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Impact of Higher Education on Economic Growth of Pakistan

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This paper investigates the returns of higher education on economic growth of Pakistan from 1972 to 2008 through the application of Cobb-Douglas production function. The prime objective of the study is to identify and establish a link between the higher education and economic growth of Pakistan. For this purpose the impact of higher education enrollment on economic growth is analyzed. An attempt is made, in this study, to analyze the educational trends, the strategies and challenges for higher educational and its role in overall development in the country. Furthermore, the study also delves that a well educated labor force appears to significantly affluence the economic growth. The research also provides some implications for the policy purpose to develop higher education so as to curb the use of expatriate manpower in different sectors of the economy.

Keywords: Pakistan; Higher Education; Economic Growth; Cobb-Douglas Production Function; Time Series Analysis.

JEL Classification: O40; C22

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1. Introduction

Education is widely accepted as a leading instrument for promoting economic growth. It plays a vital role in building human capabilities and accelerates economic growth through knowledge, skills and creative strength of a society. The benefits of education are not only confined to the national economy but individual also benefit from it. For Pakistan, where growth is essential if the continent is to climb out of poverty, education is particularly important. For several decades, Pakistan put great emphasis on primary and, more recently, secondary education. But they have neglected tertiary / higher education as a means to improve economic growth.

The interrelation between education and economic growth has been discussed since ancient Greece. Adam Smith and the classical economists emphasized the importance of investment in human skills. Early attempts to measure the contribution of education to economic growth were based either on the growth accounting approach or on the rate of return to human capital.

However, it was not until late in the twentieth century that researcher undertook formal and scientific analysis of this relationship. Several studies have investigated the relationship between economic growth and education such as Psaharoupolous, 1988; De Meulmester *et. al.*, 1995; Jorgenson and Fraumeni, 1998. Their starting point was always the root of the economic growth itself. The pioneer theorists hypothesized that economic development depended on the increase of capital and the labor factor in the productive processes. A fundamental reason for economic growth was found to be the increase of productivity in these factors of production. Whereas researchers affirmed that correlations exist across countries between economic growth

rates and schooling enrollment rates including enrollment in higher education, another group of researchers such as De Meulmester *et. al.* (1995), using more sophisticated econometric techniques, found that this relationship is not always a direct one.[1]

After World War II, several economists, including Milton Friedman, Gary Becker, and Jacob Mincer, developed the "human capital" theory to examine the benefits of education for individuals and society. Friedman and his wife Rose originally suggested that there was no evidence that "higher education yields 'social benefits' over and above the benefits that accrue to the students themselves." On the contrary, they hypothesized that higher education may promote "social unrest and political instability" (Milton Friedman and Rose Friedman, 1980). Higher education may create greater tax revenue, increase savings and investment, and lead to a more entrepreneurial and civic society. It can also improve a nation's health, contribute to reduced population growth, improve technology, and strengthen governance. With regard to the benefits of higher education for a country's economy, many observers attribute India's leap onto the world economic stage as stemming from its decades-long successful efforts to provide high-quality, technically oriented tertiary education to a significant number of its citizens (World Bank, 2004).

Indeed, it is understood that higher education can lead to economic growth through both private and public channels. The private benefits for individuals are well established and include better employment prospects, higher salaries, and a greater ability to save and invest. These benefits may result in better health and improved quality of life, thus setting off a virtuous spiral in which life expectancy

[1] Sofia, 2001 has given comprehensive details about this controversy among the education and economic growth.

improvements enable individuals to work more productively over a longer time further boosting lifetime earnings. Public benefits are less widely recognized, which explains many governments' neglect of tertiary schooling (Thompson, 1981; Tilak, 1992; Rena, 2000; Varghese, 2004). But individual gains can also benefit society as a whole.

