Impact of Human Capital on Employment and Economic Growth in Developing Countries

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ARTICLE DETAILS	ABSTRACT
History *Revised format: 30 June 2019* *Available Online: 31 July 2019*	Human Capital plays a vital role in increasing GDP growth and creating more employment opportunities. The major objective of this research paper is to analyze the impact of Human Capital on GDP Growth and Employment in developing countries using Panel Data for the period of 1996-2018. To measure the Human Capital, we have employed two proxy variables i.e. life expectancy and education expenditure. The variables of Labour force, capital formation, inflation, agriculture and manufacturing value added are used as controlled variables in the study. The fixed effect and random effect models are used in this study. The empirical results show that human capital variables (life expectancy and education expenditures) are found significant and hence contribute as an engine of growth and employment opportunities in developing countries.
Keywords *Human Capital, GDP Growth Rate; Employment, Developing Countries*	
JEL Classification: *J24, J21, O40, O5*	

1. Introduction

Process of development is always based on key variables namely, human capital, physical capital, natural and power resources which determine the pace of economic growth. Almost all classical economists believed in economic growth (Pelinescu, 2015). They attempted to explain theories of growth in different ways and developed various growth models. With the passage of time, the economists realized that diminishing marginal return in factor of production is not necessary. One can manage and increase production with the help of new technology and, of course, skilled training and education of a person (Becker, 1990).

Presently, world can be distributed into categories such as developed, developing and underdeveloped countries. The division is based on the level of economic growth achieved by each country. Factors of production are very important for increased level of economic growth. These are labour, natural resources and capital goods. In most of the developed countries goods are produced with minimum cost and most efficient ways of production (Teixeira et al., 2016). Human capital development means systematic and planned activity for human capital to learn necessary skills to meet current and future job demands. Learning is the cure to all Human Resource Development (HRD) efforts. Therefore, major focus of researchers is on a work force's learning and performance. Presently, HRD

mainly focuses to develop people's knowledge, expertise, productivity and satisfaction for development of his own personality, community and nation widely for whole humanity (Berg, 2016).

Human capital as an independent/explanatory variable of instant study is essential for self-reliant and self-sustaining growth. According to Theodore Schultz human capital is like other types of capitals. Production can be improved through investment in human capital. The classical economists described human capital as skill and knowledge and not as labour force (Su and Liu, 2016: Dinda, 2016).

2. Literature Review

There is considerable literature available about the relationship between human capital, employment and economic growth. Some significant studies have been reviewed for the purpose to look in the gap of the research.

Laitner (1993) examined an economic growth model vis-e-vis human and physical capital and believed that increments to education of single individual raises minimal productive capacity as a person having limited life span, hence the capital fully depreciates on his retirement.

Caballe and Santos (1993) found that economics with lesser ratios of physical to human capital resulted into increased physical capital by placing human capital as a key factor for growth. Mincer (1995) had explained the sources of human capital growth for economic development. Human capital plays a major role in labor economics. Iqbal and Zahid (1998) examined the impact of primary education on the economic growth of Pakistan and concluded with quantitative evidence during 1959-60 to 1996-97 that if we wanted rapid growth we must improve primary education.

Blundell et al. (1999) viewed Human capital complemented with research & development as an indirect contribution of education to macro-economic growth. Abbas (2000) empirically analysed the comparative study of Pakistan and India and concluded that human capital stock was positively co-related with physical capital having a great impact.

Nasir and Nazli (2000) provided an analysis for "Education and earnings in Pakistan". It was observed that due to availability of completed school years the authors had estimated the earning functions with continuous school years while assuming uniform rate of returns for all school years.

Abbas (2001) concluded that for these two countries human capital plays a crucial role in the economic growth. Monteils (2002) concluded that possibly the economic growth could contribute towards knowledge development but not otherwise. Hendricks (2002) took into account a data analysis that resulted into a corollary that human and physical capital did not account for the bulk of cross country income differences. Schutt (2003) explained that human capital plays a major role in economic growth. Educated people increase the growth of economy.

