

THE EFFECT OF INVESTMENT IN HUMAN RESOURCES ON ECONOMIC GRWOTH OF DEVELOPING COUNTRIES

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Abstract

This study basically examined the effect of investment inhuman resources on economic growth of developing countries. It used a panel dataset comprise of 98 middle and upper middle developing countries over the period 1981-2014. The dataset comprises 12 observations for each country at three year intervals. Analytical technique was the Hasuman test which showed that fixed effect model is appropriate for our research analysis. The results obtained from using fixed effect model were quite interesting. That is, Gross enrolment ratio from primary to tertiary, infant mortality rate , school life expectancy, gross capital formation, consumer price index (at 10 per cent level) and poverty head count ratio showed a significant effect on growth whereas GINI index was insignificant to influence economic growth. The study concludes that gross enrolment ratio, poverty head count ratio and consumer price index has an adverse effect on annual growth rate i.e. they are negatively related. Similarly the study also concludes that infant mortality rate, school life expectancy, gross capital formation and GINI coefficient have positive effect on growth of countries. Thus it is concluded that different variables have different effect on economic growth.

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1. Introduction

In this world of globalization, human resource has taken the prime most position without which no country can think of making any progress. The level of skills of population, their knowledge, efficiency, productivity, health standards and educational qualities along with organizational abilities and far sightedness are considered as an active source in the process of economic development of a country. All of these are important in influencing a country's economic progress and are called human resources of a country.

Investment in human resources is a process, refers to the transformation of people of a country into workers (labor force or manpower) that can produce goods and services. The individuals which are relatively unskilled, during this process are given the tools they require to contribute to the economy. It is vital to the long run economic progress of a country, and gives the same advantage as new technologies or more effective and advanced industrial equipment. While this process consumes time, it usually gives a high standard of living within the country in just a few decades, or even sooner. This process can be attained through the use of better health policies, education or training opportunities. The concept of investment in human resources is as old as the subject of economics and goes back to the period of Adam Smith. Actually the concept of people as "human resources" was tackled in 1776 by the "father of classical economics", Adam Smith in his book "An Inquiry into the Nature and Causes of the Wealth of Nations". Similarly other classical economists were also of the view that investment in human resources increases economic growth manifold. Since 1950's the concept of human capital was used widely by many Economists and social scientists in many aspects, methods, modes, situations and ways (Bryant, 1990), however in 1960 the formal idea and concept emerged out of the work decent by two American Economists, Theodore Schultz and Gary Becker. According to Becker, education is an investment. "Education adds to our human capital just as other investments add to physical capital". The pioneer in human capital theory, Schultz (1972), divides the investment in human resources into investment in children, Pre-school learning activities, schooling and

higher education, post-school training and learning, health, migration and information.

To investigate how investment in human resources effect economic growth, a panel of 98 developing countries was selected on the basis of their income. For selecting the countries, the World Bank classification was adopted. According to this classification economies are divided by 2016 GNI per capita, calculated using the World Bank Atlas method i.e. the groups are: low income, \$1045 or less; lower middle income, \$1,045 - \$4,125; upper middle income, \$4,126 - \$12,736; and high income, \$12,737 or more. A full list of all the countries according to their level of income is included in the appendix. Beside income, there is large difference in their gross domestic product, capital formation, inflation, income inequality, health standard and poverty. This will helpful in general understanding the effect of investment in human resources on economic growth.

2. Literature Review

Harbinson and Myers, (1964) without sufficient power of human in term of quality like health, knowledge and skills, the other resources like capital and natural resources can hardly be exploited. The development of human resources is the most important source (key input) and condition for economic growth.

Mankiw *et al.*, (1992) in his research used cross country analysis and found that the enrolment rate of secondary school has strong relationship with human capital.

In agriculture, there is 2-5% annual increase in output due to extra year of farmer's schooling in Malaysia, Ghana and Peru (Birdsall, 1993).