Several studies at national as well as at international level have been organized to capture the effect of education on economic growth. These include Schultz and Beaker (1960), Psaharoupolous (1988), Wolff and Gittleman (1993), De Meulmester *et. al.* (1995), Crowder (1996), Losada (1998), Birdsall (1999), Siphambe (2000), Ranis and Stewart (2001), Bourne and Dass (2003), Horii, *et al.,* (2003), Gupta and Chakraborty (2004), Bartik (2004), Babatunde and Adefabi (2005), Khan (2005), Bloom, *et al.,* (2005 & 2006), Brempong, *et al.,* (2006), Fleisher, *et al.,* (2006), Brempong, *et al.,* (2006), Abbas (2007), Feldman and Stewart (2007), Rehme (2007), Bhamani (2007) and Rena (2007). Most of the studies have explored the two way relationship between education and economic growth by using the cob-dogulas econometric functional form.

2. Education Sector in Pakistan

Education is a central issue to promote increased standards of living and to reduce inequality. So government of Pakistan has taken several steps to improve education sector. According to the Pakistan Education Statistics 2007-08, a total of 7,242 new institutions were added in a year which has raised the total number to 231,289 in the country. Out of total institutions, 164,579 are in public sector and 81,103 in private sector.

The government has taken several substantial initiatives for teacher's education and professional development. At higher level, HEC has provided training services to 3,726 faculty members of different universities. Under Canadian International Development Agency (CIDA) Debt- Swap initiative, the Executive Committee of National Economic Council (ECNEC) approved a project, costing Rs. 669.556 million for the promotion of teacher training and capacity building of teacher training institutes in ICT, FATA, FANA and AJK. Similar projects were also approved for the provinces of Punjab, Sindh, NWFP and Balochistan at a capital cost of Rs. 3,137.752, Rs. 1,261.773, Rs. 1,035.319 and Rs. 588.407 millions respectively. National Institute of Science and Technical Education (NISTE), Islamabad will train teachers in Science and Technical Education throughout the country.

Pakistan has been blessed with highly talented manpower, but due to insufficient research and development (R&D) activities, a large number of highly educated and trained persons leave for better career in developed countries. To tackle these challenges, the government has taken several steps to improve faculty, promote access/participation and excellence in knowledge and research at higher level. Availability of scholarships plays a vital role in promoting Human Capital. Therefore, the government has launched scholarship programs at Federal and Provisional level. Currently, 3,237 scholars are studying (under PhD Scholarship Program) in HEC recognized universities in the past four years. The foreign scholarship programs have been geared towards improving research in key areas, particularly in areas relating to engineering, applied and pure sciences. HEC has sent 2,600 scholars for studies abroad under PhD scholarship program up to 2007-08. 69 scholars proceeded abroad

under Cultural Exchange Programme in year 2007-08. In addition, HEC in collaboration with the Cuban Government has sent 366 students for undergraduate medical studies (MBBS equivalent) in year 2006-07 with 20% seats allocated to earthquake affected areas.

In view of spreading higher education to every area of Pakistan, over the past three years, 17 new universities have been granted Charters, with the majority opened in areas where higher education opportunities were previously unavailable. 23 new and advance disciplines were launched. Furthermore, 11 foreign institutions were allowed to operate in Pakistan through franchising/collaborative arrangements with local institutions of higher education. The government has established four Universities of Engineering, Science and Technology in Pakistan (UESTP) with the collaboration of Germany, Austria, France and China at a total cost of Rs. 164.869 Billion. Three additional universities are to be established in other regions of the country. In order to support the conduct of truly world-class research, more than 20 Central Research Laboratories have been established in major universities.

3. Data and Methodology

It is convenient to describe the variables used in the present study. The out put (GDP) is greatly affected by fluctuation in the number of skilled person from these higher ducation institutes. So, to see the returns of higher education on economic growth of Pakistan, GDP is taken as dependent variable, which is the main indicator of economic growth. Explanatory variables are Enrollment in Higher Education, Higher Education Expenditure, Employment Rate, Labor Force, Labor Force Participation Rate and Per Capita Income.

