

IMPACT OF HUMAN CAPITAL DEVELOPMENT ON PAKISTAN'S ECONOMIC GROWTH

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ABSTRACT-The main objective of this paper is to check the impact of human capital development on Pakistan's economic growth. The study analyses the theoretical and empirical significance of human capital development and its impact on Pakistan's economic growth. We used secondary time series data from 1985-2014. The ARDL method has been used to check the short run and long run relationship between human capital development and economic growth. Augmented Dickey Fuller (ADF) test is used to check the stationarity of the variables. The results show that secondary school enrolment ratio, life expectancy and gross fixed capital formation have positive and statistical impact on the economic growth while inflation have negative but statistical impact on the economic growth. However, the labor force participation rate has positive & insignificant impact on the economic growth. Our empirical results show that the human capital development plays a crucial role for the economic growth of the country, so the government should enhance allocation of funds for education and health sectors.

Keywords: Human capital; economic growth; ARDL; ADF.

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1. INTRODUCTION

The human resource development is important in the way of the progress of any country especially in developing countries. The human resources development promotes the employment and improves the living standard of the people of the country. The human capital is more important than the physical and financial capital. Due to the less expenditures on the human capital and less attention of the government many problems creates, likes poverty, unemployment etc. Pakistan has lot of problems on their human capital. Many policymakers give the policies to promote the economic growth and the human capital formation in Pakistan but not sufficient results have attained. Pakistan government has less focus on the on the education and health which are the main instruments of the human resources development. The research is conducted to find out the impact of human resources development on economic growth of Pakistan. Competitive conditions in underdeveloped countries to work towards the development of the developed countries which faced on their way to take off quite different. The difference between the countries is important for the take off.

1.1. Main Research Questions

The main research questions of our study are stated as under:

- Is there any significant long-run & short-run impact of HRD on economic growth in Pakistan?
- Is there any causal relationship between HRD and economic growth in Pakistan?

1.2. Objective of the Study

The main purpose of the current study is to estimate the human resource development impact on the economic growth in Pakistan for the period of 1985 to 2014. The main objectives of study are:

- For empirically verify the effects of human capital development on the economic growth in Pakistan, both in the shorter and longer period.
- To evaluate the relationship between development of human resources and economic growth in Pakistan.

1.3 Significance of the study:

Numerous individuals in different studies have experimentally call attention to the effect of HRD on monetary development in the event of various economies. The financial development is measured in the diverse measurement. The noteworthiness of this exploration is to check the genuine proof on the connection between HRD and financial development of Pakistan. This study contrasts from different studies because of dissimilar results. The study has utilized Total national output (GDPPC) for the monetary development and different factors utilized as the supporting factors.

2. LITERATURE REVIEW

Ali *et al.* (2012), explained the impact of HCF (human capital formation) on the economic growth in Pakistan. The secondary and time series data had been used and the source as the economic surveys of Pakistan, SBP and World development indicator. They used the OLS (Ordinary Least Square Method) methodology for the empirical findings. The Gross Domestic Product(GDP) used as a dependent variables while the education enrollment index, head count ratio, gross fixed capital formation, infinite mortality rate, Gini coefficient, investment growth rate and inflation rate used as the explanatory variables. The study concluded that education enrolment index, Gini coefficient and gross fixed capital formation had positive and significant impact on the economic growth of Pakistan. While the head count ratio, infinite mortality rate, investment growth rate and inflation rate had negative but significant impact on the gross domestic product of Pakistan. They

suggested the policy that government should increase the education enrollment at all education level.

Asghar *et al.* (2011), described impact of expenditure in social sector on economic growth in Pakistan. They used time series data from 1974-2008. The source of data was the economic surveys and state bank of Pakistan. Economic growth used as a dependent variable while expenditure on education and health, government spending in low order, government spending on subsidies, government spending on economic and community used as the explanatory determinants. Study showed that the government spending on human capital development and spending on the economy and the public had significant and positive impact on the economic development of the country while the spending on law and order and on subsidies had negatively correlated with the economic development of the country. It was suggested that government should reduce the expenditure on subsidies and reallocated the expenditure on the law and order.

