

How Does Human Capital Formation Affect Labour Force Participation in Pakistan? A Primary Data Analysis

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Abstract

Human Capital Formation is considered as main source of labor force participation and employment and raises economic growth and development. The major purpose of the present study is to trace out the human capital related factors which determine employment in Pakistan. The study is based on purely primary source of data, which is collected by the authors by employing multistage cluster sampling techniques. Binomial Logit regression technique is used to estimate the parameters of labor force participation model. The study concludes that the completed years of education, experience, various level of education, health status of workers significantly influenced the labor force participation and employment. In addition, it is observed that some socio economic factors like house holds' assets, spouse participation in economic activities and number of dependents also significantly affect the employment. Therefore, it is suggested that the government should provide education and health facilities without any discrimination for all.

Key words: Labor force; Human Capital; Health status; Workers' level of education; Logistic regression; Pakistan

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INTRODUCTION

Human capital formation refers to the productive capabilities of human beings as income -- producing agents in the economy. Human capital formation is related with investment in man and his development as creative and productive resource (Harbison, 1962). Human capital formation is a process through which knowledge, skills and capacities of people are enhanced. Human capital is essential for the transformation of social and political institutions which every nation desires to have. Economists have long been aware of the importance of human capital formation. In the very beginning, Adam Smith (1776) emphasized the importance of education at different points. He particularly incorporated the acquired and useful capabilities of all the members of the society in the concept of fixed capital. Smith said that:

“The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realized, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise of that of the society to which he belongs.”

Alfred Marshall (1920) stressed on the significance of education as a national investment; and according to his point of view, the capital which is invested in human beings is considered the most precious and valuable. Schultz (1962) found that the substantial rise in agricultural productivity occurred in many countries neither due to land nor physical capital, but new skills and improved knowledge brought agricultural transformation. He further maintained that even when a country possessed the physical capital and resources as those in USA, production would fall catastrophically, if it did not possess sufficient capital. There would be both low output and extra - ordinary rigidity of economic organization until the capacities of the people were raised by investing in them. However, in many underdeveloped countries, the absorptive capacity for physical capital proved to be low, because the growth of human capital failed to keep pace with the accumulation of physical capital (Hovart, 1958).

Human resource development system can be designed to help to raise production of essential goods and services and at the same time preserve and enhance the freedom, dignity and the worth of labor force. Harbison and Myers (1970) noted that the goals of the modern societies like political, social and economic goals could be attained through the development of human resources. Economic development is essentially the result of human efforts. Human capital plays a pivotal role in mobilizing physical capital and is very essential to exploit natural resources, to establish markets and to carry on trade and commerce. Human recourse development is not only meaningful indicator of modernization but it is essential for the development of technology and skill which can be a substitute for physical capital. Now, it is realized intensively that the growth of tangible capital stock depends on human capital formation to a great extent.

Keeping in view above discussion, Human resource development in underdeveloped countries like Pakistan is inevitable because of rising population growth, increasing labor force and low employment opportunities. In addition, health facilities and better education facilities are available at limited scale. Table 1 provides the comparison of human capital indicators in Pakistan and other countries in the region. Overall Pakistan's performance regarding human capital indicators is very poor in the region as indicated in Table 1.

Table 1
Human Capital Indicators

Countries	Literacy rate (Percent)	Life expectancy (Years)	Under 5 mortality rate (Out of 1000)	Human development index
Sri Lanka	90.8	74.4	15	0.658
Afghanistan	28	44.6	257	0.349
Pakistan	54.2	67.2	89	0.490
India	68.3	64.4	69	0.519
Nepal	60.3	67.5	51	0.428
Bangladesh	56.5	66.9	54.0	0.469
Maldives	97.3	72.3	28	0.602
Bhutan	52.8	66.8	81	Not Available

Source: Human Development Report 2011

The main purpose of the present study is to explore the human capital related factors that play an important role in labor force participation. The rest of paper is arranged as follows: The section II discusses the review of the past studies. Conceptual and theoretical framework is presented in the section III. The section fourth provides the data sources and methodological issues. We have presented descriptive and economic analysis in the section fifth. Section sixth offers concluding remarks and policy recommendations.

