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Investigating the Poverty Human Capital and Economic Development Nexus in Dera Ghazi Khan Division: An Econometric Analysis

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ABSTRACT

Purpose: The present study focuses on the D. G. Khan division, which is one of the important divisions of Southern Punjab, Pakistan. Being less developed, this study tries to find out different factors that can contribute to the betterment of this region.

Design/Methodology/Approach: The study was based on primary data collected during the year 2019 using the Binomial Logit and Ordinary Least Squares (OLS) regression techniques.

Findings: The findings revealed that human capital is the most significant factor that can contribute to alleviating poverty and promoting the development of the D.G. Khan division.

Implications/Originality/Value: It is suggested from the present study that development expenditures on projects like schools, colleges and universities are mandatory for the promotion of human capital and prosperity of the households in the D.G. Khan division.



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Introduction

Pakistan is a developing country facing many multidimensional issues like Poverty, unequal distribution of income, unemployment and severe inflation. People are living in extreme poverty in the 1990s as compared to 2015. The rising wealth of many developing countries has driven this progress, principally in the high populated regions of South Asia and East Asia. Over the long run, growth theories enlightened that human capital development encourages economic growth [Lucas (1988;1993)]. During the period 1960–2003, the growth rate in output per worker has raised to 2.4 percent annually in South Asian economies comprised of Bangladesh, India, Pakistan, and Sri Lanka [Collins (2007)].

With a population growth rate of 2.4 percent in 2017-18, it is very difficult to provide better opportunities to the people to improve their standard of living with limited resources [Economic

Survey of Pakistan (2018-19)]. However, the domestic savings stood at 4.2 percent of GDP and foreign savings are 4.7 percent of GDP [Economic Survey of Pakistan (2018-19)]. The present study focuses on the D.G. Khan Division which is one of the less developed and backward divisions of Southern Punjab Pakistan. Considering the problem of economic development, human capital and rising household poverty in the D.G. Khan Division. The present study has been focused to analyze the relationship between human capital, poverty and economic development in the D.G. Khan division. This paper is structured as follows. Section 2, presents a brief overview of existing literature. Section 3 offers data and methodology. Section 4 explains the empirical findings. Section 5 provides the concluding remarks.

The Literature Review

Coulomb and Mckay (1996) found that the household living in a rural area, low education, and a high dependency ratio certainly increase the likelihood of being poor. Education mainly at a higher level showed positive relationships with the per capita consumption and accelerating per capita income. In this regard, Mukherjee and Benson (1998) studied the determinants of poverty in Malawi. The authors have used an integrated household survey (IHS) during the period between 1997-1998. In this study, per capita consumption was used as a welfare indicator. The independent variables were demographic distribution, education, employment, occupation, agriculture and community characteristics, etc. It was also stated that the household consumed much time while traveling towards the bank, medical assistant units, bus station and post office. However, better provision of opportunities can ease their suffering. therefore, it is suggested that more education and people should engage in secondary and tertiary sectors leading to a high standard of living.

Cruces and Wodon (2003), examined the transient and chronic poverty situation in the Greater Buenos Aires (GBA) area, which consisted of 60 percent of the population in Argentina. The author uses panel data from 453 households for the year 1995-2002. The finding of the study has revealed that dependents especially children if living with their relatives are facing less chronic poverty. However, workers being young were suffering from transient poverty to a great extent as they are more vulnerable to income and employment shocks that forced them to live in poverty. This was also found that household head if working in the public sector was facing chronic poverty due to the low wages in the public sector. If the spouse of the household is self-employed then there would be no chronic poverty but transient poverty does exist to some extent. The study suggested that developing a formal policy would help reduce poverty incidence.

The logit regression technique was employed by Edoumiekumo et al. (2014) to discuss the causes of household poverty in the geopolitical region of Nigeria. The author has collected the data from the National Living Standard Survey (NLSS) during the period 2009-10. The study revealed that in the rural area the poverty was a chronic issue and affected households in the agricultural sectors. This study had suggested that opportunities, quality education should be provided to the household besides focusing on whether it is urban or rural. Family size should not be exceeded beyond five members.

