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IMPACT OF HUMAN CAPITAL FORMATION ON ECONOMIC GROWTH: EVIDENCE FROM PAKISTAN

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ABSTRACT- The objective of this paper is to study the situation of human capital formation in Pakistan. We used secondary data for the period from 2005-2006 to 2014-2015. OLS techniques applied for analysis of data. The results drawn through Linear Regression Model reveals that enrollment rate and low mortality rate lead to increase economic growth in Pakistan. The study uses information on infant mortality rate indicator of health and secondary school enrollment rate as indicator of education. It has been found that indicator of health has positive, robust and significant impact on productivity whereas the impact of enrollment rate as indicator of education has been found to be positive and significant. We find that education and health have negative impact on GDP due educated unemployed worker where consumer price index has a slight positive effect. These findings stress the need for improving education and health of public to ensure sustainable growth and economic development.

Key words: Education enrollment rate, infant Mortality rate, CPC, GDP, OLS.

Type of study: ***Original Research paper***

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1. INTRODUCTION

It is the fact that human capital formation is the backbone for the development of any nation. Pakistan has been experiencing deficiency in the attainment of human capital formation. This study explores relationship between the human capital formation and economic growth of Pakistan. Much of the literature discussed the main factors of human capital formation such as education, health, skills, IT and vocational training. In most of developing countries, concept of human capital formation has gained importance. Developing countries have abundant labor force due to high population growth rate. The main components of the human capital formation are education, skill and health. These are all to increase the welfare of any nation. The process of changing labor force, who are able to produce goods and services, is known as the human capital. This process can be achieved by the education, training and health policies. First of all, we talk about the health policies for the public. Good health care and beneficial nutrition can increase the life expectancy rate. Due to better nutrition people become healthier in workplace. Death rate will be decreased and people can do their activities very properly.

Next important thing is education. For human capital formation education is main important component. Most of the countries which have highly educated persons, there educated labor force has high skills and they can perform their duties very effectively. Educated persons also skilled for tough jobs, by this way their pay level also impacts on human capital formation. Brain drain problem is very common in underdeveloped countries. The reason behind of brain drain is that highly educated and skilled person move towards better opportunities. While some move for family crises. There are some sources of human capital formation. One is the investment in education. Others are investment in training and health. Health and education are the

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essential inputs for the development of future. Since its inception, Pakistan has been experiencing growth pattern leading to economic fragmentation. In the developing countries like Pakistan, most of the population lives below the poverty line. For economic growth and development country have to ended poverty but the situation of Pakistan is different. In Pakistan economic growth is achieved by reducing poverty. It is important to avail all the important indicators of economic growth. In factor of production, human capital formation is an active but the physical or other resources are slow factors. Human capital formation and economic growth are correlated with each other. It is necessary for the Government to allocate some extra funds on health and education sector. In health sector, there should be the availability of the clean water and treatment facilities. But unfortunately Pakistan is not investing too much on human capital formation. All of the investment is on the physical capital formation. This is the reason unemployment and illiteracy level increases day by day.

1.1 Main Research Question

This study is to explore the different level of human capital formation to increase the economic growth of Pakistan. Our main research question is that "does human capital formation bring impact on economic development of Pakistan?

1.2 Objectives of study:

► To examine the role of human capital formation in economic growth.

► To Estimate and analyze the effects of effective labor input on economic growth.

► To Estimate and analyze the human capital as an agent in attracting physical capital.

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2. LITERATURE REVIEW

Many studies confirmed that the relationship between human capital formation and economic development of Pakistan.

Abbas,Foreman-Peak(2007) investigates the correlation between the human capital formation and economic growth in Pakistan. Human capital plays an important role in endogenous growth and neo-classical model. Endogenous growth theory tells that an economy growth rate change by the change in some policy variables.

Ahmad Khilj et al.(2012) explored the impact of vocational training and skill on economic growth in Pakistan. Main determinant of economic growth is the human capital. Diana (2013) explored the role of human capital formation in economic growth. Tanase Diana paper highlights main theme that is to develop the Rumanian country by the advancement of education sector. Efficiency of labor and human capital depends upon the best quality of education. If the investment on education is more, the performance of human capital will be improved more.

