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Impact of Human Capital on Economic Growth: A Case of SAARC Countries

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Abstract
The study intends to examine the influence of human capital on the 10-year economic growth of SAARC nations. It comprises of one explained, three explanatory and two control variables. A panel data regression, fixed effect, random effect model and hausman specification tests were applied in the study. Econometrics findings found that labor force has significant impact on GDP/capita of SAARC countries whereas government spending on education and primary school enrollment had no discernible effects on economic growth. The results of our research offer guidance on how the national government can invest on human capital to promote economic growth.
Keywords: Economic growth, Human capital, SAARC countries, Labour Force, Inflation

1. Introduction

Effective development programs and strategies play a vital role in mobilizing the economyof any nation including, mobilization of money and human resource that eventually results in economic growth. Moreover, budgetary support helps in achieving a desired economic growth. On another side, human resource is quite significant in boosting economic development and growth as it not only helps a country to witness a rise in human capital outcome but it also improvesthe living standards, provide job opportunities and decreases poverty. It has been observed that in most of the countries, human capital has a significant impact on economic growth (Khatoon, Javed, & Hayat, 2021). Human capital is an intangible source which consists of skills, knowledge and experience owned by groups or individuals within the population. Social indicators like skills, life expectancy, knowledge and education are collectively referred to as human capital (Ali & Rehman, 2015; Kazmi, Ali, & Ali, 2017).

Since decades, extensive existing literature highlight the importance of human capital in boosting economic growth. Becker (1994) and Schultz (1961) came up with the modern human capital theory. The study of the impact of human capital on economic growth received a significantattention following the formulation of their theory. It has been noticed that a rise in national outputof a country is often compared with a rise in human capital. From this, it has been deduced that aninvestment in human capital is the main reason for an increase in economic growth (Schultz, 1961). Through school enrollment at primary level and a skilled workforce, human capital can have an impact on economic growth. The more skilled and educated the workforce is, the higher the chances are for them to have a positive impact on economic growth since they would help the localfirms in generating revenues. Research shows that through educational advancement, human capital accumulation has a major role in influencing growth and development. However, it has been observed that the effects of educational investment are not the same at different phases of economic growth (Sajid & Ali, 2018; Ding, Huang, Gao, & Min, 2021; Marc & Ali, 2023). Sufficient government education budget helps in enhancing skilled, educated, intellectual and knowledge based potential productive workforce that results in efficient effective industrial and agricultural development, consequentlycountrywide economic growth will be enhanced. Even though the magnitude of human capital effects on economic growth differs from one nation to another but still a positive relationship can be observed between investment in education and economic development in different developingand developed states, including the ones which are also a member of SAARC.

The South Asian Association for Regional Cooperation (SAARC) is a group of countries which have grouped together in order to encourage economic development and regional integration. SAARC was established in Dhaka on 8th Dec, 1985 and it consists of eight countries that act as members and they are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. All of the SAARC states together take up a total of 3% of the world's area.The global GDP of the SAARC countries has increased to almost 7 percent which is more than thedouble of that in 1980s. However, in 2014, China's growth in global share is 16.5% whereas India'sgrowth in global shares is 6% (Bhattarai, 2016).

In order to sustain economic growth, a nation needs to maintain the right set of conditionsfor growth to achieve its potential. A key task for investors in accessing growth potential is to judge how well countries are doing in keeping those essential and critical conditions in place. Forthat, nations need to formulate appropriate policies to promote economic growth. But unfortunately, in recent decades no developing country has achieved significant economic success.However, there is a dire need to study a core factor that is human capital which help to achieve growth potential of the SAARC countries. It can be seen that no research has been done which incorporates the complete set of SAARC countries that examines objective measures of economicgrowth. However, there are very few studies which either target any one or some of the countrieswithin the SAARC group, it is still not fully known that how much impact human capital has on economic growth in all of the SAARC countries. Hence this study looks into this matter in a detailedmanner and fill this gap in the research arena.

