INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 9, Issue 1, (2020) E-ISSN: 2226-6348

Is Human Capital Formation Amplifying Economic Development? Evidence from Pakistan

Shahzad Ahmad

Assistant Professor, Economics Department, Govt Postgraduate College Samanabad Faisalabad, Punjab, Pakistan

Email: shahzadahmaddddd4@gmail.com

Ahmad Khan, Muhammad Azeem

Bs Scholar, Economics Department, Govt Postgraduate College Samanabad Faisalabad, Punjab, Pakistan.

Email: muhammadkhan201014@gmail.com

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v9-i1/7011 DOI:10.6007/IJARPED/v9-i1/7011

Published Online: 29 February 2020

Abstract

Human capital dramas a very prominent part in expanding economic growth and ultimately in development of a country. The aim of this research is to investigate the long-term relation amid education enrolment and growth of the economy in Pakistan. Time series statistics has been used for the period of 1974 to 2010 for investigation. ARDL methodology, ADF and PP unit root tests have been bringing into play for estimations and to analyse the stationarity properties of all the variables used in this research. Taking the secondary school enrolment ration as a proxy of education, it was found the positive association amid human assets establishment and growth in the economy of Pakistan during the above mentioned period. Owing to one percent modification in education, growth in the economy will increase by 0.26 percent in the elongated period. Additional variables of unemployment rate, population rate and indirect taxes are likewise decidedly momentous in the long-term. Worth of ECM IS 0.47, shows 47 percent rapidity of modification. As a policy suggestion it is recommended to increase the student's enrolment at educational institutions, especially at secondary education level, if pace of economic development has to increase in our country.

Keywords: Education, ARDL, Cointegration, Economic Development

Introduction

Prime Objective of human assets realization is to enhance the economic growth by refining the structure of learning in the country like Pakistan. So, it will be examined that what would be the consequence of education on growth. The learning arrangements are also used to stimulate some other purposes like social awareness and personality grooming. Mostly, the education system of Pakistan is furnished with a lot of problems as lack of advance skills in teaching staff, Vocational training, bad infrastructure of primary schools as well as Colleges and Universities level, difference between the Syllabus of schools of Government and Private. It is need to display the influence of improving literacy rate on economic growth. How much

change will be occurred in GDP Growth rate due to change in the Education System. Early, the literacy rate in Pakistan was 40% during the period of 2010 to 2012. It has been reached to 58% in the current period of time, but its effects are not so more efficient. The literacy rate in UK, USA and others developed countries mostly has reached to 100% and their results are remarkable but the situation in Pakistan is so different. It is confirmed that there is constructive association amid education and economic development. So, in this research, we have investigated, how much educational activities imparted its influence on development of the economy in Pakistan.

The main purpose of different educational institutions at different level like at school, college and universities level is to prepare the citizens of the nation so may they can perform well in different sectors productively and efficiently. Previous research studies on education and growth relationship have identified the constructive correlation amid education and economic development. Human capital formation not only prepare the people to perform in the economic activities in better way, but also help the citizens to spend their lives more comfortably, after knowing their rights and duties. In Pakistan there is not only dual, triple, but fourfold system of education. Such discrimination in education has created restlessness among people. People who have resource they get quality education on the other hand, people who have no proper resources remains deprived from education. This decimation has produced and producing the different classes in our social society. This unfair system is harmful for the development of the economy, not only in Pakistan, but everywhere in the world.

Problem Statement

Human capital formation in form of primary, secondary and higher education plays a vital role in augmenting efficiency of the people and ultimately the development of that country in many ways. So, among these categories of education system, which plays a prominent and how much role in development of the economy of Pakistan, Is the question of concern. In this study, the question is that how much contribution of education at secondary level is, in boosting growth and development of the economy of Pakistan over the previous specific time period.