Islam (2004) discussed that increase in employment level lead to increase in the economic growth that ultimately reduced poverty. Kumar (2006) had observed no significant and positive effects of human capital which he attributed to certain factors like inappropriate specification of human capital production function, inappropriate estimation methodologies and non-controlling of variables relating to governance and instructions.

Cohen and Soto (2007) observed that human capital was an exponential function of the years of schooling. It was found that gap in human capital of rich and poor countries had remained constant over the last forty year. Siddiqui (2009) concluded that if we wanted to precede human development we should adopt growth oriented policies for capabilities development. Chaudhry et al. (2010) observed both the education and health were found to have great impact on female earnings.

Rena (2010) concluded that quality of education was more important due to international market of human capital. He pointed out that some developing countries got more benefits from the new opportunity. Ranis (2011) concluded that economic growth and human capital development were necessary to each other especially education plays a very important role in economic growth. Blanco and Grier (2012) provided for effects of natural resources on economic development catering for physical and human capital particularly in Latin America and generally across regions.

Siddiqui and Rehman (2017) tested the human capital-growth nexus in selected Asian countries. They applied Empirical Bayesian methodology. The study found that primary and secondary education was more prominent in fluctuations of economic growth in East Asia, while vocational and tertiary education had a positive impact on economic growth in South Asia.

Ogundari and Awokuse (2018) analyzed the impact of human capital on economic growth in Sub-Saharan Africa (SSA). They considered human capital and health as a measure of human capital. The results of system GMM indicated positive impact of both health and education on economic growth, and the impact of health was relatively larger than education.

The reviewed literature reflects focus on human capital and economic growth. Besides other factors of higher education, research and technology the relationship between primary education and economic growth is also discussed. The studies have also shown comparison between human capital and physical capital. Contribution of natural resources, education and training also appear to increase the economic growth. Reduction in poverty and increase in employment has a great impact on economic growth. Researchers are also found to have discussed population growth, human capital and economic growth of developed and developing countries.

It is found from reviewed literature that previous literature has not focussed on the developing countries as a group of middle income and low income developing countries while estimating the impact of human capital on employment and economic growth. Therefore, the present study will fill this gap in the empirical literature.

3. Data and Methodology
The major purpose of present research is to analyse the linkage between human capital, employment and economic growth in 48 developing countries whose data were available during the period of 1996-2018.
The study is based on panel data analysis to evaluate interaction between human capital, employment rate and economic growth in developing countries. The data is taken from World Development Indicators (WDI) by World Bank. Three categories of countries are made; low income developing countries, middle income developing countries and all developing countries (list is given in the Appendix at the end of paper).

Based on panel data, random effect and fixed effect method is applied for this research. Hausman test is also conducted to decide the appropriate method between fixed and random effect for different groups of developing countries.

Now we specify the model for the present study based upon the above theory. That will be:

Model 1:
The functional form of Model 1 is given as follows:

$$GDPG = f\left(L, Edu, LE, K_f, A_g, M_v, Inf\right)$$

The econometric form is given as follows:

$$GDPG = \alpha_\circ + \alpha_1 L + \alpha_2 EDU + \alpha_3 LE + \alpha_3 K_f + \alpha_4 A_g + \alpha_5 M_v + \alpha_6 Inf + \mu$$

Whereas:

GDP= Gross Domestic Product Growth Rate
L= Labour Force growth rate
EDU= Education expenditure as a percentage of GDP
LE= life expectance
Kf= Gross Capital Formation as a percentage of GDP
Ag = Agriculture value added as a percentage of GDP
Mu = Manufacturing Value added as a percentage of GDP
Inf= inflation rate.

In this study labour force growth rate, life expectancy and health expenditures are used a proxy variable for human capital. Agriculture value added and manufacturing value added are used proxy variables for development and research in production sector and inflation is used as a control variable for policy effectiveness.

