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# Human Capital and Poverty in Pakistan: Evidence from the Punjab Province

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## Abstract

The role of human capital (education and health) is recognized both in theoretical and empirical economic literature. Better education and health services enhance productivity and earnings of the workers. So the present study is an attempt to assess the impact of human capital in poverty alleviation. A cross-sectional data of 34 districts of Punjab province was used for the analysis. Three equations have been estimated by using the ordinary least squares method. Education and health services are found to have poverty lessening impact in the economy. The results are statistically robust as adjudged by the R-squared and F-value. The error terms of the estimated models fulfill the standard OLS assumptions. It is suggested that imparting of knowledge, training and skills in the people empowers them. Improved human resources increase the productivity and earnings of the workers. Furthermore, improved human capital can play its role in reducing multidimensional poverty and its severity. The study suggests a substantial increase in education and health expenditure by the government. Proper campaign to increase the enrollment can be fruitful. Every born child has its basic right to obtain basic education and health services. Provision of education and health services can help the poor to break the vicious cycle of poverty.

**Key Words:** Multidimensional Poverty, Education, Health, Human capital, Punjab, Pakistan

**JEL Classification:** C2, J24, O1, P36

## INTRODUCTION

The focus of the economist, for three decades, has been on the long run growth of the economies. The economic policies implemented have been aimed to increase the long-term growth rate of the economy. In the new “endogenous growth” theories, it was focused that productivity improvement was derived from the progress in technology and human capital in the shape of education, Romer (1986). The conception of capital, in the classical model, can be expanded from physical capital to take in human capital in the shapes of education, health and experience (Lucas, 1988). A country could grow more rapidly if it has more human to physical capital ratio. Increase in human capital makes possible the expanded use of physical capital and therefore result in rapid economic expansion of the economy. Moreover, increased long term growth of the economy can contribute to poverty alleviation activities in the economy.

Human resources of an economy, rather than physical and natural resources are more important for social and economic development of an economy. Human resources frame the basis for long run growth. Human resources are the “active” factors of production. The physical and natural resources are named as the “passive” agents of the economy. The “active agents” of the economy carry forward growth of by accumulating capital, utilizing natural resources, building socio-politico-economic institutions. But all of it could not be achieved without development of knowledge, skills, and techniques of the masses. A country with advanced human resources can be capable of achieving the prime objectives of higher growth, increased employment opportunities and reduced levels of poverty (Schultz, 1961; Harbison, 1973).

Kwabena Gyimah Brempong (2006) confirmed positive and statistically significant impact of education (human capital) on per capita GDP growth in African economies. In his study, the author found growth elasticity of education human capital twice as that of the physical capital. Khorasgani (2008) also evidenced a positive correlation between education and growth in Iran. A number of studies confirmed that education promotes growth (Belassi, 2004; Aurangzeb, 2008; Ahmad & Luqman, 2012).

Education not only enables the people to perform as agents of economic change by imparting knowledge and skills in them but also imparts the “values, ideas, attitudes and aspirations.” Provision of education and improved health facilities increased the labor productivity and output. Increase in the level of education increases the lifetime earnings of an individual. The difference between poverty and affluence rely on long term growth of the economy. One of the important determinants of economic growth is the human capital. It is the human capital that determines the growth trajectory of long run growth of the economy. Human capital of an economy comprises education and health (Barro, 2013a).

Barro (2013a) explored the determinants of growth and investment in a panel of 100 economies from 1960 to 1995. The study suggested growth to be positively associated to average years of schools attended by males at secondary and higher levels. The author is of the opinion that educated workers would help the dissemination of

technology in the process of development. The growth was found to be insignificantly correlated with female school attainment at secondary and higher levels. This was due to the fact that there was not well-utilization of highly educated females in the labor market. Growth was found to be insignificantly associated to primary level schooling of males. Moreover, Barro termed this level of schooling as a prerequisite for secondary schooling and it would affect growth through this channel. Furthermore, females' primary level education encourages growth by lowering the fertility rate in the economy.

