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NEXUS BETWEEN HUMAN CAPITAL ACCUMULATION AND ECONOMIC GROWTH

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ABSTRACT

Present study examines the effect of human capital accumulation and its influencing variables such as expenditure on education and quality of education, labor force, free trade and investment and its impact on economic development which can be measured in terms of Gross Domestic Product and GDP per capita. The data for the current study is comprised of economic indicators from almost 181 countries around the globe while using the panel technique. The outcome of the study suggest that enhancing the quality level of education through increasing the budget expenditure for education sector will result in capable work force which will in turn promote the economic growth of our country, similarly funds reimbursements towards fixed capital and free trade are also major determinants of economic development. The present study is also unique in terms of data collection from a vast number of countries to generate the empirical findings related to the topic.

Keywords: Skilled work force, Panel data, human capital accumulation, economic growth, brain drain, free trade, quality education, educational expenditure

INTRODUCTION

Contemporary litterateur like Schultz and Gary Becker are among some of those intellectuals who put the concept of human capital accumulation into fifteen minutes of fame. The bed rock of the conception was laid by Adam Smith a begetter of economics and Alfred Marshal in eighteen centennial. This inceptive idea of human progression has become a matter of engrossment for several academicians since then. The level of cognitive skills among inhabitants of a community is a precursor for the green advancement of that region (Gary S Becker, Murphy and Tamura 1994). About seven decades back a handful of theories were developed regarding personnel development (Schultz, 1961).

Human asset has a far reaching impact on hereafter generations as compared to any other master plan (Mincer, 1985). The valuation of the work force is set on multifarious characters including expertise in specialized spheres of arts and science (Cote and Healy, 2001). Man power has preeminence over machine power due to innumerable constituents including intellect power. Leadership of any country has to create new horizons of learning other than formal education which may include cognitive learning, on the job training, remote erudition and skill development programs at federal level. Each individual is born with distinctive capabilities which discern them from one another.

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Human capital is categorical in nature with the following stratums of systematic intellectualistic and patron loyalty (Edvinsson and Malon, 1997). In organizations an affirmed amount is tumbled for the acquisition of financial assets, while laxness is contemplated to acquire competent human capital. Work force competency is the adroitness which is substantiated in human being along with emolument of knowledge with their life span (Kumar, 2006).

Human capital is so sophisticated in the sense that it stems from an assortment of training with knowledge and experience with an astute job attitudes. Both external and internal components of environment are uppermost factors towards the work performance. The amplitude of data available for human guidance is not a leading character for their mental growth, the virtue behind the knowledge is an actual cause of human development. The proficient worker is an adequate source of engendering for the entire population of the country. Microeconomic indicators reaching the desired level of performance are found to be allied with the learnedness of the individuals of that economy. The technological advancements in the areas of remote learning can further the chances of growth estimates in any country.

Demographic components have consequential collision on almost every aspect of the economy of a particular region. Demographic revolutions in the form of age, gender, ethnicity and education collectively and individually play their role in the modulation of the society. Various approaches towards the development of growth theories can be found. One of the classical approach regarding growth and socio-economical ontogenesis was unfolded by Trevor Swan and Robert Solow during the year of 1950. The concept was sanctioned as a neoclassical growth model. The crux of the model was to flourish a conjoin between the level of output with the ratio of input. The preeminent investment in the form of labor and capital prompt in exceptional economic development was the key idea behind neoclassical growth theory. These classical models set no room for other social indicators for development which can't be discounted from the list. Human workforce is an immense source of asset that can't easily commutable like other tangible assets Human soundness and well-being plays a primitive role for the advancement of an economy. However, the traditional growth models seem to be reluctant while catering these soft aspects of human resources. Vocational advancements have multifaceted impact towards the growth accumulation, as these strategies can stabilize the relationship between contribution of capital and growth of economy. Neoclassical approaches towards production cynosure the law of demand and supply for market stability. This approach towards theories of economics focus on mathematical aspects and empirical evidences are taken as granted. Practicality of this approach is bounded due to its conceptual background while ignoring the substantial economic estate. Meanwhile the above mentioned approach reiterates the lower order needs of the labor pool of any specific region, while under rates the significance of higher order needs of personnel. However, in absoluteness the organizations and countries which convene the soft skills of their inhabitants are more inclined towards the artery of consummation. In the plight of Asian nations the prosperity and eminence of these populace during the last three decapod is evidence that there are certain other concealed factors towards the road of success available excepting the role of technology in the rebuilding of Nations. The above mentioned extraneous specimen composed another perspective in the field of economic literature which was widely noted as "endogenous growth models", (Romer, 1986). During past few years scholars in the fields of social sciences have been hustling to test these hypotheses. To get the empirical finding and to generalize them on disparate industries an incalculable effort is continue till time (Barro, 1991; R.M.Solow, 1956). This lead to the idea towards the conception of grow model in long haul (Mankiw et al., 1992). The focal point pervasive in these theories is the bunching up of earning overtops. Earnings per share go up as the result of utilization of accumulated dividends from the previous years (Goetz and Hu, 19996). The advent of contemporary ideas of growth bygone the "Malthusian model". The advocates of Malthus concept were in support of lower population in order to maintain standard of living, they criticize the family size and consider it as an exclusive measure of sluggish economy. The dividend increments are at higher pace beneath the equilibrium level and remittance goes down over and above the level of symmetry (Gary S Becker et., 1994)). With the intellectual movements contribution made towards the masses results in the augmentation of capital with in the country. Because the main sources of competitive advantage is the able work force rather than corporeal accumulation of resources. The creatural treasure is equipped with distinct capabilities which enable the administration of any country to attain strategic vision in the remote future (Gary S Becker et al., 1994). Mechanical upgrading models are no doubt a rationale for the betterment of the society (Dalgaard and Kreiner, 2001). The concept of industrialization was a major contribution towards the industrial revolution. The bifold or dual sector model of growth supports the population of rural areas towards the promotion of urban sectors where industries can absorb the surplus manpower from agriculture sector. Community progression is a source of economic advancement if the human capabilities are utilized strategically. Human development indicator (HDI) is a way of scrutiny of social