Objectives of the Research

The study Objectives are following

- To inspect the connection between education development and economic development with insertion of particular other appropriate variables such as population rate, unemployment rate and indirect taxes.
- To assess empirically small term and elongated period effects of education on growth of the economy of Pakistan.
- To give Policy Recommendations to the Government.

Study Hypotheses

H_0: Education does not have constructive effect on growth of the economy of Pakistan

H_1: Education has a constructive effect on growth of the economy of Pakistan

Significance of the Research

Exploration of this research paper will determine the association in-between education and development of the economy, whether it is negative or positive. How much educational

enrollment at secondary level contributes to augmenting economic development in our country. According to research results and data analysis, government will get an opportunity to reform the educational system and human capital formation situation in the country.

Empirical Review

Ali (2012) analyzed the twelve monthly data that lies from 1972 to 2011 with OLS as Methodology to draw the results as prerequisite. He concluded that enrollment in education, health capital and physical capital are important factor to upsurge growth of the economy. It was concluded that index of educational admission, gross static assets creation and Gini factor have constructive and momentous effect on GDP, whereas head count proportion, rate of baby mortality, CPI price rises and venture rate have adverse and momentous effect on income of Pakistan.

Amir et al. (2015) took the data of different education levels of labor force in Pakistan like labor force at primary, secondary, tertiary and advanced stages. Yearly data during 1973 to 2013 was reserved from different editions of Economic Surveys of Pakistan, Pakistan Labor Force Survey, and Federal bureau of statistics. Johnson's Cointegration, ECM model, etc. were practiced to estimation the fallouts. Outcomes showed that education has constructive influence on growth in short run. This study achieved this thing that that education is a fundamental factor of growth of the economy in Pakistan.

Lawal & Wahab (2008); Khalid, Islam & Ahmed (2019); Alzgool (2019); researched that learning is a major source of Human Assets creation and ultimately comedy a vigorous part in augmenting development of the economy in any state. Using yearly data from 1980 to 2008, and by put on ordinary least square method it was established that investment on education has direct and momentous influence on economic development in Nigeria. So, it is suggested, as a policy making that government at all levels must upsurge their money on education in Nigeria.

Francis and Lyare (2006) investigated on education and development relationship in Barbados by applying co integration and VECM methods. Yearly time series facts 1964 to 1998 were bring into play. Results showed that economic development motivates educational activities. Bi-directional causality was also observed among education and growth in the short time duration.

Aziz et al. (2008) found the advantages of innovative schooling on economy growth of Pakistan from 1972 to 2008. Cob-Douglas production function was used. Results revealed that innovative education have favorable consequence on growth of the economy of Pakistan, as well as spending on higher educational has a constructive consequence on gross domestic development.

Chaudhry et al. (2009) explore the findings about higher educational activities and economic development relation, by taking figures on twelve monthly based from 1972 to 2005, by applying co integration and causality methods. It was found a positive connection in between education and growth.

Gillani (2009); Muhammad, Saoula, Issa & Ahmed (2019) used Johnson co integration technique for the time of 1972-2005. The outcomes of co integration practice demarcated the long period relation among schooling and actual GDP. Causality upshots verify the unidirectional causality commenced from RGDP to advanced learning.

Danacica et al. (2010) guesstimated the effects of schooling on growth of the economy by utilizing data from 1982 to 2008. By applying Unit root tests, VAR representation, and Granger

causality checks, it was found the unidirectional causality and long period connotation amid GDP and higher education in the state of Romania.

Data and Data Sources

The yearly data for 36 years (1974-2010) has been procedure. The facts have gained from Economic Surveys of Pakistan, International Financial Statistics of IMF, and handbook of Statistics of SBP. Software such as Eviews and Microfit were procedured for estimations. Actual GDP per capita was practiced as substitute for growth of the economy, it is a reliant variable. Nominal GDP was divided with CPI to get it in the form of real GDP. After that real GDP was distributed with whole inhabitants of Pakistan to acquire it into the form of actual GDP per capita. Term HCM has been practiced for Secondary School Enrolment Ratio, and unemployment rate population rate and indirect taxes are autonomous variables. Three additional variables in the model were as expounding variables in the model to elude the delinquent of functional unfairness in the model or to form the model in suitable functional arrangement. Entirely variables are in unit of Millions Pakistani rupee, excluding growth rates. Wholly the variables are in log arrangement.

