ROLE OF QUALITY EDUCATION IN SUSTAINABLE DEVELOPMENT OF PAKISTAN

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ABSTRACT- The objective of this research paper is to study the role of quality education in Sustainable Development of Pakistan. For this purpose, we used time series secondary data for 28 years from 1990-2018, which was collected from World Development Indicators, IMF, world Bank, Asian Development Bank, United Nation Development Program, and Pakistan Economic survey. HDI was taken as a dependent variable while Education spending as percentage of GDP, student teacher ratio, secondary school enrollment and population growth were taken as independent variables. For data analysis, we applied ARDL and ECM Models, ADF and Bound Tests and Correlation analysis. Our results show that there is strong long run relationship between quality education and sustainable development.

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1: INTRODUCTION:

1.1. Background of Study:

Sustainable development is a long run phenomenon and it can be attained through sustainable development policies. Improving quality of education is one the policy initiative through which a country can attain sustainable development, because quality education produces quality human capital which produces inventions and innovations. At the moment, the developing countries mostly focus on enhancing literacy rate so they focus on increasing enrollment rate of students at primary and secondary level rather than improving students-teachers' ratio, learning and teaching tools and improving curriculum to make it in accordance with market demand. Now the developing countries must shift their focus from literacy rate to quality of education and make heavy investment in education sector to develop human resources. Quality Education brings structural social change (Scimecca, 1980). It proved that there is important relationship between school and community which helps to solve the social an economic problem.

In reality, this is actually the methodology of the Education for All activity and a focal component of the Millennium Development Goals.

1.2. Goals of Education

There are following five goal of education.

1.Nursery school: Nurseries and kindergartens come first in educational levels.

2. Primary Level: Primary level is the base of focus to prepare young ones for their future life phases.

3. Inter Level: Intermediate level is a general cultural level.

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4. Secondary Level: Secondary level works on age and growth traits of the students.

5. Higher Education Level: Higher education level is practical specialty level. It cares for people who are talented, and further develops their talent.

1.3. Components of quality Education:

The followings are the main components of quality education: -

1. Students-teacher ratio.

2. Qualified faculty.

3. Technology based education.

4. Quality of examinations.

5. Latest curriculum.

6. Allocation of funds for education by public and private sector.

The students-teacher ratio is the main yard stick of quality education. If this ratio is high the quality of education will be poor as teacher could not pay due attention on the class if number of students will be high. So the standard students-teacher ratio assumed to be less than 20:1. It means that students should not more than 20 in a class of one teacher. Highly qualified faculty plays vital role in building quality education. If the teachers know all latest tools of quality education, he will be in a better position to impart knowledge to the students. Similarly, technology is assumed to be a main tool of learning and communication today. The use of technology such as audio-video and other methods to enhance learning skill of students. Most of educational institutions do not change their curriculum for decades and deliver old knowledge to their students. In this way, they make the students uncompetitive. When these students go to the domestic or international job markets they could not compete with their counterparts.

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Examination shows the performance of students. If the examination system is efficient it will draw a line between a genius and average students. If this system is poor and non-fool proof and allow use of unfair means in the examinations or test system it will create a lot of students having poor knowledge, poor skill and poor performer in practical life. We cannot expect them to be innovative, inventive or efficient. So good examination system, good teachers and good curriculum and use of technology are the tools which can enhance quality of education.

1.4. Main Research Problem:

The main problem of this research paper is to analyze the role of quality education in sustainable development with special reference to Pakistan. First we have to study the status of quality education in Pakistan and second we will study its impact on sustainable development.

1.5 Objective of Research:

The objectives of the study are given in the following: -

► To study the characteristics of quality Education.

► To study the relationship between the quality education and sustainable development.

► To study the impact of quality education on economic growth.

► To suggest ways to improve quality of education in Pakistan.

1.6 Research Questions:

The research questions of our study are as follows: -

● 	What are the characteristics of quality education**?**

● 	What is impact of quality education on economic growth?

● 	What is the role of quality education in economic development?

● 	What is relationship between quality of education and sustainable

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development?

1.7: Scope of Study:

The scope of this study is very important in a sense that education plays a key role in human capital development that plays a vital role in economic development. So our results will be beneficial for policy makers, academicians, researchers and administrative heads of educational institutions in framing policies and developing strategies to improve quality of education in Pakistan.