Duflo (2000), in Indonesia found that there is 1.5 to 2.7% increase in wages due to building of extra school per 1,000 children.

According to Bils and Klenow (2000), the greater per capita income growth is attainable only in those countries which have high school enrolment rate. In such countries improvement in productivity is the result of rate of high enrolment in education. According to them, there exists a deep long term relation between enrolment rate with growth and enhancement and progress in productivity is directly related to the standard of education.

Abdullah and Sharif (2003) empirically verified the contributions of human resource development efforts in economic growth in Bangladesh

by using Lucas (1988) and Romer (1986, 1990) endogenous growth models. The results showed that there is positive correlation between HRD activities and economic growth process. Furthermore, investments in education have played crucial role in stimulating role and R&D expenditure have shown a weak but positive contribution in growth of the country.

Ranis (2004) debated and analyzed the relationship and linkage between human development and economic growth. He sought out that human development is bound to have impact on economic growth or they are mutually responsive and the individuals should be allowed more to pursue occupation in which they are most productive. He further suggests that levels of education and health should have the priority to enhance growth.

Mohun *et al.*, (2010) in their research in Mauritius, “the impact of education on economic growth” found that in the development of country, human capital play an engine role. It directly improves the output level. In Mauritius economy human capital not only increases output but also results in the introduction of new technology in the country. Further they found that there is 60% role of capital formation in the economic growth of Mauritius gross domestic product. All of such, results in growth of human capital accumulation and labor force. Their research evidently found that education is not a device that increases employer ability but also it enhanced productivity.

By using co-integration and vector error correction techniques Khan, Ahmad and Jawad (2011) examined the time series analysis between education and economic growth in Pakistan. Their research consists of data period from 1980-2009. The relationship was examined in the presence of Capital stock and labor force as these variables effect economic growth. They found that there exists a significant and strong relationship between education and growth in Pakistan in long run only however, they didn't find any significant relationship in short run.

Abdalla *et al.*, (2013) empirically investigated the impact of human capital on economic growth in Sudan covering the period from 1982-2009 by using simultaneous equation model. The model linked human capital that is school attainment and investment in education and health to economic growth, total productivity, FDI and human development index. Based on the outcome of the results from three stage least square technique the quality of education and health has a detrimental and

positive role in economic growth. Total factor productivity which mainly represents state of technology has adverse effect on economic growth.

Daniel, I.O. (2014) reveals that GDP is positively influenced by health indicators in the long run and a high level of economic growth can be achieved by improving health status of the populace in general.

Onisanwa (2014) investigated the impact of health on economic growth of Nigeria by using Cointegration and Granger causality techniques with quarterly time series data for the period of 1995-2009. the findings reveals that GDP is positively influenced by health indicators in the long run and a high level of economic growth can be achieved by improving health status of the populace in general.

Investment in human resources is the most important source of economic growth. It not only increases productivity but also leads to technological advancement. Nowadays, the progress rate of human resources, determine the difference between developed and developing countries. If a country has educated, trained, skilled and healthy humans, the results will be in the form of high productive economic activities or vice versa. In short, there exists an enormous difference in the quality, leadership and productivity of human resources which has advanced and relevant training. Similarly, advanced and relevant training of teachers, formal and informal schooling (educations) and good textbooks also support efficient human resources. Better health has significant effect on human resources; shortly all of these in turn increase productivity. All of these draw an indispensable lesson to developing countries. Thus, the objective of this work is that to check empirically the effect of investment in human resources on economic growth using panel data. This will further justify the importance given to the investment in human resources. This research will provide a guideline for developing countries in the field of investment in human resources. Moreover, it provides the reasons how the variables of investment in human resources effect growth. Further this research will reveal critical areas that were not still explored.

The study deals with the following objectives:

- i. To analyze the effect of investment in human resources on economic growth of developing countries.
- ii. To find out relationship between investment in human resources and economic growth in countries with different income level that is, lower middle income and upper middle income developing countries.

