**Linkages between Human Capital, Gender Disaggregated Demand and Economic Growth in Pakistan: An Empirical Analysis**

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This study reported on the article was Returns to Human. A Gender Disaggregated Analysis in Pakistan. The main purpose in this study was returns to human capital in Pakistan. In our country Pakistan, the level of output will increased by utilized the manpower. The Human Capital would take our economy to the way of betterment. In this study, the data use time series and technique, apply for analysis is co-integration. They use the variables Gross Domestic Product (GDP), education, mortality, enrolment, unemployment, Age. Education has positive impact on the increase of the productivity. Education level increased with raising the female labor force participation in Pakistan. The children decrease the early age participation in labor market. The result shows that, increase the education level and economic activity increase the female labor force contribution. The Government should provide the better opportunity of education and reduce the female force participation in labor market in case of developing countries, by providing the best grades and tasks to the humans both male and female, the level of the returns by human capital utilization will be increased.

Keywords: Gross Domestic Product (GDP), Unemployment, Age, Education, Mortality rate, Enrolment.

**Introduction**

Human capital is a collection of possessions all the acquaintance talents, skills, abilities, experience, intelligence, training, judgment and wisdom controlled individually and collection by individuals in a population. Human capital has positive impact on economic growth and it is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Important source of Pakistan labor market and the stock of level of production, skill and ability. The research also has assurance that the submission to increase the Productivity is right which shows that the output by investing in human capital is equally understood by the working ability of the workers (Psacharopulos 1981). In this study, socio-economy and human factor is an important factor and is directly and indirectly related to women’s participation in labor market. The study of the present days test, the part of the human capital for every person’s earnings on the provide data of Pakistan and show the heartening relationship among the social assets and income. The consequences of the research show that the method of learning and skills of the individual are the two main component of human capital, which has the positive outcome on the every person whole life incomes (Becker 1962; Mincer 1974).

We know that the learning is the major part of increase in the human capital skills. A best quantity of the research has estimated the output by the learning for the increase in wages in different countries ( Psacharopoulos 1980, 1985, 1994; Pascharopoulos and Chu Ng 1992).

The result of this observation discovers a helpful quality for employees in all these countries (developing countries) is required. The limited education completed in the economy of Pakistan also discovers the progressive link between the learning process and wages. Most of the nation-wide typical domestic investigates do not contain the data of the finished years of education, which is essential to approximate the Mincer and production task.

The consequences of these explanation discover a obliging quality for employees in the all those countries. The limited educations completed in the Pakistan also ascertain the progressive association between the learning process and wages. We discover that the workers both male and female get the high wages as their level of education is going to be higher. The level of incomes increased with the ever increasing level of learning. As in the comparison, the wages of the male workers are high and the wages of the female workers is low. The difference between male and female workers is due to renowned judgments low-paying profession.

**Literature Review**

Khan and Toor (1990-2002) examined the “The Changes in Returns to Education in Pakistan’’. This model studied the variation in Marginal Rates of Return of different level of education for pay receiving employees and shows that how the particular level of education has changed over time by the better additional investment. The researcher showed that the increasing return at different level of education. In this paper, The Mean Sample and Ordinary Least Square techniques were used for estimation of the variables. To estimate the variables the data was use of Pakistan Integrated Household Survey 1990 to 1991 and 2001 to 2002 which was published by the Federal Bureau of Statistics.

Khalid et al. (2002) examined the Future of Girls’ Education in Pakistan. Secondary date used in this paper and examined variables were gross enrolment rates, % of primary teachers by gender, literacy rate, productivity growth, female and male labor force. They focus on the increase in the literacy rate of developing countries and they pay more attention to achieve education for all. Pakistan was also the part of this developmental framework. The conclusion of this study that in the future, the countries pay the attention to the girls’ education which increase the importance of the girls and the % in literacy also increased by the efforts of institutions.

Nasir (2005) observed the Analysis of occupational Choice in Pakistan. In the determination of earnings and success in the labor market, the occupational choice plays an important role. Men and Women have different occupational distribution; was the main discussion in this regard. The model of men and women occupational choices was estimated by using the Pakistan Integrated Household Survey (PIHS) 2001-2002 data. They had taken variables discussed in this model was men and women salaries, labor force in the market, skills, productivity of men and female worker, wages and literacy. The econometric technique Multinomial Logit (MNL) used in this paper. The conclusion of this analysis showed that the positive outcome on the earning of the workers.