2: LITERATURE REVIEW

2.1 Importance of Literature Review

Generally, countries have put greater efforts in increasing education level and children enrollment rate that have improved literacy rate enormously. Quality education is deemed to be the basic of sustainable development and thus one of the goals of sustainable development. For policy implementation, education is a multiplier that facilitates self – confidence, increases economic growth by increasing skillfulness and betters the lives of people by extending the employment opportunities. The Sustainable Development set target by 2030 to ensure the access of every boy and girl to have initial and secondary level of education and ensure access to technical education as well.

2.2 Review of relevant studies

Lindahl et al, (2001) reported as economic growth model as GDP growth rate through the econometric model and defined as graphical and Theoretical framework, the literature emphasizes the role of education on income at micro as well as macro level.

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Nasir and Nazli (2000) stated that the education affects income and indicated that Pakistan more earning with associated higher education. The impact of education, literacy, quality of school, training and numeracy skills on income level was examined. It was explored that for each extra year of schooling, the income was increased by 7 percent.

Kates and M (2005) discussed that the concept of sustainable development was enshrined on the staff controlled of environmental magazine. It should be easy to completed the sentence. They concluded with the environment. In the last half of the twentieth century four key themes emerged from the collective concern aspirations of the world peoples, peace freedom development was defined in practice.

Gibb, Natalie (2015) discussed the role of quality education for sustainable development due to change in climate. He concludes that worldwide climate changed makes it clear that ESD (Education for sustainable Development) must include a strong climate action a part element school play a vital role for learning or seeking knowledge about climate and its impact.

Lauries et al (2016) analyzed (ESD) Education Sustainable Development quality education on major theme repeated across 18 studies. They used different aspects which became the part of contribution of education for development which should prevail as education of quality primary level education secondary level education and formal form of education.

Rieckmann (2016) focused on the learning skill to develop the quality of education at global level of learning. He stated that skill is basic thing for learning. He strongly suggested that all learners get knowledge and skill needed to prop up sustainable development including, among others through education for sustainable development as the life style, human rights, sex

correspondence, expansion of culture of harmony and peacefulness contribute to sustainable development.

Cornell et al, (2017) mentioned 17 Sustainable Development goals. They describe a national model for Tanzania so analyze impact of substantial investment. More importantly, the progress on these the quality of education and worldwide impact the sustainability development model can be used to support similar analyses addressed the 17 sustain development policy makers.

3: RESEARCH METHODOLOGY

3.1 What is Research Methodology?

Research methodology is regarded as a science to conduct research. Basically, it is the procedure that researchers follow to carry out their work including description, explanation and estimation. In this study the basic purpose is to examine the role of quality of education in sustainable development in Pakistan.

3.2 Nature of the Study

Quantitative data will be used to describe the effect of selected variables. The time series data will be used in this study for analysis. So our study is quantitative in nature.

3.3 Type of Data

In this research the secondary data will be used in this study. The data will be collected from Economic survey of Pakistan, World Development Indicator, IMF, Asian Development Bank, United Nation development program and State Bank of Pakistan. The nature of data will be time series and the period of data will be from 1990 to 2018.

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3.4. Sources of data

The selected variables and sources of data are shown in Table.1

Table 1: Source of data

Variables	Source
HDI % of annual growth	United Nation Development Program (UNDP)
Student Teacher Ratio percentage	World development indicator
Education spending percentage	World development indicator
Secondary school enrollment percentage	Asian World Bank indicator
Population Growth	World development indicator

3.5 Sample of the Study

The sample contains twenty-eight years (n=28) time series data for the period of 1990-2018.No researcher has so far conducted research on this period.

3.5 Selected Variables

There are some following the variable applying for econometric model.

There are following selected variable of this study.

1. Pakistan Education Expenditure … ……………. Independent variable

2. Student Teacher Ratio   ……………………….... Independent variable

3. Secondary school Enrollment……………….…Independent variable

 4. Population growth rate Annual. ………………… Independent variable

5. Human Development Index (HDI). …………… Dependent variable

3.6. Definition of variables.

3.6.1 Education Spending as percentage of GDP

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Education plays an important role in the economic development of country. It is the main bridge of the development of an economy. It is also show in table below, a raise in the education sector productivity it will be an increase in overall economic development of the country. Education expenditures spending per student are very important for the productivity because higher the investment in the education sector higher will be the return in the form of productivity. It is the one of a major sector of the government that play very important role in the economic growth of the country. It provides a skilled and efficient labor force that enables the country more productive give data of Pakistan Education expenditure as percentage of GDP.