Ehrlich & Lui (1991) and Meltzer (1995) can be termed as the pioneer studies to explore the two-way relationship between health and economic growth. The empirical study of Barro (1996) and others suggested health status to be very important determinant of successive growth. Barro (2013b) used the recent developments in growth theory to explore the relationship between health and growth.

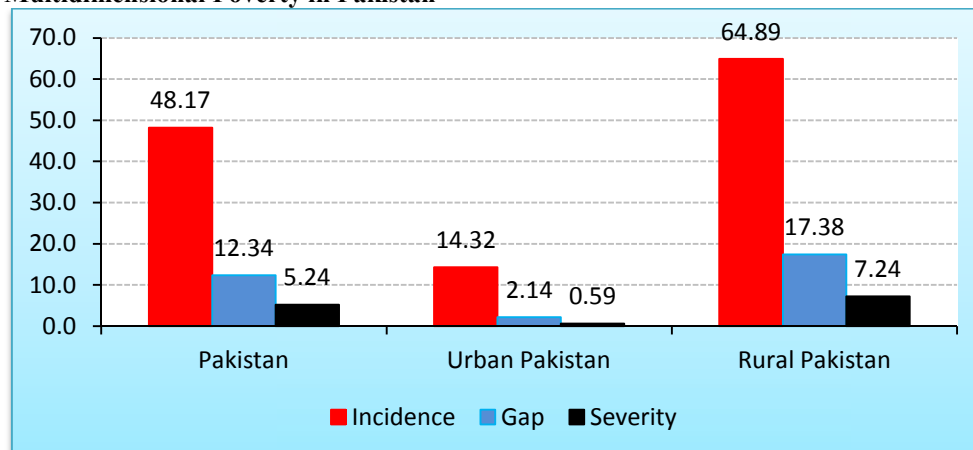
The importance of education, in the process of sustainable development of the economy, has no denial in the economic literature. Education and human capital are the basis of sound economic development process of the economy. Education imparts knowledge and skills in the individuals (Tilak, 1994). Nasir & Nazli (2000) concluded a strong negative association between achieved education and level of welfare and wellbeing. Moreover, education was supposed to enhance the earning potential of the deprived and poor by increasing their productivity. Improvement in education of the people reduces the human poverty. Education and poverty are reinforcing factors each other. Poverty of education leads to poverty of income (Tilak, 2005; Awan *et al.*, 2008). Qureshi and Arif (2005) concluded a negative relationship between education and poverty. Nasir (2008) used primary data of district Sargodha and employed Logit model to conclude that education played a critical role in poverty reduction. The author estimated direct linear association between education achieved and income level. Chaudhary *et al.* (2010) examined the impacts of different education levels on poverty incidence by using the time series data of 35 years. The study concluded an important role of education in the Pakistan economy. Chaudhry *et al.* (2010) termed human capital (education and health) as "productivity enhancing device" for female labor force. Health and education increase female earnings.

The above review of the studies confirms that education stimulates growth, empowers the individuals, increases private earnings, and help to reduce poverty in the economies. Education creates a lithe, sound and healthy environment in the society. It shapes the way in which the coming generations discover to cope with the intricacies of growth. Education increases the socio-economic participation of the individuals in economic activities. It is an important determinant not only of growth but also of development. The present study is aimed to explore the impact of human capital (especially education) on incidence of poverty, poverty gap, and poverty severity, respectively, by using the district level data of the province of Punjab, Pakistan.