Samar, B. & Waqas, M. (2014) examined the role of capital formation in economic growth of the Pakistan. They used time series data from 1979 to 2010. They used GDP as dependent variables while gross fixed capital formation, education enrolment index, gini coefficient and infinite morality rate used as an independent variable. To check the stationarity, they used ADF test. To check the short run and long run relationship they used co integration and error correction model. They concluded that the human capital had a great impact on the economic growth of the country.

Abass, Q and foreman, J. (2008) explain the effects of human capital on growth of Pakistan's economy. The time series data were used and methodology they used Jonshan approach for the estimation. They concluded that the human capital the expenditure on education and expenditure health played an important role for the development of any economy especially in the less developed countries like, Pakistan.

The lack of the human development polices before the 1990 had negative impact on the economic growth of Pakistan.

Khan *et al* (2015) described the role of human capital on economic growth of Pakistan. They used time series data from 1972-2012. They used granger test for the estimation. The research and development, education and health used as the proxy of the human capital. The result concluded that the human capital had a impact on the economic growth. They formulated the policy that government should focus on the research and development, education and health and devoted the lot of funds for the human capital.

Channaret *al.* (2015) explained the impact of human capital on the effectiveness of the organization. They used the primary data and formulated the questioner used the probability sampling. T test concluded that the male and female both had equal chance for the human capital development. Efficiency of the organization was calculated as satisfaction and commitment level of the worker of the firm. The result showed that the human capital has positive and significant impact on the efficiency of the organization.

Abbas, Q. (2000) described the role of human capital in economic growth of the Pakistan and India. He used the annual data from 1970-1994 and the data source was the economic surveys, statically year book and world economic indicator. He used the gross domestic product (GDP) as a dependent variable and school enrolment ratio as the proxy of the human capital. The study concluded that the human capital the primary education enrollment rate had a positive impact on the growth of India. The secondary school enrollment rate in both countries had a positive impact on the economic growth. While the higher enrollment rate of the education had positive impact on the Pakistan economic growths while the negative impact on the economic growth of India.

Awan (2012) explained the importance of the human capital in Bric countries. He used the annual data from 2000 to 2011. The research was descriptive in nature. He used the applied statistic technique such as trend analysis, content analysis and ratio analysis to measure the change in variables. He concluded that the human capital played an important role in the economic growth of China, Russia, India and Brazil.

Imran.et al. (2012): investigated the link between the human capital and Pakistan's economic growth We used economic growth as depending variable while social spending used the proxy of the human capital. Social spending consisted on the expenditure on education, expenditure on health and other gross fixed capital formation and debt services payment. Co integration and Granger causality test used for the long run and short association. The result showed the association between gross domestic product and the human capital. They formulated the policy that government should increase the spending on the education and health which had a positive impact on the productivity and economic growth.

Jaiyeoba and Victoria, S. (2015) explained that the importance of human capital in any nation. The research investigated the link between investment in education, health and economic growth in case of Nigeria. They used the time series data from 1982 to 2011 and used the OLS and Johnson approach for the empirical results. The result explained the link between the expenditure on education, health and economic growth in long run. Health & education expenditure secondary and tertiary enrolment ratio and gross fixed capital formation had a positive and significant impact on economic growth. They formulated the policy that the government spends the lot of funds on education and health to remove the poverty from Nigeria.

Khan, S. (2005) analyzed the human capital and economic growth in Pakistan with the others countries. He used the time series data from 1980-2002. The used GDP as a dependent variable while the gross fixed capital formation, CPI inflation,

per capita income, gross secondary enrollment, adult literacy rate and life expectancy used as independent variables. The result indicated that the large investment on the human capital had the positive and the significant impact on the economic growth of the country. The government should give the higher priority on the social spending in the country that stimulated the economic growth and also improved the living condition of the citizens of the country.