Data for the variables examined were obtained for the period 1972 through 2008. Most of the variables used in the analysis (e.g. GDP, Enrollment in Higher Education, Higher Education Expenditure, Employment Rate, Labor Force, Labor Force Participation Rate and Per Capita Income) are borrowed from Economic Survey of Pakistan (various issues) and from Pakistan's Statistical Year Book (various issues). However some data sites (e.g. www.finance.gov.pk and www.statpak.gov.pk) are also taken in to account for the purpose of data collection. The variable of PCI is formulated by dividing the GNP over total population.

Nacmias and Nacmias (1988) stated that the scientific methodology is a system of explicit values and procedures upon which research is based and against which the claim for knowledge are evaluated. To measure the economic growth Cobb-Douglas production function is used in the present study. The Cobb-Douglas production function, in its stochastic form, may be expressed as:

$$Y_i = \beta_1 LF^{\beta_2} LFPR^{\beta_3} HEE^{\beta_4} EHE^{\beta_5} ER^{\beta_6} PCI^{\beta_7} e^{\mu_i} \qquad \text{equation (1)}$$

Where Y = GDP

LF = labor force input

LFPR = labor force participation rate

HEE = higher education expenditure

EHE = enrollment in higher education

ER = employment rate

PCI = per capita income

μ = stochastic disturbance term

e = base of natural logarithm

It is clear that the relationship between GDP and explanatory variables are nonlinear. The logarithmic conversion of equation (1) above yields the structural form of the production as:

$$\ln y_i = \ln \beta_1 + \beta_2 \ln LF + \beta_3 \ln LFPR + \beta_4 \ln HEE + \beta_5 \ln EHE + \beta_6 \ln ER + \beta_7 \ln PCI + \mu_i \quad \text{equation (2)}$$

$$\ln y_i = \beta_0 + \beta_2 \ln LF + \beta_3 \ln LFPR + \beta_4 \ln HEE + \beta_5 \ln EHE + \beta_6 \ln ER + \beta_7 \ln PCI + \mu_i \quad \text{equation (3)}$$

Where $\ln \beta_1$ (equation 2) = β_o (equation 3)

Now the model is linear in parameters β_o, β_2, β_3, β_4, β_5, β_6 and β_7 and is therefore a linear regression model. Though, it is nonlinear in variables Y and X but linear in the log of these variables. The equation (3) is a log-log, double-log, or log-linear model. The properties of Cobb-Douglas production function are as under[2].

- B_2 is the elasticity of GDP with respect to labor force input, that is, it measures the percentage change in GDP for 1% change in labor force input, holding the other variables constant.

[2] For further detail of Cobb-Douglas production function, see Gujarati, D.N., (2003), Basic Econometrics, fourth edition, pp. 223-226.

- B_3 is the elasticity of GDP with respect to labor force participation rate input, that is, it measures the percentage change in GDP for 1% change in labor force participation rate input, holding the other variables constant.
- B_4 is the elasticity of GDP with respect to Government expenditure on higher education input, that is, it measures the percentage change in GDP for 1% change in Government expenditure on higher education input, holding the other variables constant.
- B_5 is the elasticity of GDP with respect to Higher education enrollment input, that is, it measures the percentage change in GDP for 1% change in Higher education enrollment input, holding the other variables constant.
- B_6 is the elasticity of GDP with respect to employment rate, that is, it measures the percentage change in GDP for 1% change in employment rate, holding the other variables constant.
- B_7 is the elasticity of GDP with respect to per capita income, that is, it measures the percentage change in GDP for 1% change in per capita income, holding the other variables constant.
- The sum $(\beta_2+\beta_3+\beta_4+ \beta_5+\beta_6+\beta_7)$ gives information about the returns to scale, that is, if sum $(\beta_2+\beta_3+\beta_4+ \beta_5+\beta_6+\beta_7) =1$ then there are constant return to scale, that is, doubling the inputs will double the output, tripling the inputs will triple the output, and so on.
- If sum $(\beta_2+\beta_3+\beta_4+\beta_5+\beta_6+\beta_7) >1$ then there are increasing return to scale, that is, doubling the inputs will more than double the output.
- If sum $(\beta_2+\beta_3+\beta_4+ \beta_5+\beta_6+\beta_7) <1$ then there are decreasing return to scale, that is, doubling the inputs will less than double the output.

