Relationship between Education and Economic Growth: Case Study of Pakistan

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Abstract
The important part of a human's life is education. The purpose of this study is that to determine the relationship among the expenditure of education and augmentation of economy in Pakistan. The data which is used for the period 1973-2011 is time series data. For estimation used co-integration technique in the long run relationship into the education and growth of economy. This study analyses the educational policies and activities and the work of education in improvement of economy in Pakistan. This article also estimates the rules for education zone and expands the economic growth of Pakistan. This article shows that education bear long term relation along economic augmentation.

Keywords: Pakistan, Labor Force Participation Rate, Education Expenditures, Real Gross Domestic Product, Gross Fixed Capital Formation

1. Introduction

Education is a basic need of human life. It shows a extreme part in the life of the whole. Gaining appropriate education is very needful to bring achievement and joyful life for example food is important for active body. Education support to everyone to better his mode of mind and quality of mind. Education makes our life successful and professional. Every person is incomplete without good education. Informational association, expenses on education and description of education play the imperative role for economic growth. After 1947, in the history of Pakistan the first Prime Minister Zulfiqar Ali Bhutto, which make the different policies for getting better education. Bhutto's government more spending on education. During this period government spend more than 2 percent of total gross national product on education department. Investment is increasing literacy rate for the augmentation of a country.

The education system of Pakistan is divided in different levels which are primary, secondary, higher secondary and university level. These systems are the basics of education which are working last several years in our country. The illiteracy rate of Pakistan is increasing day by day due to poverty. Poverty is main problem to lack of education. Education is the right of every child whether rich or poor. Every person is the part of this country and rights to get education.

In 1980-81-1984-85, the enrollment rate is 44.3 percent and 18.5 percent in which female's average is 30.0 but male's average is 57.6. But in 1975-76-1979-80, the enrollment rate is only 40.7 in which female's average is 27.3 and male's average is 53.0. From above observation it is clear that the female enrollment is low but male enrollment is high. Government gives importance on female education now a day. Governmental expenditures on sector of education continuously stand at 1.8% of total gross domestic product by the UNESCO of Pakistan. According to UNDP, Pakistan is the 12th country of the world, which is spending less than 2 percent of GDP in education.

Education is transferred knowledge, skills and habits to one person to other person by teaching, researching and presenting. To get maximum literacy rate need to large investment on education. By the government policy education is make compulsory for the children in age of 5 to 16 years old. From this policy every person gets education easily. Education is a vital investment for human and economic development. The better results of education are reducing the poorness and unfairness of the country. Education improve the behavior of persons and good government implement the policies for improve the educational level of the country.

Vol. 6 No. 1, 2018
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International SAMANM Journal of Finance & Accounting (ISJFA)

Education is depending on learning process. The meaning of learning is change the behavior. The word education is a Latin word. For Muslims Islamic education is very important. The Islamic education is based on Holy Quran and Hadith. Students are the main part of learning. In November 1947, Quaid-i-Azam labeled the educational conference for all Pakistan. The development programme of Pakistan is started in 1956. The total expenditures on education in 1955-60, are 232 million. In 1960-65, total expenditures are 463 million, in 1965-70, expenditures are 563 million. In 1988-93, B.Ed. is making compulsory for teachers.

In new policies the education system is very attractive and successful for all students. In 2002, the literacy rate is increasing and 75000 schools are open and in 2010 80000 schools are open for better education. In 2009-10, the primary schools are 18715, middle schools are 5445, and high schools are 2700 in Pakistan. Total universities are 948364 which are working for better results in education sector. All people want to get better education and want to get good job for better future.

Education is very important for economic growth, for social and individuals knowledge. The employment level of education sector increases for every person and improves the quality of life. The purpose of this article is to increase the economic augmentation and reduce the inequality of Pakistan. In education system government adopt different policies for improving this sector. Make education compulsory for every child in Pakistan. Make strategies for better education system and control the child labor. Education is a key for improve living standard and reduce the inequality. If level of income increase the income inequality is decrease and vice versa. No development is possible without education. Education is defined as the process of gaining knowledge. Education provides knowledge to make sure about to what is wrong and what is right. For our country improvement we get better education. To educate our family is our responsibility, which make educated country step by step.