REVIEW OF PAST LITERATURE

Many studies have indicated that the growth of output in many advanced countries has been significantly affected by the improvements in intangible human characteristics. In developing economies, lack of skill and knowledge is a severe limiting factor for economic development. An improvement in the quality of human factor is therefore as essential as investment in physical capital. If the human capital formation is insufficient, physical capital can not be productively used. As regards the factor for human capital formation, education performs a central role. It raises the efficiency and productivity of workers. Education produces skilled manpower that is capable of leading the economy towards the path of sustainable economic growth and development. The traditional theory of human capital developed by Becker (1962) and Mincer (1974) views education and training as the main sources of human capital formation that in turn have a positive and direct impact on workers life time earning.

There exists a vast range of empirical literature on human resource development and human capital formation both at the national and international levels. Lucas (1988) developed the endogenous growth models in which human capital was considered as the most important factor of production and education as a major source of human capital accumulation. In addition, general education like schooling and training, human capital accumulation depend on better health, nutrition, physical strength and occupational training (Fogel, 1994). Psacharopoulos (1994) provided comprehensive estimates of education returns at a global scale. He observed that there was a high rate of return of primary education in all the regions of world. Gemmell (1996) noted that both the levels of human capital and their growth rates to be important in explaining growth. Gylfason and Zoega (2003) concluded that education raised economic growth not only be enhancing and improving human capital but also social and physical capital Oketch (2006) focused on the role of human capital in improving the economic productivity. He concluded that the sources of growth of labor productivity are high investment in human and physical capital.

Most of the studies were conducted in Pakistan to observe the effect of education, experience and health as a human capital determinant on earnings, employment and economic growth. Haq (1977), Khan and Irfan (1985), Ashraf and Ashraf (1996) and Faridi *et al.* (2010) provided the estimates of earning function by using dichotomous variables for various educational levels. In addition, Faridi *et al.* (2010) investigated the influence of education and health as human capital on employment based on Primary source of data. The study concluded that all levels of education and better health were positively and significantly related to employment. Chaudhary *et al.* (2009) explored the role of higher education in economic growth. The analysis revealed that

there existed a long run relationship between economic growth and higher education.

A CONCEPTUAL AND THEORETICAL FRAMEWORK

The aggregate of knowledge, abilities and skills that may be utilized in a productive way is referred as human capital. According to Adam Smith (1776), the abilities that results from the specialization attained through the division of labour, bring a sizeable increase in the productivity of the other factors of production. Irving Fischer (1987) has incorporated the workers in the definition of the capital of a firm. The following aspects are included in the concept of human capital formation by GARCIA ADRIANO:

- i. To enhance knowledge, experience and skills
- ii. To maximize the utilization rate.
- iii. To give incentives and records to work.
- iv. To explore the means and ways to enhance the allocative efficiency for decisions making and the ability to lead.
- v. To create innovative working environment for human resources.

Charles and Berger (1988) suggested a various forms of investment in human capital e.g. formal schooling, job market information, on the job training, health and sanitation, and migration. Human capital formation refers to such phenomenon in which a person becomes more productive, capable and more beneficial for the society as a result of an improvement in human activities due to changes in the economy. Schultz (1961) stated that in the process of human capital formation, humans considered as productive assets. Further, he mentioned that education might lead to higher productivity of labor or worker. Modern technique of production, skill and knowledge may lead to technological development.

Education is a type of human capital investment. Generally, economists interpret education as having “direct effects” and “indirect effects”. Direct effects of education are monetary returns to investment in education. These are the granting of knowledge and skill that are attached with more wages. The indirect effects of education are non monetary returns to investment in education. These are also known as external benefits or as non market benefits or consumption benefits (Mc Mahon, 1999). According to Bynner *et al.* (2003), non monetary benefits of education are referred as the wider benefits of learning. These benefits include political stability, human rights, higher level of democratic participation, reduced crimes and environmental protection, reduction in fertility and family welfare and health.