In a nutshell, this research examines the underlined core objectives in reference to the impact of government's expenditure on education, school enrollment at primary level and labour force, on economic growth of SAARC countries. Economic growth is multidimensional, it not only includesthe development of entire output, but it also comprises of economy change via sectoral change, demographic, geographic, social, political, environment and institutional set up. This leads to a rich array of inquiries and need for an assortment of new approach in encountering basic questions that are related to economic growth. Interaction of societies and nations on one side harmonized the trade, as well as transformation of knowledge, skill, expertise, technology and exchange of specialized goods and services that drive the pace of development.

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Therefore, it is quite vital to study the human capital's effect on the economic growth of SAARC economies.
Figure 1 summarizes the research model of our study.

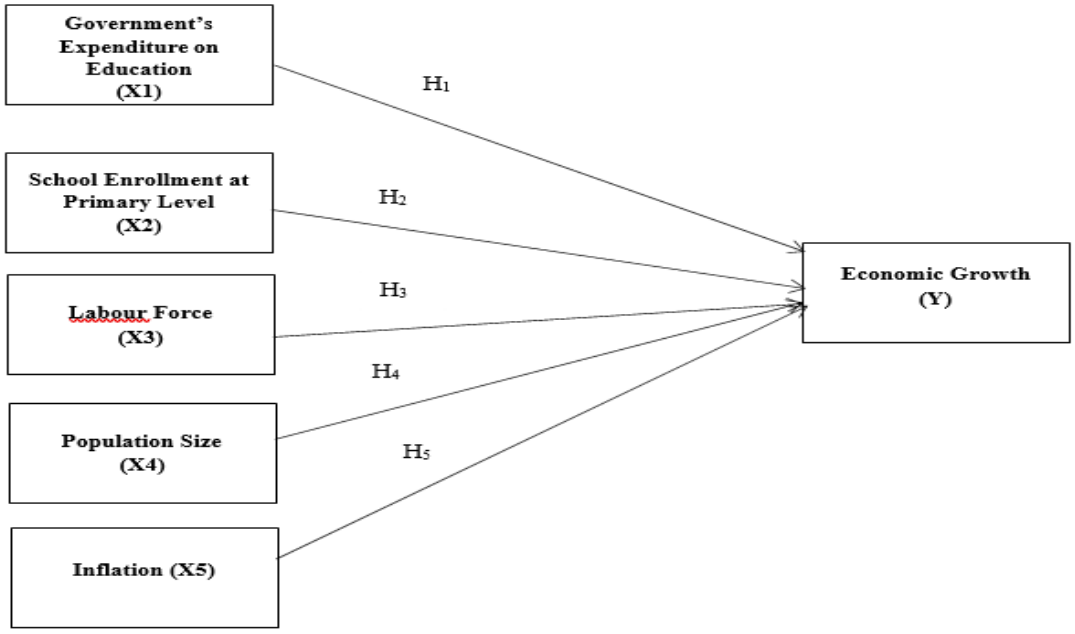

Fig. 1: Research Model

1.1. Research Question

Is there any impact of human capital on economic growth of SAARC countries?

1.2. Research Objectives

- To examine a relationship between government expenditure on education and economicgrowth of SAARC countries.
- To analyze a relationship between school enrollment in primary education and economicgrowth of SAARC countries.
- To study a relationship between labor force and economic growth of SAARC countries.
- To investigate a relationship between population size and economic growth of SAARCcountries.
- To examine a relationship between inflation and economic growth of SAARC countries.

1.3. Research Hypotheses

H1: There is a significant relationship between government expenditure on education andeconomic growth of SAARC countries.

H2: There is a significant relationship between school enrollment in primary education andeconomic growth of SAARC countries.

H3: There is a significant relationship between labor force and economic growth of SAARCcountries.

H4: There is a significant relationship between population size and economic growth ofSAARC countries.

H5: There is a significant relationship between inflation and economic growth of SAARC countries.

Section I gives a general background of the study. Section II entails a supporting literatureon understudy variables with a special focus on the relationship between the variables. Section III discusses methodology. Section IV entails data analysis. Section V provides limitations and futuredirections have been stated and lastly section VI entails conclusion of our study.

2. Literature Review

Since ages, economic growth has been the major focus of theorists, economists, policy makers and researchers. Economic growth, also known as economic development is multidimensional. It not only comprises of an aggregate output but it also focuses on how an economy has transformed fundamentally including it's social, sectoral, institutional, political andgeographical structures and its human development (Acemoglu, 2012; Senturk & Ali, 2021). The level of economic growth varies from country to country. Following are the literature on the relationship between thevariables.

