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   STATEMENT OF THE PROBLEM

   OBJECTIVES

   HYPOTHESES

   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

   RECOMMENDATIONS/SUGGESTIONS

   CONCLUSIONS

   SCOPE FOR FURTHER RESEARCH

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**CONTRIBUTIONS TO BOOKS**

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

**JOURNAL AND OTHER ARTICLES**

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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# DOES EDUCATION EXPENDITURE IMPACT INDIA'S ECONOMIC GROWTH: A TIME SERIES ANALYSIS

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## ABSTRACT

*The paper empirically estimated the relationship between education expenditure of government and economic growth in India using annual data over the period 1981 to 2011. The unit root properties of the data were examined using the Augmented Dickey Fuller test (ADF) after which the co integration and causality tests were conducted. The estimation shows the following findings: (1) the empirical analysis on basis of ordinary Least Square Method suggests that there is positive relationship between EDU and GDP and vice versa and also there is positive relationship between GDP and GDCF and vice versa. (2) The unit root test clarified that economic growth; education and gross domestic formation are non-stationary at the level data but found stationary at the first differences. Therefore, the series of the variables of our consideration-EDU, GDP and GDCF, namely, education economic growth and gross domestic capital formation were found to be integrated of order one using the ADF tests for unit root. (3) The Granger causality test finally confirmed that there exist no causality that can runs from economic growth to education and GDCF. The causality can runs from education to economic growth. Finally, it can be suggested that concerted effort should be made by policy makers to increase the level of human capital in India through which productivity can be enhanced in order to boost growth (GDP). Moreover, quality assurance in education should be given utmost priority in order to make it growth enhancing.*

## KEYWORDS
education expenditure, economic growth.

## 1. INTRODUCTION

It is well known and widely accepted that investment in education is critical for economic growth and social cohesiveness of society. Many of the potential payoffs to society from various types of public investment in education are not immediately apparent but are nevertheless important. One of the best examples relevant to the Indian context is the much hyped software boom that itself reflects at least partly the earlier public investment in Indian Institutes of Technology (IITs). Further, there are huge advantages to society in improving the general level of education, not only because the quality of workforce improves, but because various other aspects such as health, nutrition and sanitation are positively affected, and also because educated citizens can be more effective participants in a democratic civil society. Expenditure on education is supposed to bring into the economic system the externalities and other indirect effects such as higher education attainment and achievement of children, better health and lower mortality of children, better individual health and lower number of birth which subsequently cause higher productivity in terms of increased earnings, more participation in the labour force i.e. increased labour force; all these coupled with lower population growth and better health of population tend to positively influence higher economic growth (Michaelowa, 2000).

One of the fundamental ways of generating sustainable economic growth has been educational development. The crucial purpose of education is to assist individuals with knowledge to be better able to apply that knowledge. Therefore, it is important to mention that returns on investment in education convert to economic growth and of course extend to improvement in the quality of the society because education can affect children's attitudes and assist them to grow up with social values that are more beneficial to themselves and the nation at large (see Pradhan, 2009; Yogish, 2006; Babatunde & Adefabi, 2005). The conviction, that education promotes growth has led governments of many developing countries to invest in the education sector. Even the theoretical literature also provides support for such a policy. However, the empirical literature has failed to establish a strong relationship between education expenditures and growth. According to the economic theory, it is expected to have a positive causal relationship to exist between education expenditure and economic growth. But different empirical papers investigating the above mentioned relationship for India have come up with different results.

Therefore, the paper is contribution to fill the gap existed in the literature in Indian context.

