Constant	-0.13 (0.69)

The absolute value t statistic in the parentheses

CHAPTER 5

CONCLUSION AND RECOMMENDATION

This study conduct to analyze the impact of human capital, social spending and growth in Pakistan. The time series annual data have been taken in the period of 1975 to 2017. In this study we estimate simultaneously four equation like as growth equation, investment equation, education equation and health equation using generalized method of moment. In this study we used some important and main variable like real per capita GDP, composite enrollment rate, of under age five child mortality rate, education spending, health spending and some control variables. We found that in most cases results of our study is consistent with previous literature. Most of the variables have positive coefficient and significant impact on economic growth in Pakistan. We found that education capital and health capital are positively effect on growth. Health capital have effect also indirectly by the way of investment in table 3. Moreover, in education equation, health equation can see that education spending, health spending effect the variables education capital and health capital. So, social spending also impact on boom the economic growth by the way of human capital. Additionally, greater income will lead to generate additional improvement in education capital. Female education is passively significant impact in education equation table 5 and significant and adverse relationship in health equation in Table 6.

Now, the role of governance in human and investment equation decrease the economic growth. Moreover, increasing rate of inflation with the period of time calls for the requirement of the providing the education and health facilities to the populations. The

government of Education and Health sector should help in encouraging the significance of health and increase health carefulness information in individual on urgent basis.

Overall findings of this study is to support that human capital, social spending are positive significant impact on economic growth in Pakistan. In this study the indicator for human capital are used like as education capital and health capital. Social spending indicator like as education spending and health spending are used.

5.1 Recommendation

Education is a main contributor to the societal and economic growth in country of Pakistan. Thus, it is government responsibility to promote education department and should increase enrollment ratios in all level of education. Government should make policies specially concentrate about the rural areas of country. Government should provide resources in rural areas to get the education for female. Government must be provide opportunities in female education. Because, due to this fertility rate will be decrease. It contributes in productivity and economic growth not only in recent generation but also in the next generation. Government should provide job

Opportunities for female student. More research in this area too will ideally help in the design of policies that allow women at large to enjoy the benefits of increased job opportunities while minimizing the potential costs. It will cause increase the economic growth in Pakistan. Government must be concentrate on investment in health sectors Government should also focus in inflation rate. It should be minimum. Because due to high inflation rate people purchasing power of individual decrease.

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