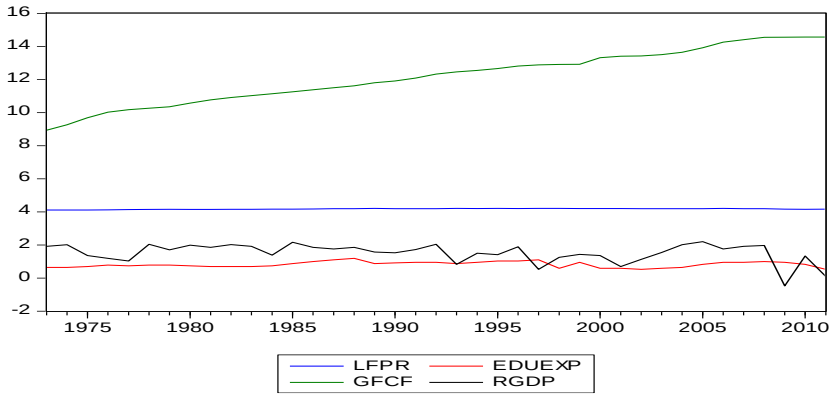

Figure 1: Trend of dependent and independent variables

In this graph LFPR on 1973-75, is 4.11 then increasing on 1976-79, that is 4.11-4.16, on 1980-81, decreasing from point 4.16 to 4.15, 1982-83, is again 4.16, 1984-85, is 4.17, 1986-88, is 4.19, on 1989 value is 4.21, then again constant 1990-92, is 4.19, on 1993-2001, value is change around 4.2 and 4.21, on 2002-05, value is 4.19, on 2003 4.21, 2004-05, is 4.19, then 4.21, on 2007-08, value is again 4.19, then decreasing 4.17,4.16 and again 4.17. Now we see in graph of RGDP in this graph the value on 1973 is 1.9, on 1974, value is 2.0, then 1975-77, RGDP is decreasing, in 1978 again 2.0, then 1979-81, again decreasing, in 1980, 2.0, 1981-82 decreasing again 1984-91, RGDP is continuously decreasing , in 1992 the value of RGDP is 2.0, in the era of 1993-2008, RGDP is circulate round about 0.8-2.1, in 2009 RGDP is in negative then in 2010 1.3 and in 2011 again decrease on 0.1. In the graph of GFCF the value of GFCF is continuously increasing from 1973-2011. Therefore, the curve of GFCF is upward sloping. In the end we see the graph of EDUEXP the value in 1973-74 is 0.6, in 1975-80, the value is 0.7, in 1981-83, EDUEXP is decreasing and the value is 0.693, 1984-88, EDUEXP is increasing from 0.7 to 1.2, then again in 1989-94 decrease from 1.2 to 0.956, in 1995-97 EDUEXP on 1.1, and continuously 1998-2011, EDUEXP is below to 1. The trend line is shown in single graph of all variables. In this graph clearly show gross fixed capital formation curve is upward sloping, RGDP, IFPR and EDUEXP curves are change in different ways.

Vol. 6 No. 1, 2018
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International SAMANM Journal of Finance & Accounting (ISJFA)

2. Literature Review

Samad, Husain and Zahid (1988) investigated investment and inequality in Pakistan's education sector used panel data for the time period 1975-85. They used in this study investment, higher education, household and institutional expenditures, productivity of education, educated unemployment, social and private expenditures and labor force survey. They analyzed by aggregate social expenditure on education and enrolment rates. The result of this study is that the productivity of education is low and extended families get jobs and return to investment in education therefore this result is unjustified.

Chaudhary, A.R, Iqbal.A, & Gillani,S.Y.M (2009) investigated that the link between higher education and economic augmentation used panel data for the time period 1972-2005 and used co integration modeling technique for analysis. They used output, capital, and labor and education level in this study. The result of this artical is that the rates of highly educated people of Pakistanis very low therefore demand for labor increasing the level of education in the country.

Khan, Azhar and Shah (2011) investigated causes of primary school dropout among rural girls in Pakistan and used panel data for the time period 2006-2007 and analyzed by simple descriptive method. In this study they used rural girls, dropout, primary education and poverty in his estimation. The result of this study is that the reasons which are affected that parent and children's interest, parent's death and economic activities. Kakar, Khilji and Jawad (2011) investigated relationship among education and economic augmentation in Pakistan. The time series data is used for the years 1980-2009, for estimation. The co-integration model and vector error correction model used for analysis and used Pakistan, human capital, education, economic growth as variables. It is estimated that education quality, efficiency and productivity of labor force in long run increase the economic growth.