Human Capital

Oketch (2006) has used the Two Stages Least Squares (2SLS) technique in Africa to measure the role of human capital in economic growth. The author had collected data of 47 African countries from 1960-1998 from the United Nations Educational, Scientific and Cultural Organization (UNESCO) and World Bank development indicators. The author had used three models, using alternatively GDP per capita, physical capital and human capital as dependent variables. The study concluded that physical capital and human capital are very crucial for the development of African countries.

Šimco and Ťuaca (2015) studied the determinants of human capital in Sweden. The author had collected cross-sectional data from the Sweden government statistical administrative agency during the year 2001 to 2010 and used regression analysis. The main determinants of human capital were the

size of the economy, expenditure on education expenditure, Cultural diversity and Tolerance, Urban amenities, Industry structure, Proximity to institutions of higher education. The authors had constructed a human development index, consisting of education, creativity, and health of the citizens. The finding derived from the study showed that education expenditure does not necessarily influence human capital. Tolerance and human capital were negatively correlated. It was suggested to carry out detailed research on human capital accumulation.

Economic Development

Woolard and Leibbrandt (1999) had observed the determinants of household income in South Africa. The authors have collected primary data and used a multivariate approach. The results have shown that household members that are educated up to the secondary school level are contributing to generating income for their household. This represents the role of adults that are employed are the main driver in lifting the status of their household above the poverty line. It has been observed that there are significant urban-rural differences in the mean income level of the household and poverty prevails provinces. Adequate policies are necessary for implementing successful anti-poverty strategies to reduce poverty incidence.

Ndambiri et al. (2012) highlighted the main contribution of factors behind economic growth in Sub-Saharan Africa. The authors have collected panel data of 19 countries during the year 1982-2000, using the Generalized Method of Moments (GMM) estimation. The results indicated that human capital formation, physical capital formation, and export were positively associated with economic growth in sub-Saharan countries. However, the nominal discount rate, foreign aid and government expenditure were negatively associated with economic growth. It was further suggested that effective policies must be postulated to promote economic growth in this region.

Data and Methodology

The primary data has been collected through a household survey in the D. G. Khan division during the year 2019. The size of the sample consists of 338 household heads, adopted simple random and stratified sampling.

Multiple Regression Analysis

Two econometric methods i.e., Binomial Logit and Ordinary Least Squares (OLS) regression have been employed in the present study. The simplest technique for analyzing the determinants of poverty is Binomial Logit Regression. For analyzing the determinants of human capital and economic development Ordinary Least Squares (OLS) regression analysis would be used for the econometric results of the study.

It starts with a general function,

$$Y_i = f(X_1, X_2, \dots, X_n) \quad (\text{I})$$

Where “ Y_i ” indicates Poverty. Y is equal to “1” if poverty exists in the household and equal to “0” if poverty does not exist in the household... X_1, X_2, \dots, X_n represents different socio-economic and demographic variables.

We construct the following model.

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_K X_{ji} + u_i \quad (\text{II})$$

Being a dummy or a dichotomous variable Y can be written in the form of

$$Y_i = 1, \quad \text{if } Y_i < 0; \quad Y_i = 0$$

Thus, the logistic equation can be written as [(Maddala (2001), Gujrati (1995) and Berndt (1991)],

$$F\left(-\sum X_i'\beta\right) = \frac{e^{-\sum X_i'\beta}}{1 + e^{-\sum X_i'\beta}} = \frac{1}{1 + e^{\sum X_i'\beta}}$$

Table 1: Variables Utilized for Binomial Logit and OLS Regression Estimates

The Description of the Variables		
Dependent Variable for Binomial Logit Model		
Y	Poverty	= 1 if per capita income is lower than \$1.90/day then the household is Poor = 0 if per capita income is more than \$1.90/day then the household is non-Poor
Dependent Variable for OLS Regression Model		
LNPCI	Log of Per Capita Income	It is the proxy for Economic Development. It is the natural log of per capita income.
HCI	Human Capital Index	It is the proxy for Human Capital. It is an index constructed by considering the household's education and health-related factors.
Independent Variables		
Demographic Variables		
HSIZE	Household 's Size	The total person in a household
Economic Variables		
OCC	Occupation of Household Head	= 1 if household head working in the primary sector = 0 if household head not working in the primary sector
NOEIH	Number of Earners	The household comprising of total earners
LNVLPA	Physical Assets	The natural log of value of physical assets owned by the household
REM	Remittances	= 1 if household receive remittances = 0 if a household does not receive remittances