Figure 1: Education expenditure % of GDP
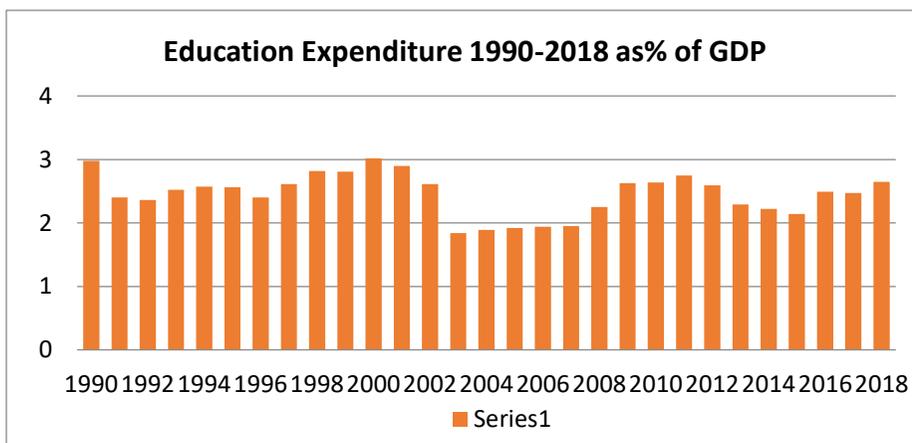
Source: World development indicator

3.6.2 Students- Teacher Ratio

Student teacher ratio is an important driver of productivity as the development of education, economically a basic element for the sustainability in role of quality education. The role of quality education in sustainability have a direct impact on economic growth and development.   The average value student teacher ratio in 2018 ratio is 48.3. The ratio of student teacher

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calculated as the total student in class enrolled. The obtained value of the student teacher dividing by the number of student at a given level of education by the number of the Teacher in similar types of schools. Pakistan average value during the period of 2000 was 39.68 students per teacher with a minimum of 33 students per teacher. And the maximum ratio of 47.63 student per student in 2016.

Figure 2: Students-teacher Ratio
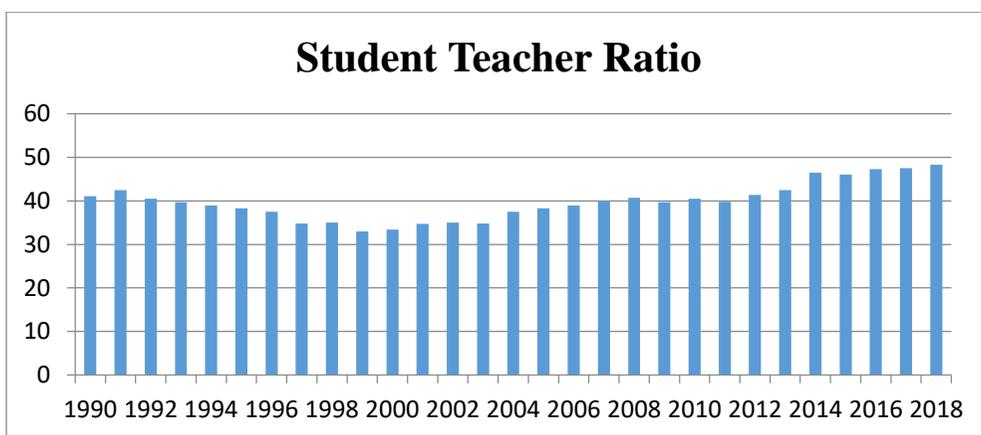
Source: World development indicator

3.6.3 Secondary School Enrollment

The secondary school enrollment values for different levels of education for secondary level have been varying. Gross enrollment ratio is the ratio of total enrollment, over the total population. This ratio may be of any age group of students for which it is required. At initial stage, preprimary education is considered as organized instruction. Its main purpose is to introduce children to the environment of school and also to provide a link between home and school. The value for School enrollment, secondary (% gross) in Pakistan was 42.78 as of 2018. As the figure below shows, that in 1990 the enrollment rate was 21.98 % which was increased to 40.78 % in

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2018.It was more than doubled during 28 years-period. Here is no data on higher education.

