Does Education level lead to Higher Earnings of Farmers and Businessmen in Pakistan? A Case Study of District Bahawalnagar

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Abstract

The current study examines the role of education on earnings in informal sector. By using stratified random sampling technique sample of 382 individuals is collected through questionnaire and interviews. Ordinary least square method is applied for statistical estimation on data. Education of the respondent in years and categories of education variable from primary to M. Phil. level, age of the respondent, experience, gender, area of living, spouse education, mother's education, household size, size of land, livestock, availability of healthy diet, investment, and rental property are positively associated with earnings of farmers and businessmen, whereas age square, experience square, schooling of respondent, technical education, working hours, father's education, marital status and spouse job are negatively associated with earnings of farmers and businessmen.

Keywords: Education levels, Bahawalnagar district, Fathers' Education, Mother's Education, Schooling of respondents.

I. Introduction

According to human capital theory, there exists a positive and significant impact of education and work experience on earnings of the individuals. An important assumption of this theory elaborates the regular increase in earnings with the increase in experience of employment at different level of schooling. Several studies shows that as the level of education of individuals improve, they have more earnings, same as the rise in experience improves the skills and make them more productive so they have more earnings. Education imparts advantage not only at the initial stage when someone enters the market but also cumulative advantage with the increase in market experience. So it is not necessary that at different levels of education, experience has constant rate of return.

In order to investigate the effect of education and experience on earnings, Mincer (1974) introduced an interaction term of both variables as independent variable in the earnings' function to check the cumulative impact of these variables on earnings in his article. He found the value of coefficient negative and significant calculated from U.S. data and concluded that the high educated individuals get maximum earnings with less experience whereas in literature the results are quite opposite. However, there are also some exceptional cases e.g. using data for Morocco, Psacharopoulos (1981) observed an insignificant impact of this interaction term in earnings' function. For British data, Psacharopoulos and Layard (1979) found that the value of these interactions increased with the increase in one of the both variables i.e. education or experience. Recently, Connolly and Gottschalk (2003) found that the return to tenure increase with education but decrease to experience with increase in level of education in U.S. which showed that less educated individuals had more returns on education. In UK, Kirby and Riley (2004) found that an extra year of schooling had more return than extra year of experience of job. The overall conclusion of studies using interaction terms of education and experience exploring the return to education that the earnings increases with the increase in level of education as well as experience.

The educational institutes in Pakistan are still underdeveloped and unable to provide quality education in specific fields. Individuals have no awareness about that in which field they should get admission for knowledge seeking. The level of adult literacy is very low, low rate of enrolments to schools, rates of drop out at primary level and student-teacher ratios are also high, wider range of gender and regional discrimination and low public investment are the indicators of poor performance of educational institutes. The rate of literacy for population having age of 10 years and above was 45% in 2001-02 out of which 58% for males and 32% for females. Despite many govt. programs and efforts, no change has been found in the literacy rates during 1998-99 to 2001-02 [for details see PIHS (2001-02)]. This not only shows that the large share of population is illiterate but also indicates the significant gender discrimination which is more in rural areas. [See Arif, Nazli, and Haq (2000)] The rate of enrollments highlighted large improvements from 1951-1991. This rate increased by 98% during 1998-99 but fall to 91% in 2001-02. The increasing rate of poverty in 1990s is may be the major cause of such decline, because it has become difficult for parents to send their children in schools especially for those who belong to rural areas. Moreover, the higher rate of dropout also shows the poor performance of educational institutes. However, 28% individuals are dropout before reaching the sixth class.

It is an empirical fact that income is positively associated with education. Several studies have estimated that high- educated individuals have more earnings in markets in both the developed and developing nations. Starting with each and every activity of human being, education is the key factor for developing human capital. It does not impart only productive and efficient labor force but also creates human resource or highly skilled man power that contributes in the economy to grow and develop. Education, skills and training are major parts of human capital. Education raised the knowledge and developed skills in individuals which stimulated their productivity that led towards increase in earnings and generated new sources of earnings which enhanced the income growth (Saxton, 2000). Endogenous growth theories (e.g. Lucas, 1988) augmented Solow growth theories (e.g. Mankiw, Romex and Weil, 1992) have stressed that education is very important to sustain economic growth.

The education and earnings always has strong association. Education has significant role on earnings of the individuals. In numerous nations, the studies on education and earnings indicate positive association between them that encourage the individuals to continue their education. On average high-educated individuals have more returns than less-educated because they can perform more tasks and can easily absorb the new technologies and skills in themselves. Educated individuals have more earnings, respect and dignity, sustainable and stable employment. So education which is a main measure of human capital plays a key role on earnings as well as status of the individuals.

Besides education, some other important factors such as experience, age, gender, occupation, working hours, technical education, parental education and some other characteristics of household plays significant role on earnings of the individuals. Usually with the increase in age, the earnings also increase but in some cases this relationship becomes reverse. Gender is also an important factor that determines the earnings, as male have an advantage on female in markets because of gender discrimination in developing nations. Female were paid less than male (Siphambe, 2000). Husain and Awan (2007) estimated the return to education in Pakistan and found that the earnings of male individuals were higher than their female counterpart. Along gender, marital status also affects the earnings. Green, (2003) found that married person had more earnings than unmarried ones. Family background of the individuals had positive and significant impact on earnings in Pakistan (Khan and Irfan, 1985). Nature of the work also has significant impact on human capital and earnings. Vijverberg (1995) found that in case of self-employed work, education had minor impact on earnings. Bennell (1996) observed that in developing nations several studies were based on

the data collected from the job holders and very rare researches were performed on informal sectors where impact of education on earnings of the individuals was very low.