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Literature Review

The wealth of any nation is a key factor towards the growth and development of its inhabitants. The citizenry of any country collectively plays an important role in the stoutness of the nationwide interest. As humans being are the main component to run any organization soundly, same way human capital is a vital sign for the bright future of any geographical region. When an enterprise is financially sound its management makes decision to further its capital by making investments in a prudent way. On best way to acquire this target is investing in its people. Investment in people results in knowledge workers who contribute towards the attainment of strategic objectives of the organization. Same is the case of public administration of any country, by sound and sufficient investment made on human development can yields higher gains by efficient usage of resources.

This idea originates the concept of Hicks-neutral back in 1932. This model presented an evolutionary concept of growth which can be implemented on various capital techniques as well as distinct human power of the nation. With the emergence of such a prototype for intuitive development and growth solves the dilemma of spontaneous maturation in such a dynamic era specifically in the East Asian region. The population of a country that is in a fine fettle are considered as a standard of long run growth for economies of Asian region. The above results were procured after a precious analysis of data from these countries related to above mentioned factors (Hassan, 20010).

Endemic evolution is not practicable without the meaningful contribution by its civic component. Even through a country can be politically free but to be at the level of fiscal deliverance (Bils and klenow, 1998) the contribution by its members in good terms is out of question (Grubb et al., 2004);(Sen, 1999). The two major contributors on this subject are worth mentioning includes Hanushek and Kimko in the year 2000. A historical record with a considerable effort was assembled for the year's bitwixt 1965 till 1991. The implication of that longitudinal study comprised of accomplishments in the areas of mathematics and scientific disciplines from over and above 38 countries. After thorough research study constructed and administered by the scholars naming Hanuskek and Kimko, a comparison of major findings indicated a fine relationship among level of education and gross domestic product (GDP). The matter of discussion is quality of tutelage not the quantity. A far reaching precision of education is not just comprised of work force capital of a country or financial expenditure made by governments for the growth of its masses but it also cover the cost bread by parents and guardians of young natives of that country. A sound schooling system of any nation that has the ability to harness distinct capabilities through aptitude development is crucial to enhance productivity of its masses (Prados de La Escosura and Roses,2010). Development of any sort is a challenge for the supervision of any country. The concept of human development can be traced from the history of early civilization. Adam Smith was an exceptional philosopher and economist in the sense that he laid down the founding stone in the field of theory after a noteworthy analysis regarding development of a nation. However, Thomas Malthuswas one great scholar in the meadow of economics who fabricated a potent process for the viable growth of a country (Gary S Becker et al,. 1994).

In order to traverse the linkage among organizational growth and its counterparts it was observed that genesis in the burgeoning of economic inducement was the result of drilling of human asset (Lucas Jr, 1980). Similarly, the negligence towards the standards of intellectual capital cost the nation in the long run. Intuitive learning is even more related to self-actualization. The work force who cater their inner needs through attainment of education and prosper due to intrinsic factors are never surpressed by external chaotic situations (Lucas Jr, 1988). Gross domestic product (GDP) is overelaborated by various consequential standards, one of them is personage evolution is the fields of knowledge and skill. A heedful observation from slow grow model provides a lucid indication of economic development due to skillful labor force of a country. Scientific advancement after industrial revolutions and then state of the art inventions which are endowments by informational technology can cause strategic development of a country in the long run as broached by a-neo-classical growth model. Research and development expenditures are amongst one of those capital decisions if made after a careful analysis can benefit the nationa in real gross domestic build-up(Romer, 1990). To realize the interconnection betwixtfiscal expenditure in the semblance of education sector and the revenues generated by the civilians of any country, a longitudinal survey study during the time period of 1980-2009 was escorted.