Three models are estimated to see the returns of higher education on economic growth of Pakistan in the present study:

3.1. MODEL 1

In model 1, following regression line is estimated:

$$\ln GDP = \beta_0 + \beta_2 \ln ER + \beta_3 \ln HEE + \beta_4 \ln EHE$$

Where GDP = gross domestic product

ER = employment rate

HEE = higher education expenditure

EHE = enrollment in higher education

3.2. MODEL 2

In model 2, following regression line is estimated:

$$\ln EHE = \beta_0 + \beta_2 \ln GDP + \beta_3 \ln LFPR + \beta_4 \ln HEE$$

Where GDP = gross domestic product

LFPR = labor force participation rate

HEE = higher education expenditure

3.3. MODEL 3

In model 3, following regression line is estimated:

$$\ln ER = \beta_0 + \beta_2 \ln GDP + \beta_3 \ln EHE + \beta_4 \ln LF$$

Where ER = employment rate

GDP = gross domestic product

EHE = enrollment in higher education

LF = labor force

The sum of three betas ($\beta_2+\beta_3+\beta_4$) will yield the information about the returns of the scale. The sum ($\beta_2+\beta_3+\beta_4$) gives information about the returns to scale, that is, if sum ($\beta_2+\beta_3+\beta_4$) =1 then there are constant return to scale, that is, doubling the inputs will double the output, tripling the inputs will triple the output, and so on. If sum ($\beta_2+\beta_3+\beta_4$) >1 then there are increasing return to scale, that is, doubling the inputs will more than double the output and finally, if sum ($\beta_2+\beta_3+\beta_4$) <1 then there are decreasing return to scale, that is, doubling the inputs will less than double the output.

4. Empirical Results

Human capital theorists agree to the existence of a correlation between higher education and economic growth; however, their methodology has been questioned. Correlational statistics have been the most widely used method by these theorists; but, correlation does not imply causation. They are also questioned because usually the economic growth rate is a dependent variable, and all other variables are independent. This study tests GDP and higher education enrollments as dependent variables and also as independent variables. This gives in depth information about these relationships, adding new information to the theory. By presenting Cobb-Douglas production function analysis that relates economic growth and higher education, this study remains in the same theoretical track that previous studies of Human Capital had established; and by introducing employment as a third variable in the analysis and showing its influence on higher education. The question of whether the system of higher education and employment causes economic growth is addressed. Cobb-Douglas production function models are used for forecasting and structural analysis. In the present study trivariate relationships between higher education and economic

growth is considered in the presence of the employment rate variable.

4.1. MODEL 1

The results of estimated model are reported in table 4.1.The estimated regression line is as: $\ln GDP = 27.90+5.35\ln ER+0.48\ln HEE+1.25\ln EHE$

It is observed that all of the estimated coefficients are statistically significant from zero and have expected signs. It is further observed that the enrollment rate, expenditure on higher education and enrollment in higher education have appositive impact on the growth of GDP. The results of estimated model show that (log of) employment rate is statistical different from zero at 10% level of significance. While (log of) higher education expenditure and (log of) enrollment in higher education inputs both are statistical different from zero at 1% level of significance. The negative sign of (log of) employment rate shows that there is a negative relation between employment rate and GDP. The positive sign of (log of) higher education expenditure shows that there is a positive relation between higher education expenditure and GDP. A rational of this positive sign is that GDP increase due to increase in higher education expenditure. Similarly (log of) enrollment in higher education has a positive impact on GDP.