The current research attempts to explore the impact of education on earnings of farmers and businessmen in Pakistan. Apart from introduction in section 1, we have discussed the previous literature relating to our study in section 2. In section 3, we have explained the methodological discussion that is used for estimation of the study. In section 4, findings of the study are elaborated. In section 6, concluding remarks are stated with some important policy suggestions.

II. Literature Review

In recent years, few studies have been presented both nationally and internationally on Education and Earnings using time series, cross sectional as well as panel data. But still this issue is needed to be discussed more at micro level to find solid policy framework in the future. Keeping in view the importance in Pakistan at district level, some empirical evidences from Pakistan and International Economy are reviewed here in this section.

Card (1999) aimed to survey and interpreted some of the most recent evidence on the causal relationship between schooling and earnings. The data was collected through surveys of 1994-96. Results were estimated through ordinary least square method. The author concluded that years of completed education, individual had worked since completing schooling was positively associated with Individual's earnings.

Lemieux (2001) discussed that how estimates of the economic returns to education could be used to assess the benefits of education for the individual, the society, and the government. Results were estimated through ordinary least square method. The research found positive returns to education which was also indicated that education was contributed to economic growth.

Walker and Zhu (2003) tested the theory that education also raised productivity. The results were estimated through ordinary least square method by using time series data from 1993 to 2001. The results showed that education was endogenous to wages.

Lauer (2004) analyzed the relationship between education, gender and earnings in France and Germany. The data was collected from 1991 to 2000 through existing surveys. Estimation was performed simultaneously by maximum likelihood method. The author concluded that in Germany, the probability of being employed for men with level 12 education did not differ significantly from that of the reference group, but from this level onwards, it rather increased with education. In France also, the work propensity of men rather

tended to increase with education. In both countries, however, the positive and significant effect of the female-education interactions indicated that education had more discriminatory power for women than for men in terms of access to employment. The coefficients of the interactions were larger in magnitude for France than Germany.

Nazli (2004) examined the role of education, experience and occupation on earnings. Data was collected from 1271 respondents through Pakistan Socio Economic Survey (PSES). Ordinary least square method was used to estimate the results. The research concluded that Year of schooling, Labor market experience, Primary education, Middle education, Metric and above, Employment experience 1-4 years, Employment experience 4-8 years, Employment experience 8-12 years, Experience above 12 years & Technical training were positively associated with earnings. A stronger effect of education than experience suggested the need for expansions and improvements in the education sector. Technical training also had strong effect on earnings so technical institutes should also be established.

Blundell (2005) focused on the private return to education, ignoring any potential externalities that might benefit the economy at large. Data was collected from 3639 respondents by using questionnaire technique. Ordinary least square estimation was performed for obtaining results. The results showed positive returns to schooling.

Migali and Walker (2009) acknowledged that the relationship between log wages and schooling was considerably more complex than the simple human capital earnings function suggested and that schooling was endogenous. The total sample size was 16212 males and 26448 females, aged from 16 to 72 years old, born between 1935 and 1991. Ordinary least square method was used for estimation of regression coefficients. The research found that schooling was endogenous in case of log of earnings of both, male and female.

Kuepie et al (2009) estimated the private returns to education among representative samples of workers in seven economic capitals of West Africa. Data was collected from the surveys of 2001 to 2003 of 93,213 respondents. Method of ordinary least square was used for the estimation of results. They found that the returns to schooling were most often enhanced once an endogenous education variable was accounted for. This effect held particularly true in the informal sector. They suggested that in ordered to increase the returns to low levels of schooling, improving primary school quality should certainly remain on top of any education's political agenda.

Chaudhry et al (2010) examined the effects of health and education on female earnings in Pakistan. Primary data was used for 200 respondents and data was collected

through questionnaire. By using ordinary least square, the research estimated the findings. The study concluded that respondents' education, respondents belong to urban area, respondents' formal employment, visit of respondent to health unit in a year, female's work hour per day, marital status, availability of healthy diet, joint family, number of rooms in respondent's home, visit of health workers in a year, years of vocational training, and age had positive association with log of females' earning per month but negative association existed between marital status if single, number of children, health unit distance in kilometer from her home, presence of disease, if she faced infant death, square of age and value of total assets with log of females' earning per month. The research suggested that the government should provide good educational and health facilities to females. Consequently they would contribute to the households' income and would lead to reduce poverty levels.

Faridi et al (2010) analyzed the impact of different education levels on students' earnings. By using questionnaire technique, primary data was collected from 200 respondents. Ordinary least square method was applied for the results estimation. They found that earnings were positively associated with completed years of education, experience and number of hour's worked and negative association with experience squared. The study suggested that govt. should give scholarships to the students and make proper arrangements for the needy students.

Afzal (2011) explored the major factors that affected individual's earnings and estimated the private financial returns to education by different levels of education. A questionnaire technique of primary data was used for 3358 respondents. By using ordinary least square, the study estimated the results. The research concluded that education, age, experience, occupation, gender, working hour, spouse education, family background and family status were positively and significantly contributed to earnings of all respondents. The research suggested that rational development programs and policies should be initiated that minimized the staff earnings differentials that arose due to occupation (teaching vs. non-teaching) and gender (male vs. female) basis.