### MULTIDIMENSIONAL POVERTY IN PUNJAB PROVINCE AND PAKISTAN

The approach of multidimensional poverty to assess the wellbeing of an individual or household has been derived from the Sen's Capability theory (Sen, 1997). The traditional measures of poverty relied on the income poverty or consumption poverty. But the poverty is a multidimensional phenomenon. Multidimensional poverty takes into account the capabilities enjoyed by the individuals or household. Jamal (2012) was a seminal attempt to measure multidimensional in Pakistan. Jamal (2012) measured multidimensional poverty for Pakistan. He also measured district wise multidimensional poverty incidence, poverty gap and poverty severity of Pakistan. The figures 1 and 2 show the situation of multidimensional poverty in Pakistan and Punjab, respectively. The situation of poverty, when measured in context of multidimensional poverty, is very alarming. About half of the population of Pakistan (48.17 percent) is living under the poverty line.

**Figure 1: Multidimensional Poverty in Pakistan**



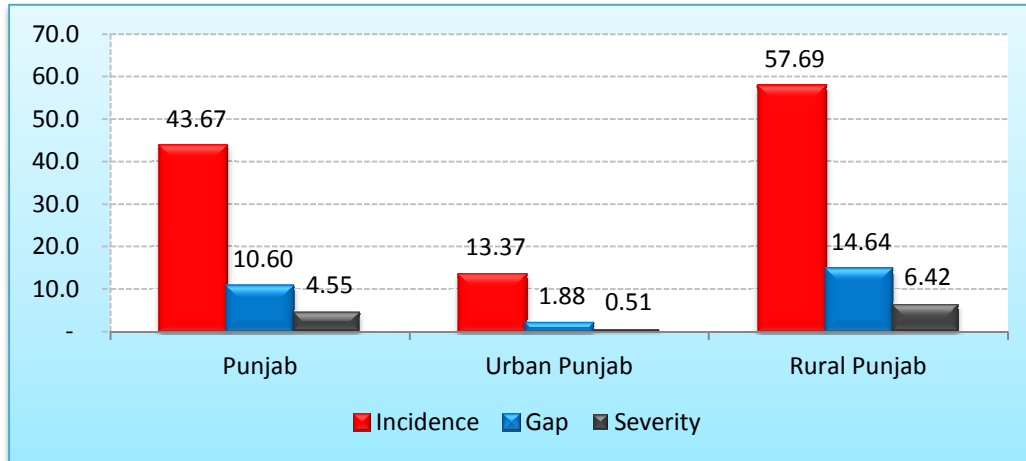
Source: The data from the Table 2 in Jamal (2012).

Having a look on the regional poverty in Pakistan, we see that the incidence of multidimensional poverty, poverty gap and poverty severity is very high in rural Pakistan. The incidence of poverty is high in rural areas than that in urban areas. The rural population in Pakistan is living with higher levels of poverty gap and severity than that of urban areas.

The story of multidimensional poverty in Punjab is not much more different than that of Pakistan. More than 43 percent population is living under the poverty line with 10.60 and 4.55 percent poverty gap and severity, respectively. The rural-urban poverty analysis shows that about 58 percent of the rural are living in absolute multidimensional poverty. The figures of poverty for urban Punjab are very low as compared to rural Punjab as 13.37 percent of the rural population is living under miserable conditions of poverty (see Figure 2).

**Figure 2: Multidimensional Poverty in Punjab**

Source: The data from the Table 2 in Jamal (2012).



### THE MODEL, DATA AND METHODOLOGY

The present study is an attempt to explore the impact of human capital on incidence of poverty, poverty gap, and poverty severity. Three models are estimated by using method of Ordinary Least Squares (OLS). In these three models poverty incidence, poverty gap and poverty severity are dependant variables respectively. The percentage of the Population having access to improved water sources and sanitation, infant mortality rate and literacy rate are used as explanatory variables in each of three models. A dummy variable of education has been developed to be used as explanatory variable. The dummy variable takes the value of 1 when literacy rate is more than or equal to 60 and zero otherwise. Cross sectional data of 34 districts of Punjab has been used for the analysis. The data of poverty incidence, poverty gap and poverty severity has been taken from Jamal (2012). The data for access to improved water sources and sanitation, infant mortality rate, and literacy rate has been taken from the Statistical Pocket Book of the Punjab (SPBP, 2011) and Punjab Development Statistics (PDS, 2011) issued by Bureau of Statistics, Government of the Punjab, Lahore. The models to be estimated are:

$$P_i = \alpha_0 + \alpha_1 WSS_i + \alpha_2 IMR_i + \alpha_3 E_i + \alpha_4 D_i + \mu_{1i} \quad (1)$$

$$PG_i = \beta_0 + \beta_1 WSS_i + \beta_2 IMR_i + \beta_3 E_i + \beta_4 D_i + \mu_{2i} \quad (2)$$

$$PS_i = \gamma_0 + \gamma_1 WSS_i + \gamma_2 IMR_i + \gamma_3 E_i + \gamma_4 D_i + \mu_{3i} \quad (3)$$

Here P = Multidimensional Poverty head count, PG is poverty gap, PS is poverty severity, WSS is percentage of population having access to improved water sources and sanitation, IMR is infant mortality rate ( per 1000 births), E is literacy rate, and D is the dummy variable. Where D = 1 when Literacy rate  $\geq$  60% and D = 0 when literacy rate is less than 60%. The logged values of the variables have been used for the analysis.

### RESULTS AND DISCUSSIONS

The results of the OLS regression of the model (1), (2) and (3) are reported in the Table 1. Referring to the estimates of the equation (1), show that access to improved water sources and sanitation to the public, and literacy rate have poverty reducing impact in the Punjab province. The WSS elasticity of multidimensional poverty incidence is statistically significant at 10 percent level. The elasticity of poverty with respect to infant mortality is positive and significant. The elasticity of education is negative but insignificant. But the coefficient the dummy variable (D) is negative and significant at 5 percent implying that increase in education facilities in the economy help to alleviate poverty in the economy.

**Table 1: Results of the OLS Regressions**

Variable	Poverty (Eqn. 1)	Poverty Gap (Eqn. 2)	Poverty Severity (Eqn. 3)
<b>Constant</b>	6.62* (0.00)	11.96* (0.00)	16.62* (0.00)
<b>Use of Improved Water Source and Sanitation (WSS)</b>	-0.62*** (0.06)	-0.83** (0.07)	-0.88 (0.18)
<b>Infant Mortality Rate (H)</b>	0.52** (0.03)	0.51 (0.12)	0.42 (0.36)
<b>Literacy Rate (E)</b>	-0.61 (0.26)	-2.09* (0.01)	-3.37* (0.00)
<b>Dummy Variable (D)</b>	-0.29** (0.04)	-0.36*** (0.07)	-0.39 (0.16)
<b>R-squared</b>	0.84	0.89	0.87
<b>Adjusted R-squared</b>	0.82	0.87	0.85
<b>F-statistic</b>	37.72 (0.00)	56.97 (0.00)	47.80 (0.00)
<b>Durbin-Watson d-value</b>	1.95	2.34	2.42

Source: Author

Note: the values in ( ) are p-values

\*significant at 0.01 level, \*\*significant at 0.05 level, \*\*\*significant at 0.10 level.

Having a look on the coefficients of poverty gap and poverty severity equations, we see that WSS and E elasticities have negative sign in equation (2) and (3) but the WSS elasticity in equation (3) is not significant. The coefficients of E in both of the equations are statistically significant at 5 percent level. Coefficient of D in equation (2) is significant at 10 percent level. The robustness of the estimated models can be adjudged by the R-squared and adjusted R-squared values. The F-value of all of the regressions is significant at 1 percent level. The Durbin-Watson value of each of the estimated regression is in closer to one. It implies that error term is uncorrelated. Diagnostic test to check the error term of each regression are applied on each error term. The diagnostic test results are displayed in the Table 2.

Jarque-Bera normality test results show that all of the error terms of the estimated regressions are normally distributed. A normally distributed error term is considered to be serially uncorrelated. So Breusch-Godfrey serial correlation LM test was applied. The all of three error terms are found to be serially uncorrelated. It is necessary for the coefficient to be efficient that the error terms has constant variance (*i.e.* they are homoscedastic). Breusch-Pagan-Godfrey heteroscedasticity test confirm that the error term of each equation is homoscedastic.