In the above mentioned study scholar put it into light the concept of social movement by figuring out gross domestic production (GDP), conversely man power contributions, ratio of financial income segregated for education

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sectors and acquisition of some cast-off material were type indicators for capital accumulation. These results were appropriate for the remote future however, if generalized for shorter span on time can yield contrast results (Kakar et al., 2011). Skill worked force and dividend formation can be put into connection, however, gross fixed capital formation (GFCF) as well as pedagogy of citizens are found to have trifling impacts towards improvements of economy during a transitory duration of time (Kakar et al., 2011). Experienced capital is an undeniable actuality towards breakthrough of developing nations. Individual interests can also be traced back from their educational potentials. Individuals equipped with feasible dexterities as a result of 12% supplementary schooling are supposed to be more socio-economically settled as compared to untutored adolescent population (Lemieux and Caurd 2001).

Communal participation adjoined with their educational dexterity paves the way towards political stability. United States and United Kingdom are the countries where megalopolitan population has a sound impact on political transposition of the country (Milligam, Moretti, and orepoulos, 2004). It is worth mentioning to narrate certain type of connection among educational level, civic sense and robustness of the society. Indoctrination is not only a necessity for mental health but it is salient factor towards somatic soundness of personnels. Research indicators have been designating lack of education and awareness as a paramount facet towards hospitalization (Arendt, 2008).

Literacy advancement among protuberance of any geographical region has sagacious influences aver the standard of living of their co-members. The numeracy and oracy ability of the residents of any country can results in a prompt progression in each sector whether it is agriculture, industrial, health, higher education or transportation. That's the reason why scholars attempt to investigate any connector prevailing in the growth of National Income (NI) and the quality of educational facilities available for the civilian of that region (Coulombe and Tremblay, 2006). One of a rigorous study was administered with the help of facts and figures provided by organization of economic development and cooperation (OECD). The material was collected from the statistics of fourteen individual member states.

"Health is wealth", is an old proverb. It is best befitted in current dynamic environment with higher uncertainty. The countries with financial and socio-economic prosperity are found to be having literacy index along with a mediating role of health sector (Gross man, 1972). The disbursement made on fitness and health of live ware motivates the individuals towards higher order needs. On the examination of educational level of variegated sovereign states, few labeled with centennial percentages viz. Finland, Green land, North Korea and Norway are among such states, the region facilitating their workforce with lofty learning prerequisites are fortunate in reaching average life span of human over and above eighty years. The leadership of the country who is unenthusiastic about the medicament facilities dispensed to the commonalities are welcomed with a sluggish growth quota in assorted stratum of trade and economics (Gross Man, 1972). Time, Resources and efforts focused during pandemics and other convulsions impediment any sort of monetary augmentation.

A critique study was executed in the populated province of China state to button down any eloquent conjunction enclosed by education and welfare of labor pool of that province; exceptionally the resulting data endorse the development of the region with the level of education of its clan (Gong, Li and Wang, 2012). However, population immensity in itself is nevertheless a gauge of its dividend surge. Revenue earned after the deductions of inflation impacts represent the income level in its real terms (Bucci, 2008). Wealth creation as a matter of gratuity for its stake holders is another dilemma which exclaims for punctilious empirical evidence; however, trying to create a linkage between capital accumulation and a variable socio-political juncture is not admissible. A sufficient chunk of the worldly population is still living under impecuniousness. Endeavors to reduce exiguity should be brought into an alignment with sophisticated indoctrination. According to a ballpark figure about seven hundred million people are continuing their lives with almost poorness. Considering the case of Pakistan disregarding an admiring growth rate in the financial precinct income inadequacy is over and above thirty nine %. For the reason, it's pertinent to upgrade apprenticeship in order to reap the brilliant proceeds in the form of fiscal gains. Primary and secondary health affliction for the underprivileged stratum of the region can aftereffect in superior standard of living in distant future.