2.1. Government's expenditure on education and economic growth

Generally, investment in education by the government and economic growth are closely related. An increase in the investment in education leads to a rise in economic growth as well (Marc et al., 2022). When the government invests in the educational sector, more and more people become educated and that allows them to have jobs which help them in developing skills. Not only the unemployment level and poverty level falls in the economy because of this but it also provides a country's economy with an educated and skilled workforce who then have the ability to work in an efficient and effective way. This eventually leads to a rise in economic growth. However, the exact percentage increase in economic growth varies from country to country.

The graph below shows the expenditure that was allocated for education by SAARC countries from the year 1990 till 2013. A high fluctuation can be noticed in the expenditure of allthe countries, except for Bangladesh and Pakistan.

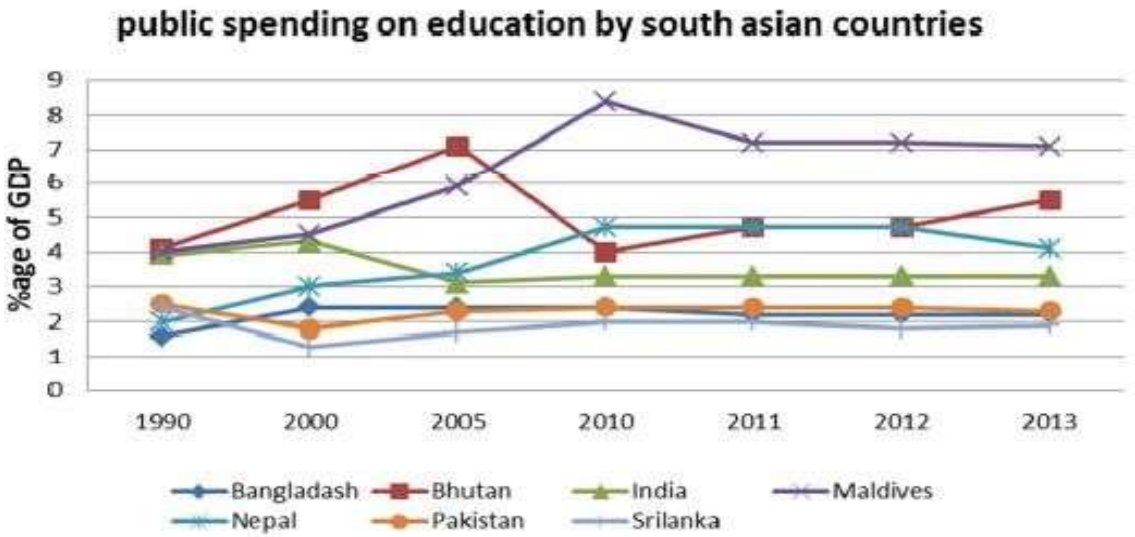

Fig. 2: Expenditure on Education by South Asian Countries
Source: Pakistan economic survey 2014-15, UNDP and the World Bank