Methodology

In our study we have used ARDL technique, Popularized by Pesaran and Pesaran (1997), Pesaran and Smith (1998), Pesaran and shin (1995, 1998, 1999) and Pesaran et al. (1996, 2001). This is a relatively new econometric technique. This method trials the co integration connotation without of seeing the matching edict of amalgamation of entirely variables, whichever they are unified of 1(0), 1(1) or jointly assimilated. ADF and PP checks have been practiced to check the stationarity qualities of each variable of the study.

After finding the co integration among the variables in the extensive period, then ECM is realized to study the tiny period changing aspects among variables. When co integration is originated, at that moment as a next stage, the lag order of the variables is picked by way of Akaike information criteria, Schowartz Bayesian criteria or Hanan Quinn Measure. Afterward the lag order is established, the elongated period coefficients of the model are estimated and at that point values of ECM are predicted. Here the short term coefficients are analyzed and pace of adjustment is also analyzed.

Description of the Model

Null proposition of the research is that education does not have positive connection by means of growth. This supposition is foreseen by ARDL apparatus on the later equation.

$$GDP = \beta_o + \beta_1 HCB + \beta_2 PGR + \beta_3 UNGR + \beta_4 IDT + \mathcal{E}_t \text{.....(1)}$$

Overhead cited reckoning is renewed into Log arrangement as

$$LnGDP = \beta_o + Ln\beta_1 HCB + Ln\beta_2 PGR + Ln\beta_3 UNGR + Ln\beta_4 IDT + \mathcal{E}_t \text{.....(2)}$$

It is a double Log model. Here, HCB, PGR, UNGR, IDT are autonomous variables.

The null supposition for the overhead stated log formula calculation is articulated as under, it shows no long term affiliation. The alternative supposition is as

$$H_\circ = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0 \text{.....(3)}$$

$$H_1 \neq \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0 \ldots\ldots\ldots\ldots\ldots\ldots(4)$$

The null supposition of no Long term connotation among education and growth of the economy is experienced by the equation cited under

$$DLnGDP_t = \beta_o + \sum_{i-1}^{4} \beta_{1i} DLnGDP_{t-1} + \sum_{i-1}^{4} \beta_{2i} DLnHCB_{t-1} + \sum_{i-1}^{4} \beta_{3i} DLnPGR_{t-1} + \sum_{i-1}^{4} \beta_{4i} DLnUNGR_{t-1} + \sum_{i-1}^{4} \beta_{5i} DLnIDT_{t-1}$$

$$+\lambda_1 LnGDP_{t-i} + \lambda_2 LnHCB_{t-i} + \lambda_3 LnPGR_{t-i} + \lambda_4 LnUNGR_{t-i} + \lambda_5 LIDT_{t-i} + u_t \ldots\ldots\ldots\ldots\ldots\ldots(5)$$

Check of Variable Addition

The ensuing ECM model in ARDL construction is practiced for the small term projection amongst education, growth of the economy, population rate, unemployment rate, and indirect taxes.

$$DLnGDP_t = \beta_o + \sum_{i-1}^{4} \beta_{1i} DLnGDP_{t-1} + \sum_{i-1}^{4} \beta_{2i} DLnHCB_{t-1} + \sum_{i-1}^{4} \beta_{3i} DLnPGR_{t-1} + \sum_{i-1}^{4} \beta_{4i} DLnUNGR_{t-1} + \sum_{i-1}^{4} \beta_{5i} DLnIDT_{t-1} + \alpha ECM_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots(6)$$

Empirical Upshots and Debate

Table 1 displays outcomes with intercept and drift; whereas table 2 displays outcomes with intercept on the other hand no drift.