Figure 3: Enrolment of students at Secondary level
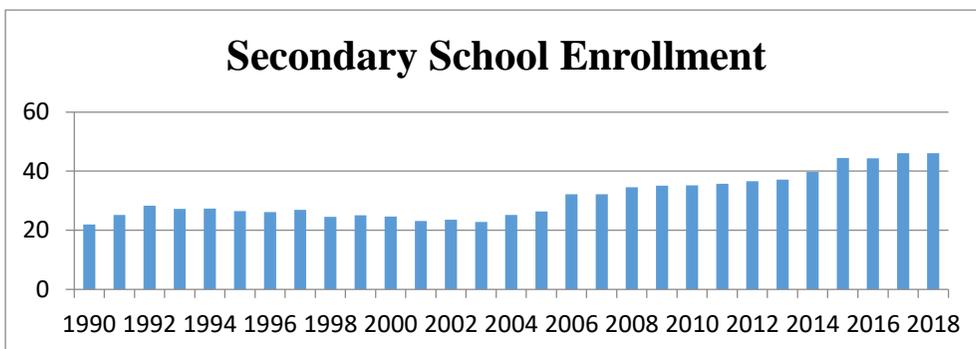
Source: Asian World Bank indicator

3.6.4 Population Growth Rate

Population growth as the independent variable of economic development related to HDI. It is directly related to the economic development of the country. Population growth rate means increase in population growth rate per annum and the government will have to allocate budget for development to meet the needs of growing population. The data in Figure 4 shows that population growth rate in Pakistan was around 2.9 percent per annum in 1990 which was substantially reduced to around 1.9 percent in 2018.Thus, one percent population growth rate was decreased during 28-year period.

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Figure 4: Population growth rate per annum,1990-2018.
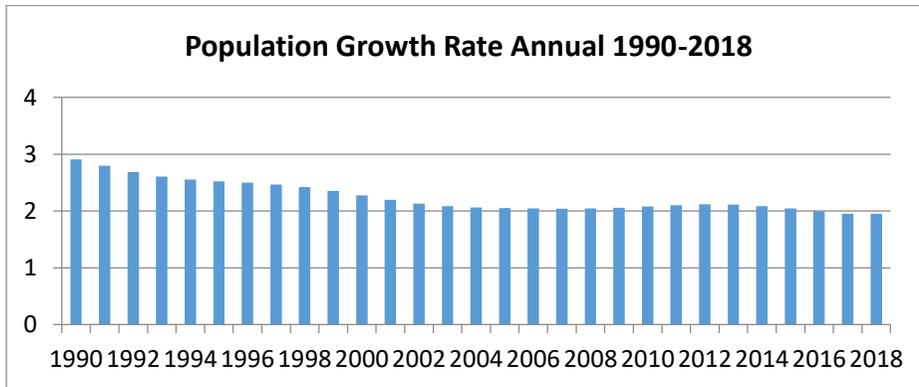
Source: World development indicator

3.6.5 Human Development Index

Human Development measures long term growth. It depends on three basic dimension of human development: 1. life expectancy, 2. schooling year which is average number of schooling year and the third one is gross national income (GNI) per capita income. Pakistan HDI value for 2018 was 0.560 which is in medium ranking of human development at internationally level. Between 1990 and 2018 Pakistan's HDI value increased from 0.404 to 0. 560, which show in Figure 5.

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Figure 5: Human Development indicators,1990-2020
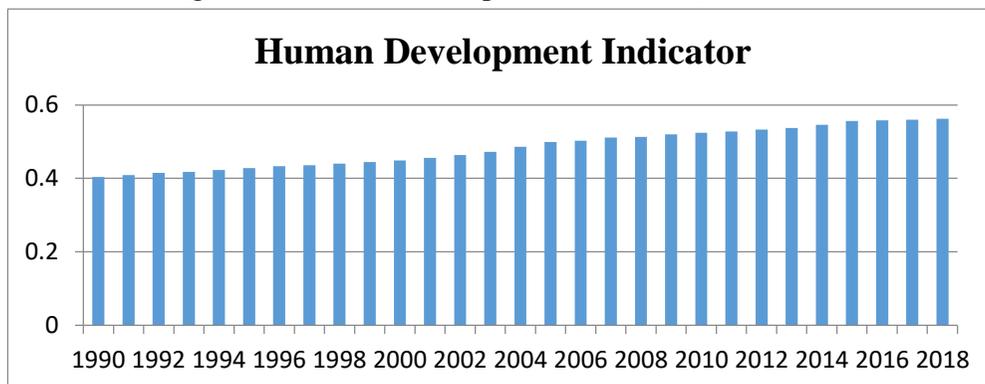
Source: United Nation Development Program (UNDP)