Olatunji A. Shobande et al. (2014) highlights the effect of human capital formation on economic growth of Nigeria. An economist Meier (1970) defined that human capital development relates the two main objective skills and also providing the Employment opportunities for unskilled and under-utilized peoples. Education and training are the stem from investment in man. Samar and Waqar (2014) identified the human capital formation and economic growth in Pakistan. This theory presents the human capital by health and education, because these two components are very important. If government of Pakistan spends more on education and health than the living standard of people will be improves

Khattak and Khan (2012) concentrate the contribution of human capital as an education to economic growth of Pakistan. Human capital is the form of school

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enrollment and education provides market or non-market benefits. Their study explored that some other studies tells that primary and secondary growth on economic growth is higher in developing countries. They used the school enrollment at secondary and elementary level. They used the ordinary Least Square method. This test shows that all variables are non-stationary at level.

Kefela and Rena (Spring 2007) explored the human capital investment is a continuous proposition; a study of North East Asian states. They investigated that economic growth cannot achieved without investment in human capital formation. Rena (2007) comes to this that each regions of the Africa have different distributions of income. Unequal distribution of income is due to unequal education policies of different regions. Government of their regions focused more on tertiary and secondary education rather than primary education.

Moisa Altar et al (2007) modeling the economic growth in Romania, the role of human capital. To determine the factors of economic growth, one of the most beneficial factor of economic growth is education, and investment is called human capital. Uzawa and Lucas first mentioned the importance of education and human capital. Barro explored that economic growth is positively related to schooling. Here this study identified that Romanian economy behaves under the assumption of Uzawa Lucas model. To understand this, we assume that there is two sector economy, one is producing human capital and other is producing goods and services.

Awan (2012) contends that allocation of more funds and trained teachers at primary and elementary level can enhance not only literacy rate but also helps formation of human capital. For development of human capital, it is an imperative need to reduce level of poverty and income inequality.

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3. RESEARCH METHODOLOGY

Time series data from 2005-2015 is used to investigate the relationship between human capital formation and economic development of Pakistan. The data is taken from different sources like World Bank, State bank of Pakistan and various economic survey of Pakistan. Following variables are selected for this research study.

3.1 Selected variables

1. Education enrollment index
2. Infant mortality rate
3. Consumer price index
4. Dependent variables in this study is Gross Domestic product which is directly affected by economic growth.

3.1.2 Econometric model

We develop an analytical model with our dependent (gross domestic product) and independent variables (education enrollment index, infant mortality rate, consumer price index). This model is developed to see the relation between dependent and independent variables. After using this model will make this study able to analyses that how human capital formation effect the economic growth of Pakistan.

$$GDP = \beta_0 + \beta_1 EEI + \beta_2 IMR + \beta_3 CPI + e$$

Where;

GDP= Gross Domestic Product

EEI= education enrollment index

IMR= Infant mortality rate

CPI= consumer price index

B_0= intercept of slope

$\beta_1, \beta_2, \beta_3$=Coefficient of economic growth of Pakistan

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4. EMIRICAL ANALYSIS

4.1   Regression Analysis

[Data Set1]

Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	CPI, EEI, IMR[b]	.	Enter

 a. Dependent Variable: GDP

 b. All variables entered.

In model 1, three variables are entered. Education enrollment index, infant mortality
rate, consumer price index. There is no variable removed in model 1. All the variables
are entered.

Table 1   Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.891[a]	.793	.690	1.23955	.793	7.673	3	6	.018

 a. Predictors: (Constant), CPI,

 EEI, IMR

The R column represents the value of R, the multiple Correlation coefficients. R can
be considered to be one measure of the quality of the prediction of the dependent
variables; in this case, gross domestic product. A value of 0.891, in this case, a good
relation of the variable like on the secondary school education enrollment, infant
mortality rate, consumer price index. The R^2 value (also called the coefficient of

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determination) which is the proportion of variance in the dependent variable that can be explained by the independent variables (technically it is the proportion of variation accounted for by the regression model above and beyond the mean model. You can see value of .793 that explains 79.3% of the variation in dependent variable, gross domestic product.

Table 2   ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	35.369	3	11.790	7.673	.018[a]
Residual	9.219	6	1.536		
Total	44.588	9			

a. Predictors: (Constant), CPI, EEI, IMR

b. Dependent Variable: GDP

The F- ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically significant predict the dependent variable,F 7.673,p<.0005(i.e,the regression model is good for the data.