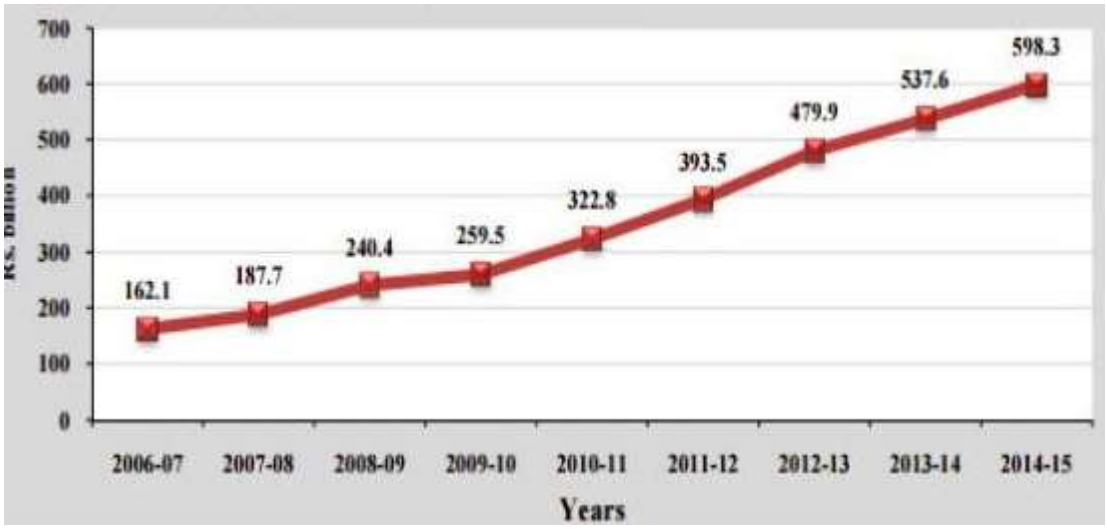

Fig. 3: Expenditure on Education by Pakistan
Source: Pakistan economic survey 2015-2016

Recent studies and surveys indicate an increase in the expenditure spent on education by South Asian countries, especially Pakistan. The above graph shows how the total expenditure on education is rising in Pakistan with the passage of time. Ahmed (2021) reports that out of all the SAARC countries, Bangladesh has the highest household expenditure on education (71pc) whereas Pakistan has the second highest at 57pc and Nepal has the third highest at 50pc.

This indicates that a high level of investment is being made in the educational sector by SAARC Countries. This has a positive impact on the GDP of these countries as well. However, their level of impact is different from one another. The World Bank, (2021) states that the South Asian countries are expected to grow by 7.1% in the years 2021 and 2022. It also highlights that the year-on-year growth of these countries continues to stay high.

2.2. School enrollment at primary level and economic growth

If the government ensures the school enrollment of at least majority of its public for primaryeducation by making primary education compulsory for every individual then this would lead to the future generation of workforce being educated who would be better than an illiterate workforce. This is because in comparison to an illiterate workforce, an educated one would not only be able to develop new skills but they would be more successful in generating revenues by working efficiently and effectively which in return would have a positive impact on economic growth of SAARC countries.

Allocation of a certain percentage of expenditure on education by the government may have an impact on economic growth but it is not enough to bring about a significant rise in economic growth if similar efforts are not reciprocated by the general public of SAARC countries. Together with the allocation of expenditure on education, if the enrollment rates in private institutions on primary or secondary level of education are also high then a positive result would not only be experienced in terms of a high literacy rate, low unemployment and poverty level but also in terms of higher economic growth (Global Education Monitoring

Report, 2021).