Sarwar and Sial (2012) estimated the effect of the education on different parts of earning distribution. Secondly, the study used educational dummies in earning function to compute the effect of primary, secondary and tertiary levels of education on earning distribution. The author collected data through a statistical survey. Results were estimated through ordinary least square. The research concluded that education had a positive and significant effect on earnings of the individuals in Pakistan. The study suggested that

integration of education system should improve with accordance to the demand of market as well as more investment is required in education sector.

Carnevale et al (2011) examined just what a college degree is worth and what else besides a degree might influence an individual's potential earnings. This report examined lifetime earnings for all education levels and earnings by occupation, age, race/ethnicity, and gender. By using ordinary least square method the authors estimated the results. They found that education was endogenous to earnings.

Barone & Werfhorst (2011) examined that to what extent education is rewarded on the labor market because of the cognitive skills, using IALS data for the US, the UK, Germany and the Netherlands. They empirically distinguished between general cognitive ability and work-specific cognitive ability. Data was collected through surveys of 1994 and 1998. Results were estimated through ordinary least square. The research found that in all countries education exerted a strong effect on earnings.

Parinduri (2012) investigated the effects of a longer school year on grade repetition, educational attainment, employability, and earnings. Through survey technique data was collected from 1960 to 1987 from 17,938 respondents. For estimating the results, ordinary least square method was used. The study concluded that the longer school year seemed to decrease grade repetition and to increase employability, though the estimates were not significant statistically. There was, however, some evidence that the longer school year increased the educational attainment and earnings later in life, and it was affected females more than males.

III. Data and Methodology

Empirical estimation using primary data is critical issue for economists of this decade as there are many problems related to cross sectional data of growing economies. To solve the problem, there have been developed many new techniques discussed in this chapter.

A. Model Specification

We introduce to compare four different models and check their impact on earnings of farmers and businessmen in our sample. First we compare the impact of experience and age with education in separate models.

$$
\begin{aligned}
LEARN = \alpha_\circ &+ \alpha_1 EXPR + \alpha_2 EXPRSQ + \alpha_3 GEND + \alpha_4 ARLV + \alpha_5 EDUC + \alpha_6 SCHL + \alpha_7 TECT \\
&+ \alpha_8 WORH + \alpha_9 SPED + \alpha_{10} FTED + \alpha_{11} MRED + \alpha_{12} HHSZ + \alpha_{13} MART \\
&+ \alpha_{14} SPJB + \alpha_{15} SZLD + \alpha_{16} LVST + \alpha_{17} AVHD + \alpha_{18} LINVT + \alpha_{19} RPRP \\
&+ \mu_i \qquad (i)
\end{aligned}
$$

$$LEARN = \beta_\circ + \beta_1 AGE + \beta_2 AGESQ + \beta_3 GEND + \beta_4 ARLV + \beta_5 EDUC + \beta_6 SCHL + \beta_7 TECT$$
$$+ \beta_8 WORH + \beta_9 SPED + \beta_{10} FTED + \beta_{11} MRED + \beta_{12} HHSZ + \beta_{13} MART$$
$$+ \beta_{14} SPJB + \beta_{15} SZLD + \beta_{16} LVST + \beta_{17} AVHD + \beta_{18} LINVT + \beta_{19} RPRP$$
$$+ v_i \qquad (ii)$$

In model (i), LEARN indicate the log of earnings of individuals, α_0 is intercept and other α's are slope coefficients. EXPR is used for experience of respondent and EXPRSQ is square of Experience. GEND shows the gender of respondent, either male or female. ARLV is the living area of individual i.e. divided as urban or rural. EDUC indicates the education of respondent in years and SCHL is schooling of the respondent, either they got public or private education. TECT shows that individuals having technical education or not. WORH shows the hours of working of the individuals. SPED, FTED and MRED are used as spouse education and education of father and mother respectively. HHSZ indicates the size of household i.e. how many people living in household. MART is the indicator of marital status i.e. either the individual is single or married. SPJB shows that is spouse doing job? AVHD is used for Availability of healthy diet to respondent and investment is used in its log form after transformation which is LINVT. SZLD and LVST are size of land and live stock in model (i). μ_i is introduced as error term.

In model (ii) we replace the variable EXPR and square of it with AGE and AGESQ which are age of respondent and age square respectively while all other variables are same which are used in model (i). Sign of coefficients α is replaced with β and error term μ_i with v_i in model (ii).