There is a strong and positive correlation between growth and human capital. According to the conventional Noe-classical growth theories, presented by Robert

Solow and Trevor Swan in the 1950s, an economy’s output increases due to an increase of capital and labor in physical term. These theories neglect the role of non-economic variables e.g. human capital and human health. These growth models are subject to law of diminishing returns to scale, which implies slow down in the growth of the economy as the capital stock increases. In order to keep the economy growing, the technological progress is required, which is exogenous to the system. Considering the above issues, Romer (1986) developed new theory of economic growth which is known as “endogenous growth models”. He broadened the concept of capital by incorporating human capital. By rejecting the law of diminishing returns to scale phenomenon, he argued that the firm which invests in capital also employs educated skilled and healthy workers. They not only will be more productive but will use the capital and technology more efficiently. Simply, both human capital and technology are “endogenous”. Lucas’ (1988) model structurally supported to Romer’s model. He maintained that investments in human capital had spillover effects that raise the level of technology by outward influences of human capital.

DATA AND METHODOLOGICAL ISSUES

Data Sources

In order to analyze the role of human capital formation in determining labor force participation, the study based on the primary source of data that is gathered by the authors through field survey in the year (2007-08). Multistage cluster and simple random sampling techniques are used for collecting data. Information is recorded on the spot by filling a simple and comprehensive questionnaire. We have selected district Bahawalpur to analyze the characteristics of human capital. Regional features of the district are that it is almost center of Pakistan and is land locked from all sides. The total area of the district is 24830 square kilometers and almost one third of the total area is desert called cholistan.

Total population of the district Bahawalpur is about 2.433 million and the annual average population growth rate is 3.07 percent. The population density is about 98 persons per square kilometers and average household size is about 6.8. Almost 72.7 percent of total population is living in rural area. The total literacy rate is 35 percent out of which 57 percent in urban areas and 26 percent in rural areas. The literacy rate for males is 44.9 percent while for females is only 26 percent. The major source of employment in Government and private sector is education and health sectors. As concerned the higher education and health facility, there are one Public Sector University, one medical college and hospital and six degree colleges for boys and three for females in the district.

The study has included all relevant variables to human capital for analysis. A sample of 494 people is drawn

randomly both from rural and urban area considering the age group 15-64 years. The study is based on an empirical analysis. The present analysis is made at two stage level. At first stage, statistical description of the data in the form of mean, standard deviation, Skewness and Kurtosis is presented. Further, a pair wise correlation matrix is constructed to examine the multicollinearity problem among the explanatory variables. In the second stage, we have provided the logit estimates of the human capital formation model, which is framed in the framework of traditional theory of utility maximization (Becker, 1965) by employing the maximum likelihood Logit model.

Model Specification

We have used employed labor force (EMPL) as dependent variable. There is a variety of micro and macro economic variables that determine whether a person desires to participate in the labour force or not. Labor force participation decision is also affected by some of these factors and others require decision. We start with general function:

$$Y_i = f(X_1, X_2, X_3, \dots, X_n) \quad (1)$$

Where, Y_i indicates the labor force participation decision as employed worker. Y_i is equal to "1" if worker joins the labor market and equal to zero if the worker does not work. Considering, an index function of Blundell (1987), Y may be defined that depends on a vector of explanatory variables X_i . These variables settle whether an individual who desires to work. Hence,

$$Y^* = \beta X_i + v_i \quad (2)$$

$$\text{If } Y^* = \beta X_i + v_i > 0 \quad (3)$$

The individual would be in the employed labor force, where as if:

$$Y^* = \beta X_i + v_i \leq 0 \quad (4)$$

He or she would not. While Y^* is not directly observable, only dummy variable Y is observed which is defined as:

$$Y = 1 \quad \text{if } Y^* > 0$$

$$Y = 0 \quad \text{otherwise}$$

The probability of finding the employed labor force which is proxied for human capital formation.

$$\text{Prob } Y_i = 1 = \text{Prob} (v_i > -\beta X_i)$$

$$= 1 - F(-\beta X_i)$$

Where F is the cumulative distribution function for v . It is assumed that v_i is normally distributed with mean zero and constant variance (i.e., $IN(0, \sigma^2)$).