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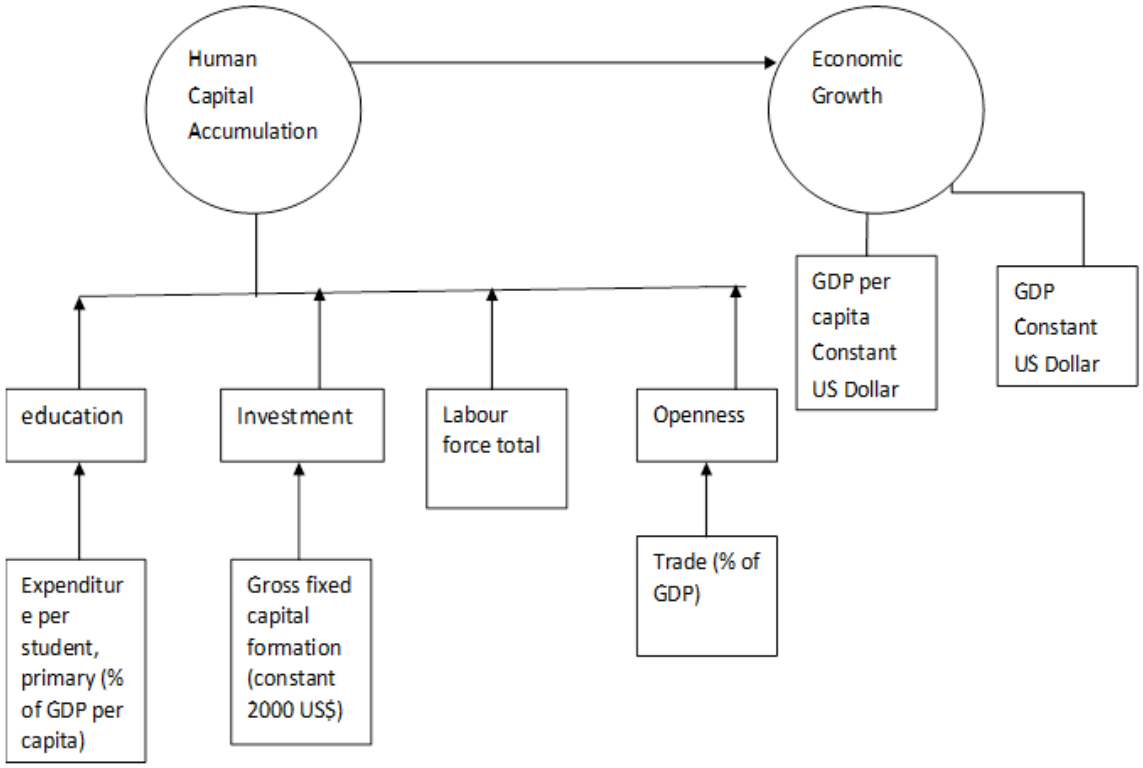
Theoretical Framework

We described our theoretical framework with the help of figure 1. GDP per capita (Constant US $ 2000) and GDP (Constant US $2000) are used as proxies of dependent variable i.e., economic growth.

Figure.1. Theoretical Framework



The independent variable is human capital accumulation and the proxies for the variable are labor force total, gross fixed capital formation (constant 2000 US$), expenditure per student, primary (% of GDP per capita) and trade (% of GDP).We measure the main variables through their proxies and then evaluate the impact of independent variable on dependent variable and the intensity of the impact, if there is.

Data, Variables and Methodology

In this study, we used the panel data of 180 countries round the globe. This includes developed, developing and under developed nations. The data of all variables are collected from the World Bank economic Indicators. We used the annual data without transformation. The list of countries included in our sample is given in Appendix 1.

Variables

The main variables used in present study are human capital and economic growth. We used different proxy variables for both. The proxies for human capital are labor force total, trade (% of GDP), expenditure per student primary (% per capita of GDP) and gross fixed capital formation (constant 2000 US$). Labor force has been used by many researchers in the previous studies like (Chi, 2008; Kakar et al., 2011; Kumar, 2006; Prados de la Escosura & Rosés, 2010)and many others. The sign for this proxy is (+) in some cases and (-) in others. In our study our expected sign for this proxy is (+).(Bucci, 2008) used openness to trade in its study and found a positive and significant impact. The expected sign for our study is (+).The expenditure on education of a single student at primary level is mostly used to proxy human capital accumulation. This proxy is used by (Chi, 2008; Kakar et al., 2011) . The positive and significant impact is noticed. We also expect a positive and significant relation of expenditure on education in our study. The data is in % of GDP constant US$ 2000. Gross fixed capital formation is

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used as a measure of net investments in fixed capital assets of one year. GFCF is a concept of macroeconomics.(Kakar et al., 2011). The researchers like (Kakar et al., 2011) used this proxy to evaluate human capital accumulation. The impact is positive and significant.in our paper, we are also hopeful for a positive and significant impact. Economic growth is mostly measured in terms of CPI, HDI or GDP. In our study we will study it with respect to GDP. The proxies used for the evaluation of economic growth are GDP, GDP per capita , future labour income, GDP expenditure on education, real GDP and per capita income etc,. there are also many other proxies used by researchers to evaluate economic growth of a country .