The study deals with the following hypothesis:

- i. There is no effect of investment in human resources on economic growth of developing countries.
- ii. There does not exist a similar effect of investment in human resources on economic growth of lower and middle income developing countries.

3. Methodology

In this study, secondary panel dataset is used to find out the effects of investment in human resources on economic growth of developing countries. The panel dataset is comprised of 98 countries, that are, 27 Asian countries: Armenia, Azerbaijan, Bangladesh, Bhutan, China, India, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kyrgyzstan, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Pakistan, Philippines, Sri Lanka, Tajikistan, Thailand, Timor Leste, Uzbekistan, Vietnam and Yemen; 22 American countries: American Samoa, Belize, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru and Suriname; 27 African countries: Algeria, Angola, Botswana, Cameroon, Cape Verde, Congo, Cote d'Ivories, Djibouti, Egypt, Gabon, Ghana, Kenya, Lesotho, Libya, Mauritania, Mauritius, Morocco, Namibia, Nigeria, Saotome, Senegal, South Africa, Sudan, Swaziland, Syrian, Tonga, Tunisia and Zambia; 10 European countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Montenegro, Romania, Serbia, Turkey and Ukraine and 11 others countries: Fiji, Kiribati, Marshall Islands, Micronesia, Palau, Papua, New Guinea, Samoa, Solomon Islands, Tuvalu and Vanuatu. Each dataset will comprise of 12 observations for each country at three years intervals. The data was collected from World Development Indicators (WDI), Human Development Reports, UNESCO AND World Development Indicators and each country's official's sites and surveys.

To study empirically the effect of investment in human resources on economic growth, a single model is estimated. Analytical technique will be the Hausman Test. Further, this test will determine whether to use Fixed Effect Model or Random Effect Model for the study. Simply this test provides an appropriate model for analysing the effect of investment in human resources on economic growth of developing countries.

Following Mankiw, Romer, Weil (1992) and Sajid Ali, Imran Sharif Chaudhry, Fatima Farooq (2012), GDP= Gross Domestic Product is

taken as a function of investment in human resources along with HCR = Head Count Ratio, GCF = Gross Capital Formation, GINI = Gini Coefficient, CPI= Consumer Price Index, GERPT = Gross education enrolment ratio from primary to tertiary, SLE = School life expectancy and IMR = Infant mortality rate the model is written as;

$$GDP = \beta_0 + \beta_1 (CPI) + \beta_2 (HCR) + \beta_3 (GCF) + \beta_4 (GINI) + \beta_5 (GERPT) + \beta_6 (SLE) + \beta_7 (IMR) + \varepsilon \quad \dots\dots\dots (1)$$

Where GDP = Gross Domestic Product,
HCR = Head Count Ratio,
GCF = Gross Capital Formation,
GINI = Gini Coefficient,
CPI= Consumer Price Index, and
GERPT = Gross Education Enrolment ratio from Primary to Tertiary,
SLE = School Life Expectancy,
IMR = Infant Mortality Rate,
 ε = Error Term

4. Results and Discussions

This test is applied to see whether fixed effect is appropriate for out model or random effect is appropriate. The hypothesis in this test is as,
H0: Random effect is appropriate

H1: Fixed effect is appropriate

If the probability of test is below 0.05, then the alternative hypothesis of fixed effect will be accepted against null hypothesis while if it is above 0.05 then the null hypothesis of random effect will be accepted. The following are the results obtained from Hausman test.

Table 1: Result of Hausman Test (Test cross-section random effects)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	15.880050	7	0.0262

From the above table, the probability is below 0.05 therefore, the alternative hypothesis is accepted against null hypothesis, that is, fixed effect model is appropriate. The probability is significant therefore favouring the alternative hypothesis of using fixed effect model.