The GDP elasticities of (log of) employment rate, (log of) higher education expenditure and (log of) enrolment in higher education are 5.35, 0.48 and 1.19 respectively. In other words, holding higher education expenditure and enrollment in higher education inputs constant, a 1 percent increase in employment rate input leads to 53.7 percent increase in GDP, holding employment rate and enrollment in higher

education inputs constant, a 1 percent increase in higher education expenditure input leads to 0.48 percent increase in GDP, holding employment rate and higher education expenditure inputs constant, a 1 percent increase in enrollment in higher education input leads to 1.19 percent increase in GDP and holding employment rate, higher education expenditure and enrolment in higher education inputs constant, 27.90 percent increase in GDP. It is clear from the regression equation that enrollment in higher education input has a stronger positive impact on GDP. The impact of employment rate, higher education expenditure and enrollment in higher education on GDP can be justified as followed.

With the increase in expenditure on higher education from government side, people become more interested in getting higher education. So enrollment in higher education also increases. The estimated equation, as mentioned above, shows that these two variable s have a positive impact on GDP because higher education provide more skilled and qualified labor forces that is essential for the progress of the economy. It is also clear from the equation that employment rate decreases with the increase in other two variables (higher education expenditure and enrollment in higher education) because, increase in enrollment in higher education people are likely to be less available for jobs in Pakistan. They are more interested in getting higher education to improve their skills and vision for future job demands.

Adding all GDP elasticities we come up with the value 7.09, which indicates that the function exhibits the property of increasing returns to scale i.e. doubling the inputs (employment rate, higher education expenditure and enrolment in higher education) will result in increase in the output (GDP) more than doubled.

TABLE 4.1. Results of equation 4.1.

$$\ln GDP = \beta_0 + \beta_2 \ln ER + \beta_3 \ln HEE + \beta_4 \ln EHE$$

Variable	Coefficient	t-values	Probability
B_0	27.91	1.72***	0.0959
LnER	05.35	2.16***	0.0044
LnHEE	00.48	3.75*	0.0007
LnEHE	01.26	3.41*	0.0008

*** and * indicate the significance level at 10 % and 1 % respectively.

R^2	0.85
F-statistic	193.32

The estimated regression line fits the data quite well. The value of R^2 is 0.85, which is very high; this high value of R^2 is due to time series data. The values of R^2 shows that 85 percent variation in (log of) GDP is explained by the (log of) employment rate, (log of) higher education expenditure and (log of) enrolment in higher education, while the remaining variations are due to some other factors. The value of F-statistics is 193.32 and probability of F-statistic is 0.00000 which show that the overall model is a good fit.

4.2. MODEL 2

The results of estimated model are reported in table 4.2. The estimated regression line is as: $\ln EHE = -29.78 + 0.37 \ln GDP + 10.49 \ln LFPR + 0.08 \ln HEE$

The results of estimated model show that (log of) GDP and (log of) labor force participation rate inputs are statistical different from zero at 1% level of significance. The positive sign of (log of) GDP, (log of) labor force participation rate and (log of) higher education expenditures shows that there is a positive relation between enrollment in higher education and GDP, labor force participation rate and higher education expenditures. A rational of this positive sign is that enrollment in higher

education increase due to increase in GDP, labor force participation rate and higher education expenditures.

The EHE elasticities of (log of) GDP, (log of) labor force participation rate and (log of) higher education expenditures are 0.37, 10.49 and 0.38 respectively. In other words, holding labor force participation rate and higher education expenditures inputs constant, a 1 percent increase in GDP input leads to 0.37 percent increase in enrollment in higher education, holding GDP and higher education expenditures inputs constant, a 1 percent increase in labor force participation rate input leads to 10.49 percent increase in enrollment in higher education, holding GDP and labor force participation rate inputs constant, a 1 percent increase higher education expenditures leads to 0.38 percent increase in enrollment in higher education and holding GDP, labor force participation rate and higher education expenditures inputs constant, 29.78 percent decrease in enrollment in higher education. It is clear from the regression equation that labor force participation rate input has a stronger impact on enrollment in higher education.