## 2. REVIEW OF LITERATURE

Quite a few empirical studies have tried to examine the relation between investment in human capital and economic growth. The relationship has been tested for countries such as USA (Jorgenson & Fraumeni, 1992), Pakistan (Aziz et al., 2008), Tanzania and Zambia (Jung &Thorbecke, 2001), Nigeria (Ogujiuba & Adeniyi, 2005) and India (Chandra, 2010). The results from the above mentioned papers indicate that education expenditures do affect growth positively. Fiszbein & Psacharopoulos, 1992 conducted a study to assess the effects of education investments in Venezuela and found that primary education investments have the highest effects on growth whereas higher education investments exhibits the lowest returns among the three levels of education. This is mainly due to the fact that high cost of university education offsets the benefits accrued from a university degree. Further, according to Becker, Murphy etal (1991), education expenditures since 1960 has been an important determinant of the subsequent growth in per capita incomes for around hundred countries since 1960. However, overall, the empirical evidence is quite mixed. Ansari and Singh (1997) use annual time series data from 1951 to 1987 to study the relationship between public spending on education and growth. They found that there is no long run relationship between the two. Bosworth, Collins and Virmani (2007) test that what are the major contributors to India's economic growth and conclude that education's contribution has been negligible. Pradhan (2009) investigates the causality between public education spending and economic growth in India during 1951 to 2001. The empirical investigation has been carried out by Error Correction Modelling. The findings suggest that there is unidirectional causality between education and economic growth in the Indian economy. The direction of causality is from economic growth to education spending and not vice versa. Chandra (2010) has tested for a causal relationship between education investments and economic growth for India for the time period 1951-2009 using linear and non-linear Granger causality methods. He found that there is bi-directional causality between education spending and GDP for India. Thus, it can be seen that overall, the empirical evidence regarding this relationship for India too is quite mixed.

## 3. DATA SOURCES AND METHODOLOGY

The objective of this paper is to investigate the dynamics of the relationship between educational expenditure of Govt. and economic growth in India using the annual data for the period 1980-81 to 2010-11 which includes the 31 annual observations. The three main variables of this study are economic growth, educational expenditure of Govt and gross domestic capital formation. The Gross Domestic Product (GDP) is used as the proxy for economic growth in India and represents the economic growth rate by using the constant value of Gross Domestic Product (GDP) measured in Indian rupee and gross domestic capital formation used as a proxy of physical capital. The data for the sample period are obtained from the Handbook of Statistics on Indian Economy, 2010-11 published by Reserve Bank of India. Expenditure on Education used as a proxy of human capital is taken from our publication titled 'Analysis of Budgeted Expenditure on Education' published by Dept. of Higher Education, Govt. of India. All the variables are taken in their natural logarithms to avoid the problems of heteroscedasticity. Using the time period 1980-81 to 2010-11 for India, this study aims to examine the long-term and causal dynamic relationships between the level of education expenditure and economic growth. The estimation methodology employed in this study is the co integration and error correction modelling technique. The entire estimation procedure consists of three steps: first, simple regression analysis by OLS technique, second, unit root test; and third, Granger causality test estimation **(steps explain in appendix)**. The paper is based on the following hypotheses for testing the causality and co-integration between GDP and education expenditure in India first whether there is bi-directional causality between GDP growth and EDU, second whether there is unidirectional causality between the two variables, and last whether there is no causality between GDP and EDU in India. Similar hypothesis is used for GDP and gross capital formation.

The model specification draws inspiration from the earlier works of Pradhan (2009) and Babatunde and Adefabi (2005). The choice of the existing model is based on the fact that it allows for generation and estimation of all the parameters without resulting into unnecessary data mining. The growth model for the study takes the form:

GDP=f (EDU) ---------------------- (1)

Where, GDP and EDU are the gross domestic product and education expenditure respectively. Equation (1) is treated as a Cobb-Douglas function with investment in education, EDU, as the only explanatory variable. The link between Economic growth (measured in terms of GDP growth) and EDU in India can be described using the following model in linear form:

Ln GDPt= $\alpha + \beta$ Ln EDUt + εt----------------- (1.1)

$\alpha$ and $\beta>0$

The variables remain as previously defined with the exception of being in their natural log form, εt is the error term assumed to be normally, identically and independently distributed.