Table 1:

Upshots of ADF and PP together with Intercept and Drift

VARIABLES	ADF at LEVEL	ADF at DIFF	PP at LEVEL	PP at DIFF	OI	OUTCOME
LnGDP	-3.052	-5.251	-3.651	-6.095	I(1)	Stationary
LnHCB	-1.584	-4.246	-1.550	-5.337	I(1)	Stationary
LnUNGR	-2.232	-4.228	-2.056	-6.512	I(1)	Stationary
LnPGR	-10.591	-4.705	-3.464	-3.865	I(1)	Stationary
LnIDT	-2.390	-3.778	-2.524	-5.086	I(1)	Stationary

ADF critical values

1 % -4.2412
5 % -3.5426
. 10 % -3.2032

PP critical values

1 % -4.2324
5 % -3.5381
10 % -3.2009

Table 2:

Results of ADF and PP together with Intercept but no Drift

VARIABLES	ADF at LEVEL	ADF at DIFF	PP at LEVEL	PP at DIFF	OI	OUTCOME
LnGDP	0.062	-5.372	-0.632	-6.243	I(1)	Stationary
LnHCB	-1.222	-4.311	-1.190	-5.361	I(1)	Stationary
LnUNGR	-2.669	-3.992	-2.222	-6.149	I(1)	Stationary
LnPGR	-2.295	-6.204	-1.337	-3.003	I(1)	Stationary
LnIDT	-0.654	-3.869	-1.000	-5.181	I(1)	Stationary

ADF critical value

1 % -3.628
5 % -2.947

PP critical value

1 % -3.622
5 % -2.944

10 % -2.611 10 % -2.610

Table 3:
Results from ARDL Method

Reliant Variable	Lags	F-statistics	Possibility	Consequence
LGDP	4	5.857	0.026	Co-integration

Test of Variable Addition

Values of table 3 indicate that, to inspect the null supposition of no elongated term connotation the assessment of F-test's figures has been proposed by the Micro fit student sort 4.1. At this point the worth of F statistics (5.8571) is bigger than the higher borders of precarious figure (5.122), displays that there is cointegration amongst the different variables.

Table 4:
Fallouts of Guesstimation of Co integration vectors

Reliant Variables	Self-governing Variables	F-Statistics	Lags
LnHCB	LnGDP, LnPGR, LnUNGR , LnIDT	10.165	4
LnPGR	LnGDP, LnHCB, LnUNGR, LnIDT	1.352	4
LnUNGR	LnGDP, LnHCB, LnPGR, LnIDT	0.873	4
LnIDT	LnGDP, LnHCB, LnPGR, LnUNGR	2.610	4

Co integrating vector's guesstimation by ARDL method

The Upshots of the table 4 display that wholly the self-governing variables are engaged as reliant variable one by one. The co integration trajectory was created from side to side ARDL approach. Firstly, taking the HCB as a reliant variable in the place of LGDP, the worth of F-check is 10.165 by value addition-check, is higher than higher boundary, thus it shows no co integration amid the variables. Once LnHCB as reliant variable like F (LnHCB/LnGDP, LnPGR, LnUNGR, LnIDT) =10.1658> 3.574 whichever worth of higher bound on lag 4. Secondly the population growth rate taking as a reliant variable, the worth of F test is 1.5329, it is less than the worth of higher bound and shows the not any co amalgamation amongst variables like F (LnPGR/LnGDP, LnIDT, LnUNGR, LnHCB) = 1.3529< 3.574 on lag 4. The LnUNGR as dependent variable shows F test value 0.87389 is less than upper bound as F (LnUNGR/LnGDP, LnPGR, LnHCB, LnIDT) =0.87389 < 3.574, it shows no co integration between the variables on lag 4. The LnIDT is engaged as a reliant variable the worth of F-check is 2.6106 is greater than upper bound like (LnIDT/LnGDP, LPGR, LnUNGR, LnHCB) =2.6106 > 3.574 there is co integration between variables on lag 4.