Afzal, Ehsan, Begum, Sarwar.K. And Fatima.H. (2012) investigated affiliation between education, poverty and economic augmentation in Pakistan. The time series data is used for analyses for the years 1971-72 to 2009-10.They used education, poverty, and economic growth for estimation used Auto Regressive Distributed Lag (ARDL) approach to co-integration. The result of this study is that education help to reduce poverty and the economic status makes very well. Ali, Chaudhry and Farooq (2012) investigated human's capital formation and economic augmentation in Pakistan used secondary data, for the years 1972-73 to 2010-11. They used human capital, economic growth, Pakistan and used for estimation used ordinary least squares (OLS). They estimated that the effect of investment augmentation rate is negative on the growth of economy in Pakistan. When capital investment is low then reduce the demand for goods. Hence, investment is a major source of economic growth. Gudaro, Chhapra and Sheikh (2012) investigated that the percussion of foreign direct investment (FDI) on economic augmentation used panel data for the years 1981-2010. In this study used GDP, FDI, and CPI. They analyzed that investment is an important part for economic growth.

Khan and Khattak (2013) investigated the importance of research and development for economic augmentation. The time series data is used for the years 1971-2008, for estimation used the ordinary squares method. They used real gross domestic product, health, labor force, quality of education as variables. They estimated that increase in investment in education sector increase the economic growth. Afzal, Butt, Akbar, R.A. and Roshi.S. (2013) investigated common inequality in Pakistan used primary data collected from multiple indicator cluster survey 2007-2008.The dependency ratio is used for estimation and used in this study gender disparity, school education. The result of this study is that the level of inequality is very high in rural areas but low in urban areas.

Din and Jabeen (2014) investigated eliminating educational inequality through e-learning and used panel data. They used education, inequality, virtual university of Pakistan and for analysis used descriptive statistics and independent sample t-test. The result of this study is that the virtual university gives quality in education in the entire county. Qaisrani and Ahmed (2014) investigated exploring new pathways to gender equality in education used statistical data for the period 2000-2010. They used education, gender equality, information and communication technologies, and economic growth and used the system generalized method of moments for estimation. It is estimated that lower middle income countries and gender equality is more important for economic growth.

Vol. 6 No. 1, 2018
Online ISSN 2308-2356
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International SAMANM Journal of Finance & Accounting (ISJFA)

Salik and Zhiyong (2014) investigated gender discrimination and inequalities in higher education used panel data for the period of second half of the 20th century. They used education, gross domestic product and development of country as variables and used for estimation main streaming strategy. The result of this study is that there is demand for female education is high, but educational facilities for female population are low. Government introduced organizations for females to reduce the inequality in country. Zia, Rehman and Abdul Rehman (2015) investigated education and income inequality of Pakistan, used time series data and used cross tabulation and applying qualitative research method for analysis. The keywords used Pakistan, education, income, inequality and poverty. The result of this study is education falls poverty and increase economic growth

3. Data, Model and Methodology

Variables	Descriptive Variables	Unit of Measurement	Source	Sign
Dependent Variable				
LFPR	Labor Force Participation Rate	Percentage	Bureau of Labor Statistics	+ve
Independent Variable				
RGDP	Real Gross Domestic Product	Percentage	State Bank of Pakistan	+ve
EDUEXP	Education Expenditure	Percentage	World Bank	+ve
GFCF	Gross Fixed Capital Formation	Million Rupees	State Bank of Pakistan	+ve

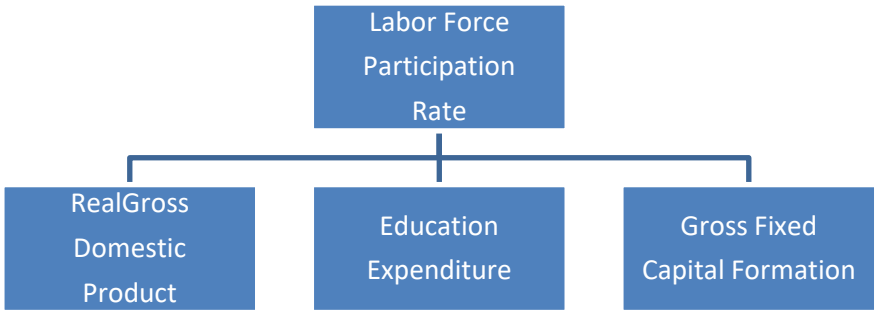
Table 1: Nature of Sources of Data

3.1. Model Specification

In this model we used four variables which are LFPR, EDUEXP, GFCF and Real GDP. In our study, LFPR is dependent variable and others are the independent variables.