The explained variable is dichotomous in our study. So the inadequacy of linear probability model suggests that non linear specification may be more appropriate. In order

to interpret the dichotomous dependent variable, we will use Logit model. The Logit model assumes the following cumulative probability density function.

$$Y = \frac{1}{1 + e^{(-\beta X_i)}} \quad (5)$$

Where Y is the probability that a person belongs to employed labor force, "e" is the exponential value. β is a row vector of parameters and X_i is the column vector of the variables.

With the Logit model, the natural log of the odd ratio of employed labor force to unemployed labor

force in $\ln\left(\frac{Y}{1-Y}\right)$ is expressed as a linear function of independent variables, such as:

$$\ln\left(\frac{Y}{1-Y}\right) = \beta_0 + \beta_1 X_i + \mu_i \quad (6)$$

Therefore, it is cumbersome to interpret the parameters of our econometric model because these parameters give only information on the influences of explanatory variables on odd ratio. So we calculate marginal effects to describe the effect of independent variables on the probability of employed labor force. The marginal effects are calculated by the following formula (Greene, 2003).

$$\frac{\partial Y}{\partial X_i} = \bar{P}(1-\bar{P})\beta X_i \quad (7)$$

Labor Force Participation Model

The research under study is based on the human capital theory developed by G. Becker (1964) and Mincer (1974). The above specified model is a general model which can be used as a guiding paradigm. Based on the theoretical rationale, labor force participation model is sketched in the following equations. In order to analyze the determinants of labor force participation, we have constructed the following two equations considering the Beckerian and Mincerian conception.

The first specified model for labor force participation is:

a) Model I:

$$EMPL = f(EDY, EXPR, EXPSQ, HEL, MAR, PHA, FAS, SPA, NDT, SEX, LCN)$$

In the equation of labor force participation model-I, the explanatory variables are completed years of education, experience in years which is calculated by deducting completed years of education and age of the worker at the time of entry into the school from the completed age of the worker (i.e., $EXPR = AGE - \text{Years of education} - 5$), experience square, health, marital status, family setup, spouse participation in economic activities, number of dependents, sex and location.

b) Model II:

In the second model, we have included dummies of different educational levels to observe the influence

of complete contribution of education on labor force participation. In addition, age of the worker is incorporated in the model instead of experience.

$$EMPL = f\left(\begin{matrix} ED1, ED2, ED3, ED4, ED5, AGE, AGESQ, \\ HEL, MAR, PHA, FAS, SPA, NDT, SEX, LCN \end{matrix}\right)$$

c) Model III:

In the third model, we have incorporated interaction dummies in order to investigate the combined effect of Gender Interaction.

$$EMPL = f\left(\begin{matrix} EDY, EXPR, EXPSQ, HEL, MAR, PHA, FAS, SPA, \\ NDT, SEX, LCN, SEX_EDY, SEX_MAR \end{matrix}\right)$$

Table 2 gives the definitions and explanations of the list of variables that affect human capital formation. It also provides the theoretical expected signs of each variable.