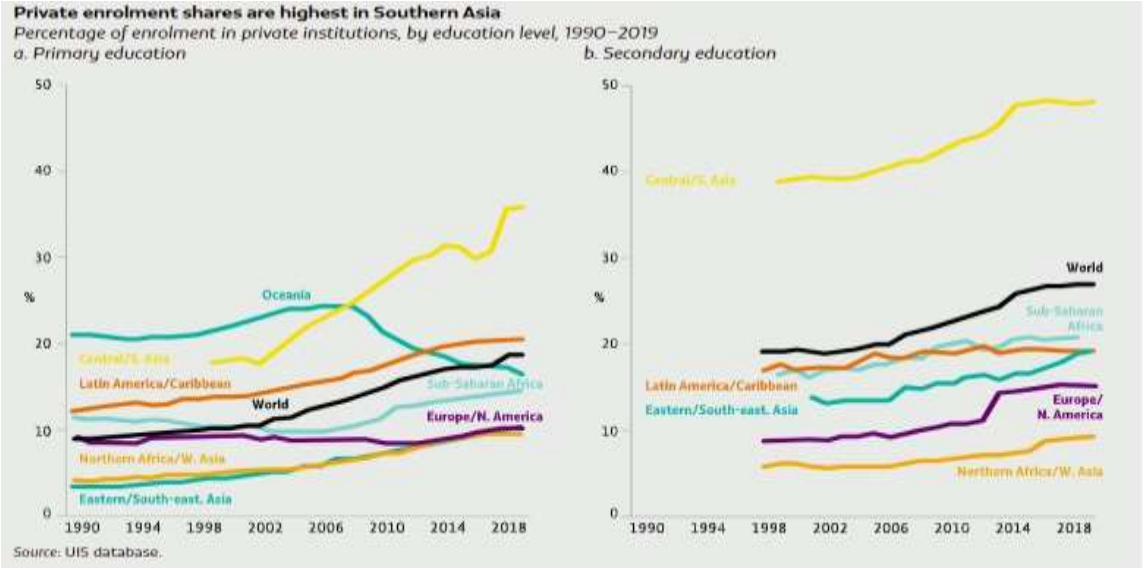

Fig. 4: Private enrollment shares in Southern Asia

The share of private institutions has been increasing worldwide. In 2013, it rose from 17%in primary education to 26% in 2014. However, the above figure shows that in SAARC countries, the percentage of enrollment in private institutions on primary level is either the lowest or the second lowest as compared to other countries during the years 1990 till 2018 whereas on the secondary level of education, it rose from 13% in 1998 to almost 18% in 2018. According to recent studies, the enrollment in private and public institutions continue to increase in the South Asian countries. Hence, the higher the enrollment in private and public institutions, the higher thenumber of skilled and educated workforce. This would then also result in a rise in economic growth.

2.3. Labour force and Economic Growth

Different research studies state that labour productivity positively impact the economic growth (Ogura, 2009; Campbell, 2009; Wu, 2013; Haider & Ali, 2015). When the labour productivity of an economy increases, more goods are produced for the same amount of work. This then results in higher revenues and higher economic growth. According to research, in order to maintain productivity and economic development, a highly skilled workforce is required (Zulu & Banda, 2015; Mehmood et al., 2022).

2.4. Population size and Economic Growth

Most research studies consider the relationship between population size and economic growth quite controversial as the impact of population on economic growth can be both positive and negative. Peterson (2017) states that low population growth in developed countries results in social and economic problems where as high population growth in developing countries slows down the economic growth of those countries. This may be due to the reason that in developed countries, low population growth means shortage of labour which would then affect the production processes, ultimately effecting economic growth as well. However, for developing countries, highpopulation growth means a shortage in the available resources since more people means more consumption. That shortage in the available resources would then have an adverse impact on production processes and eventually the economic growth of that country as well. Pickett (1973) mentions that a rise in population growth is considered to be a distinct factor which contributes inthe economic growth of developed countries in a positive way.

2.5. Inflation and Economic Growth

In order to acquire a sustainable and stable economic growth, the economic shocks of a nation must be controlled so that an increase in those shocks does not lead to an adverse impact on the economic growth of a nation. For instance, a rise in commodity price, supply side and demand side shocks will result in financial or economic crisis in the world. Hence, it must be avoided by promoting economic stability (IMF, 2021). Friedman (1977), a Nobel prize winner, explained that a high fluctuation in inflation affects the economic growth of any nation. Since then,the debate on the relationship between inflation and economic growth has been focused on. Growth is found to be mainly affected by the uncertainty of inflation. As per the theory of Friedman (1977), economies who face unstable and high volatile inflation mainly distort the relevant information about commodity prices which then puts nations in a place where they are unable to make efficient allocation of resources.

2.6. New Economic Growth Theory

In 1980s, Paul Romer and Robert Lucas came up with a new economic growth theory which is also referred to as the endogenous growth model. This theory focuses on long run growthrate on the basis of internal factors. This means that instead of external factors, economic growth is caused by internal factors. Romer stated that a high level of investment in human capital development leads to a better and high level of training, highly educated and skilled labour force,better investment opportunities, low level of unemployment, improved health conditions and a plethora of opportunities for new and existing firms. Kostakis (2014) explains that high level of corruption and poor governance lower the human capital which eventually affects the economicgrowth in an adverse manner.

3. Methodology

3.1. Sample and procedures

In order to examine the relationship between economic growth and human capital (government's expenditure on education, school enrollment in primary education and labour force), cross sectional data of SAARC countries was gathered. This study is descriptive and quantitative in nature. The time horizon of this study analysis is 10 years (2010-2019). This study has been analyzed in two phases. It covers descriptive analysis, mean, standard deviation, correlation analysis and other tests. It also comprises of fixed effect model, random effect model and pooled regression analysis. Secondary data has been collected from World BankDevelopment indicators, UNESCO global education monitoring reports and Pakistan's EconomicSurvey in order to examine the influence of human capital on economic growth as well as other factors affecting the economic growth of all of the SAARC countries.