Now we compare two more models in which education variable is categorized in different levels and these categories are used in model instead of education variable measured in years and regress on log of earnings with all other variables used in previous models including experience first and then replace it with age of the respondent.

$$LEARN = \Upsilon_\circ + \Upsilon_1 EXPR + \Upsilon_2 EXPRSQ + \Upsilon_3 GEND + \Upsilon_4 ARLV + \Upsilon_5 EDUCII + \Upsilon_6 EDUCIII$$
$$+ \Upsilon_7 EDUCIV + \Upsilon_8 EDUCV + \Upsilon_9 EDUCVI + \Upsilon_{10} SCHL + \Upsilon_{11} TECT + \Upsilon_{12} WORH$$
$$+ \Upsilon_{13} SPED + \Upsilon_{14} FTED + \Upsilon_{15} MRED + \Upsilon_{16} HHSZ + \Upsilon_{17} MART + \Upsilon_{18} SPJB$$
$$+ \Upsilon_{19} SZLD + \Upsilon_{20} LVST + \Upsilon_{21} AVHD + \Upsilon_{22} LINVT + \Upsilon_{23} RPRP + \varepsilon_i \qquad (iii)$$

EDUCII category is used for education level from 6 to 10, EDUCIII for level 11 to 12, EDUCIV for level 13 to 14, EDUCV for level 15 to 16 and EDUCVI for level 17 to 18. The sign of Υ and ε represents the coefficients and error term respectively. In this model different categories of education with experience and other variables regress on earnings.

$$LEARN = \lambda_\circ + \lambda_1 AGE + \lambda_2 AGESQ + \lambda_3 GEND + \lambda_4 ARLV + \lambda_5 EDUCII + \lambda_6 EDUCIII + \lambda_7 EDUCIV$$
$$+ \lambda_8 EDUCV + \lambda_9 EDUCVI + \lambda_{10} SCHL + \lambda_{11} TECT + \lambda_{12} WORH + \lambda_{13} SPED$$
$$+ \lambda_{14} FTED + \lambda_{15} MRED + \lambda_{16} HHSZ + \lambda_{17} MART + \lambda_{18} SPJB + \lambda_{19} SZLD$$
$$+ \lambda_{20} LVST + \lambda_{21} AVHD + \lambda_{22} LINVT + \lambda_{23} RPRP + \omega_i \qquad (iv)$$

In model (iv) age variable is used instead of experience along the same variables used in model (iii).

B. Definitions of Variables

Earnings of Farmers and Businessmen (EARN)

EARN indicate the earnings of farmers and businessmen which is our dependent variable. We use EARN after its log transformation to reduce the large variations in earnings by measuring these values in percentages. Heckman and Polachek (1974) investigated alternative transformations of earnings and concluded that the log transformation is the best in box-cox class. The log transformation for earnings variable is found convenient in previous researches.

Age of the Respondent (AGE), Experience (EXPR)

AGE and EXPR are proxy of each other. Both the variables are accounted for measuring practical exposure of the respondent. These variables are measured in number of years and the squared value of these variables is used to find the existence of non-linearity in them. There should be positive impact of AGE and EXPR on LEARN and negative impact of their squared values. As we know that if the practical exposure increases, the individuals will be more skilled in their field and will have more earnings as compare to those who are less skilled and have small practical exposure. There should be nonlinearity between these variables as after a certain age the individual has huge practical exposure but he will not remain sharp and efficient. Furthermore, he will near to retire and not able to make hard efforts.

Gender (GEND)

Gender of the respondent shows either the respondent is male or female in our sample. The dummy variable is introduced to measure the gender. 1 value is given to the male category and 0 for female. There should be positive relationship between gender and earnings. The studies show that in Asia, there exists inequitable discrimination against girls in education, health, for life saving and for employment. So it is expected that males should have more earnings than females (Todaro and Smith, 10th Edition).

Area of Living (ARLV)

Area of living means that the respondent belongs to urban or rural area. 1 value is given if he belongs to urban area and 0 to rural area. ARLV should be positively associated with earnings because cities are more developed than villages and have developed infrastructure about transportation, developed markets and huge number of consumers than rural areas. Individuals belong to urban areas can save transportation cost as they are nearby the markets whereas in rural areas there are no or small markets and they have too much cost of transportation and selling costs so that they have small opportunities to increase earnings.

Cities receive large share of public investments and incentives for private gains, so there is large share of population i.e. consumers and more economic activities as compare to rural areas. (Todaro and Smith, 10th Edition).

Human Capital: Education; EDUC, EDUCI, EDUCII, ……. , EDUCVI, TECT and Health Indicator; AVHD

EDUC is the formal education of the respondent completed which is measured in years and regresses on earnings. 0 value is given to the individual having no education, 5 years of education for primary level, 8 years for middle, 10 years for metric, 12 years for intermediate, 14 years for graduates, 16 years for master degree holders and 18 years for M. Phil. The education variable is also categorized as EDUCI for 0-5 year's education, EDUCII for 6-10, EDUCIII for 11-12, EDUCIV for 13-14, EDUCV for 15-16 and EDUCVI for 17-18 years education and regress on earnings in another model. Another variable TECT i.e. technical education is included in model and 1 value is given to those individuals having technical education.

AVHD (availability of healthy diet) is health indicator which is regressed on earnings along education. AVHD variable shows the good health as if individual has healthy diet then he will be healthy.

According to the human capital approach there should be positive relationship of education and health variables with earnings, so education variables, technical education, and availability of healthy diet should have positive association with earnings of individuals.

Health and education levels are much higher in high income countries that show the bidirectional relationship of these variables with earnings. People having higher earnings, more they spend on health and education and healthy and educated people have higher productivity and earnings (Todaro and Smith, 10th Edition). Human capital is term economists often use for education, health, and other human capacities that can raise productivity when

increased. (Todaro and Smith, 10th Edition). Education play key role in absorption and utilization of modern technology and raising the productivity (Todaro and Smith, 10th Edition).