Definitions and Description of Variables

Table 2
Definition and Hypothesized of the Variables

Variables	Explanation of variables	Expected signs
Dependent Variable		
EMPL	= 1 if a worker is employed labor force = 0 Otherwise	
Independent variable	Explanations of variables	Expected signs
AGE	Age of the worker in years	+ve
AGESQ	Square of the worker's age	-ve
EXPR	Experience of the worker which is a continuous variable i.e. EXPR = Age – Education – 5.	+ve
EXPSQ	Square of worker's experience	-ve
EDY	A continuous variable defined as the completed years of education	+ve
ED1	= 1 if the worker's education level is up to middle (8 years of education) = 0 Otherwise	+ve
ED2	= 1 if the worker's education level is Matric (10 years of education) = 0 Otherwise	+ve
ED3	= 1 if the worker's education level is Intermediate (12 years of education) = 0 Otherwise	+ve
ED4	= 1 if the worker's education level is Graduation (14 years of education) = 0 Otherwise	+ve
ED5	= 1 if the worker's education level is MA/MSc (16 years of education) = 0 Otherwise	+ve
HEL	= 1 if worker is affected by fetal and chromic diseases like high blood pressure, diabetes, heart disease, limping, seeing difficulties etc. = 0 Otherwise	-ve
MAR	= 1 if worker is married = 0 Otherwise	+ve
PHA	= 1 if worker is holding financial and physical assets = 0 Otherwise	-ve
FAS	= 1 if the worker belongs to joint family system = 0 Otherwise	-ve
SPA	= 1 if the worker's spouse is participating in economic activities = 0 Otherwise	-ve
NDT	Total number of dependents in the family	+ve
SEX	= 1 if the worker is male = 0 Otherwise	+ve
LCN	= 1 if the worker is living in urban area = 0 Otherwise	+ve
SEX_EDY	=1 if the worker is male and educated =0 Otherwise	+ve
SEX_MAR	=1 if the worker is male and married =0 Otherwise	+ve

RESULTS AND DISCUSSION:

A) Descriptive Analysis:

The study narrates the descriptive statistics of some selected variables in the Table 3. We have noted that the average age of the employed worker is 39.72 years and its variability about mean 13.37. The value of the coefficient of Kurtosis is 2.04 which show that the shape of the distribution is Plato - Kurtic. If we consider the completed years of worker's education, the mean years of education are 10.64 years with standard deviation 3.84. The shape of the distribution regarding the years of education is also Plato - Kurtic. Almost 27 percent employed workers are educated up to middle level, while 22.3 percent, 17 percent, and 16.4 percent workers are matriculate, intermediate and graduate respectively in our data. On the average, the experience of the workers is 24.08 with 13.63 standard deviation. The study reveals that on the average 12.3 percent employed labor force is affected by major diseases like High blood pressure, heart diseases, diabetes etc. In addition, it is observed that 56.7 percent workers are living in joint family setup. 74.5 percent are married and 34 percent are residing in urban areas on the average.

Correlation Matrix:

The Table 4 reports the degree of the relationships among the explanatory variables. This pair wise correlation matrix is useful in detecting the multicollinearity problem. The study reveals that age and experience are highly multicollinear. But all other variables are free from the

problem of multicollinearity. In the rest of the analysis, we have avoided the multicollinearity problem by developing separate models.

Table 3
Descriptive Statistics

Variables	Mean	Standard deviation	Skewness	Kurtosis
AGE	39.72	13.37	-0.01	2.04
AGESQ	1756	1074.86	0.49	2.26
ED1	0.271	0.45	1.03	2.06
ED2	0.223	0.42	1.33	2.78
ED3	0.166	0.38	1.80	4.22
ED4	0.164	0.38	1.82	4.29
ED5	0.152	0.36	1.94	4.77
EDY	10.64	3.85	-0.49	2.83
EMPLD	0.694	0.47	-0.84	1.71
EXPR	24.08	13.63	0.16	2.11
EXPSQ	765.1	712.86	0.98	3.08
FAS	0.567	0.50	-0.27	1.07
HEL	0.123	0.33	2.29	6.24
LCN	0.34	0.48	0.68	1.46
MAR	0.745	0.44	-1.12	2.26
NDT	4.508	1.85	0.35	2.36
PHA	0.565	0.50	-0.26	1.07
SEX	0.668	0.48	-0.71	1.51
SPA	0.435	0.50	0.26	1.07