Table 1: Study Variables

Sr.No.	Variable Name	Variable Type	Measures
1	Economic Growth	Dependent Variable	▪ GDP per Capita
2	Human Capital	IndependentVariables	• Government's Expenditure onEducation ▪ School Enrollment in Private Education
3	Other Factors	Control Variables	▪ Labour Force • Population Size • Inflation

4. Results

4.1. Descriptive and correlation analysis

Table 2: Descriptive and Correlation Analysis

Variable	Obs	Mean	Std. Dev.
y	80	3.795721	2.864826
x1	80	3.383188	1.369236
x2	80	107.2939	16.30204
x3	80	7.97e+07	1.53e+08
x4	80	2.17e+08	4.19e+08
x5	80	6.036751	3.218083

Source: Data has been extracted from Stata 14

Table 3: Correlation Matrix

	y	x1	x2	x3	x4	x5
y	1.0000					
x1	-0.0146	1.0000				
x2	0.2454	0.1418	1.0000			
x3	0.2198	-0.0307	0.0096	1.0000		
x4	0.2087	-0.0286	-0.0085	0.9996	1.0000	
x5	0.0022	-0.1607	0.1386	0.1292	0.1251	1.0000

Source: *Data has been extracted from Stata 14*

Table 2 shows descriptive statistics and correlation analysis of study variables where the mean and standard deviation is also calculated. The total number of observations are 80. X1, X2, X3 are the independent variables that are, government's expenditure on education, school enrollment at primary level and labour force respectively. Whereas Y is the dependent variable that is, economic growth. X4 and X5 are the control variables of this study including population size and inflation, respectively. According to the correlation analysis, there is a positively significant relationship between inflation and economic growth since the value 0.0022 that is lessthan 0.05. The value -0.0146 indicates that there is a negative, significant and an inverserelationship between government's expenditure on education and economic growth. This shows that the variables government's expenditure on education and economic growth are related to each other. However, since the values are more than 0.05, insignificant relationships are found betweenschool enrollment at primary level and economic growth, labour force and economic growth and population and economic growth. The correlation analysis also indicates a perfect relationship whenever the value is 1.000.

4.2. Pooled Regression Model

Table 4: Pooled Regression Model

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.			Interval]
x1	.0187717	.2278062	0.08	0.935	-.435142			.4726855
x2	-.0001446	.024479	-0.01	0.995	-.04892			.0486308
x3	2.67e-07	9.03e-08	2.95	0.004	8.66e-08			4.46e-07
x4	-9.57e-08	3.29e-08	-2.91	0.005	-1.61e-07	-3.01e-08		
x5	-.0737386	.0956026	-0.77	0.443	-.264231	.1167538		
_cons	3.741085	2.566895	1.46	0.149	-1.373565	8.855735		

Source	SS	df	MS	Number of obs	=	80
				F(5, 74)	=	3.82
Model	132.879092	5	26.5758185	Prob > F	=	0.0040
Residual	515.491911	74	6.9661069	R-squared	=	0.2049
				Adj R-squared	=	0.1512
Total	648.371003	79	8.20722789	Root MSE	=	2.6393

Table 4 shows the pooled regression model while assuming that all the SAARC countriesare the same. There is total 80 number of observations. Since the Prob > F value is less than 0.05 i.e. 0.0040, the overall model is good and acceptable. R-squared is 20% which shows that there isa 20% change in the dependent variable, economic growth due to all of the explanatory or independent variables, namely, government's expenditure on education, school enrollment at primary level, labour force, population size and inflation. From the P > l t l values, it can be observed that only X3 and X4 i.e., labour force and population size are significant since their valuesare less than 0.05.