Faridi et al*. (*2009) explored the Analysis of the Determinants of Male Labor Force Participation and Employment Status in Pakistan in the Case of Bahawalpur District time series data used for this estimation. Econometric technique Binomial Logit and Multi-nomial Logit approached for this analysis. we have explored how participation and employment status change with age, level of education, region of residence, closed relative’s education and sex by using statistical analysis. It has been observed the various education levels, presence of Assets, dependency burden and location are significantly affecting participation in various employment statuses.

Faridi and Malik (2009) explored the Impact of Education on Female Labor Force Participation in Pakistan: Empirical Evidence from Primary Data Analysis time series data used for this estimation. Econometric technique Binomial Logit and Multi-nomial Logit approached for this analysis. The role of parents’ education turns out to be insignificant while the spouse educational status has positive and significant impact on female labour force participation. Thus study concluded that educated female is successful in attaining employment, raising output and growth.

Faridi et al. *(*2010) explored the Impact of Education on Students’ Earnings: A Case of Public Sector Universities in Pakistan time series data used for this estimation. Econometric technique Ordinary Least Square Method used to analyze the impact of Educational level on Students’ earnings. Our results showed that completed years of education and experience in years are positively and significantly contributing to monthly earnings of students in first model. In education level, the monthly earnings of students are increasing and have significant impact on earnings of students. Study shows that PhD and M.Phil students can earn more than bachelor students. This indicated positive contribution of educational level in earnings. Experience and number of hours worked also have a positive contribution in monthly earnings.

Chaudhry et al. (2010) observed The Effect of Health and Education on the Female Earnings. The measure of human capital; health and education are considered most significant. The main goal of this research was to find out the effects of health and education on the wages of the female workers in Pakistan. The technique used in this model were the descriptive and OLS. The health and education have the significant and positive impact on earnings of the female workers. The variables used in the study were education, health status, mortality rate, age and training.

Son (2010) looked out The Human Capital Development . This paper has two main goals, Firstly, it worked on to measure the gaps in the human capital stock across the world. It showed that how effectively many countries were moving towards the development path by the improvement in human capital stock. Secondly, it worked on the contribution of the human capital for the purpose of Economic Growth, worked for the Employment Growth, which also have the effect on the human capital growth to explain the total output per workers’ growth. They had taken variables for literacy rate, school enrolment rates, years of schooling, education skills, workforce, gender disparity, total output and Gross Domestic Product (GDP). The world’s poorer areas like South Asia and Sub-Saharan Africa have the very low human capital in early 1950.

Nasir and Nazil (2010) worked on the Education and Earnings in Pakistan and Returns to Human Capital. The theory of Human Capital was conventionally developed by Becker (1962) and Mincer (1974). To estimate the all variables, the dummy variable technique was used in this modek. The variables used in this model were completed years of schooling, age starting school, literacy, numeracy skills, quality of school, and technical training. Most of the nationally representative surveys of households do not contain the information about the variables like; quality of school, literacy, age starting school, numeracy skills, quality of school, completed years of schooling. The Pakistan Integrated Household Survey (PIHS) worked on these variables to provide all the available data regarded to these above variables.

Himaz .R (2011) examined that education and household welfare a case study of Sri-lanka. He used cross- section during the time period 1985 to 2006. The econometric technique OLS and QR was used. In this paper two main findings that come out of analysis. In this result shows that individual qualifications are important in labor market and other result the upper qualities collision shows privileged force of education on welfare than lower qualities, representative that these households are superior their human capital welfare.

Ali (2011) worked on “The Deficient Policy Communication, Deficient Outcomes-Capacity Building Policy under Education Reforms in Sindh, Pakistan. In (2003) USAID sponsored the programmed”Education Sector Reforms Assistance” (ESRA), to build the capacity of District Education Managers. The method of qualitative research was used to driven up the work for the more effective results. Most of the policies failed to achieve any of the arranged targets year after year despite the special management. The result of this model was to understand the capacity building policy of education managers in Pakistan.

Hassan and Cooray (2012) examined the effect of male and female health in economic growth; cross country evidence within a production function framework. The human capital plays the significant role in economic growth. The major purpose of the paper was to show that the life expectancy of male has a positive effect on the economic growth and the life expectancy of female has a negative impact. They had taken variables for life expectancy, age, health rate, capital stock, economic growth and GDP. The techniques used were OLS, random effect and three stage least squares estimation.