GDP at customer's prices is total value added by all manufacturers in the economy adding product encumberment and less subsidies excluded from the product's value. GDP is calculated without deducting depreciation of prevaricated assets or for deficiency of natural resources. Data we used is in constant 2000 U.S. dollars. Figures in dollar for GDP are transformed from home currencies using 2000 official exchange rates. For some countries where the official exchange rate does not interpret the rate effectively applied to actual foreign exchange, a substitute conversion factor is used.(Mundial, 2011) previous researchers (Arayama & Miyoshi, 2004; Barro, 1991; Benhabib & Spiegel, 1994; De Meulemeester & Rochat, 1995; Gemmell, 1996; Kawakami, 2004; KRUEGER & LINDAHL, 2001) used it as proxy of economic growth. The second proxy we used for GDP is GDP per capita. GDP per capita is not a measure of personal income. It is also assumed that it is the amount a country earned from per citizen in a year. Researchers like (Wei et al., 2001; Yao & Zhang, 2001) used this proxy for evaluation of economic growth. It has a positive and significant impact. We also expect to have a positive impact in our study.The positive sign indicates the proceeding towards productivity and prosperity of the country on the per capita basis.

Methodology

The models previously used all encounter the problems of endogenity, omitted variable biasness and weak instruments etc. in order to overcome this situation I used panel data, models of fixed effects and random effects as we have a large set of data with cross country analysis at different time periods. Through literature we also found it helpful that panel data is most suitable for evaluation of our data.Fixed effects and random effects models are most significant and extensively used techniques over others to conduct panel data analysis.In previous studies different researchers convey different explanationstoadopt thesemethods. C. Dougherty (2007)suggested a conditionto choose panel data regression model, if sample is randomly chosen from population then writers should must apply both approaches, fixed effects and random effects model. After applying the both panel data approaches authors necessarily conductHausman's specification test, the null hypothesis"difference in coefficients not systematic"shouldbe discarded and authors should go for fixed effects model, if the above mentioned test delivers significant result. If Hausman's specification test results are insignificant than researchers should go for random effect model and should apply further tests i.e. Breusch Pagan Lagrange multiplier test afterwards. The null hypothesis "no random effects" will be rejected if the above mentioned test produce significant results and random effect model will be applied. Contrary, if test results are insignificant than pooled ordinary least square (OLS) regression model is best fit to use.Fixed effects is basically a model in which intercept differs across the cross-sectional unit while slope coefficients are persistent.On the other side random effects model treats cross-sectional unit and variation withinit. Our proposed fixed effects and random effects models are as follows:

First economic indicator GDPit1

$$GDP_{it}^{1} = \beta_{0i} + \beta_1 LAB_{it} + \beta_2 INV_{it} + \beta_3 EDU_{it} + \beta_4 TO_{it} + u_{it}$$

$$GDP_{it}^{1} = \beta_{0i} + \beta_1 LAB_{it} + \beta_2 INV_{it} + \beta_3 EDU_{it} + \beta_4 TO_{it} + u_{it} + e_{it}$$

Second economic indicator $GDPPC_{it}^{2}$

$$GDPPCi_{it}^{2} = \beta_{0i} + \beta_1 LAB_{it} + \beta_2 INV_{it} + \beta_3 EDU_{it} + \beta_4 TO_{it} + u_{it}$$

$$GDPPC_{it}^{2} = \beta_{0i} + \beta_1 LAB_{it} + \beta_2 INV_{it} + \beta_3 EDU_{it} + \beta_4 TO_{it} + u_{it} + e_{it}$$

Where;

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$HCiit$ = Human Capital Accumulation of country i at time t

EG_{it} = Economic Growth (GDP) country i at time t

GDP_{it} = GDP (in constant US$) i at time t

$GDPPC_{it}$= GDP per capita (in constant US$) i at time t

LAB_{it} = Labor Force (Total) country i at t

EDU_{it} = Education (as expenditure on education in % of GDP per capita) of country i at time t

TO_{it} = Trade openness (ratio of import, and exports to GDP) of country i at time t

β_{0i} = y-intercept of country i

u_{it} = Error Term of country i at time tor between country error

e_{it} = Within country error

Results and discussion

In this section we describe the outcomes of econometric models used in this study to examine the effect of human capital on economic growth of 180 countries and to get some insight into the relationship among variables. We started with the descriptive statistics. The results are presented in table 1.