GDPt and EDUt show the Gross Domestic Product annual growth rate and educational expenditure of govt. at a particular time respectively while εt represents the "noise" or error term; α and β represent the slope and coefficient of regression. The coefficient of regression, β indicates how a unit change in the independent variable (educational expenditure ) affects the dependent variable (gross domestic product). The error, εt, is incorporated in the equation to cater for other factors that may influence GDP. The validity or strength of the Ordinary Least Squares method depends on the accuracy of assumptions. In this study, the Gauss-Markov assumptions are used and they include; that the dependent and independent variables (GDP and EDU) are linearly co-related, the estimators (α, β) are unbiased with an expected value of zero i.e., E (εt) = 0, which implies that on average the errors cancel out each other. The procedure involves specifying the dependent and independent variables; in this case, GDP is the dependent variable while EDU the independent variable. But it depends on the assumptions that the results of the methods can be adversely affected by outliers. In addition, whereas the Ordinary Least squares regression analysis can establish the dependence of either GDP on EDU or vice versa; this does not necessarily imply direction of causation. Stuart Kendal noted that "a statistical relationship, however, strong and however suggestive, can never establish causal connection." Thus, in this study, another method, the Granger causality test, is used to further test for the direction of causality.

## 4. RESULT

**ORDINARY LEAST SQUARE TECHNIQUE**

**TABLE 1: RESULT OF OLS TECHNIQUE**

| Variable | Dependent variable is Ln GDP | | | | |
|---|---|---|---|---|---|
| | Coefficient | SE | t ratio | R2 | F Statistic |
| Ln EDU | 3.412437 | 0.84184 | 4.05 | 0.3617 | 16.43 |
| | **Dependent variable is Ln EDU** | | | | |
| Ln GDP | 0.1059865 | 0.02615 | 4.05 | 0.3617 | 16.43 |
| | **Dependent variable is Ln GDP** | | | | |
| Ln GDCF | 0.7174564 | 0.01439 | 49.86 | 0.9885 | 2486.26 |
| | **Dependent variable is Ln GDCF** | | | | |
| Ln GDP | 1.377743 | 0.02763 | 49.86 | 0.9885 | 2486.26 |

In Ordinary least Square Method, reject the hypothesis that there is no relationship between the variable and the results of the Ordinary Least Squares Regression are summarized in the Table 1. The empirical analysis on basis of ordinary Least Square Method suggests that there is positive relationship between EDU and GDP, GDCF and GDP and vice versa.

**UNIT ROOT TEST**

**TABLE-2: UNIT ROOT TEST WITH LEVEL**

| variable | intercept | |
|---|---|---|
| **Ln GDP** | lag (0) | lag(1) |
| AIC | 1.44006 | -5.16596* |
| HQIC | 1.45433 | -5.13741* |
| SBIC | 1.48805 | -5.06997* |
| **Ln EDU** | | |
| AIC | -2.65906 | -3.23816* |
| HQIC | -2.64479 | -3.20961* |
| SBIC | -2.61107 | -3.14217* |
| **Ln GDCF** | | |
| AIC | 2.13463 | -1.89745* |
| HQIC | 2.1489 | -1.86172* |
| SBIC | 2.18263 | -1.79427* |

**Ho**: series has unit root; **H1**: series is trend stationary, *MacKinnon critical values for rejection of hypothesis of a unit root. AIC stands for Akaike info criterion SBC stands for Schwarz Bayesian criterion

Table 2 & 3 present the results of the unit root test. The results show that both variables of our interest, namely LnGD, LnEDU and LnGDCF attained stationary after first differencing, L (1). Table 2 presents the results of the unit root test for the three variables for their levels. The results indicate that the null hypothesis of a unit root cannot be rejected for the given variable and hence, one can conclude that the variables are not stationary at their levels. To determine the stationary property of the variable, the same test above was applied to the first differences. Results from Table 3 revealed that the ADF value is greater than the critical t-value at 1% level of significance for all variables. Based on these results, the null hypothesis that the series have unit roots in their differences is rejected, meaning that series are stationary at their first differences [they are integrated of the order one i.e. L (1)]. The AIC (Akaike Information criterion) and SBC (Schwartz Bayesian criterion) are shown in the tables to determine the number of lags that makes the error term a white noise, which is one lag, as can be seen from Table 2.