3.6 Econometric Model

Our econometric model is given below;

HDI = βo+β1(str)+β2(ssr)+β3(edus)+β4(pga)+μ

HDI = Human Development Index % of annual growth

str = student teacher ratio

edus= education spending as percentage of GDP

ssr=secondary school enrollment

pga= population growth annual

μ = stochastic term

βo = intercept

β1, β2, β3, β4 = partial slope or parameters.

There is the following variable are given below in the diagram.

3.7 Analytical Techniques

ARDL (autoregressive distributed lags) techniques will be applied to find out relationship between variables in the short run and long run. Furthermore, the unit root test will be applied to check the stationarity of variables and correlation analysis will also be used to measure strength of relationship

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among variables. The ARDL bound test of Pearson and Shin (1999) and Pearson et al. (2001) will also be used to determine long run relationship. That show the variable integrated in different order.

4: DATA ANALYSIS

4.1 Descriptive statistics

The results of descriptive statistics are shown in Table 2

Table 2: Descriptive statistics

	HDI	EDUS	STR	PGA	SSR
Mean	0.4837	2.45	39.5035	2.26	30.67
Median	0.4860	2.54	39.70	2.11	27.30
Maximum	0.5620	3.02	47.50	2.91	46.11
Minimum	0.404	1.84	33.00	78.91	21.98
Std.Dev	0.0526	0.32	4.055	0.26	7.118
Skewness	0.0240	-0.47	0.372	0.91	0.76
Kurtosis	1.56	2.26	0.529	2.61	2.430
Jarque-Bera	2.498	1.67	0.907	4.07	3.073
Probability	0.286	0.43	0.635	0.13	0.21
Sum	14.028	68.73	1106.10	63.32	858.79
Sum Sq.Dev	0.0774	2.88	443.98	1.95	1368.31
Observations	29	29	29	29	29

The Table 2 indicates Descriptive value of different variable. There is significant relation with Mean Median. The results show that there are 29 observations of each variable. The mean value of different variables like as HDI 0.4837, EDUS value 2.45, student teacher ratio value of mean 39.50 PGA

value 2.26 and SSR (secondary school enrollment) value 27.30. As consider the median of HDI is 0.4860, EDUS 2.54, STR (student teacher ratio) 39.70, PGR 2.11and the SSR (secondary school enrollment) 27.30. The median value is greater than the Mean value. According the table 4.1 the value of these different variable in maximum range like as HDI 0.56, education spending per student 3.02, STR (student teacher ratio) 47.50 and the last one SSR (secondary school enrollment) range 27.30 which show the descriptive value among the different value.

4.2 Correlation Analysis

A numerical measure of the correlation matrix is the strength of the linear relationship between any two and more variables. The results of correlation analysis are given in Table 2 .

Table 2 Correlation Analysis results

	HDI	EDUS	PGA	STR	SSR
HDI	1	-0.279701	0.8823	0.5978	0.8644
EDUS	-0.07970	1	0.2855	0.27872	-0.24792
PGA	0.8823	0.28558	1	-0.2123	-0.58485
STR	0.59787	0.2782	-0.5848	1	0.8322
SSR	0.2479	-0.5848	0.5848	0.8322	1

The Table .2 shows   the relationship between variable is symmetric in nature and it is a proportion of direct connection or straight wards as it were. The correlation between some variables are positive while with some are negative.