Specification of the Models

The specification of the models presenting an interrelationship between poverty, human capital and economic development nexus in Southern Punjab, are given below:

$$Y = f(HCI, REM, OCC, PHYASSETS, HSIZE)$$

$$HCI = f(Y, LnPCI, NOEIH, HSIZE, REM)$$

$$LnPCI = f(HCI, Y, REM, OCC, HSIZE)$$

The Empirical Findings

Table 2: Descriptive Analysis of the variables in D.G. Khan Division

Variables	Mean	Standard Deviation
Poverty	0.44	0.49
Human Capital	9.25	0.65
Per Capita Income	9199.9	6566.34
Remittances	0.11	0.31
Occupation of the Household Head	0.58	0.49
Value of the Physical Assets	4979044	10954050
Household Size	6.2	2.4
Number of Earners in the Household	1.95	1.06

Source: Survey data 2019

Results of Econometric Analysis of Poverty, Human Capital and Economic Development Nexus in D.G. Khan Division

This section provides the estimates of an econometric analysis of poverty, human capital and economic development nexus in the D.G. Khan division.

In Table 3, poverty is engaged as a dependent variable, to analyze its relationship with human capital and economic development in the D.G. Khan division. The Binomial Logistic regression technique has been utilized to analyze the results.

Human capital comprises health and education-related variables that significantly influence household poverty. Table 3 shows the econometric results of the coefficient of human capital that there is a negative relationship between household poverty and the human capital of the household, significant statistically. The marginal effect concludes that there will be a 0.125 percent chance of reducing household poverty if the human capital index or human capital of the household increase by one unit. The reason behind this may be that as household heads are more educated, they can able to find good jobs and this will help to raise their income and standard of living [Otsuka et al., (2010), Hassan and Birungi (2011), Ali and Ahmad (2013)].

About the foreign remittances received by the household, the results of the econometric analysis turn out to be a negative relationship between remittances and household poverty, significant statistically at a 5 percent significance level. The marginal effect infers that an increase in remittances by one unit, the poverty probability reduces by 0.407 percent [Adams (2006), Azam and Gurbert (2006), Hashmi et al., (2008) and Arif and Bilquees (2007)]. The increase in the remittances received by the household results in increasing household per capita income.

Table 3 shows the coefficient of the occupation of the respondent in the primary sector is showing a positive relationship with household poverty, significant statistically. Therefore, those people working in the primary sector remain in the poverty trap due to low income and earnings. The marginal effect depicts that there is a 0.048 percent likelihood of increasing household poverty if the occupation of the household head is associated with the primary sector [Marjit et al., (2006); Kar and Marjit, (2001; 2009)]. The wages in the primary sector are considerably low as compared to the wages in the secondary and tertiary sectors. With regards to the household size, the estimates of the coefficient of household size show a positive relationship between household size and household poverty, at a one percent level of significance. The marginal effect infers that if the size of a household increase by one member, the poverty level of the household increases by 0.048 percent. The families having a large household size, are usually poor [Musgrove (1980), Amjad and Kamal, (1997), Qureshi and Arif (2001), Orbeta (2005), Jan, et al., (2009)]. The reason is that households suffering from chronic poverty, having low per capita income due to large family size and therefore are forced to live in poverty. The coefficient of the value of physical assets is found to be statistically insignificant and no relation between the poverty and value of physical assets has been found in the D. G. Khan division. The McFadden R-squared of the model is 0.387. The LR statistics is 179.817 and the p-value is 0.000, which is significant statistically.