Khadim and Akram (2013) Female Labor Force Participation in Formal Sector An Empirical Evidence from PSLM (2007-08) Econometric technique such as Binomial Logit and Multi-nomial Logit approached for this analysis. The empirical results of the study suggests that for women higher education attainments lead to greater participation in formal sector The results elucidate that there is greater probability of female labor force participation with education at primary and matriculation level and the females are more likely to participate are married and belong to nuclear family living in urban area

Afzal (2014) looked on the analysis of Earning Oriented Education System of Lahore   
Pakistan. The study describes the effect of the factors that affect the earnings and also estimates the Returns to the education (RTEdu) of the educational institutes in Lahore. They used the primary data for a sample of 8327 respondents in 2011 and econometric technique of ordinary least square (OLS) in this paper. They had taken variables of Computer skills, literacy rate, earning of individuals, and nature of job, family background, marital status, gender and training. The theory of Human Capital was valid in this regard. The final suggestion of this paper showed that the education have positive impact on the future life of the individuals.

Amir et al. (2015) discussed the impact of Education labor Force on Economic Growth of Pakistan. The time series data was used in the time period of 1973-2013. The techniques used in this model were the Augmented Dickey Fuller test (ADF), Vector Auto Regressive test (VAR) and the Johansen Co-integrated test. All these above tests were used for the estimation of the model. They had taken variables of labor force, physical capital, illiterate labor, labor force and real GDP. The findings of this study in the Economic Growth showed that the human capital has positive contribution. The research showed that the investments in the man can increase the productive growth at macro level.

Mat et al. (2015) discussed that the impact of human capital investment on education and economic development in case of Sabah. The econometric technique ordinary least square (OLS) was used in this paper. The annual time period 1980 to 2010 used and the Solow growth model theory also used. Gross domestic product (GDP) per capita used dependent variable and literacy rate, life expectancy at birth, Number of immigrations and Growth rate of capita was used as independent variables. The result shows that human capital on education boost literacy rate concerning the additional schooling attain of acquaintance.

Jamal (2015) worked on private return to education; a case study in Pakistan. He used the time period 1990-91 to 2012-13. The data was composed of 16 nationally labor force surveys through the period are utilize with some revision. In this study traditional approach LFC was used. The source of data was collected Pakistan Bureau of Statistic (PBS).

**Model Specification, Data and Methodology**

This section will provide a justification on the data and methodology of this theory. Methodology will used to get the measurements. The source of data and the list of variables will be included here also.

**Data Sources and Definition**

Time series data used for study. To estimate the relationship among the variables used data from 1973 to 2016. The data was collect State Bank of Pakistan and IMF. The econometric technique of Auto Regressive Distribution Lag (ARDL) used in this study. Unit root of Augmented Dickey- Fuller (ADF) used apply to get rid of parameters.

**Model Specification**

The present study has been specified in following model;

Y= α+ β1 X + β2 X + β3 X + β4 X + β5 X + µ

Y= Gross Domestic Product (GDP)

X 1 = Education

X2 = Mortality

X3 = Unemployment

X4 = Age

X5 = Enrolment

Now, justify the ARDL estimation equation

This equation Y is denoted by the dependent variables and their lagged, are also shows the independent variables. These variables have the different relationship some are positive and some negative. The steadiness of ARDL is skilled through compassion of study. The compassion psychiatry involves the sequential co-relation. Function farm, hetroskedasticity and normality. CUSUM and CUSUMSQ constancy is another way to decide the consistency of ARDL model.

**Figure 1:**

***Model of Dependent and independent variables***

There is Gross Domestic Product dependent variable and education, mortality, unemployment, age and enrolment are independent variables.

**Description of Variables**

**Gross Domestic Product**

Gross Domestic Product is one of the most usually used measures of an economy’s output. It is define as “total value of goods and services produced within a country’s margins in specific time period-monthly and yearly “GDP is a correct sign of a size of economy.

**Education**

Education reflects an individual’s ability to read and write . Education has positive effect on one’s life. In Pakistan, many people are well educated. People get the education primary and secondary system. In Pakistan 44% people are educated. In urban areas, women get education colleges and universities. In rural areas, women are getting less education because they worked field with men.

**Mortality Rate**

The mortality rate is defined as the unit of death per 1000 person per year. 9.5 % mortality rate of the whole population. Much disease, for example cancer, TV and aids spread in our country. Many people face to problem. Many people are death lack of food and issue of health facilities. In Pakistan, the death rate increase day by day.

**Unemployment Rate**

Unemployment rate is percentage of total person’s unemployed to total labor force. The unemployed person are those that started their search to get a job but the cannot get any job. In our economy many people are unemployed. Some people go to abroad countries and send the earned money to their families. In our country the jobs are few and people faced to unemployed. In Pakistan as compared to US countries people are jobless. Here mostly peoples are un-skilled and do not work properly.

**Employment**

People are employed means that they are paying their full / part time to their job and works. Many people do work it may be a part time job or a full time job and some people time spent their time in their family business. They are referred as employed person. People seek the training programs to get the better job’s opportunities and it may enhance their working capability ad may cause a decline in chances of jobs loss or separation.