Sacerdoti et al (1998) investigated the impact of human capital on the economic growth of Africa. They used the growth equation method for the empirical findings. They concluded that the private capital had a great impact on the economic growth of the West Africa. Similarly, the human capital played the tremendous role on the economic growth of the Africa but in this study the investment in human capital was not statically significant. They used the other variables that effected the economic growth like, term of trade, trade openness, government deficit and total government investment. The policymaker suggested the policy that promoted the private investment and the skills of the workers of the country.

3. RESEARCH METHODOLOGY

In this study the gross domestic product per capital is a dependent variable while secondary school enrollment ratio and life expectancy used as the proxy of human capital development used as explanatory variables. Other control variables are used inflation, gross fixed capital formation used as control or independent variables. This some portion of study has concentrated on the utilitarian and econometric type of human capital improvement and monetary development.

Table 1 Selected variables

Variables	variables Explanation	Measurement Unit
Dependent variable		
GDPPC	GDP per capita	Annual (%)
Explanatory variables		
SSER	Secondary School enrollment Ratio	Total Enrollment in secondary Education in %
GFCF	Gross fixed capital formation	% of GDP
LE	Life expectancy	Rate
INF	Inflation	Inflation Rate (Average CPI) % change
LFPR	Labor Force Participation Rate	Labor Force Participation Rate

Table 1 shows the relationship between dependent and independent variables. The GDPPC (Gross Domestic Production Per capita) is a dependent variable and is taken in Pak Rupee. The human capital development is consisted of education and wellbeing. The secondary school enrolment rate utilized as the proxy of the education and life expectancy. Wellbeing and training are the principle part of the human capital advancement. The Gross fixed capital formation is taken as % of Gross domestic product and the data is collected from Economic survey of Pakistan.

The basic aim of Secondary education after completion of primary education is development of the human capital. Inflation rate and labor force participation rate are used as explanatory variables and the data is collected from World Development Indicators.

3.1 Data and sources

To check the relationship between human capital development and economic growth in Pakistan, time series data has been used from 1985-2014. The review of the study

explains the different variables which effect the economic growth and different researcher used these variables in their research. Various sources of data used to collect the data about different variables. The data regarding fixed capital formation, interest rate. Secondary school enrolment rate and labour force participation work drive interest rate, auxiliary school enlistment and future information is taken from Economic Survey of Pakistan, while data relating to the other variables have taken from World Bank, State Bank of Pakistan and Ministry of Finance, Government of Pakistan.

3.2 Model Specification

This research focused on the impact of human capital development on economic growth of Pakistan. The different researcher used different variables as the proxy of the human capital development. Some researcher used the index of human capital development and some used separate variables. We used Auto Regressive Distribution Lag (ARDL) to study relationship between variables.

Johnson co-integration test has lot off drawbacks, to overcome these drawbacks Pesaran *et al*, (2001) developed the new approach of co-integration that is called the ARDL approach. ARDL is a mixture of autoregressive and distributed lag model.

ARDL approach is valid then the other approaches for many reasons which are presented as;

- a) ARDL technique of co-integration produced unbiased and efficient results.
- b) ARDL explains the short run and long run results in a single equation.
- c) No serial correlation is occurred due to the ARDL technique.
- d) ARDL explains that the variables are stationary at the different levels.

Stationary is defined as that if the mean co-variance, and variance are constant or the same then the data is said to be a stationary. If the data is not covered the assumption of constant mean, variance and co-variance then the data is said to be a non-stationary.

To check the stationarity in the data we have used "unit root test". The ADF test is also used to check the stationarity of the data. This study follows long run "Solow Growth Model" which shows that there is a relationship between the output and input. Our study focuses to measure the impact of human capital improvement on financial development of Pakistan.