Table 5:
Result of ARDL (1,3,3,1,0) Grounded on AIC

Regressors	Coefficients	Standard-Error	T-Ratio	Possibility
LnHCB	0.265	0.143	1.845	0.081
LnPGR	-1.236	0.173	-7.111	0.000
LnUNGR	-0.598	0.098	-6.063	0.000
LnIDT	-0.743	0.176	-4.206	0.000
C	8.255	0.630	13.095	0.000

Consequences of table 5 show that entirely the variables are significant. Variable education has constructive link with variable of the growth of the economy in the long term. Variable of population rate, unemployment rate and indirect taxes has negative affiliation with growth. Owing to one % modification in Secondary School Enrolment Ratio, growth would increase by 0.26 % in the elongated term. Constant term is also momentous.

Table 6:
Result of ARDL (1,3,3,1,0) ECM Based on AIC

Regressors	Coefficients	Standard error	T-ratio	Probability
dlnGDP2	-0.925	0.291	-3.180	0.019
dlHCB	0.207	0.094	2.210	0.038
dlPGR1	-1.480	0.699	-2.116	0.046
dlUNGR	0.091	0.046	-1.961	0.063
dlIDT	-0.351	0.088	-3.997	0.001
Dc	3.908	0.770	5.075	0.000
ECM(-1)	-0.473	0.097	-4.841	0.000

Outcomes of table 6 highlight the short term figures. The number of ECM is extremely momentous and has accurate adverse sign. The value of ECM factor is - 0.47344 by t-ratio of – 4.8412. ECM number specifies that 47 % modification will happen in elongated term imbalance during twelve months, owing to one-time shockwave in small term.
In small term, education has also positive association with growth of the economy. But the coefficient of education is momentous at second lag. Owing to one percent alteration in education, growth will upsurge by 0.17 %. Variable of Population and indirect taxation have adverse connection with growth of the economy; while rate of unemployment is constructively connected with growth and is noteworthy.

Table 7:
Results of ARDL (1, 3, 3, 1, 0) ECM grounded on AIC

R^2	0.675	Adj R^2	0.471
S.E Reg	0.027	F-Statistics	4.403(0.002)
AIC	65.081	SBC	55.554

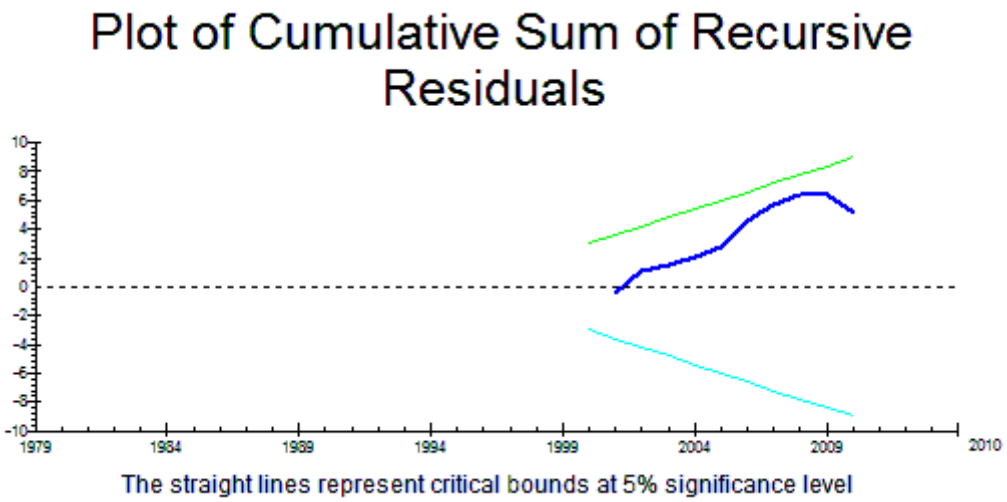
Above defined assessment of R^2 is 0.67, worth of R^2shows that exactly how fine the OLS regression route hysterics the numbers or displays in what way various illuminating variables elucidates the reliant variable. Worth of adjusted R^2 is 0.47; it is too named modified R^2.