Model 2:
The functional form of Model 2 is given as follows:

$$ER = f\left(L, Edu, LE, K_f, A_g, M_v, Inf\right)$$

The econometric form is given as follows:

$$ER = \alpha_\circ + \alpha_1\,LFPR + \alpha_2\,EDU + \alpha_3\,LE + \alpha_3 K_f + \alpha_4 A_g + \alpha_5 M_v + \alpha_6 Inf + \mu$$

Whereas:

ER= Employment Rate
L= Labour Force Participation Rate
EDU= Education expenditure as a percentage of GDP
LE= life expectance
Kf= Capital Formation as a percentage of GDP
Ag = Agriculture value added as a percentage of GDP
Mu = Manufacturing Value added as a percentage of GDP
Inf= inflation rate.

In this study labour force, life expectancy and health expenditure are used a proxy variable for human capital. Agriculture value added and manufacturing value added are used proxy variables for development and research in production sector and inflation is used as a control variable for policy effectiveness. The present study will estimate model 1 and 2 in order to examine the interaction between Human capital, employment rate and economic growth. Model 1 will examine the link between Human capital and GDP growth rate while model 2 will find the link between Human capital and employment level in developing countries.

4. Panel Data Analysis
In order to analyse the impact of human capital on economic growth and employment, for developing countries, we have applied fixed and random effect techniques. The results are displayed in table 1 and table 2. Table 1 shows the impact of human capital on economic growth and table 2 shows the impact of human capital on employment in developing countries.

Table 1: Panel Results of Impact of Human Capital on Economic Growth in Developing Countries

Explanatory Variables	Fixed Effect Model – Dependent Variable: GDP Growth rate		
	All Developing Countries	Low Income Developing Countries	Middle Income Developing Countries
Labour force growth rate	0.0771 [0.0837]	4.8594 [0.8450]	-0.3813 [0.8943]
Capital formation (% of GDP)	0.1158 [0.0000]	0.0749 [0.019]	0.1936 [0.0000]
Life Expectancy	0.0109 [0.8575]	0.0617 [0.0547]	0.1141 [0.2860]
Education Expenditure (% of GDP)	0.0858 [0.0913]	0.0359 [0.5804]	0.0079 [0.0064]
Inflation	-0.0011 [0.0968]	-0.0705 [0.0571]	-0.0732 [0.0457]
Agriculture, Value Added (% of GDP)	0.11344 [0.0038]	0.0462 [0.4593]	0.1375 [0.0223]
Manufacturing, Value Added (% of GDP)	0.0864 [0.2698]	0.5579 [0.0000]	0.2735 [0.0001]
Constant	8.0573	12.3869	17.329

	[0.0874]	[0.0262]	[0.0298]
F – Statistics (Probability)	0.0000	[0.0000]	[0.0000]
Random Effect Model – Dependent Variable: GDP Growth rate			
Labour force growth rate	0.0743 [0.0500]	5.4312 [0.8132]	0.9597 [0.7155]
Capital formation (% of GDP)	0.0769 [0.0000]	0.0740 [0.0101]	0.0956 [0.0000]
Life Expectancy	0.0623 [0.0115]	0.0717 [0.0347]	0.1215 [0.0012]
Education Expenditure (% of GDP)	0.0057 [0.0543]	0.0897 [0.1206]	0.1317 [0.0858]
Inflation	-0.0121 [0.5739]	-0.0497 [0.1476]	-0.0076 [0.7854]
Agriculture, Value Added (% of GDP)	0.1532 [0.000]	0.1744 [0.0006]	0.1358 [0.0000]
Manufacturing, Value Added (% of GDP)	0.1178 [0.0000]	0.4793 [0.0000]	0.0580 [0.0488]
Constant	8.0416 [0.0002]	16.8626 [0.0008]	8.2188 [0.0026]
F – Statistics (Probability)	[0.0000]	[0.0000]	[0.0000]
Hausman Test (Probability)*	[0.0201]	[0.2472]	[0.0366]

Note: Probability values are given in square brackets [ ], *Hausman test (H0: Random effect model is preferred to fixed effect model).