4.3. Fixed effect model

Table 5: Fixed Effect Model

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
x1	-1.174454	.6220112	-1.89	0.063	-2.415994	.067085
x2	-.0030266	.0920169	-0.03	0.974	-.1866931	.1806398
x3	8.40e-08	2.15e-07	0.39	0.697	-3.45e-07	5.13e-07
x4	-4.15e-08	5.79e-08	-0.72	0.475	-1.57e-07	7.39e-08
x5	-.2106801	.1203586	-1.75	0.085	-.450917	.0295567
_cons	11.69008	10.91281	1.07	0.288	-10.09198	33.47213

Fixed-effects (within) Regression	Number of obs	=	80
Group variable: Coding	Number of groups	=	8
R-sq:	Obs per group:		
within = 0.0805	min =	10	
between = 0.1372	avg =	10.0	
overall = 0.0265	max =	10	
	F(5,67)	=	1.17
corr(u_i, Xb) = -0.9576	Prob > F	=	0.3319

Source: Data has been extracted from Stata 14.

Table 5 shows the fixed effect regression results while assuming that not every country is the same and they also have different intercepts as well. The 8 number of groups are basically the 8 countries which are collectively referred to as SAARC. According to the Prob > F value i.e. 0.3319, the overall model is insignificant since it is more than 0.05. The P > l t l values of all the variables are higher than 0.05 which means that they are insignificant.

4.4. Random effect model

Table 6 shows the results of random effect model. The REM can be considered as appropriate because its p value is less than 0.05. This means that it is overall a significant good fitmodel. In the random effect model, the p values for X3 and X4 i.e., labour force (p value 0.031) and population size (p value 0.034) are less than 0.05 which makes them significant. Whereas, government's expenditure on education, school enrollment at primary level and inflation has nosignificant impact on GDP of SAARC countries.

Table 6: Random Effect Model

Random-effects GLS regression				Number of obs	=	80
Group variable: Coding				Number of groups	=	8
R-sq:				Obs per group:		
within	= 0.0317				min =	10
between	= 0.6211				avg =	10.0
overall	= 0.1990				max =	10
				Wald chi2(5)	=	11.65
corr(u_i, X)	= 0 (assumed)			Prob > chi2	=	0.0399

y	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
x1	-.1190214	.2800227	-0.43	0.671	-.6678558	.429813
x2	.0104682	.0295608	0.35	0.723	-.04747	.0684064
x3	2.21e-07	1.02e-07	2.16	0.031	2.05e-08	4.22e-07
x4	-7.91e-08	3.73e-08	-2.12	0.034	-1.52e-07	-5.96e-09
x5	-.1010583	.0965682	-1.05	0.295	-.2903284	.0882118
_cons	3.249003	3.184973	1.02	0.308	-2.99343	9.491435

Source: Data has been extracted from Stata 14.

4.5. Hausman specification test

Table 7: Hausman specification test

Chi-Square test value (Coef.)	4.16
P value	0.2446
H0: Random effect model is appropriate	
H1: Fixed effect model is appropriate	

Source: Data has been extracted from Stata 14.

Table 7 shows Hausman test results. Hausman test determines whether fixed effect modelor random effect model is appropriate for the study. Since, p value is found to be more than 0.05,so this indicates that the null hypothesis would be accepted rather than being rejected. Hence random effect model is found to be appropriate for this study in order to explain the outcomes.

5. Limitations and Future Directions

This study is important for policymakers in order to evaluate how human capital has an impact on economic growth. This study has few limitations and study empirical findings can be based for future research. It can be observed that the main independent variables which are government's expenditure in education and school enrollment at primary level are not found significant. Due to limitations of data accessed, main human capital variables are found to be insignificant hence increase in time period span might bring better results.

Moreover, future research can be conducted by undertaking more variables or proxies which are found to have a more significant impact on economic growth of SAARC countries, forinstance, research and development expenditure.

6. Conclusion

This study aims to analyze the impact of human capital (government's expenditure on education, school enrollment at primary level, labour force, population size and inflation) on economic growth of SAARC countries over the period of 10 years (2010-2019). Hausman test suggested that random effect model is suitable for this study. The empirical findings of random effect model endorsed that only one determinant of human capital which is labour force (x3) and control variable i.e. population size (x4) are found to have a significant impact on economic growthof SAARC countries. Therefore, it is concluded that skilled workforce boosts economic growth. This research highlights the significant factors that affect economic growth of SAARC countries. It is expected that future research on this topic will contribute more in literature by adding more variables. Moreover, future research can be conducted by undertaking more variables or proxies which are found to have a more significant impact on economic growth of SAARC countries, forinstance, research and development expenditure.

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