Worth of F-statistics is 5.8571 and is extremely momentous displays combined momentous of the model.

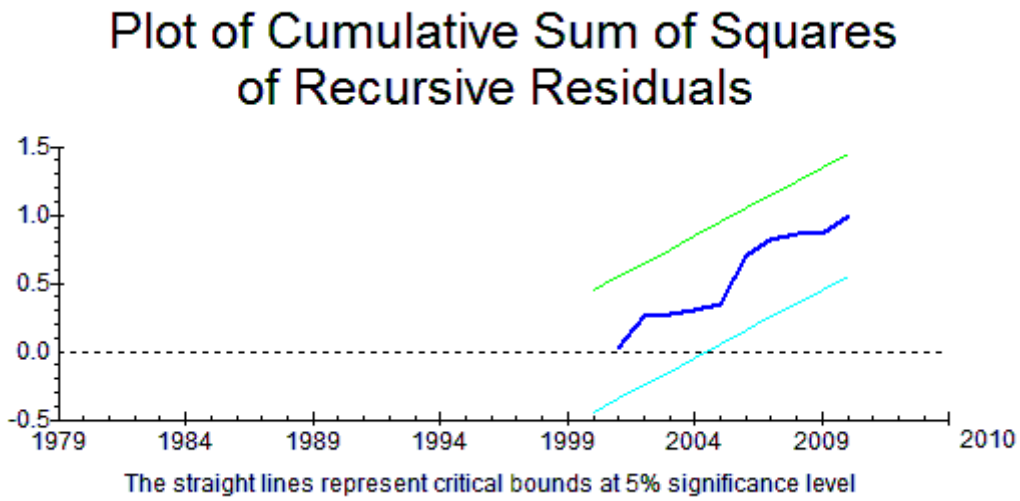
Solidity of the Model

Drawing of CUSUM exemplifies that its design remains inside the perilous 5 % edge and CUSUMSQ figures does not outstrip the perilous limitations. These displays exhibit the strangeness of elongated period coefficients and steadiness of elongated period linking within education and growth of the economy.

Graph 1



Graph 2



Conclusion

The determination of this investigation was to investigate the connection among education and economic growth during the period of 1974 to 2010, in long and short-term. The education has encouraging and noteworthy consequence on growth of the economy in elongated term. Owing to one % change in education, growth in the economy would increase by 0.26 percent in the long term. In short term the coefficient of human capital formation is also significant. It shows that due to one percent change in education, the growth of the

economy would increase by 0.20 percent. The result of ECM figure of human assets formation has 47 percent swiftness of modification in a year. Agreeing to these research consequences, it is essential to increase the education level, if we want to enhance growth of the economy. At present the literacy rate is 58 percent. If we want to surge the growth, there is need to increase the educational expenditures in our annual budget.

In previous studies different proxies for education or human capital formation have been taken by the researchers like literacy rate, percentage share of educational expenditures in gdp or gnp, primary school enrollment ratio, higher education enrollment ratio etc., but we have taken a different proxy for human capital formation, that is secondary school enrollment ratio. We have targeted the education at secondary level, especially. It was find the impact of education at secondary level on economic growth of Pakistan by taking additional variables of population growth rate, unemployment growth rate and indirect taxes during the period of 1974 to 2010, by applying superior technique like ARDL.

Recommendations

With references to our research study, it is advising following commendations to develop the education system of Pakistan, and ultimately the economic development.