Table 1 Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
GDP_{it}	5217	23.14398	2.431627	16.13369	30.16809
$GDPPC_{it}$	2254	7.709059	1.597987	4.618463	11.12069
TO_{it}	4821	84.9043	51.12587	6.320343	460.4711
INV_{it}	3541	22.26416	2.258511	12.55595	28.44076
EDU_{it}	1825	15.14946	8.225153	0	67.6661
LAB_{it}	3525	14.86802	1.803091	10.37706	20.49955

Table 1 shows the observations for all variables and also describes the mean and standard deviation for our sample. Standard deviation values indicate the diversity of data. Overall, descriptive statistics indicate verify the normality in data.

We checked the correlation among our variables prior to apply main model. Correlation analysis simply gives relationship between two variables. Purpose of this analysis is to describe nature of the relation between two variables. The analysis is unable to describe the extent to which one variable impacts another variable. It tells us about the liner relationship between variables. The correlation analysis of the study is shown in table 2.

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Table 2: Correlation Matrix

	gdpnew	**gpdpca~w**	**tradeo~p**	**gcffnew**	**expend~d**	**labnew**
gdpnew	1.0000					
gpdpca~w	0.4167 0.0000	1.0000				
tradeo~p	-0.1407 0.0000	0.3381 0.0000	1.0000			
gcffnew	0.9844 0.0000	0.5054 0.0000	-0.1284 0.0000	1.0000		
expend~d	0.1489 0.0000	0.2771 0.0000	-0.0036 0.8836	0.1594 0.0000	1.0000	
labnew	0.7117 0.0000	-0.1648 0.0000	-0.3620 0.0000	0.6552 0.0000	-0.0483 0.0786	1.0000

Correlation analysis show a positive and significance correlation between economic growth and human capital accumulation. Economic growth has a negative correlation with independent variable trade openness. The value of this correlation is -0.1407 and insignificant for GDP. Economic growth has a positive correlation with control variable labor force. The value of this correlation is 0.7117 and significant at level of 1%. Economic growth has a positive correlation with education. The value of this correlation is 0.1489 and found significant. Economic growth has a positive correlation with variable investment. The value of this correlation is 0.9844 and significant at 1% level of significance. As far the GDPPC is concerned, there is a significant and positive relation between trade openness, gross fixed capital formation and education expenditure with GDPPC but labor force has a negative and insignificant relationship. Another purpose of this table is that it detects the possible chances of muticollinearity. Rule of thumb is that correlation between two independent variables must be less than 0.8. Therefore, our variables are free from any damaging impact of correlation. Thus, we can proceed with our main model of fixed or random effect.

The results of fixed effects model shows that human capital has positive and significant impact on economic growth in 180 countries. The results of this model are illustrated in table 3. Independent variables investment, education, labor force and trade openness have positive and significant relationship with economic growth. As investment with a coefficient value of 0.3466661, education with 0.0031509, labor force with 0.788371, and trade openness with 0.0014367 is significant at 1% level of significance. It means that if there is improvement in human capital accumulation then economic growth of countries will also increase significantly. The values of three R^2 are as follows; overall R2 has value of 0.7617 which shows explanatory variables can explain 76.17 % variation from in the panel of 180 countries, within R^2 has value of 0.8157 which means explanatory variables can explain 81.57% variation from one year to another year in the panel, and between R^2 has value of 0.7685 which means explanatory variables can explain 76.85% variation from one country to another country in the panel. This model is good fit as F-statistics 119.37 is significant.

Table 3: Fixed Effects Model with GDP

Variable	**Coef.**	**R. Std. Err.**	**t**	**Sig**
TO_{it}	.0014367	.0003881	3.70	0.000**
INV_{it}	.3466661	.0440733	7.87	0.000**
EDU_{it}	.0031509	.0014084	2.24	0.027*
LAB_{it}	.788371	.0973296	8.10	0.000**
Constant	4.384468	1.119766	3.92	0.000

Notes: Observations = 1110, F test = 119.37**, within = 0.8157, between = 0.7685, overall R^2= 0.7617. The ** and* mean that variable is significant at 1% and 5% level of significance respectively.

We also applied a random effects model to cross check our estimations under fixed effects model. The results of random effects model again shows that human capital accumulation has positive and significant effect on

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economic growth of 180 countries. The results of this random effects model is shown in table 4. Independent variables education expenditure, labor force, trade openness, and investment have positive and significant relationship with economic growth. As investment with a coefficient value of .5333343, education with .0025999, labor force with .4460194, and trade openness with .0010349 is significant at 1% level of significance is significant at 1% level of significance. This means that if improvement in human capital increase then economic growth of 180 countries will also increase significantly. The values of three R^2 are as follows; overall R2 has value of 0.9066 which shows explanatory variables can explain 90.66% variation from in the panel of 180 countries, within R^2 has value of 0.7825 which means explanatory variables can explain 78.25% variation from one year to another year in the panel, and between R^2 has value of 0.9103 which means explanatory variables can explain 91.03% variation from one country to another country in the panel. This model is good fit as Wald chi^2 1058.58 is significant.