This section represents the results obtained from the countries fixed effects model. The below table shows the estimation of the model

using countries fixed effects. The coefficients of all variables are strong and statistically significant at 5 % level except for GINI and CPI, which are not statistically significant at this level. CPI is significant at 10% level. Further the coefficients of CPI, GERPT and HCR are negative while all others are positive. The R-squared (= 0.56) means that the model is good fitted. It is a good sign in case of panel data. Further it means that independent variables jointly explained dependent variables by 56 %. Simply it indicates that 56 % of the variation in the regressand can be explained by the regressors. The probability of F-statistic is significant that is 0.004 showing the whole model a good fitted. The Durbin Watson value is 2.41 which is near to the standard range of no serial correlation.

Table 2: Results from Panel Least Square with Country Fixed Effects
 (Dependent Variable: Gross Domestic Product (growth annual %))

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.542810	8.217907	0.187738	0.8517
CPI**	-0.065671	0.034775	-1.888464	0.0634
GCF*	0.031179	0.009302	3.351851	0.0013
GINI	0.034618	0.121251	0.285504	0.7762
GERPT*	-0.670450	0.247610	-2.707682	0.0086
HCR*	-0.149103	0.060170	-2.478012	0.0158
IMR*	0.249597	0.083973	2.972357	0.0041
SLE*	3.745948	1.470141	2.548019	0.0132

Cross-section fixed (dummy variables)

R-squared	0.568073	Mean dependent var	4.523184
Adjusted R-squared	0.286666	S.D. dependent var	3.051564
S.E. of regression	2.577323	Akaike info criterion	5.020554
Sum squared resid	438.4112	Schwarz criterion	6.100746
Log likelihood	-232.1305	Hannan-Quinn criter.	5.458686
F-statistic	2.018690	Durbin-Watson stat	2.410307
Prob(F-statistic)	0.004946		

Note: (*) Indicate that variable is significant at 5% level, (**) Indicate that variable is significant at 10% level

The first table analyses data of all lower and upper middle income developing countries i.e. 98 countries. It contain gross domestic product or annual percentage growth (GDP) as the dependent variable and consumer price index (CPI) (noted in the second column), gross capital formation

(GCF) shown in the third column, Gini index (GINI) in fourth, gross enrolment ratio from primary to secondary as expressed as (GERPT) in fifth, head count ratio for poverty or the percentage of population living below the \$ 1.90 per day poverty line (HCR) in sixth, mortality rate of infant (IMR) in seventh and school life expectancy (SLE) in the last column as regressors.

The coefficient of CPI (= - 0.06) in second column is negative, however, is statistically insignificant at 5 % level while significant at 10% level. This shows that, other thing remaining constant, one per cent point increase in CPI, decreases annual growth rate by 0.06 %. This result is in agreement with the findings of Barro (1995) that there is a negative relationship between growth rate and inflation.

The coefficient of GCF (=0.03) is statistically significant showing positive relationship. It implies that, *ceteris paribus*, the one per cent increase in GCF increases the annual growth by 0.03 %. Thus we found an expected result of significant positive relationship with evidence. This finding confirms that economy grows faster with higher capital formation Abramovitz (1955).

The GINI shows an unexpected positive coefficient. However statistically its probability is higher therefore it is insignificant meaning that it is not significant to explain the dependent variable. Further its coefficient (= 0.03) means that one per cent increase in GINI that is, income inequality increases the annual growth by 0.03 %.

The coefficient of GERPT (= - 0.67) implies a negative relationship with annual growth. This is also an unexpected result due to negative sign. However, the probability value is statistically significant that is it can explain the dependent variable significantly. Its coefficient means that a one per cent increases in GERPT reduces the annual growth by 0.67%. This represents a totally unexpected result against the literature however the fact is that during the past decades the school enrolment ratio has increased but due to uncertain situation like financial crisis, Arab Springs, war in Iraq and Afghanistan, war against terrorism in Pakistan, instability in African countries, all such reflects a strong negative impact on education enrolment from primary to tertiary so, directly influence the annual growth rate. Therefore, negative correlation is found. Another reason is that during last decades, population growth rate of almost all developing countries are usually greater than growth rate. Due to which the enrolment ratio with respect population has increased but actually

showing downsizing of investment with respect to population rate therefore represents a negative effects.