- The research fallouts display that human capital formation (secondary school enrollment ratio) has positive influence on economic growth with the share of 0.26 percent, during the last 36 years (1974-2010). So student's participation at secondary level must be increased.
- Expenditures at secondary education level must be increased to enhance economic growth. Presently the share of educational overall expenditures is only almost less than 2 percent of GNP, that is so much low, and it is needed to enhance it up to 10 percent initially and then gradually up to 20 percent like is in Malaysia.
- The literacy rate in Pakistan at present is about 58 percent, that is very low as equated to established nations where this rate has reached to 100 percent like America, Japan, China and in many other developed countries. Our education system is out dated and backward. There is needed to make a lot of changes to acquire the targets of high economic growth with education reforms. There should be educational reforms in our country, proper educational planning is needed. Educational discrimination should be ended; instead there should be equal system of education for all. Educated and well trained teachers are engaged at school, college and university level.
- It is also recommended that educational emergency must be imposed at once in Pakistan.

References

Amir, H., Khan, M., & Bilal, K. (2015). Impact of educated labour force on Economic growth of Pakistan, *European Online Journal of Natural and Social Sciences*, 4(4), 814-831.

Ali, S., Chaudhry, I. S., & Farooq, F. (2012). Human Capital Formation and Economic Growth in Pakistan. *Pakistan Journal of Social Sciences,* 32(1), 229-240.

Alzgool, M. (2019). Nexus between Green HRM and Green Management towards Fostering Green Values. *Management Science Letters*, *9*(12), 2073-2082.

Bell, W. R., Miller, R., Wolter, K. M., & Dicky, D. A. (1986). Unit Roots in Time Series Models: tests and implications. *The American Statistician*, 40, 12-26.

Chaudhry, M., & Azeem, T. (2009). Higher education and economic Development of Pakistan. *Journal of business and management,3*(2), 18-29.

Dicky, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a unit root. *Econometricia*, 49, 1057-1072.

Daniela-Emanuela, D., Belaşcu, L., & Ilie, L. (2010). The interactive causality between higher education and economic growth in Romania, *International Review of Business Research*, (4), 491-500.

Engle, R. F., & Granger, C. W. J. (1987). Co integration and Error Correction Representation Estimation and Testing. *Econometrica*, 55, 251-276.

Gillani, J. (2009). Relationship among Education, Poverty and Economic Growth in Pakistan: An Econometric Analysis. *Journal of Munich Personal RePEc Archive, 7*(1), 43-56.

Granger, C.W. J. (1969). Investigating Causal Relations by Econometrics Models and Cross-Spectral Methods. *Econometricia*, 37, 424-438.

Granger, C. W. J., & Newbold, P. (1974). Spurious Regression in Econometrics. *Journal of Econometrics*, 2(2), 111-120.

Government of Pakistan, (various Issues). Economic survey of Pakistan, Ministry of finance, Pakistan.

Gujrati, D. N. (2004). *Basic Econometrics*. 4th Edition. The McGraw-Hill, India.

Granger, C. W. J. (1981). Some Properties of Time Series Data and their use in Econometric Model Specification. *Journal of Econometrics*, 16, 121-130.

Khalid, N., Islam, D. M. Z., & Ahmed, M. R. M. (2019). Sentrepreneurial Training and Organizational Performance: Implications for Future. *Humanities & Social Sciences Reviews*, *7*(2), 590-593.

Hall, A. (1994). Testing for a Unit Root in Time Series Pretest Data Based Model Selection. *Journal of Business Statistics*, 12, 461-470.

Lawal, N. A., & Wahab, T. I. (2011). Education and Economic Growth: The Nigerian Experience. *Journal of Emerging Trends in Economics and Management Sciences,* 2 (3), 225-231.

Muhammad, K., Saoula, O., Issa, M., & Ahmed, U. (2019). Contract Management and Performance Characteristics: An Empirical and Managerial Implication for Indonesia. *Management Science Letters*, *9*(8), 1289-1298.