Table 4
Pair Wise Correlation Matrix

Variables	ED1	ED2	ED3	ED4	ED5	EDY	EXPR	EXPSQ	FAS	HEL	AGE	AGESQ	LCN	MAR	NDT	PHA	SEX	SPA	
ED1	1.00																		
ED2	-0.33	1.00																	
ED3	-0.27	-0.24	1.00																
ED4	-0.27	-0.24	-0.20	1.00															
ED5	-0.26	-0.21	-0.19	-0.19	1.00														
EDY	-0.60	-0.10	0.11	0.36	0.53	1.00													
EXPR	0.15	-0.05	-0.08	-0.05	-0.04	-0.21	1.00												
EXPSQ	0.17	-0.02	-0.08	-0.08	-0.08	-0.26	0.96	1.00											
FAS	0.06	0.06	0.01	-0.08	-0.05	-0.08	-0.32	-0.28	1.00										
HEL	0.14	0.05	-0.07	-0.07	-0.09	-0.15	0.15	0.15	-0.11	1.00									
AGE	-0.02	-0.08	-0.05	0.05	0.11	0.07	0.96	0.91	-0.35	0.10	1.00								
AGESQ	0.00	-0.06	-0.05	0.03	0.09	0.05	0.95	0.94	-0.33	0.11	0.99	1.00							
LCN	-0.03	0.00	0.01	0.03	0.05	0.12	-0.04	-0.06	-0.01	0.03	-0.01	-0.02	1.00						
MAR	-0.08	-0.13	0.02	0.08	0.13	0.15	0.53	0.44	-0.43	0.02	0.59	0.53	0.01	1.00					
NDT	-0.03	-0.05	0.05	0.05	0.01	0.07	0.21	0.18	0.24	-0.19	0.24	0.22	-0.24	0.26	1.00				
PHA	-0.05	0.07	0.14	0.01	-0.17	-0.03	-0.05	-0.05	-0.03	0.26	-0.06	-0.04	0.02	-0.08	-0.20	1.00			
SEX	0.00	0.01	-0.01	0.02	0.00	0.00	0.08	0.08	-0.05	0.03	0.08	0.08	-0.02	-0.06	-0.07	0.03	1.00		
SPA	0.00	-0.04	0.05	0.00	-0.01	0.02	0.19	0.14	-0.32	0.10	0.20	0.17	0.07	0.45	-0.09	0.12	-0.16	1.00	

B) Estimation Analysis:

We have presented the binomial logit estimates of the factors affecting labor force participation in the Tables 5, 6 and 7. Tables contain 5 sets of numbers. The second last column of each table explains the marginal effects that indicate the probability derivatives. The probability derivative shows the change in probability due to a one unit change in a given explanatory variable after keeping all other variables as constant. We estimate these derivatives at the mean of the sample because binomial Logit model is non linear and its probability derivatives are not constant. The reliability of the point estimates is examined by using two-tailed test of significance or Z-statistic to determine the acceptance or rejection of null hypothesis. We have used 1 percent, 5 percent and 10 percent level of significance for this purpose.

The intercept term in both specified equations of the model are negative and highly significant. Generally, it has no economic interpretation, except that it shows the average impact of all other omitted variables on the dependent variable. Even then, there may be many unknown factors influencing the variables under consideration, no matter how carefully one selects the potential explanatory variables. The explanatory power of our model is also examined by the value of McFadden R^2 (0.53). Overall, significance of our model is judged by the value of LR-Statistic which is highly significant.

The core human capital variables which directly influence the labor force participation and play an important role in employment are education, experience and health. The coefficient of the completed years of education (EDY) is positive and highly significant at one percent level of significance. Workers are more likely to be employed by 4.8 percentage points due to an addition of one year of education. In order to observe the return of education at various levels of education, study has used five dummies for different levels of formal education, considering non formal education as base category. As expected, the probability of employed labor force rises monotonically with various levels of education. All the educational levels are statistically significant except the basic level of education (ED1). It is observed that higher education turns out to be the most crucial factor for raising labor force participation. About 90 percent people are more likely to be employed as a result of one unit increase in higher education (ED5). The results of the study verify the findings of Psacharopoulos (1989; 1994), Psacharopoulos and Patronos (2004), Becker (1962), Mincer (1974), and Mc Mahon (1984; 1987a; 1987b; 1999; 2000), these could find that education is regarded as a form of human capital investment and raises the returns to education.