To decide which model is appropriate (Fixed Effect or Random Effect), Hausman Test is employed. The null hypothesis states that random effect is appropriate. We accept null hypothesis if probability value of Hausman comes greater than 5%). So based on the above table, we can accept null hypothesis that random effect model is appropriate in case of low income developing countries, while fixed effect model is appropriate for overall developing countries and middle income developing countries.

In the Table 1 we have shown relationship between human capital and economic growth with respect to developing countries. There are four columns in the table. First column shows the explanatory variables and other three columns exhibits segregation of developing countries into low income and middle income countries. The dependent variable is GDP growth rate.

The first explanatory variable is labour force growth rate. The Value of parameter is positive suggesting that labour force is growth promoting in overall developing countries. In fact labour is primary factor of production that contributes to economic growth. Various studies have confirmed the view that labour is growth promoting see for example (Islam (2004), Rosenzweig (1987), Daly and Regev (2007). The labour force growth rate is positive and insignificant in low and middle developing countries.

The second variable capital formation as a percentage of GDP, the parameter is positive and highly significant in all countries specification. The results are in accordance with investment multiplier theory which explains that there is positive relationship between investment and economic growth. The result confirms that capital along with labour force play an important role in the growth process of developing countries. Our results are in line with the studies of Hamid and Pichler (2009); Siddiqui (2009); Khan (2005) and Abramowitz (1955).

The parameter of life expectancy is positive and insignificant except low income developing countries where parameter is significant. The life expectancy or longevity enhances the economic growth in low income developing countries. Many studies also supported this view (Behrman and Schneider (1993); Chaudhary et al. (2010); Akram et al. (2006).

Educational expenditures also contribute in human capital formation and economic growth. Coefficient of educational expenditure is positive and significant in overall developing countries except the low income developing countries where it is insignificant. So, educational expenditure increases the human capital formation

that will further increase economic growth. Our results are compatible with the studies of Abbas 2001; Schutt (2003); Nasir and Nazli (2000) and Tsai et al. (2010).

The last two regressors i.e. agriculture value added and manufacturing value added are related with the commodity producing sector (CPS). In fact, commodity producing sector is the mainstay of the economy comprising two vital sectors: agriculture and industry. Almost both the variables show the positive relationship with the GDP growth except the low income developing countries. The result reveals that both agricultural and manufacturing output are enhancing that economic growth in these countries due to powerful backward and forward linkage with other sectors of the economy. Our results are in accordance with the studies (Wennekers and Thurik (1999); Soneta et al. (2006); Hussin and Ching (2013).

Table 2: Panel Results of Impact of Human Capital on Employment in Developing Countries

Explanatory Variables	Fixed Effect Model – Dependent Variable: Employment rate		
	All Developing Countries	Low Income Developing Countries	Middle Income Developing Countries
Labour force participation rate	0.3077 [0.0000]	1.2936 [0.0000]	0.9539 [0.0000]
Capital formation (% of GDP)	0.0116 [0.3277]	-0.0220 [0.1150]	0.0452 [0.0269]
Life Expectancy	0.0680 [0.0109]	0.2199 [0.0000]	0.4194 [0.0000]
Education Expenditures (% of GDP)	0.1649 [0.0597]	0.2287 [0.0030]	0.0403 [0.7268]
Inflation	-0.0093 [0.4643]	-0.0290 [0.0492]	-0.0019 [0.9269]
Agriculture, Value Added (% of GDP)	0.0570 [0.0016]	0.0507 [0.0490]	-0.2416 [0.0000]
Manufacturing, Value Added (% of GDP)	0.0882 [0.0179]	0.0427 [0.4259]	0.1582 [0.0000]
Constant	65.037 [0.0000]	33.0212 [0.0000]	40.9025 [0.0000]
F – Statistics (Probability)	0.000000	[0.0000]	[0.0000]
Random Effect Model – Dependent Variable: Employment rate			
Labour force participation rate	0.3402 [0.0000]	1.2849 [0.0000]	0.9927 [0.0000]
Capital formation (% of GDP)	0.0128 [0.2807]	-0.021 [0.1293]	0.0502 [0.0127]
Life Expectancy	0.0722 [0.0066]	0.2179 [0.0000]	0.2984 [0.0000]
Education Expenditure (% of GDP)	0.1730 [0.0472]	0.2190 [0.0000]	0.1605 [0.1502]
Inflation	-0.0082 [0.5176]	-0.0292 [0.0468]	0.0016 [0.9386]
Agriculture, Value Added (% of GDP)	0.0613 [0.0007]	0.0491 [0.0550]	-0.2325 [0.0000]
Manufacturing, Value Added (% of GDP)	0.0796 [0.0312]	0.0469 [0.3784]	-0.1801 [0.0000]
Constant	64.5077 [0.0000]	32.5305 [0.0000]	31.9110 [0.0000]
F – Statistics (Probability)	[0.0000]	[0.0000]	[0.0000]
Hausman Test (Probability)*	[0.0812]	[0.2484]	[0.5444]