Schooling of the Respondent (SCHL)

SCHL (Schooling of the respondent) means that individual complete his education from govt. or private institution. The dummy variable for schooling of the respondent is used and 1 value is given to the public education. There should be positive relationship between schooling of the respondent and earnings. As govt. provides equal quality to the respondent and they have aim towards public interests whereas private institutions have their own interests moreover govt. facilitates at low cost but private one has high costs.

Working Hours (WORH), Size of Land (SZLD), Livestock (LVST), Investment (INVT), Rental Property (RPRP)

WORH indicates the working hours of individuals which measured in unit of time i.e. hours. The increase in hours relate to the increase in time that is labored. SZLD shows the size of land possessed by the individuals measured in acres. LVST (live stock) is used to check the impact of live stock on earnings. INVT variable is used for the investment of business. RPRP (rental property) is the dummy variable and 1 value of this variable shows that individuals have rental property.

There should be positive relationship of all these variables on earnings of individuals. According to the production function approach, WORH variable is an indicator of labor input and SZLD, LVST, INVT and RPRP are indicator of capital inputs and the increase in one of these inputs raises the productivity (Dwivedi). Moreover land, live stock and properties are also inputs that increase the output.

These capital indicators are also investment indicators and according to the IS curve approach the increase in investment increases the level of output or income level (Mankiv).

By virtue of huge investment and large scale production, large units enjoy absolute cost advantage due to economies of scale in purchase of inputs (Dwivedi)

Spouse Education (SPED)

SPED shows the education of spouse of the individual measured in years. It should have positive impact on earnings of individuals, as educated spouse will be responsible for good health of individuals which will be raised the productivity and earnings of them (Todaro and Smith, 10th Edition).

Spouse Job (SPJB), Spouse Earnings (SPER)

SPJB is the dummy variable and 1 value of it shows that spouse has job. This variable should have positive impact on earnings because if spouse doing job and having earnings then the expenditures of the individuals and household will be divided and personal savings of them will increase which will raise the investment that results in increase in productivity and earnings of the individuals (Mankiv).

Parent's Education; Father's Education FTED, Mother's Education MRED

FTED (father's education) shows the education level of father measured in years. If father is educated then he will educate his child and will inherit the theoretical exposure and skills in them which will raise their productivity so it should have positive impact on earnings.

MRED indicates the education level of mother's measured in years. According to human capital approach earnings of individuals should increase if they have educated mother. Greater mother's education, however, generally improves the children's health and education which will raise the productivity of individuals. Studies show that mothers' education plays an important role in increasing nutritional levels in rural areas. The level of child stunning, a valid indicator of child under nutrition, is much lower with higher attainment of education of mother at every income level (Todaro and Smith, 10th Edition).

Household Size (HHSZ) and Marital Status (MART)

HHSZ shows the household size i.e. how many individuals living in household. MART variable indicates the marital status of the individuals, either they are single or married. 1 value is given to the marital status of individual if he is married other than 0. There should be negative impact of HHSZ and MART on earnings of individuals. As if the individual will be married or having greater household size, will have more burden of the house hold and more will be the expenditures. According to the IS curve model, expenditures will lower the savings and then investment and actual productivity and income level will be decreased (Mankiv, G.).

Table 1: Definitions of Variables

Variables	Abbreviation	Unit of Measurement	Expected Relation
Earnings	EARN	Pak Rupees	**Dependent Variable**
Age	AGE	Years	Positive
Age square	AGESQ	Years^2	Negative
Gender	GEND	Dummy Variable 0= Female 1= Male	Positive

Area of Living	ARLV	Dummy Variable 0= Rural 1= Urban	Positive
Education	EDUC	Years	Positive
No Education	EDUCI	Dummy Variable 1= No Education 0= Otherwise	Negative
Primary Education	EDUCII	Dummy Variable 1= Primary Pass 0= otherwise	Positive
Metric Education	EDUCIII	Dummy Variable 1= Metric Pass 0= Otherwise	Positive
F.A Education	EDUCIV	Dummy Variable 1= F.A Pass 0= Otherwise	Positive
B.A Education	EDUCV	Dummy Variable 1= Graduate 0= Otherwise	Positive
M.A Education	EDUCVI	Dummy Variable 1= Post Graduate 0= Otherwise	Positive
Schooling of Respondent	SCHL	Dummy Variable 1= Public 0= Private	Positive
Technical Training	TECT	Dummy Variable 1= Yes 0= No	Positive
Experience	EXPR	Years	Positive
Experience Square	EXPRSQ	Years^2	Negative
Working Hours	WORH	Hours	Positive
Spouse Education	SPED	Years	Positive
Father's Education	FTED	Years	Positive
Mother's Education	MRED	Years	Positive
Household Size	HHSZ	Units	Negative
Marital Status	MART	Dummy Variable 1= Married 0= Unmarried	Negative
Spouse Job	SPJB	Dummy Variable 1= Yes 0= No	Positive
Size of Land	SZLD	Acres	Positive
Live Stock	LVST	Dummy Variable 1= Yes	Positive

		0= No	
Availability of Healthy Diet	AVHD	Dummy Variable 1= Yes 0= No	Positive
Investment	INVT	Pak Rupees	Positive
Rental Property	RPRP	Dummy Variable 1= Yes 0= No	Positive