Model is given as:

$$Ln(LFPR)=Ln(RGDP)+Ln(EDUEXP)+Ln(GFCF)$$



List of Abbreviations:

Ln = Natural Logarithm

LFPR = Labor Force Participation Rate

EDUEXP = Government Education Expenditure as % of GDP

GFCF = Gross Fixed Capital Formation

RGDP = Real Gross Domestic Product

3.2. Test Implications

In this paper we used Augmented Dicky Fuller test for analysis. The results of this test is given in Table below, which shows that the data is non-stationary at level but all values become

stationary at 1st difference. This result shows that the variables are unified of same level.

Vol. 6 No. 1, 2018
Online ISSN 2308-2356
Print ISSN 2309-3439

International SAMANM Journal of Finance & Accounting (ISJFA)

Variables		ADF Test Values		D-F Test Values		PP Test Value	
		At Level	1st diff.	At Level	1st diff.	At Level	1st diff.
Edu.exp	Intercept	-2.9	-7.9	-2.6	-7.9	-2.8	-7.9
	I&T	-2.7	-8.1	-2.8	-8.1	-2.6	-8.1
	None	-0.6	-8.1	----	----	-0.6	-8.1
Gfcf	Intercept	-2.7	-3.9	0.4	-3.1	-2.4	-3.6
	I&T	-4.7	-4.1	-2.1	-3.9	-4.7	-3.9
	None	7.5	-2.4	----	----	6.2	-2.3
Lfpr	Intercept	-2.4	-7.1	-1.1	-7.2	-2.6	-7.1
	I&T	-0.8	-8.3	-1.2	-7.9	-0.7	-24.7
	None	0.9	-6.9	----	-----	0.9	-6.9
Rgdp	Intercept	-4.7	-11.1	-4.7	-11.1	-4.8	-13.8
	I&T	-5.2	-10.9	-5.3	-10.6	-5.2	-14.9
	None	-1.2	-11.1	----	----	-1.4	-13.7
At level:- Intercept at 1%, -3.62 at 5%, -2.94 at 10%, -2.61							
T&I:- at 1%, -4.22 at 5%, -3.53 at 10%, -3.20							
None:- at 1%, -2.63 at 5%, -1.95 at 10%, -1.61							

Source: calculate values using E-views7 *Table 2: Unit Root Test Table*

For long period dependence among LFPR and the democratic values of variables are used johansen co-integration model. The table of this result is given below. The trace test results given in Table below and maximum eigenvalue test are shown in Table below. The tool range of this test is explained in 3 indicators. The significant level of 5% is shown in the trace test table which shows 2 equations and maximum eigenvalue integrate 1 co-integrating equation. These results show that this article bear a long time relation.

Deliberate		Element	0.05	
No.of CE	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.3884	43.224	47.856	0.1272
At most 1	0.3586	25.030	29.797	0.1603
At most 2	0.2022	8.5962	15.494	0.4040
At most 3	0.0063	0.2358	3.8414	0.6272

Source: calculate values using E-views7 *Table 3: Cointegration Rank Test (Trace)* *Value shows at the 0.05 level*

Deliberate		Elements	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.3884	18.193	27.584	0.4791
At most 1	0.3586	16.434	21.131	0.2005
At most 2	0.2022	8.3603	14.264	0.3433
At most 3	0.0063	0.2358	3.8414	0.6272

Source: calculate values using E-views7 Table 4: *Cointegration Rank Test (Maximum Eigenvalue)* Value shows at the 0.05 level

3.3. Descriptions of the Variables

Vol. 6 No. 1, 2018
Online ISSN 2308-2356
Print ISSN 2309-3439

International SAMANM Journal of Finance & Accounting (ISJFA)

Labor Force Participation Rate

In this model the dependent variable is LFPR. The percentage of the labor force due to the total population. People who are willing and able to work are included in LFPR but those people who are not willing and not able to work are not included in LFPR, e.g.; children's and over age people.

Real Gross Domestic Product

In this model the independent variable is real gross domestic product. Real gross domestic product is measuring the value of the production of economy accommodate for change in prices. An economic value that is measuring by the base year prices is called real gross domestic product.