TABLE 4.2. Results of equation 4.2.

$$\ln EHE = \beta_0 + \beta_2 \ln GDP + \beta_3 \ln LFPR + \beta_4 \ln HEE$$

Variable	**Coefficient**	**t-values**	**Probability**
B_0	-29.78	-5.26*	0.0000
LnGDP	00.37	5.09*	0.0000
LnLFPR	10.49	5.96*	0.0000
LnHEE	00.38	1.94***	0.0058

*** and * indicate the significance level at 10 % and 1 % respectively.

R^2	0.89
F-statistic	165.62

Adding all GDP elasticities we come up with the value 11.24, which indicates that the function exhibits the property of increasing returns to scale i.e. doubling the inputs

(GDP, labor force participation rate, higher education expenditure) will yields a more than doubled increase in the enrolment in higher education.

The estimated regression line fits the data quite well. The value of R^2 is 0.89, which is very high; this high value of R^2 is due to time series data. The values of R^2 shows that 89 percent variation in (log of) enrollment in higher education is explained by the (log of) GDP, (log of) labor force participation rate, (log of) per capita income and (log of) employment rate, while the remaining variations are due to some other factors. The value of F-statistic is 165.6287 and probability of F-statistic is 0.00000 which show that the over all model is a good fit.

4.3. MODEL 3

The results of estimated model are reported in table 4.3. The estimated regression line is as: $\ln ER = 4.87+0.042\ln GDP+0.040\ln EHE-0.39\ln LF$

The results of estimated model show that (log of) enrollment in higher education and (log of) labor force inputs are statistical different from zero at 1% and 5% level of significance respectively. The positive sign of (log of) GDP and (log of) enrollment in higher education shows that there is a positive relation between employment rate and GDP/enrollment in higher education. A rational of this positive sign is that employment rate increase due to increase in GDP and enrollment in higher education. The negative sign of (log of) labor force shows that there is a negative relation between employment rate and labor force.

The employment rate elasticities of (log of) GDP, (log of) enrollment in higher education and (log of) labor force are 0.04, 0.04 and 0.39 respectively. In other words, holding enrollment in higher education and labor force inputs constant, a 1 percent increase in GDP input leads to 0.04 percent increase in employment rate, holding GDP and labor force inputs constant, a 1 percent increase in enrollment in higher education input leads to 0.04 percent increase in employment rate, holding GDP and enrollment in higher education inputs constant, a 1 percent increase in labor force input leads to 0.39 percent decrease in employment rate, holding GDP, enrolment in higher education and labor force inputs constant, 4.87 percent increase in employment rate. It is clear from the regression equation that GDP input has a stronger positive impact on employment rate than enrollment in higher education.

Adding all GDP elasticities we come up with the value 0.47, which indicates that the function exhibits the property of decreasing returns to scale i.e. doubling the inputs (GDP, enrollment in higher education and labor force) will yields the out put (employment rate) less than the doubled.

TABLE 4.3. Estimated Results of equation 4.3

$$\ln ER = \beta_0 + \beta_2 \ln GDP + \beta_3 \ln EHE + \beta_4 \ln LF$$

Variable	**Coefficient**	**t-values**	**Probability**
B_0	4.87	29.84*	0.0000
LnGDP	0.04	1.95***	0.0365
LnEHE	0.04	3.16*	0.0034
LnLF	0.39	2.02***	0.0522

*** and * indicate the significance level at 10 % and 1 % respectively.

R^2	0.88
F-statistic	161.26

The estimated regression line fits the data quite well. The value of R^2 is 0.88. The values of R^2 shows that 88 percent variation in (log of) employment rate is explained by the existing variables and the remaining variations are due to some other factors.