**Table 2: Diagnostic Test Results**

Test	Poverty (Eqn. 1)	Poverty Gap (Eqn. 2)	Poverty Severity (Eqn. 3)
<b>Normality Test (Jarque-Bera)</b>	5.77 [0.06]	1.65 [0.43]	1.60 [0.44]
<b>Breusch-Godfrey Serial Correlation LM Test</b>	0.03 [0.98]	3.74 [0.15]	5.85 [0.05]
<b>Heteroskedasticity Test (Breusch-Pagan-Godfrey)</b>	6.84 [0.14]	3.07 [0.54]	2.32 [0.67]

Source: Author

The results of the analysis conclude poverty alleviating impact of education and health in the Punjab province. Increase in education reduces the incidence of multidimensional poverty, poverty gap and poverty severity. Access to improved water sources and sanitation helps individuals and households to break the vicious circle of poverty. Since education and health are the main components of human capital any improvement in education and health sectors would lead to develop human capital. The positive role of education and health on productivity has been recognized both in theoretical and empirical studies. Formation of human capital in the economy may have its direct impact on the productivity of the individuals. Furthermore, its development may have undeviating effect on productive capability of the economy through innovations in modern methods of production that are appropriate for the process of domestic production (Romer, 1990).

Increase in the average attended years of schooling increases the size of the labor force. Moreover, the efficiency per unit of efficient worker increases. This stimulates the growth of the economy. More available education facilities enable the labor force to adopt new modern technique of production. Increased productivity of the labor

force makes the economy produce advanced and sophisticated products (Meir & Rauch, 2000). School education and growth in Pakistan are directly linked (Afzal, 2010; Ahmad & Luqman, 2012). Therefore, increased education (human capital) increases the economic growth of the economy. The higher growth can be helpful to alleviate poverty. Women are the most vulnerable amongst the poor. Increase in human capital through better health education services for women can be helpful in enhancing their productivity. Female earnings increase with the increase in better health and education services (Chaudhry *et al.*, 2010).

## CONCLUSION

The main objective of the present study was to assess the impact of human capital (education and health) on multidimensional incidence of poverty, poverty gap and poverty severity. The district level data of 34 districts of the Punjab province was used for the analysis. The OLS results confirmed the poverty alleviating impacts of education and health services. The results are statistically robust as adjudged by coefficient of determination and F-statistic. The diagnostic tests confirm that the error terms of the estimated OLS regression has been found to be normally distributed, uncorrelated and homoscedastic.

The results of the analysis are evident that education and health services are very important for economic development and poverty alleviation. The development of human resources by imparting knowledge, skills and training not only for overall growth of the economy but also empowers the deprived and help lessening the incidence of multidimensional poverty. Education also enables the people to have better health resulting in fertility and infant mortality rates. Increase in the better health services in turn may be helpful in increasing the enrollment rate, decreased in dropout rates.

Since primary education is very beneficial for the development of the economy (Todaro & Smith, 2006; Ahmad & Luqman, 2012) so there is a dire need, in Pakistan economy, that measures should be taken to increase the enrollment rate. Enrollment of the children can be ensured by providing the schools at the door steps of the people. Moreover, hiring of trained teachers and training of already employed teachers would also help to improve the education environment of the schools. Focus should be on rural areas. There is a shortage of schools and health centers in remote rural areas. Most of the population lives in rural areas basic education, better and improved health services, access to improved and safe drinking water are beyond the basic human right notion. There is an urgent need of increasing the education development expenditure as a percentage of GDP as per charter of United Nations. The creation of non-farm job opportunities is desirable by expanding the formal and technical education in the rural areas. Provision of better health services by increasing the well-equipped hospitals accompanied by technically trained staff would help to reduce incidence, gap and severity of multidimensional poverty.

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