Experience is another vital factor which determines the labor force participation. Age and experience are highly correlated. To avoid the problem of multicollinearity, we have used experience in equation 1 and age in equation 2 of the model. The coefficient of experience is positive and

highly significant. Experience increases the labor market participation. The probability of employed labor force rises by 3 percentage points because of an increase of one year of experience. The negative sign of experience shows the non linearity relationship. Age is positively affecting the employment of labor but has insignificant impact. Our result supports to the findings of Mincer (1974), Becker (1962), Faridi *et al.* (2010), Shah Rummana (2007).

Health status of the worker is a good indicator of labor force participation. Workers productive capacity, thinking style and management qualities are enhanced by good health. The present study incorporates a binary variable for health. Labor force participation reduces, if workers are affected by major diseases like high blood pressure, heart diseases, diabetes, seeing difficulties etc. The coefficient of health (HEL) is negative and highly significant. Labor force participation is also influenced by marital status of the work force. Married workers are more likely to participate in productive activities. The study shows that coefficient of MAR is positive and insignificant. We have found that the presence of household's assets has negative and significant effect on labor employment. The probability of employed labor force diminishes by more than 50 percent due to an increase of one unit in household assets. The reason may be that the asset holding people do not learn skill and experience and do not take part in economic activities. We have also observed in the study area that the people holding less assets are even no assets, are more likely to work for meeting the need of their families.

Family setup is regarded a very vital factor in raising labor force participation at an individual level. The present study reveals that the family setup has positive and insignificant impact on labor force participation. We have observed that labor force participation diminishes because of spouse's participation in economic activities. The coefficient of SPA is negative and statistically significant at one percent level of significance. The number of dependents has significant impact on human capital formation. Workers are more likely to participate in economic activities by 7.5 and 8.1 percentage points due to an addition of one dependent. The economic reason may be that workers earn more income by improving their skill and attaining experience through learning by doing for meeting the basic necessities of dependents.

We have found in the present study that sex and location or region of residence both have positive influence on labor market participation. The probability of male worker raises human capital stock by 5.5 and 5 percentage points. Similarly workers living in urban areas are more likely to join labor market and increase the employment stock more rapidly as compared to rural workers. The reason may be that the male labor force and urban labor force have more opportunities for attaining jobs and education. In addition, there are many training institutions in urban areas which raise the productivity and efficiency of the workers by providing education and skills to enhance the work force participation.

Table 5
Logit Estimates of Labor Force Model-I

Variables	Coefficient	Std. error	z-statistic	Marginal effects	Prob.
C	-2.612	0.830	-3.146		0.002
EDY	0.228	0.048	4.785	0.048	0.000
EXPR	0.142	0.047	2.982	0.030	0.003
EXPSQ	-0.002	0.001	-2.304	0.0004	0.021
HEL	-4.788	0.727	-6.588	-1.017	0.000
MAR	0.708	0.565	1.254	0.150	0.210
PHA	-2.499	0.379	-6.598	-0.531	0.000
FAS	0.044	0.402	0.110	0.009	0.912
SPA	-1.437	0.429	-3.349	-0.305	0.001
NDT	0.354	0.106	3.346	0.075	0.001
SEX	0.255	0.329	0.775	0.054	0.438
LCN	0.144	0.327	0.441	0.031	0.659
LR statistic (11 df)	313.232	McFadden R-squared			0.52
Probability(LR stat)	0.000	Sample Size			494