Note: Probability values are given in square brackets [ ], *Hausman test (H0: Random effect model is preferred to fixed effect model)

To decide which model is appropriate (Fixed Effect or Random Effect), Hausman Test is considered. The null hypothesis states that random effect is appropriate. We accept null hypothesis if probability value of hausman

comes greater than 5%). So based on the above table, we can accept null hypothesis that random effect model is appropriate in case of low and middle income developing countries, while fixed effect model is appropriate for overall developing countries.

Now we discuss the results of impact of human capital on employment in developing countries. The results have been displayed in table 2. We have discovered the positive correlation between labour, capital and employment rate. The results of our study are consistent with the studies of Faridi et al., 2012; Daly and Regev (2007) and Ali et al. (2012).

Turning towards the variables in which we are more interested i.e. life expectancy and education expenditure that we are using as a proxy of human capital. Again both the variables appear with positive sign in all the specification. The results proposed that due to an increase in human capital employment rate of the developing countries accelerate. Our results are compatible with the studies of Mushtaq et al. (2013); Idrees and Siddiqi(2013) and Sabir (2002) .

The parameter of inflation is found to be negative with the employment rate in fixed effect model. The possible interpretation of this negative relationship may be that when the price level increases, aggregate demand falls leading to reduction in demand for labour and results in low employment. Our results are matched with the study of Rangarajan (2011). In random effect model, the inflation has positive impact on employment in middle income developing countries.

The final two regressors are agriculture value added and manufacture value added which are the bases of the economies of developing countries. Thus our results show that agricultural and manufacturing output augments the employment opportunities in these countries. Our results are similar to the studies of Baer and Herve (1966); Khan and Iqbal (2008) and Diao et al.(2007).

5. Policy Implications
Based on our findings we can suggest some policies in favour of human capital to enhance the employment and economic growth in developing countries.

Governments of developing countries should enhance the education expenditures to increase the human capital in these countries. For this purpose, governments should improve education by developing and constructing schools in rural areas of the country. Education system in primary schools should be strengthening. A policy of "no child out of school" should be ensured. Infrastructure of schools should be improved. There should be a check and balance on punctuality and regularity of teachers. Technical and vocational education should be promoted.

Government should start different training programs. E-libraries should be established for higher and technical education. Universities should give facilities to faculty and students to access the international journals by providing internet access to them. Advanced computer labs and modern technology should be provided in education institutes. Promotion of teaching staff should be linked with the performance of a teacher. Access to education should also be improved by reducing the cost of education which can be achieved through providing free books, providing scholarships to talented students and by providing special quota in higher education for remote areas.

To enhance the life expectancy (another variable to measure the human capital) the government should focus on the health sector because a healthy person can contribute more efficiently in economic activities. Basic health centres should be provided and free medicines should be provided to poor people. Government should also provide child-mother health care centres, clean water and better sanitation facilities. Governments of developing countries should also focus on the agriculture growth and development. Key industries should be promoted to provide job opportunities for technical and poor people and different youth employment schemes should be started.
The recommendations made hereinabove are in consonance with the results of the research carried out in view of the hypothesis thereby made. The results are practicable and worth implementation as a policy matter.

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