C. Data Source and Range

Profile of Study Area

The Bahawalnagar district is spread over 8878 sq. Km area comprising five tehsils and one hundred and eighteen union counsels. It is situated in south east of Punjab between 20-51 to 30-20 North latitude and 72-17 to 73-58 east longitude and 130 meter above the sea level. Islamabad is north from Bahawalnagar at the distance of 543 Km travel time 429 mints or 7H and 9M. Lahore is north north-West from Bahawalnagar at the distance of 257 Km travel time 235 mints or 3H and 55M. Karachi is south north-west from Bahawalnagar at the distance of 999 Km travel time 812 mints or 13H and 32M. River Sutlej flows through this district. Two sides of Bahawalnagar share a border with India. Population of district Bahawalnagar is about 2743346, with 2% annual growth rate and population density is about 295 persons per sq. km. 70% population of the district belong to rural areas and 30% from urban areas out of which 51% individuals are male and 49% are female. In urban areas literacy rate of male persons is 59.6% and 38.3% for female.

The climate of the district is very hot. At the top of summer, the temperature of the district remains above 50°C. 1/3 of land is water logged and some of its part is sandy but most of the areas are very fertile. Rainfall is very little. The climate in winter is very dry and cold. The minimum temperature recorded was below 11°C. Five Tehsils of the district are Bahawalnagar, Haroonabad, Minchinabad, Chishtian and Fortabas. The population is congested in cities whereas scattered in villages. Bahawal Nagar is an old district and even before partition it was the biggest district area-wise in South Asia. People living here are before 1947 with rich culture and heritage. Basically people are agriculturists. The main crops are cotton, wheat, sugarcane, tobacco, rice, corn and mustard seed. Main Fruits are Citrus, Guavas and Date. Main Vegetables are Cauliflower, Onion, Turnip, Carrot, Potato and Tomato. There are 24,195 acres of forest. In Nawab of Bahawalpur era, under the scheme for irrigation the barren land particularly in the district Bahawalnagar was brought under

cultivation under the name of Satluj Valley Project. Two canals namely Sadiqis and Fordwah were cut from the Sulemanki Head Works and the areas of sub-divisions Fort Abbas, Haroonabad, Chishtian, Bahawalnagar and Minchinabad were developed and brought under cultivation by it and the rural economy of the state was established.

One textile mill on Arif Wala road, several Rice Mills scattered all over the city of Bahawal Nagar, one Cotton Factory (ginning only) in haronaabad and there is one Sugar mill in Chishtian city. Fishing, Fish farming and Poultry industry is also blooming nowadays.

Educational Facilities

The sub-campus of Islamia University is located here. Presently this sub campus is offering limited subjects for postgraduate education and graduation while there is only one post-graduation degree college for boys with an area nearly equal to 75 acres, formed in 1948, and one for girls. There is one commerce college for boys which offer M.Com, B.Com, D.Com, and CCA programmers. For girls, a separate college was built, but it offers only D.Com and few short courses which gives a sign of less interest in community development by local authority.

D. Sampling and Range

By using questionnaire technique and conducting interviews, the sample is collected from 382 respondents through stratified random sampling in 2017. Out of them 200 belong to urban areas and 182 from rural areas. In our sample 357 respondents are male and 25 female. Sample from 135 respondents is collected in Minchanabad out of them 55 from urban areas and 80 from rural areas same as 167 respondents from Bahawalnagar out of them 100 from urban areas and 67 from rural areas. Sample of 40 respondents is collected from Chishtian and same from Haroonabad with equal proportions from urban as well as rural areas.

E. Methodological Discussion

A regression is an econometric method which is helpful for overcoming the uncertain problems and imparts guidelines for decision-making and planning. It is merely not an easy task to build up the model. To achieve a good model it should need valid and proper a lot of work through a certain criteria e.g. to avoid from serial correlation. Furthermore it is required proper decision-making about including the variables in model. Inclusion of too many variables may cause problem of including irrelevant variable misspecification or few variables in the model may cause problem of omitted necessary variable misspecification or wrong functional form.

The Classical Linear Regression Model

The CLRM is used to examine the relationship among dependent and explanatory variables. The direction of causality among variables is an important issue i.e. which variable cause to the other variable or which variable is dependent between two. We want to predict the variations in dependent variable (which is denoted by Y) due to independent variables (denoted by X). Let us assume that both the dependent and independent variables are linked through a simple linear relationship.

$$E(Y_i) = \alpha + \beta X_i \qquad\qquad (i)$$

Where E (Y_i) shows the mean value of Y_i for given value of X_i and parameters α and β (the subscript i shows the number of observations. Expected value of $E(Y_i)$ will not always equal to the actual value of Y_i. There are several factors that can affect its actual value and creates error or make disturbance in actual Y_i so we can write Y_i as,

$$Y_i = E(Y_i) + \mu_i \qquad\qquad (ii)$$

Or

$$Y_i = \alpha + \beta X_i + \mu_i \qquad\qquad (iii)$$

Where μ_i is error term or disturbance term, which is included in the model to overcome the effects of errors in regression.

IV. Education and Earnings: Econometric Analysis

At this stage all the models are estimated to find the impact of education on earnings in several ways and the results are discussed here to justify the actual relationship among variables.

Experience has positive relationship with earnings in our model. Experience enhances the practical exposure, skills and expertise of individuals to judge the market positions, techniques and tricks of business which raises the earnings of individuals. Moreover Experienced people have full focus on production of agricultural and business items, so they forecast the rise and downfall in production as well as prices of any item and hold that item to earn maximum profit in both agri. and business fields. But the negative relationship of experience squared shows the nonlinearity in data because individuals do not remain sharp and efficient to judge the market techniques and their practical knowledge is not updated in old ages especially in the range of 65 to 75. Both the experience and experience squared variables are statistically significant in our models.