Table 4: Random Effects Model with GDP

Variable	Coef.	R. Std. Err.	t	Sig
TO_{it}	.0010349	.0003963	2.61	0.009**
INV_{it}	.5333343	.0408297	13.06	0.000**
EDU_{it}	.0025999	.0012192	2.13	0.033*
LAB_{it}	.4460194	.0591246	7.54	0.000**
Constant	5.073393	.5708109	8.89	0.000

Notes: Observations = 1110, Wald chi2 = 1058.58**, Within R2 = 0.7825, between = 0.9103, overall = 0.9066. The ** and* mean that variable is significant at 1% and 5% level of significance respectively.

We applied Hausman's test to check whether fixed effects or random effects is more preferable model. The result of this test with Chi^2 24.60 and probability 0.0004 is significant and proves that a fixed effect is preferable over random effects model.

Fixed Effect and Random Effect for GDP Per Capita

The second proxy variable for economic growth is the GDP per capita. We have applied both random and fixed effects models for this proxy. The results of fixed effects model are illustrated in table 5. The results of fixed effect model again shows that human capital has positive and significant impact on economic growth in 180 countries. Independent variables investment, education, labor force and trade openness have positive and significant relationship with economic growth. As investment with a coefficient value of .3911951, education with .3911951, labor force with .0788458, and trade openness with .001871 is significant at 1% level of significance. This means that if there is improvement in human capital accumulation then economic growth of countries will also increase significantly. The values of three R^2 are as follows; overall R2 has value of 0.2446 which shows explanatory variables can explain 24.46 % variation from in the panel of 180 countries, within R^2 has value of 0.8246 which means explanatory variables can explain 82.46% variation from one year to another year in the panel, and between R^2 has value of 0.2668 which means explanatory variables can explain 26.68% variation from one country to another country in the panel. This model is good fit as F-statistics 116.34 is significant.

Table 5: Fixed Effects Model with GDPPC

Variable	Coef.	R. Std. Err.	T	Sig.
TO_{it}	.001871	.0002935	6.38	0.000**
INV_{it}	.3911951	.0381306	10.26	0.000**
EDU_{it}	.0035927	.0017587	2.04	0.046*
LAB_{it}	.0788458	.0716926	1.10	0.276
Constant	-2.007977	.7630013	-2.63	0.011

Notes: Observations = 477, F test = 116.34**, within = 0.8246, between = 0.2668, overall R2= 0.2446. The ** and* mean that variable is significant at 1% and 5% level of significance respectively.

The results of random effects model again show that human capital has positive and significant effect on economic growth in 180 countries. The results of this model are illustrated in table 6. Independent variables investment, education, labor force and trade openness have positive and significant relationship with economic growth. As investment with a coefficient value of .4367587, education with .0043643, and trade openness with

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.0020787 is significant at 1% level of significance. Only there is insignificant relation of labor force with -.1477642.It means that if there is improvement in human capital accumulation excluding labor force then economic growth of countries will also increase significantly. The values of three R^2 are as follows; overall R2 has value of 0.5763 which shows explanatory variables can explain 57.63 % variation from in the panel of 180 countries, within R^2 has value of 0.8065 which means explanatory variables can explain 80.65 % variation from one year to another year in the panel, and between R^2 has value of 0.5918 which means explanatory variables can explain 59.18% variation from one country to another country in the panel. This model is good fit as Wald chi2 is 563.72 and significant.

Table 6: Random Effects Model with GDPPC

Variable	Coef.	R. Std. Err.	T	Sig
TO_{it}	.0020787	.000297	7.00	0.000**
INV_{it}	.4367587	.0331984	13.16	0.000**
EDU_{it}	.0043643	.0017308	2.52	0.012*
LAB_{it}	-.1477642	.0657408	-2.25	0.025*
Constant	.0193983	.7657622	0.03	0.980

Note: Observations = 477, Wald chi2 = 563.72**, Within R2 = 0.8065, between = 0.5918, overall = 0.5763. The ** and* mean that variable is significant at 1% and 5% level of significance respectively.