Education Expenditure

Expenditure on education is an investment that increases the augmentation of economy and reduces the unfairness. Expenditure on education means development in education sector. For improving in educational institutions, expenditures on education are compulsory.

Gross Fixed Capital Formation

Gross fixed capital formation is defined as the fixed expenditure in natural assets for the analysis in fixed time. It is not a version for the expenditure of fixed assets, and also it is not include in purchasing land. It is a part of fixed expenditure approach for measuring GDP.

4. Results and Discussions

The different results of all variables are given in tables a, b and c, which are calculated by Eviews 7 and explanation of these tables are given below. Following are the tables which show discussion.

Variable	Coefficient	Std.error	t-Statistic	Prob.
c	3.975975	0.031459	126.3866	0
RGDP	0.004458	0.005992	0.743952	0.4619
EDUEXP	0.047392	0.018682	2.536792	0.0158
GFCF	0.012739	0.002154	5.912937	0
R-Squared	0.589107	Mean dependent var		4.176667
Adjusted R-Squared	0.553887	S.D.dependent var		0.029320
S.E. of regression	0.019583	Akaike info criterion		-4.931378
Sum squared resid	0.013423	Schwarz criterion		-4.760756
Log likelihood	100.1619	Hannan-Quinn criter		-4.870161
F-statistic	16.72675	Durbin-Watson stat		0.578029
Prob(F-statistic)	0.000001			

Source: researcher's calculations using E-views7 Table 5: Estimation Equation

Vol. 6 No. 1, 2018
Online ISSN 2308-2356
Print ISSN 2309-3439

International SAMANM Journal of Finance & Accounting (ISJFA)

	LFPR	RGDP	EDUEXP	GFCF
Mean	4.176667	1.521513	0.821564	12.16564
Maximum	4.210000	2.197000	1.194000	14.57000
Minimum	4.110000	-0.470000	0.531000	8.940000
Std.Dev.	0.02932	0.574475	0.174393	1.602481
Skewness	-0.93597	-1.562985	0.068396	-0.14492
Kurtosis	3.013282	5.595675	2.030858	2.026868
Jarque-Bera	5.694595	26.82749	1.556665	1.67536
Probability	0.058001	0.000001	0.459171	0.432713

Source: researcher's calculations using E-views7 Table 6: Descriptive Analysis

	LFPR	RGDP	EDUEXP	GFCF
LFPR	1	-----	----	----
RGDP	-0.12	1	----	-----
EDUEXP	0.39	0.12	1	-----
GFCF	0.7	-0.35	0.14	1

Source: researcher's calculations using E-views7 Table 7 : *Correlation*

In table-a, we include dependent variable is LFPR and independent variables are RGDP, EDUEXP and GFCF. In all variables relationship is positive. RGDP is insignificant with LFPR, EDUEXP and GFCF are positively related with LFPR. R-Square is greater than the Durbin-Watson stat value.

In table-b, mean of LFPR is 4.176667, maximum on point 4.210000, minimum on 4.110000 and skewness is negative. It is leptokurtic and normally distributed. The mean value of RGDP is 1.521513, maximum on point 2.197000, minimum on -0.470000 and skewness is negative. It is leptokurtic and normally distributed. The mean value of EDUEXP is 0.821564, maximum on point 1.194000, minimum on 0.531000 and skewness is positive. It is platokurtie and normally distributed. The mean value of GFCF is 12.16564, maximum on point 14.57000, minimum on 8.940000 and skewness is negative. It is also platokurtie and normally distributed.

In table-c, the correlation between LFPR and RGDP is negative, between LFPR and EDUEXP is positive, between LFPR and GFCF is positive. The correlation between RGDP and EDUEXP is positive, between RGDP and GFCF is negative. The correlation between EDUEXP and GFCF is positive.

5. Conclusion

This article shows the relationship between the expenditure on education by the government and augmentation of economy in Pakistan for the period of 1977-2011, used co-integration technique. In this study LFPR and GFCF in augmentation of economy in Pakistan used as variables that shows the effect of economic development along with education in long run. The result shows that literacy has long time relation with the development of economy because improve the quality of education, productivity of labor force participation and economic growth has done in long run period. In short time literacy has not some relation with development of economy.

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International SAMANM Journal of Finance & Accounting (ISJFA)

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