The value of F-statistic is 161.26 and probability of F-statistic is 0.00000 which show that the over all model is a good fit.

5. Conclusions and Policy Implications

Higher education plays a vital role in the development of any nation. Skill labor force participation rate is important because of their contribution to economic growth. In this final chapter we briefly review the substantive findings of this latest research work and then consider some of the implication of the study for the future of national skill labor formation strategies in Pakistan.

5.1. Summary

Interest in higher education has greatly increased all around the world during last 36 years. Developing countries realized higher education as the most important means of scientific, technological and industrial progress which is a vital for economic growth and development of country. Pakistan is one of them which considered higher education as mean for producing highly educated leaders in all walks of life.

Higher education is widely accepted as a leading instrument for promoting economic growth. For Pakistan, where growth is essential if the continent is to climb out of poverty, education is particularly important. For several decades, Pakistan put great emphasis on primary and, more recently, secondary education. But the area of tertiary education is neglected as a means to improve economic growth. The prime objective of the study was to identify and establish a link between the higher education and economic growth of this country. For this purpose the impact of higher education enrollment on economic growth was analyzed.

The data was collected from various issues of economic survey of Pakistan and then be analyzed by using the econometric techniques. The out put (GDP) is greatly affected by fluctuation in the number of skilled person from higher education institutes. So, to see the returns of higher education on economic growth of Pakistan, GDP is taken as dependent variable, which is the main indicator of economic growth. In the present study trivariate relationships between higher education and economic growth is considered in the presence of the employment rate variable. This study also tests GDP and higher education enrollments as dependent variables and also as independent variables. The results of this study corroborate that the returns of higher education have a constructive impact on economic growth of Pakistan. Also employment rate is a key factor in the higher education and economic growth relationship.

5.2. Conclusions

A causal relationship from the system of higher education and employment rate to economic growth was found in Pakistan. This means that the system of higher education enrollment /employment rates does cause impact on the GDPs.

This study corroborates the findings of the International Labor Office (ILO, 2000) that education is one of the key indicator in the labor market. The connections between higher education and the labor market are among the most frequently discussed issues of higher education.

The results of this study confirm that the returns of higher education have a positive impact on economic growth of Pakistan. Enrollment in higher education and higher education expenditure has a positive impact on GDP. Also higher education expenditure and GDP has a positive impact on enrollment in higher education. This study extends this theory specifically to higher education which provides high skill and quality in labor. So labor force participation rate is found to be highly related to higher education and skilled labor force is highly related to economic growth.

Employment rate has found to be greatly related to enrollment in higher education. Nevertheless, expenditure on higher education put a greater contributes to improvements in economic growth.

5.3. Suggestions

The present study is about returns of higher education on economic growth of Pakistan. In the light of findings the present study has following suggestions such as:

- Higher education must provide the education related to and needed by the labor market.
- It is obvious from our parametric results that employment rate, higher education expenditure and enrollment in higher education contribute positively towards the GDP. As we find that there is a strong positive effect of higher education on the economic development of the country, so this sector must be promoted and special attention must be given for the sake of rapid and proper economic

development of the country. For this reason the share of the expenditures on higher education as a percentage of national incomes must be increased.

- Special policies must be designed in order to increase the higher education enrollment rate. In order to increase the said enrollment rate scholarship schemes must be instigated and soft loans through banking system must be set in motion in order to full fill the financial needs of the students.
- Investment in the higher education sector must be made while taking in to account the current nature of the demand of labor so that the unnecessary wastage of the national resources may be stopped.
- In order to create the awareness among the masses, a massive campaign about the role of higher education in the overall economic development and progress of the country must be launched at local as well as at national level.

In nut shell, keeping in mind the above mentioned suggestions, we could be able, in a much better way, to enjoy the fruits of economic prosperity as a resultant of investment in higher education sector of the country.

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