The earnings of the individuals are increasing with the increase in age of individuals. The age and experience are co-linear with each other. Same as, in case of experience, the age

is also raising the practical exposure of the individuals which is yielding higher earnings. Moreover farmers and business community are relying on oldies and individuals having experience of the relative business and farm production for getting farming and business tips in this area so they have advantages to get higher earnings but age is also nonlinear in this model because the individuals are losing their sharpness and efficacy after certain level of age. Both the variables the age and age squared have significant impact on earnings of the farmers and the businessman.

Gender is positively associated with earnings of individuals in our model. Here we find that earnings of males are comparatively higher than females. Because male are committing, hardworking and paying more time and physical efforts to their work as compare to females. In our research area females are mostly illiterate or having low level education so they have low earnings. In our sample there are little women who are educated. People are against the education of females and their work in this area even they thought that it is against their religion, especially in rural areas. Mostly high-educated females are involved in govt. job and those females who are engaged with their own business have low education and have technical skills like beauticians. The impact of gender on earnings of individuals is insignificant.

We find the positive impact of area of living on earnings {individuals belong to urban area have higher earnings} when we regress it with experience variable whereas it has negative relationship with earnings {individuals belong to rural area have higher earnings} when we replace the variable experience with age of the individuals. In our sample mostly the individuals belong to urban areas having government jobs and they have rental earnings from agricultural land and businesses and having no experience whereas individual having more experience in urban areas having more earnings as compare to those living in rural areas. When we replace the experience variable with age in our model, the negative relationship of area of living is because of that individuals belong to urban areas having rental earnings which are low and they have no practical exposure that is why they have same earnings with increasing age whereas individuals belong to rural areas having own businesses and farm production so as their practical exposure increases, their earnings are increasing with age. The area of living has insignificant role on earnings of farmers and business.

Education has positive and significant influence on earnings of individuals. Increasing value of coefficients show that returns to education are convex that is earnings tend to increase as the level of education increases. High-educated individuals have higher

earnings as compare to those who are low educated, as they are more familiar with modern techniques and laws relating to their business. They are using latest technology for agricultural production and having more yield than those using old and antiquated equipments. In our sample, individuals get education in agricultural field who are relating to agricultural productivity and others get education relating to their businesses which is very useful for them as they have theoretical exposure in their fields.

Table 2: Results

Variable	Model I		Model II		Model III		Model IV	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
Constant	8.501	0.000	6.878	0.000	6.939	0.000	8.539	0.000
EXPR	0.041	0.000					0.038	0.001
EXPRSQ	-0.001	0.044					-0.001	0.059
AGE			0.071	0.000	0.071	0.001		
AGESQ			-0.001	0.006	-0.001	0.006		
GEND	0.087	0.609	0.227	0.176	0.216	0.197	0.085	0.614
ARLV	0.048	0.581	-0.022	0.799	-0.033	0.712	0.043	0.627
EDUC	0.089	0.000	0.085	0.000				
EDUCII					0.472	0.000	0.567	0.000
EDUCIII					0.691	0.000	0.807	0.000
EDUCIV					0.882	0.000	0.958	0.000
EDUCV					1.169	0.000	1.203	0.000
EDUCVI					1.199	0.111	1.081	0.149
SCHL	-0.439	0.001	-0.463	0.000	-0.228	0.065	-0.233	0.058
TECT	-0.069	0.530	-0.083	0.451	-0.053	0.628	-0.046	0.677
WORH	-0.011	0.404	0.008	0.501	0.008	0.515	-0.009	0.468
SPED	0.018	0.050	0.017	0.065	0.017	0.069	0.018	0.052
FTED	-0.010	0.311	-0.010	0.318	-0.011	0.298	-0.009	0.351
MRED	0.026	0.037	0.032	0.009	0.032	0.011	0.026	0.035
HHSZ	0.036	0.015	0.035	0.017	0.035	0.018	0.035	0.017
MART	-0.247	0.062	-0.277	0.043	-0.260	0.058	-0.233	0.080
SPJB	-0.299	0.008	-0.304	0.008	-0.317	0.006	-0.309	0.007
SZLD	0.014	0.000	0.015	0.000	0.015	0.000	0.014	0.000
LVST	0.318	0.001	0.363	0.000	0.368	0.000	0.322	0.001
AVHD	0.799	0.000	0.830	0.000	0.855	0.000	0.822	0.000
LINVT	0.022	0.004	0.021	0.006	0.022	0.004	0.023	0.003
RPRP	0.326	0.003	0.326	0.003	0.310	0.006	0.321	0.004
R-squared	0.541		0.534		0.541		0.546	
Adjusted R-squared	0.517		0.510		0.511		0.517	
F-statistic	22.476		21.907		18.353		18.750	
Prob. (F-statistic)	0.000		0.000		0.000		0.000	
Sample Size	383		383		383		383	

Schooling of the respondent has negative and significant impact on earnings. The negative sign shows that individual getting education from private sector have more earnings than those who get their education from public sector because the well-known private educational institutions impart the quality education and practical exposure to the individuals

along with theoretical exposure. Technical education is negatively associated with earnings. Those people get technical training that is not capable to get higher education in this area so that their earnings are low as compare to high educated individual. The impact of technical education on earnings is statically insignificant.