The Solow model can be explained as below.

$$GDP = f(L, K)$$

Extended growth model

$$Y = f(L, K, \text{Human capital development})$$

$$GDPPC = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 SSE + \beta_4 LE + \beta_5 INF + \epsilon_i \quad (1)$$

Where

GDPPC = Gross Domestic Product Per capital

L= Labor Force participation rate

K = Gross Fixed Capital Formation

SSE= Secondary School Enrollment Ratio

LE= life expectancy

Zi = Matrix or the set of additional control variables in our model.

Zi = f(INF).

This model is based on the equation 1, that show the relationship between human capital formation and economic growth. The variables of human capital formation are secondary school enrollment ratio and the life expectancy rate.

Putting the value of Zi in equation 1

$$GDPPC = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 SSE + \beta_4 LE + \beta_5 INF + \epsilon \quad (2)$$

In the econometric frame β_0 demonstrate the capture and β_1 indicate coefficient of work drive p β_2 demonstrate the coefficient of capital, β_3 is coefficient of optional school enlistment proportion, β_4 demonstrate the coefficient of future while β_5 demonstrate the coefficient of Expansion and ϵ demonstrate the blunder term.

$$\begin{aligned}
 (GDPPC)_t = & \alpha + \sum_{i=1}^{z1} \alpha 1i (GDPPC)_{t-i} + \sum_{i=0}^{z2} \alpha 2i (GFCF)_{t-i} + \sum_{i=0}^{z3} \alpha 3 (INF)_{t-} \\
 & i + \sum_{i=0}^{z4} \alpha 4 (LE)_{t-i} + \sum_{i=0}^{z5} \alpha 5 (LFPR)_{t-i} + \sum_{i=0}^{z6} \alpha 6 (SSER)_{t-i} + \varepsilon_i \dots (3)
 \end{aligned}$$

The equation 3 explains the relationship between human capital formation and economic growth of Pakistan. The parameters of β_i demonstrate the long run relationship between explained variable monetary development and explanatory determinants secondary school enlistment proportion and future rate. Where δ demonstrates the short run relationship of Auto regressive distributed lag models. ε_i is the residual term.

$$\begin{aligned}
 \Delta (GDPPC)_t = & \gamma_0 + \sum_{i=1}^{k1} \gamma 1i (GDPPC)_{t-i} + \sum_{i=0}^{k2} \gamma 2i (GFCF)_{t-i} + \sum_{i=0}^{k3} \gamma 3i (INF)_{t-} \\
 & i + \sum_{i=0}^{k4} \gamma 4i (LE)_{t-i} + \sum_{i=0}^{k5} \gamma 5i (LFPR)_{t-i} + \sum_{i=0}^{k6} \gamma 6i (SSER)_{t-i} + \lambda (ECM)_{t-i} + \varepsilon_i \dots (4)
 \end{aligned}$$

To check the long run relationship between the variables is the main concerns of the study. The ARDL approach is used for the empirical results and the F test value.

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \text{ (No Co integration)}$$

$$H_1 = \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0 \text{ (Co integration)}$$

The null hypothesis explains that there is no association between the variables while if one variable is not equal to zero then the long run relationship exists between the variables. We contrasted F-ascertained esteem and the basic qualities presented by Pesaran et al. (1996). On the off chance that the processed estimation of F is bigger than basic estimation of bound test invalid theory demonstrate that no co reconciliation among the variable is rejected. On the off chance that the figured F measurement esteem is not exactly the basic estimation of bound test the invalid theory is picking that there is relationship among the factors.

If human capital development and economic growth are linked for the long period of time, then the long run variables can be approximated by applying the 3 equation and equation 4 shows the short run parameter of physical infrastructure and economic growth. Equation 3 explains the long run parameter of human development variables and economic growth.

4. DATA ANALYSIS

4.1 Correlation matrix of variables

The correlation matrix of the variables explains the association between the variables its value lies between +1 to -1. The sign shows the positive or negative association between the variables if the sign is positive then the relationship between the variables is positive if the sign is negative then the relationship between the variables is negative.