Table 3: Binomial Logistic Regression Results of Poverty, Human Capital and Economic Development Nexus in D.G. Khan Division

Dependent Variable: Poverty (if Poverty =1, Otherwise = 0)					
Variable	Coefficients	Standard Errors	Z-Statistic	P-value	Marginal Effects
Constant	2.128	1.303	1.633	0.102	-----
Human Capital	-0.508	0.071	-7.115	0.000	-0.125
Remittances	-1.649	0.801	-2.058	0.040	-0.407
Occupation of the Household Head	1.468	0.316	4.638	0.000	0.363
Value of the Physical Assets	-0.077	0.082	-0.948	0.343	-0.019
Household Size	0.193	0.068	2.858	0.004	0.048
McFadden R-squared		0.387	Mean dependent var		0.447

LR statistic	179.817	Prob. (LR statistic)	(0.000)
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Source: Survey data, 2019

In Table 4, the human capital is the dependent variable to analyze its relationship with household poverty and economic development in the D.G. Khan division. For this purpose, the human capital index is constructed and employed as a proxy for human capital. The Ordinary Least Squares (OLS) regression technique is used for the econometric analysis.

As far as poverty is concerned, the relationship between poverty and human capital is originated to be negative and significant statistically at the 10 percent significance level. The coefficient of the variable shows that if household poverty rises by one unit, it will decrease the human capital index or human capital of the household by 0.588 units. Due to the lack of education, households are engaged in low-skilled jobs having low wages. It is very difficult for poor households to raise their livelihood in rural areas. As most of the poor households are associated with farming and other related activities having a low-income level and unable to afford their household's education expenditure and remain below the poverty line. The same findings are concluded by Chen and Wang (2001), Handa et al., (2005), and Awan et al., (2011).

Considering the impact of per capita income on human capital, the econometric results show a positive relationship between human capital and earnings per capita of the household. From Table 4, the estimates of the variable show that if per capita earnings of a household increase by one percent, it will lead to an increase in the human capital index or human capital by 1.191 units. The results show that if the per capita income of the poor household is increased, this will help them to uplift their human capital, statistically significant. Due to the low-income level, households are unable to afford expenditures on education and health facilities. They remain deprived of basic social needs due to the low infrastructure and lack of resources [Chen and Wang (2001), Warren et al., (2001), Handa et al., (2005), Takahashi and Otsuka (2008), Awan et al., (2011), Attanasio et al., (2017)].

Regarding the number of earners in the household, the results of econometric analysis from Table 4 show a positive association between the earners in the household and human capital. This association is found statistically significant. An increase in the number of earners in a household by one member will result in an increase in the human capital index or human capital by 1.569 units. Due to the increase in earnings, the standard of living in the household will be improved and now be able to afford education and health facilities [Smith, (2007), Estudillo, et al., (2008), Jehovaness (2010) and Ackah (2013)]. The better-educated household head has a greater capability to get the advantage of opportunities professionally and raise their standard of living.

Due to the large size of the families, it is very difficult for the household to spend a large proportion of their limited income on education and health facilities. Considering the household size, the econometric analysis from the study is showing a negative relationship between household size and the human capital of the household. the coefficient of the variable infers that a rise in household size by one person will result in falling the human capital index or human capital by 0.400 units. Households living in rural areas have a large family size and they are engaged in farm-related activities and petty jobs [Lloyd and Gage-Brandon (1994), Desai (1995), Downey (1995), Maralani, (2008) and De Haan (2010)]. The value of the constant is -4.294. The R-squared of this model is 67.8 percent and the values of F-statistics are -641.094 and the p-value is 0.000. To investigate the presence of Heteroskedasticity, the White test indicates that there is no issue of Heteroskedasticity.

Table 4: OLS Regression Results of Human Capital, Poverty and Economic Development Nexus in D.G. Khan Division

Dependent Variable: Human Capital INDEX (HCI)

Variable	Coefficients	Standard Errors	t-Statistic	p-value
Constant	-4.294	2.046	-2.098	0.037
Poverty	-0.588	0.318	-1.851	0.065
Per Capita Income	1.191	0.215	5.548	0.000
Remittances	0.444	0.320	1.387	0.166
Number of Earners in the Household	1.569	0.108	14.547	0.000
Household Size	-0.400	0.045	-8.788	0.000
R-squared	0.678	Adjusted R-squared		0.673
F-statistic	139.682	Prob(F-statistic)		(0.000)

Diagnostic Test: Heteroskedasticity White Test

F-statistic	1.632	Prob. F(18,319)	0.102
Obs*R-squared	135.998	Prob. Chi-Square(18)	0.110

Source: Survey data, 2019

In Table 5, economic development is the dependent variable to analyze its relationship with household poverty and human capital in the D.G. Khan division. For this purpose, the per capita income of the household is employed as a proxy for economic development. The Ordinary Least Squares (OLS) regression technique is used for the econometric analysis.