Table 6
Logit Estimates of Labor Force Participation Model-II

Variables	Coefficient	Std. error	z-statistic	Marginal effects	Prob.
C	-3.344	1.731	-1.932		0.053
ED1	1.453	1.040	1.397	0.309	0.162
ED2	1.681	1.036	1.623	0.357	0.105
ED3	2.468	1.055	2.340	0.524	0.019
ED4	3.094	1.093	2.829	0.657	0.005
ED5	4.229	1.248	3.390	0.898	0.001
AGE	0.102	0.075	1.351	0.022	0.177
AGESQ	-0.001	0.001	-0.906	0.0002	0.365
HEL	-4.881	0.753	-6.484	-1.037	0.000
MAR	0.855	0.564	1.515	0.182	0.130
PHA	-2.382	0.383	-6.221	-0.506	0.000
FAS	-0.065	0.410	-0.158	-0.014	0.875
SPA	-1.353	0.426	-3.174	-0.287	0.002
NDT	0.379	0.109	3.474	0.081	0.001
SEX	0.236	0.337	0.700	0.050	0.484
LCN	0.119	0.333	0.356	0.025	0.722
LR statistic (15 df)	321.844	McFadden R-squared			0.53
Probability(LR stat)	0.000	Sample Size			494

Table 7
Logit Estimates of Labor Force Participation Model-III with Interaction Terms

Variable	Coefficient	Std. error	z-statistic	Marginal effects	Prob.
C	-1.182	0.948	-1.247		0.212
EDY	0.191	0.050	3.798	0.040	0.000
EXPR	0.137	0.049	2.812	0.029	0.005
EXPSQ	-0.002	0.001	-2.336	0.000	0.020
HEL	-5.008	0.741	-6.756	-1.062	0.000
MAR	-0.780	0.814	-0.958	-0.165	0.338
PHA	-2.464	0.383	-6.429	-0.522	0.000
FAS	-0.105	0.414	-0.254	-0.022	0.800
SPA	-1.304	0.442	-2.950	-0.276	0.003
NDT	0.471	0.115	4.099	0.100	0.000
SEX	-1.607	0.648	-2.480	-0.341	0.013
LCN	-0.656	0.480	-1.366	-0.139	0.172
SEX_EDY	0.127	0.055	2.318	0.027	0.021
SEX_MAR	1.996	0.740	2.697	0.423	0.007
LR statistic (13 df)	326.201	McFadden R-squared			0.54
Probability(LR stat)	0.000	Sample Size			494

We have included interaction terms in our labor force participation model-III. Table 7 interprets the effect of interaction dummies on labor market participation. We have observed very interesting results in the present study. The interaction dummies i.e. sex with education and sex with marital status have positive and highly significant impact on work participation. The probability of employment labor force rises if the individual is male and educated or male and married.

CONCLUSIONS AND POLICY RECOMMENDATIONS

The present study has emphasized on the socio-economic and human related factors which directly and indirectly influences worker's market participation in Pakistan. The research based on the micro study at the district level including both quantitative as well as that are qualitative variables. The important conclusions that are derived from the study are outlined.

We have noted that the education, experience and health status of the workers are turned out to very significant factors. These factors have a discernible impact on labor force participation. The results of the study show that labor force participation takes place not only at an additional year of education but more employment and earning opportunities with rising trends are available at each level of education. The study has also concluded that the experienced and trained workers have more chances to get profitable jobs and aggravate the employed labor force. We have observed in the present analysis that health status has also perceptible influence on workers' participation. In addition, the research concludes that presence of assets in the form of physical and financial assets has negative and significant affect on labor force participation. It means that labor force participation is adversely influenced by income inequality.

Considering the above conclusions and findings, the study has suggested the following policies for raising the employment and made more productive and efficient existing and gradually rising labor force.

- a) Govt. should provide education facilities to all the people of the country with out any discrimination.
- b) Imperative measures should be taken by the Government to narrow down the regional and gender differences in providing education and employment opportunities..
- c) At the Matric and intermediate levels, technical training and at least one hour or one day in a week practical or on-the-job training must be compulsory so that the students may become an earner or responsible residents of the country rather than burden on the economy.

- d) Govt. should established such institutions where technical, commerce and business oriented education should be given.
- e) Higher education in science and technology and research activities should be enlarged.
- f) Better health facilities should be given to people of the country generally and especially in the study area.
- g) The gap between 'have and have not' should be narrow down through equal income distribution policies.

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