4.3 Unit Root Test

To check the stationary of the variables we applied the ADF test. The ADF results a reliable at first difference or level one if the level of stationarity held on level two then we could not apply the ARDL model. In the table 3 the

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results indicate that there is no co-integration exists because the variables are not at the same level of integration. It indicates that the variables are stationer as different level. The unit root value of HDI is integrated at level where the coefficient value 0.46 with 0.024 probability value. It also integrated at level and level two but we have taken the first one where it integrated. The Pakistan's education expenditure is stationer at level is -2.98 and the probability is 0.05. It also integrated at two. The value of student teacher ratio is integrated at first difference with the coefficient value -1.342 and the probability is 0. 0052.And the * value show the probability value.

Table 3: Results of Unit Root Test

	Trend	Trend & Intercept	Trend	Trend & Intercept	Trend	Trend & Intercept	Result
HDI	-0.603 0.2*	**0.460** **0.024***	0.0028 0.0035*	0.632 0.0036*	-1.374 0.0000*	-1.3864 0.0000*	I(0)
EDUS	**-2.98** **0.05***	-2.85 0.019*	-3.92 0.006*	-3.89 0.02*	-7.35 0.0000*	-7.19 0.0000*	I(0)
STR	-0.093 0.85*	-0.094 0.23*	**-1.342** **0.0052***	-3.98 0.02*	-1.623 0.0000*	-1.624 0.0000*	I(1)
SSR	0.34 0.98*	-0.739 0.959*	**-0.718** **0.0824***	-0.993 0.0018*	-1.633 0.0000*	-1.6338 0.0000*	I(1)
PGA	**-3.673** **0.012***	-2.004 0.56*	-1.512 0.51*	-1.412 0.83*	-4.65 0.0001*	-4.486 0.0082*	I(0)

As all variables are integrated at different order in the above table, we can employee Autoregressive distributed lag (ARDL) Model.

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4.4 ARDL Model-Long Run Relationship

Selected Model (2, 0, 0, 0, 0, 1), (HDI) is dependent variable.

Table 4: Result of ARDL

Variables	coefficient	Std.Error	t-Statistic	Prob
C	0.5939	0.0180	32.95	0.000
EDUS	0.0217	0.0042	5.1489	0.0001
STR	0.00746	0.00185	4..026	0.0009
SSR	-0.00108	0.0012	-0.855	0.0404
PGA	-0.1330	0.0124	-10.7239	0.0000

From the table 4, we concluded that the value of regression coefficient of education spending per student is 0.0217, which means one-unit increase in education expenditures as % of GDP will cause to increase HDI by 0.0217%. Similarly, the coefficient value of STR (student teacher ratio) is 0.0074, which means there exist a positive and significant relationship between of STR and HDI, while the coefficient value of SSR (secondary school enrollment) is -0.010 which means one-unit increase in secondary school enrollment rate will enhance HDI by 0.0010. The coefficient value of PGA (population growth annual) is -0.133, which indicates that if one-unit increase in population growth rate per annum it will have negative effect by -0.133 in HDI. In other words, HDI will decrease due to increase in population. In our analysis the estimated coefficient of secondary school enrollment is negative-0.00108. The basic reason of this variable negative effect on HDI is that students-teacher ratio is lower so that increase in enrollment will likely to negative impact on quality of learning.

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4.5 Bound test

Table 5. Results of Bound Test

Test Statistic	value	Signif.	I(0)	I(1)
F-Statistic K	11.33	10%	2.2	3.09
		5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

In the table 4. we can see the critical values of the upper I (1) and lower bound I (0). The results show that the value of F –Statistic is 11.33 and it is greater than the upper bound. The long run relationship between variables exists.

4..6. Error correction Model: Short Run Relationship

Table 6: Results of ECM

Variables	Coefficient	Std.Error	t-Statistic	Prob
Δ HDI	0.855	0.061	11.437	0.001
ΔHDL(1)	0.9956	0.0677	14.6858	0.0000
Δ PGA	-0.012	0.007	-1.66	0.121
Δ PGA(1)	-0.0101	0.008	-1.21	0.041
Δ EDUS	-0.0101	0.084	-1.20	0.0013
Δ EDUS(-1)	0.0053	0.0077	1.666	0.040
Δ STR	0.0069	0.0031	2.22	0.0001
Δ STR(-1)	0.0013	0.046	0.57	0.0001
ΔSSR	-0.0242	0.004	-0.494	0.0012

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ΔSSR(-1)	0.090	0.043	3.62	0.0035
Coint Eq(-1)*	-0.479	0.014	-7.81	0.0000
R²	0.90	D.W	2	
Adj.R²	0.82	Prob (F-Statistic)	0.0000	
S.E. of regression 0.60		F-statistic	6.99	

In   table 4.6 the short run results are calculated from Error Correction Model (ECM) equation. According to the results, the value of R^2 is 0.90 and the value of Adj-R^2 is 0.82 it means that there is 82% variation in HDI (dependent variable) with respect one unit change in independent variables. The value of ECM showed the adjustment of speed. The value of D.W is 2.00 that indicate there is no autocorrelation. The value of R2 shows the model is goodness of fit to the data and stable in the short run.