The HCR for measuring poverty reflects a negative relationship with dependent variable that is annual growth rate. Further it is significant to explain the dependent variable. Its coefficient ($= - 0.14$) indicates that One per cent decrease in HCR, increases growth by 0.14 %. This is an expected result. It is also evident statistically that poverty head count ratio and growth rate are negatively related. Similarly it is accordance with Cingano (2014) who found that income inequality has a negative and statistically significant impact on subsequent growth across OECD countries over a period of 30 years.

IMR another factor of investment in human resources shows a positive relationship with annual growth rate. The probability is below 0.05 therefore reflecting a significant relationship, meaning that it can explain growth significantly. It is a health indicator. The coefficient of IMR ($= 0.24$) indicate that, other thing remaining constant, a one per cent increase in IMR increases growth by 0.24 %.

The school life expectancy also shows a positive relationship. The probability value is below 0.05 therefore statistically it is significant to effect annual growth rate of GDP. The coefficient of SLE means that a one per cent increases in SLE brings about 3.74% positive changes in growth. Simply it indicates that with the increase of school life expectancy, annual growth increases. It is an expected result, similar relation was empirically studied by Cooray (2009), he also found a direct, significant and positive relationship between SLE and annual growth rate. Among all the variables school life expectancy showed the strongest relationship with annual growth of gross domestic product.

All the results were significant except for GINI. Similarly all relationship of the variable were expected to be the same as were expected except, GINI showed an expected positive relationship as compared to negative. However in the above circumstances of insignificance GINI is insignificant to explain the dependent variables.

5. Conclusion and Recommendation

This study was conducted to know about the effect of investment in human resources on economic growth of developing countries. The main objectives of the study were to analyze the effect of investment in human resources on economic growth of developing countries and to find

out relationship between investment in human resources and economic growth across countries.

The study reveals that investment in human resources in the form of gross enrolment ratio (quantitatively measurement of education) decreases growth due to uncertain internal and external situation of lower middle and upper middle income countries. This represents a totally unexpected result against the literature however the fact is that during the past decades the school enrolment ratio has increased but due to uncertain situation like financial crisis, Arab Springs, war in Iraq and Afghanistan, war against terrorism in Pakistan, instability in African countries, all such reflects a strong negative impact on education enrolment from primary to tertiary so, directly influence the annual growth rate. Therefore, negative relationship is found. Another reason is that during last decades, population growth rate of almost all developing countries are usually greater than growth rate. Due to which the enrolment ratio with respect population has increased but actually showing downsizing of investment with respect to population rate therefore represents a negative effects.

On the basis of conclusion of this research it is recommended that

It is no doubt that the annual growth rate along with all variables of almost all developing countries has performed well during the past decades, that is, the significant reduction in poverty head count ratio i.e. - 0.14 per cent along with increased gross capital formation i.e. 0.03 percent reflects a good positive sign.

The investment in human resources with respect to school life expectancy and health i.e. 3.74 per cent and 0.24 per cent are also far better than before however still there is a large gap, need a lot of attention. The gross enrolment ratio i.e. - 0.67 % has a great adverse effect on a country economy. To achieve a sustainable long run growth it required a deep focus, as nowadays all production of goods and services are knowledge intensive (Galbraith, 1973) and the real fact is that knowledge can only be improved through by making investment in education that is investment in human resources.

Furthermore, the developing countries should adopt a policy of free education for all children in the primary and secondary level, as it directly improve enrolment ratio as seen in Pakistan, China and India. For high tertiary education enrolment a policy of scholarships, fee concession and student loans program should be adopted like Pakistan and India. As it not only increases enrolment ratio but also enhance quality, directly affect growth of a country.

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