**Enrollment**

Matriculation, the method of initiate audience to a school. Total number of students appropriately registered. The method of being enters onto an electoral roll. Concurrent enrolment, the procedure in which high school student enrolls at a university or college typically to achieve college praise. Biometrics, the procedure of addition a user&#39 ; s credentials to the verification system.The suspicious curling of a trilobite over its yielding ventral organs.

**Table 1:**

***List of Explanatory Variable with Expected sign***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | Descriptive  Variables | Units of measurement | Sources | Sign |
| Dependent  Variable |  |  |  |  |
| GDP | Gross Domestic Product | Million Rupees | State Bank of Pakistan | Positive |
| Independent  Variables |  |  |  |  |
| EDU | Education | Million Rupees | State Bank of Pakistan | Positive |
| Age | Age | Million Rupees | State Bank of Pakistan | Positive |
| Mort | Mortality | Million Rupees | State Bank of Pakistan | Negative |
| Unemp | Unemployment | Million Rupees | International Monetary Fund | Negative |
| Enroll | Enrollment | Million Rupees | International Monetary Fund | Positive |

In this table, the Mortality and unemployment show negative association with Gross Domestic Product, while education, age and enrollment positive association with gross domestic product.

***Table2: Descriptive Analysis***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | Mean | Median | Std.Dev | Skewness | Kurtorsis | Jarque Bera |
| GDP | 5.123 | 5.5 | 2.291 | - 0.618 | 3.266 | 2.599 |
| Edu | 1.785366 | 1.8000 | 0.335940 | 0.386851 | 2.011207 | 2.692895 |
| Mort | 128.3707 | 128.3000 | 28.16819 | 0.021571 | 1.680175 | 2.978990 |
| Unemp | 9.771799 | 9.60000 | 4.731128 | 0.527608 | 2.476382 | 2.370582 |
| Agr | 35.10443 | 35.9000 | 4.670657 | -0.010334 | 1.333725 | 4.743869 |
| Enr | 68.02244 | 70.68848 | 15.39021 | 0.294802 | 1.788144 | 3.102724 |

Source: Calculate values using E-views 9.5

In above table show the analysis of selected variables which are GDP, Edu, Mort, unemp, age and Enr. We show the mean, median, Skewness, jarque-Bera etc.

**Table3**

***ADF Test with Level and 1st Difference***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | | | ADF test | | Result | |
|  | | Level | | 1st difference | |  |
|  | Intercept | | Trend | Intercept | Trend |  |
| GDP | 1.950686 | | 0.131592 | -4.778045 | -5.229734 | I(1) |
| Edu | -1.924679 | | -1.071376 | -4.750300 | -4.883165 | I(1) |
| Mort | 1.328003 | | -5.834085 | -3.729472 | -3.903278 | I(0) |
| Unemp | -1.633038 | | -1.669866 | -10.27427 | -10.13673 | I(1) |
| Age | 4.888981 | | 4.550720 | -5.673092 | 1.357399 | I(1) |
| Enr | -0.004240 | | -2.613707 | -6.383087 | -6.404868 | I(1) |

Source: Calculate are carried with the help of E-views 9.5. (Note \*,\*\*,\*\*\* indicator the significant at 1%, 5%, 10% respectively interpretation).

In above table we define different result of variables. In the ADF test we confirm the stationary of values in our time series data. When the values are at 1st difference and the best level then we will apply ARDL and some variables have 1st and some have at best level. So, the result shows use the ARDL technique in this study.

***Table 4:***

***Bound Test***

The bound test shows the existence and nonexistence of the long run relationship. Here the bound test result are shown below

***Table 5:***

***Bound Test Results Co-Integration***

|  |  |  |  |
| --- | --- | --- | --- |
| Equation | F-Statistic | Upper Bound Value | Results |
| GDP, Edu, Mort, Unemp, Age, Enr  Co-integration exists | 6.276956 | 4.26 |  |

Source: Calculation is carried with the help of E-views 9.5. (Note \*.\*\*,\*\*\* indicator the significant at 1%, 5%, 10% respectively interpretation).

In above Bound test we illustrate the F-statistics values. The value which takes place in this test is high from all other values and the values of F-statistics better than upper boundaries and also better than know lower boundaries then it show Co-integration in the long-run relationship.