4.7 Stability Test:

The Cumulative Sum Recursive Residual (CUSUM) Model is applied to examine the stability of the model. It is criteria which tells us about our model is stable or not. If our graph lies between two bounds, then we can say our model is stable.

Figure 6: CUSUM Test
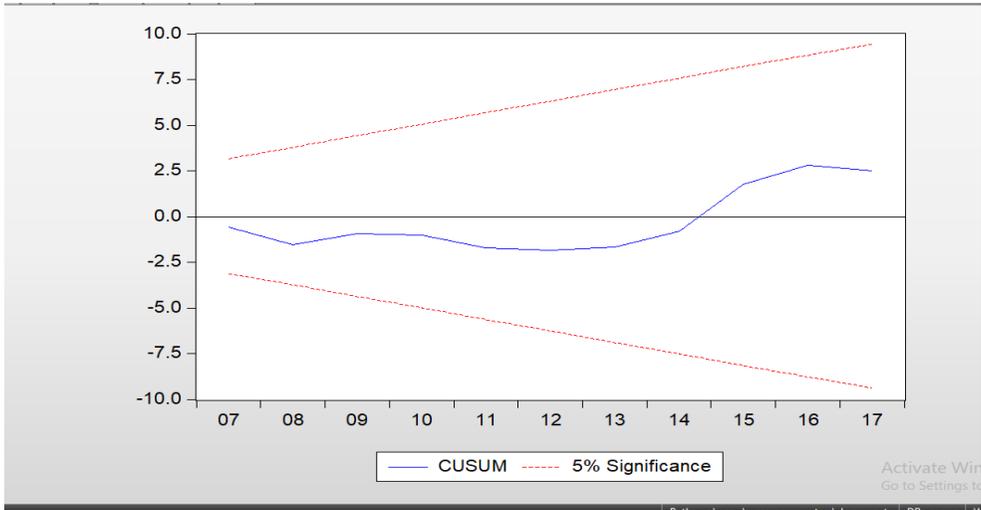
The cumulative sum recursive residuals (CUSUM) model shows the consistency in the coefficient over the time period. The graphical representation shows the stability of the model in the study period 1990-2018.

5. FINDINGS AND RESULTS

The overall effect of explanatory variables is statistically significant. The value of R-Square (®²) is 0.90 that means there is 90 percent variation in the dependent variable due to independent variables of the model. It means that the model is goodness of fit to the data. One variable, student enrolment at secondary school level has negative relationship with HDI which, perhaps, highlights the fact that in Pakistan students-teacher ratio is very poor and in case of increase in number of enrollment of students it will become worse. So there is needs to improve students-teacher ratio. However, investment in education has positive impact of HDI because it improves level of education of the student and dissemination of education in the country. Population growth rate also has negative effect on HDI because increase in population growth rate per annum will have negative effect on HDI and will reduce it.

6. CONCLUSIONS.

From the above results we can conclude that government should enhance educational expenditures as percentage of GDP in order to improve literacy rate, learning facilities, quality of faculty and overall quality of education. The government should control population growth rate because it has negative effects on HDI. Students- teacher ratio may be improved through recruiting the teachers having higher qualification and teaching experience. Government should gradually shift its focus from improving only literacy rate to improve quality of education, which is the demand of hours for sustainable development.

7. RECOMMENDATIONS

In order to obtain sustainable development, it is imperative to improve quality of education through improving students-teachers' ratio, increasing educational expenditures as percentage of GDP and controlling population growth rate to improve Human Development indicators. The government must focus on social indicators to bring improvement in the lives of the people rather than focusing on increasing per capita income and GDP growth rate.

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CONTRIBUTION OF AUTHORS AND CONFLICT OF INTEREST

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