Table: 1 Correlation matrixes of variables

	GDPPC	GFCFC	LFPR	INF	LE	SSE
GDPPC	1					
GFCFC	0.062637	1				
LFPR	0.28	0.36	1			
INF	-0.30856	-0.05161	0.02	1		
LE	0.05722	0.61189	0.30	0.276999	1	
SSE	0.29668	0.59374	0.10	0.374236	0.851238	1

Source: Author's calculation

The matrix correlation shows the pair wise relationship between the variables. In the above table the association between the GDPPC and gross fixed capital formation the coefficient is 0.062 and the sign is positive. The correlation between labor force participation rate and GDPPC is also positive and the coefficient is 0.28. The correlation between inflation and GDPPC is negative sign which indicates that the relationship between inflation and GDPPC is negative and the coefficient is -0.30. The relationship between GDPPC and LE is positive and the coefficient is 0.057 similarly the positive link between SSE and GDPPC and value is 0.29.

Table 2: Results of ADF Test

Intercept		Intr. & trend	Intercept	Intercept & trend	Integration
GDPPC	-3.38*	-	-	-	I(0)
LFPR	-	-5.41509*	-	-	I(0)
GFCF	-	-	-	4.776021*	I(1)
SSE	-	-	-6.496680*	-	I(1)
LE	-	-	-	-3.8660*	I(1)
INF	-	-	-7.775093*	-	I(1)

Table 2 explains the results of ADF test. The ADF shows the results some variables are stationary at level and some are at first difference that is why the ARDL is a suitable technique for empirical analysis. The table indicates the GDPPC is stationary at the level and labor force participation rate at level at 5%. While net settled capital arrangement, future, optional school enlistment proportion and swelling are stationary at first level I (1). The factors are stationary at various levels that are the reason ARDL strategy is best for the econometric estimation.

4.2 Bound test result

In this section the result of the bound test is discussed. The bound test is used to check the co integration of the variables. In the bound test the F value and the upper and lower bound values are compared if the F values is greater the bound value then

long run association occur between the variables but if the F values is smaller than the bound value than there is no relationship occur between the variables.

Table 3: Result of bound test

Models	F Statistic	1% Critical Value Bounds		2.5% Critical Value Bounds		5% Critical Value Bounds		10% Critical Value Bounds	
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
GDPPC,LFPR, GFCF,SSER,LE,IN F	7.56	3.7 4	5.0 6	3.2 5	4.4 9	2.8 6	4.1	2.4 5	3.5 2

Sources: Author’s calculation

Table4.3 demonstrates the consequence of the bound test. The invalid speculation is that there is no long run relationship between the factors however the invalid theory is rejected on the grounds that the F esteem is more prominent than the bound esteem. The long run association exists between the GDPPC and human capital development. The F value is greater than the upper bound and lower bound value at 1%, 2.5%, and 5% and at 10% level.

4.3 Long run Results

Table 4 shows the Long-run Results of the human capital development and economic growth. The dependent variable is economic growth per capita. The independent variables are Secondary school enrolment ratio and life expectancy used as a proxy of the human capital and gross fixed capital formation, inflation and labor force participation rate use as the explanatory variables.

Table 4: Long run Results

Dependent Variable: GDPPC				
ARDL(2, 0, 0, 0, 0, 2)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GFC	0.240773	0.083420	2.886266	0.0180
LFPR	0.011304	0.07129	0.158565	0.8750
INF	-0.237916	0.045333	-5.248127	0.0005
E	0.257114	0.133021	1.932880	0.0453
SSE	0.329395	0.029770	11.064512	0.0000
C	-0.573664	9.219158	-0.062225	0.9517

Source: Author's calculation

The table 4 explains that due to one unit increase in a GFC 0.24 units increase in gross domestic production per capita. Similarly, the one unit increase in LFPR 0.011 units increase in the GDPPC. Inflation and GDPPC has negative relationship. Due to one unit increase in life expectancy GDPPC 0.25 units increase and statically significant. SSER and GDPPC has positive and significant relationship and significant. Gross fixed capital formation; inflation and secondary school enrolment ratio has statically significant while other explanatory variables have insignificant.