To examine the impact of household poverty on the economic development of the households, the econometric results show a negative relationship between poverty and per capita income or economic development of the households, statistically significant. The coefficient of the variable shows that if household poverty rises to one unit, it will decrease the income per capita or economic development of the household by 0.929 percent. Rural areas in developing countries are deprived of many socio-economic issues like unemployment, lack of education and health facilities, low skilled jobs. Therefore, poor households are forced to live in chronic poverty. The same findings are concluded by Amjad and Kemal (1997), Jongwanich (2007), Okoroafor and Nwaeze (2013).

Considering the impact of human capital on per capita income in the D.G. Khan division, the results from the econometric analysis show a positive relationship between human capital and economic development, statistically significant. Table 5 shows that if the human capital index or human capital increases by 1 unit, it will increase the income per capita or economic development of the household by 0.065 percent. The human capital of the household will help in raising the income level of the households. Due to the lack of resources, the households belonging to rural areas remain deprived of basic socio-economic facilities [Lee and Lee (1995), Datt and Ravallion (1998), Middendorf (2006) and Pelinescu (2015)].

Relating to the household head's occupation in the primary sector, the study concludes a negative relationship between the occupation of the household associated with the primary sector and the per capita income of the households, statistically significant. The coefficient of the variable depicts that if the occupation of the household head in the primary sector increase by one unit, it will decline the per capita income or economic development of the household by 0.243 percent. It has been observed that occupation in the primary sector, does not help the household in raising the income level [Rigg (2006) and Tuyen (2014b)].

The larger the family size, the lower will be income per capita of the households. As far as the household size of the family is concerned, it is found out that there is a negative relationship exists between the household size and income per capita of the household, at a 5 percent significance level. From Table 5, the coefficient of the variable infers that if the household size increases by one member, it will reduce income per capita or economic development of the household by 0.023 percent [Quartey (2006), Biyase and Zwane (2018)]. The value of the constant is 9.121. The R-squared of this model

is 75.5 percent and the values of F-statistics are 209.069, having a p-value of 0.000. To investigate the presence of Heteroskedasticity, the White test indicates that there is no issue of Heteroskedasticity.

Table 5: OLS Regression Results of Economic Development, Poverty and Human Capital Nexus in D.G. Khan Division

Dependent Variable: Per Capita Income (LNPCI)				
Variable	Coefficients	Standard Errors	t-Statistic	P-value
Constant	9.121	0.106	86.425	0.000
Poverty	-0.929	0.055	-16.838	0.000
Human Capital	0.065	0.010	6.796	0.000
Remittances	0.039	0.076	0.509	0.611
Occupation of the Household	-0.243	0.049	-4.986	0.000
Household Size	-0.023	0.009	-2.574	0.011
R-squared	0.759	Adjusted R-squared		0.755
F-statistic	209.069	Prob(F-statistic)		(0.000)
Diagnostic Test: Heteroskedasticity White Test				
F-statistic	1.647	Prob. F(17,320)		0.109
Obs*R-squared	33.145	Prob. Chi-Square(17)		0.114

Source: Survey data, 2019

Conclusion and Policy Recommendations

The present study is based on a household survey collected from 338 household heads from the D. G. Khan division. This region is less developed as compared to the other regions, therefore the present study tried to find out socio-economic and demographic factors that can be helpful in the development and prosperity of the households belonging to the D. G. Khan division. The study concluded that the household poverty, large household size and occupation of the household head in the primary sector show a negative relationship with the per capita income of the household. An increase in the per capita income and number of earners in the household plays an influential factor in promoting human capital for this region. However, the presence of physical assets and human capital are the most significant factors in alleviating household poverty in this region. Government should develop strategies and generate funds for the development of educational and vocational training institutions, to promote human capital in the D. G. Khan division.

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