Table 3   Co-efficients[a]

Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant) 80.155	28.872		2.776	.032	9.508	150.803
EEI -.713	.202	-1.675	-3.525	.012	-1.208	-.218
IMR -.519	.260	-.985	-1.999	.093	-1.155	.116
CPI .120	.112	.271	1.072	.325	-.154	.393

a. Dependent Variable: GDP

Unstandardized Coefficients indicates that how much the dependent variable varies with an independent variable when all other independent variables are held constant. Consider the effect of economic growth in this. The unstandardized coefficient B_1 for education enrollment index is equal to -0.713. This means that increase in growth, there is decrease in enrollment of -7.13 each year.

4.2 Interpretation of Results

Correlation and multiple regression analyses were conducted to examine the relationship between human capital formation and its impact on economic growth. Table 1 summarizes the descriptive statistics and analysis results. As can be seen each of the in model summary score of R= .891 is positively and significantly correlated with the criterion. Gross domestic product is negatively correlated with the infant mortality rate and consumer price index. The multiple regression model with three predictors R^2= .793   F(7.673).p<.018. As we see that gross domestic product has significant and positive impact on the secondary school enrollment rate.

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Table 4 Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.223136	8.102785	4.251000	1.9823947	10
Residual	-1.6831049	2.1368637	0E-7	1.0120876	10
Std. Predicted Value	-1.527	1.943	.000	1.000	10
Std. Residual	-1.358	1.724	.000	.816	10

a. Dependent Variable: GDP

5. CONCLUSIONS

In this study an investigation was made to find out the relationship between human capital formation and economic growth. In this study data was annual and time series from 2005-2006 to 2014-2015. According to this research, we discuss different reviews of different economies. The objective of this paper was to study the contribution of human capital formation in economic growth of Pakistan. In human capital formation, first thing is education. In education, we take the indicator of secondary school education enrollment. We see the secondary school Education enrollment impact on the economic growth. Take different years of data and take the gross domestic product relation with each other. In our model the values indicate that there is weak correlation between secondary school enrollment and gross domestic product.so that we reject the null hypothesis and accept the alternative hypothesis. Results of secondary school enrollment indicate that these are in negative form.

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Human capital formation is integral and most important part of economic growth. Next human capital formation indicator is infant Mortality Rate. By the year passing, mortality rate is decreasing. But the fact is that there is negative correlation with the gross domestic product. In other words, there is weak relation with each other. Here, we accept the alternative hypothesis that there is no impact of human capital formation in economic growth of Pakistan. Gross domestic product is decreasing year by year. So our conclusion about infant mortality rate is that its values goes toward the negative, so death rates are decreasing day by day. And both the variables have insignificant relations with each other.

Another indicator of human capital formation is that consumer price index according to inflation point of view. Our data conclude that CPI is decreasing at last year. So that both independent and dependent variable has positive and significant relationship due to the reason that both the variables are changed in the same way. Values of beta for CPI are also in positive sign.

It is concluded that education enrollment index, infant mortality rate, consumer price index are the independent parameters of our data. Gross domestic product is dependent variable. Results indicate that human capital formation indicators boost the economic growth of Pakistan.so that an economy can be improved by the full utilization of these resources.so that productivity can be increased by this.

6. POLICY IMPLICATIONS

First of all, about human capital formation one indicator is education enrollment index. There is negative impact on economic growth of this indicator. Drop out at secondary school education is more than other school education. Main thing is that to end up this drop out. To tackle down this, some scholarships programs

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will be started. Discourage the drop out at secondary education level. Universal Primary education programs will be started. It must be focused on the lifelong higher and secondary education. Government should take some steps to the provision of basic and secondary education and greater attention to those areas where inadequate of education. The reason is that surveys tell that in urban areas enrollment rate is higher than in rural areas enrollment rate. So that the provision of education must be in rural areas. Another important thing is that government and private sector should increase investment in education sector. our annual budget comprises very low amount on education sector so government increase the budget amount for education sector. Government should take some steps to tackle down the inflation because if the prices increased common people affected by higher prices. Another important thing is that education must be top priority for the masses. So at the end I personally recommend that private and government sector should start such programs that can enhance the human capital formation and increase the economic growth.

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Authors' contribution/Conflict of interest

This research work was carried out in collaboration between two authors. Author AGA designed the study, performed the statistical analysis, wrote the protocol and edited final draft of the manuscript. Author TA collected data, analyses of the study, conducted literature review, and prepared first draft. Both authors read and approved the final manuscript. They declared no conflict of interest with any institution or any person.