4.4 Error correction Model

The error correction model explains the dynamic model that the speed of the dependent variables returns to independent variables. ECM model explains the short run results of the dependent variables and independent variables.

Table 5: Error Correction Model results

Dependent Variable: GDPPC				
ARDL(2, 0, 0, 0, 0, 2)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDPPC(-1))	2.277554	0.454805	5.007764	0.0007
D(GDPPC(-2))	1.076443	0.278121	3.870414	0.0038
D(GFC)	0.297064	0.308094	0.964200	0.3601
D(GFC(-1))	-0.432755	0.302507	-1.430562	0.1863
D(GFC(-2))	0.663167	0.314402	2.109296	0.0641
D(INF)	-0.322902	0.137165	-2.354117	0.0430
D(INF)	0.261484	0.117787	2.219978	0.0536
D(LFPR)	0.002114	0.013143	0.160811	0.8733
D(LE)	9.167739	4.972021	1.843866	0.0983
D(LE(-1))	-128.10190	32.116853	-3.988619	0.0032
D(SSE)	-0.206200	0.096365	-2.139792	0.0610
D(SSE(-1))	0.617613	0.163416	3.779401	0.0044
D(SSE(-2))	0.352389	0.130293	2.704595	0.0242
CointEq(-1)	-4.349504	0.691602	-6.289023	0.0001

Source: Author's calculation

ECM explains the variables convergence its equilibrium path because it shows that how quick or slow the targeted path. Short run period GDPPC, GFCF, LE and LFPR positive and statically significant. ECM value is -4.34 t value -6.28 and p value is 0.0001 the results shows that we attained the equilibrium path and T value explain the significant and p values also explain the significant association of the variables in this model.

5. FINDINGS AND RESULTS

The goal of this study is to check the impact of human capital development and economic growth in Pakistan. For the econometrics results the time series data is used from 1985-2014. To check the suitable technique for the econometric results first check the stationary through the unit root test. The results of ADF test shows that the variables are stationary at the different level I (0) and I (1) the ARDL method is best for econometric results. Bound test also used for check the long run association between the variables if the F values is greater than the upper and lower bound values the there is a long run relationship between variables. ECM values show the convergence into the equilibrium path. The all factors except the work drive support rate has huge effect on GDPPC. The expansion has negative however noteworthy effect on the monetary development of the Pakistan.

6. CONCLUSIONS

The objective of this paper was to analyze the effect of human capital advancement on the monetary development of Pakistan. The study analyzed the empirical and theoretical significance of the human capital development on Pakistan's economic growth. Time series data was used from 1985 to 2014. First results of the unit roots test of ADF show the mix trends as some variables are stationary at level and some are at 1st difference, which suggest the ARDL approach to co-integration. The ARDL test examined the short run and long run results. The core variables of our research study was the secondary school enrollment ratio, which is the proxy of human capital and life expectancy also has positive and significant impact on Pakistan's economic growth. While gross fixed capital formation and inflation has significant impact on economic growth. Inflation has the negative relations with the economic growth. Thus, we conclude that secondary school enrolment and life expectancy play as a crucial role in the economic development of the country.

Investment in education, health and the social infrastructure is an imperative need to accelerate the pace of economic growth in the Pakistan.

7. POLICY RECOMMENDATIONS

As indicated by the discoveries of the exploration, now the researcher can propose taking after arrangements in the support of human capital advancement to upgrade the financial development.

- The government should focus on the human capital and physical capital but the development should be according to the need of economy
- For the economy of Pakistan government should investment on such projected which promoted the human capital development.
- Government should increase the expenditure on the education and health both development expenditure and non-development expenditure.
- Government should focus on providing the free education for all and o construction of new schools.

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