**Table 6:**

***Estimates of Long- Run Co-efficient of the Model***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | Coefficient | Std.Error | t-ststistics | Prob |
| GDP | 15.2711044 | 54.112769 | 0.282209 | 0.7799 |
| AGE | 42.306430 | 6.953716 | 6.084003 | 0.0000 |
| ENROLL | -4.3606430 | 4.244654 | -1.027491 | 0.3130 |
| UNEMP | 1.340513 | 3.486882 | 0.384445 | 0.0367 |
| MORT | -6.442325 | 1.653256 | -3.896750 | 0.0006 |
| C | -903.08208 | 456.162820 | -1.979736 | 0.0576 |

There is a co-efficient of long run. We explain the effects of different variables. A coefficient of long-run relationship in this we define the different special effects of variables. Here female labor force rate and education have positive effect of the economy. The effect of variables use of verify the probability less than 0.05 then it will be significant while the probability is greater than 0.05 than it will be insignificant, t- Statistics values must be equal to 2 that is significant and it can be in – significant of value of -1.

**Table7**

***Estimates of Short-Run Co-efficient of the Model***

There is coefficient of short run relationship. In this table we explain the effect of different.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | Coefficient | Std.Error | t-Statistics | Prob |
| D(GDP(-1 | 0.278931 | 0.112076 | 2.488777 | 0.0190 |
| D(EDU) | 70.36982 | 35.88009 | 1.961250 | 0.0599 |
| D(EDU) | 12.62426 | 4.460738 | 2.830083 | 0.0085 |
| D(AGE(-1) | -20.3534 | 4.569877 | -4.453833 | 0.0001 |
| D(ENROLL) | -1.076335- | 2.131169 | -0.505044 | 0.6175 |
| D(UNEMP) | -0.54416 | 1.461700 | -0.372280 | 0.7125 |
| D (MORT) | -2.84660 | 2.630330 | -1.082225 | 0.2884 |
| CoinEq (-1) | -0.491422 | 0.077123 | -6.371952 | 0.0000 |
| R-Squared | 0.9736 | AIC 1.0852 |  |  |
| Adjusted R-squared | 0.9736 | SC 1.8890 |  |  |
| F-statistic | 18.5721 |  |  |  |
| Prob (F-ststistic) | 0.0000 | HQ 1.3615 |  |  |
| Durbin-Watson 2. | 2.104414 |  |  |  |

The coefficient Gross Domestic Product (GDP), EDU and AGE shows the Positive relationship and ENROLL, UNEMP and MORT shows the Negative relationship. In this table the effect of variables apply to verify the probability of values. If the probability is less than 0.05 then it will be significant while if the probability is greater than 0.05 then it will be insignificant.

**Stability Test**

The stability test should be defined CUSUM and CUSUM of Square test.



This diagram of CUSUM lies within red lines which are critical boundaries lies at 5% level so this shows the level is significant. This situation shows our model is specific and exact established.

**CUSUM of Square Test**

In this diagram short run and long run checked by CUSUM of square test.



CUSUM Square lies within red lines which are critical boundaries lies at 5% level so this show the level is significant. This situation shows our model is precise and accurate established.

**Conclusion**

The paper identified the major determinates of human capital like Gross Domestic Product, Education, Age, Mortality, Unemployment and Enrolment. For this purpose we use time series data which covered the 1974 to 2016 and the source of data State Bank of Pakistan. It has been used the ARDL model. The study employed that total population of Pakistan play an important role in our country. Women’s participation in labor market is rising due to their increasing rate of literacy. The researchers are the opinion women’s education is very important for our economy for its positively affects women’s participation in the labor market. Hence, binomial logit model to find out women’s participation in labor market. According to the findings of this research, experienced and trained women have more chances of jobs; hence, increase in employment in labor market. In this study, age and experience of women have been shown positive factors for women participation in country’s economic activities. Women’s less education have shown negative effects in economic activities. The study finds out that per capita income increase due to decline in women’s self- employment. The people should use the gifts of Allah and raise our country to the way of development. We can increase our productivity level. The result shows that women’s participation is very low.

**Policy Implication**

In this study, human capital has positive effect on the economy. The GDP will increase if we utilize the resource of increasing productivity. The education can increase the GDP of our country if there are best policy maker. The rate of mortality can be reduced because the people should know that would be better for them. In Pakistan female participation is very low. Women don’t get the education and not provide the basic needs of life.

Government improves the better situation of education following steps:

* Government should improve the education facilities to the people of the country.
* It is suggested that government improve health system.
* In rural areas, mostly women engaged in productive activities.
* Government should establish the training and professional school for women, so that increase the women income and participation in labor market.
* Metric and intermediate level is not enough and provides the job opportunities of the skilled people.
* Government should make policy and fix that the education is important for girls.
* All these factors like education, Age; employment etc. can increase our production levels.

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