In our sample, an increase in working hours drive the earnings towards down when we have estimated this variable along with experience because there are some individuals who are working on old techniques and pay more physical effort but their earnings are very low as compare to those who are using modern technology and earn more while they are paying comparatively short time to their work and we find that with increase in experience individuals are using modern technology and less time consuming techniques in their farms and business. Whereas when we have used age variable instead of experience along with working hours in our model, the results are become reversed because with the increase in individuals' age, they are paying more time to expand their enterprise or farms so that by increasing working hour along with age, the individuals have more earnings. It has insignificant result.

Spouse education has positive and significant impact on earnings of individuals. Mostly, educated individuals have educated spouse and uneducated ones have uneducated spouse in our sample. Moreover educated spouse are involved in economic activities to minimize the expenditures of the household and to increase the savings which are reinvested to earn more profits. Father education has negative and insignificant relation with earnings. Mostly father of educated individuals are uneducated in rural areas and educated father especially those who belong to urban areas, usually try to support their children in education. They want to send them to public sector after completing their education. Individuals having high educated father are rarely involved in business and farm productivity. Those who are involved in such activities after completing their education having no inherited as well as self practical exposure regarding business skills and have low earnings whereas uneducated fathers are not providing higher education to their children and getting them involve to their business or farm production in early ages so they have more experience, skills as well as having inherited practical exposure and their father teach them business tricks and skills so they have more earnings. Moreover educated father are less involved in the children

Mother education play positive and significant role in earnings of individuals. Mothers are playing important role in training of the children. In uneducated families mostly mothers are uneducated and individuals have low earnings whereas high educated member of

household having high educated mother have more earnings because of major contribution of mother for human capital formation in our sample. The increase in household size increases the earnings of individuals. Individuals of large household size are mostly poor and send their children to do job at early age as more the number of employed members in household, their expenditures are divided between them and personal savings of individuals are increased which are reinvested and getting more profit whereas in small household size there is few members who are employed and hardly meet their expenditures.

The impact of marital status is negative on earnings of individuals. After getting married they feel more burden and mental pressure of family. Individuals are not remained inspire to their work and pay more time to the family than their work. Marital status has significant impact on earnings. Individuals have low earnings if their spouse doing job. Mostly, the spouses of the individuals are unemployed in rural areas. Individuals of middle and lower class who belong to urban areas are mostly earn to meet their expenditures only, if their spouse are doing job then their expenditures are divided among them so that they are paying less efforts to increase their earnings. Furthermore, some individuals are unemployed and they have employed spouse as well as they have rental earnings from land or property or their business is too small and they are paying very short time to work, in result they have low earnings. The results we find statistically significant.

The individuals have more investment, larger the business they have and more opportunities to earn. That is why they have more earnings than those have small investments. Investment has significant impact on earnings. Same as, we find that more the number of employees, more earnings the individuals have while we have replaced with investment that indicate that the business is large and the large businesses have more earnings. Number of employees also has significant association with earnings. Size of Land, live stock and rental property are positively and significantly associated with earnings of individuals because all of these are investments and having some return. There is positive association between the availability of healthy diet and earnings of the individuals. The individuals having healthy diet are healthy and pay more time and concentration to work and have more earnings and those who are not availing healthy diet are weak and unable to do hard work so they have low earnings. The availability of healthy diet has significant impact on earnings of individuals.

V. Concluding Remarks

Educational institutions are still underdeveloped in Pakistan and these institutes are not able to impart quality education in particular fields. Individuals have no awareness about that in which field they should get admission for knowledge seeking purpose. The level of adult literacy is very low, low rate of enrolments to schools, rates of drop out at primary level and student-teacher ratios are also high, wider range of gender and regional discrimination and low public investment are the indicators of poor performance of educational institutes so we think that it is necessary to measure the impact of education on earnings. By using stratified random sampling, the sample of 389 individuals is collected through questionnaire and interviews from the population of district Bahawal Nagar. Ordinary least square method is applied for statistical estimation on fourteen different models that are specified to check their comparative impact on earnings of farmers and businessmen in our sample. In the models earnings are taken to regress after log transformation. We have found that education of the respondent in years and categories of education variable from primary to M. Phil level, age of the respondent, experience, gender, area of living, spouse education, mother's education, household size, number of employed members in household, agricultural land, size of land, value of land, livestock, quantity of livestock, value of live stock, availability of healthy diet, presence of disease, investment, number of employees and rental property are positively associated with earnings of farmers and businessmen, whereas age square, experience square, schooling of respondent, technical education, working hours, father's education, marital status, number of children, spouse job, earnings of spouse and visits of respondent to health unit are negatively associated with earnings of farmers and businessmen.

After analyzing our results we recommend some suggestions with respect to the relationships we have found in regression analysis. Govt. should improve the status of educational institutes. Govt. should also start programs and campaigns to create awareness in individuals to understand the value of education. Govt. should increase the number of institutes of female education in backward areas and they should start programs and campaigns to make people aware about the importance of female education to increase the female literacy rates. Govt. should start programs and campaigns regarding family planning to reduce the size of households. Govt. should take these factors under consideration and should make proper reforms in health and diet sectors.

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