To check the best fit model, we again used the Hausman's test. The results for the Breusch and Pagan Lagrangian multiplier test shows Chi2 value 37.14, and probability 0.0001 ,proving fix effect the more suitable model than random effect model for GDP per capita.Our results show that there is positve and signifcant relation of human capital accumulation and economic growth in 180 countires. These results are in accordance with previous studies , as many researchers have proved positive and significant effect of investment on economic growth (Alexander, 1996; Angrist & Lavy, 2002; Barro, 1991; Côté & Healy, 2001); Dessus et al. (2001); (Kakar et al., 2011; Lucas Jr, 1988; Mincer, 1958; Norton, 2001; Petty & Hull, 1899; Romer, 1990; R. Solow, 1997; Teles & Andrade, 2008; Uliana et al., 2005; Van Leeuwen, 2007; Weiss, 1995; Young, 1995).These findings confirms that if invesmenton education can be made effeivtly then it is certain that economy of their countiry grow daramatically. But there are many problems faced by these countries which hinders the level of invesmtnet or expenditure in these countries. The mojor of these countries is courrptuion, lack of resources, unemployement, poor tax collection and lack of merit and independent decision of private spender on education. All these problems cause unskilled labor force and low standards of education in these countires. These probems hinders the flow of investment in education and economic growth. the policy makers of these countires can take serious actions to remove these problems and conentrate on education infrastrsture. If Governement and policy makers of these countries effectively make development plans and execute them perfectly then it is certin that it attracts the public to finance in education.

The private public expenditure on education can promote the trade and productivty of labor. When people start their business poverty and unemplomet is elminate automatically and personl income of an indivdual is imporve. When people of these countires have resaonabale income then they start saving. When they have resonsable saving then they start investing in new business and ventures. When these new business opate sucessfully then lot of probem of Governement is resolve satisfactoraly. Governmenent should increase the budget for education in these countries . so public consider gaining education as important factor for life like earning. Governement is cabable enough to build tax free zones, accqirung latest inverted technology and imrpoving infrastructure. If Government constantly and effectively invest public education then it attract foregin investoers and reverse brain drain along with private invesmtent on edcucation from parents and projects of foreign investors.If the education expenditure and trade openness is treated in a right manner as they deserve to be. The workers of these countries working aborad will return to their homes. These returned workers may start business and serve their nations. The value of these retruned worker will improve productivty dramatically. The economices of these countires can grow at great pace.

Conclusions and policy implications

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The prsent study endorse with out-turns observed in previous studies conducted to identify the significance of human capital towards economic growth. The aim of the study was to probe any deviation if present between the positive relationship of investement and economic development aggregation obtained through fixed effects model depicts that human resources asset have profound implications for economic growth per capita constant US dollars. All the predictor variables were found to be with a positive sign. The positivity implies for significance of realtionship, which hints out that capital accumulation in any form results in certain type of boom in economies of multiple countries.

The research work made during this duty is fruitful for policy makers, entreprenuers, government administrative department academicians, scholars and resource planners, as the recommendations of the present study demand for reasonable investment in the eductaion sector to promrote skill levels of the labor force as it is the strong source of human develpement and economic expension. Education sectoe should be promoted both publicly as well s private partnership sould be encouraged with startegic pplanning.

Present study is unique in a way that it focused on multiple dimensions of human capital as compared to a particular region. However, present study incorporate the data from over and above 179 countries. Skilled workforce such as engieers, doctors lawyers, staticians, ecoomicsts and economic advisors are the real developers of any economy. However, a new dilemma that developing cuntries are facing is the issue of “brain drain” which means the intellectual capacity of the country is inclined to migrate from home countries to developed states. Due to globalalization and availability of work in industralizes states the educated population of the country tends to move on towards developed nations. So this issue needs to be focused in future studies. Furthur studies can be conducted with taking into account a number of other dimensions which are not discussed in present study. Current study also highlights that there is a room for future scholars in the area of brain drainage of skilled work force and impact of this issue on human capital accumulation as well as economic growth.

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APPENDIX.

LIST OF COUNTRIES

A	Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan.
B	Bahamas, The, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi.
C	Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Rep., Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic.
D	Denmark, Djibouti, Dominica.
E	Ecuador, Egypt, Arab Rep., El Salvador, Eritrea, Estonia, Ethiopia.
F	Fiji, Finland, France.
G	Gabon, Gambia, Georgia, Germany, Ghana, Greece, Greenland, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana.
H	Haiti, Honduras, Hong Kong, Hungary.
I	Iceland, India, Indonesia, Iran, Islamic Rep., Iraq, Ireland, Israel, Italy.
J	Jamaica, Japan, Jordan
K	Kazakhstan, Kenya, Kiribati, Korea, Rep., Kuwait, Kyrgyz Republic
L	Latvia, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg.
M	Macao SAR, China, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Monaco, Mongolia, Morocco, Mozambique.
N	Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, North America, Norway.
O	Oman
P	Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico.
Q	Qatar
R	Romania, Rwanda.
S	Samoa, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic.
T	Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu.
U	Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan.
V	Vanuatu, Venezuela, Vietnam.
Y	Yemen,
Z	Zambia, Zimbabwe

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