**TABLE-3: UNIT ROOT TEST - THE RESULTS OF THE AUGMENTED DICKEY FULLER (ADF) TEST FOR THE FIRST DIFFERENCE WITH AN INTERCEPT & LINEAR TREND**

| Variable | test statistic | 1 % critical | 5 % critical | 10 % critical |
|---|---|---|---|---|
| Ln GDP | -3.873 | -3.723 | -2.989 | -2.625 |
| Ln EDU | -6.335 | -3.723 | -2.989 | -2.625 |
| Ln GDCF | -6.472 | -3.723 | -2.989 | -2.625 |

**GRANGER CAUSALITY TEST**

The results of Pair wise Granger Causality between economic growth (GDP) and investment in education (EDU) are contained in Table 4. The results reveal the existence of a bi-directional causality which runs from economic growth (GDP) to investment in education (EDU) and vice versa and runs from economic growth (GDP) to gross domestic capital formation (GDCF) and vice versa.

The null hypotheses of the Granger-Causality test are:

$H_0$: X ≠ Y (X does not granger-cause Y)

$H_1$: X ≠Y (X does Granger-cause Y)

We have found that both for the Ho of "LNEDU does not Granger Cause LNGDP" and Ho of "LNGDP does not Granger Cause LNEDU", we cannot reject the Ho since the probability values greater than 0.1. Therefore, we accept the Ho and conclude that LNGDP does not Granger Cause LNEDU. On the basis of probability, LNGDP does not Granger Cause LNGDCF and, LNGDCF does not Granger Cause LNGDP.

The below results generally show that there is only causal relationship between education expenditure indicators and economic growth in India. Because on the basis of probability value which is less than 0.1, we can reject the null hypothesis that is LNEDU does not Granger Cause LNGDP. There is unidirectional casual relationship between education expenditure and economic growth.

**TABLE 4: GRANGER CAUSALITY TEST**

| Null hypothesis | chi2 | P-value | Decision |
|---|---|---|---|
| LNGDP does not Granger Cause LNEDU | 0.1003 | 0.951 | Accept |
| LNEDU does not Granger Cause LNGDP | 14.73 | 0.001 | Reject |
| LNGDP does not Granger Cause LNGDCF | 2.9542 | 0.228 | Accept |
| LNGDCF does not Granger Cause LNGDP | 0.76278 | 0.683 | Accept |

## 5. CONCLUSION

The paper empirically estimated the relationship between education expenditure of government and economic growth in India using annual data over the period 1981 to 2011. The unit root properties of the data were examined using the Augmented Dickey Fuller test (ADF) after which the co integration and causality tests were conducted. The estimation shows the following findings: (1) the empirical analysis on basis of ordinary Least Square Method suggests that there is positive relationship between EDU and GDP and vice versa and also there is positive relationship between GDP and GDCF and vice versa. (2) The unit root test clarified that economic growth; education and gross domestic formation are non-stationary at the level data but found stationary at the first differences. Therefore, the series of the variables of our consideration-EDU, GDP and GDCF, namely, education economic growth and gross domestic capital formation were found to be integrated of order one using the ADF tests for unit root. (3) The Granger causality test finally confirmed that there exist no causality that can runs from economic growth to education and GDCF. The causality can runs from education to economic growth. Finally, it can be suggested that concerted effort should be made by policy makers to increase the level of human capital in India through which productivity can be enhanced in order to boost growth (GDP). Moreover, quality assurance in education should be given utmost priority in order to make it growth enhancing.

## REFERENCES


1. Aziz, Babar; Khan, Tasneem and Aziz, Shumaila G C (2008), "Impact of Higher Education on Economic Growth of Pakistan", University Faisalabad, MPRA Paper No. 22912.
2. Chandra, Abhijeet (2010),"Does Government Expenditure on Education Promote Economic Growth? An Econometric Analysis" MPRA Paper No. 25480, August.
3. Jung, Hong-Sang and Thorbecke, Erik, "The Impact of Public Education Expenditure on Human Capital, Growth, and Poverty in Tanzania and Zambia: A General Equilibrium Approach", IMF Working Papers, August 2001.
4. Murphy, K.; Shleifer, A. and Vishny, R. (1991), "The Allocation of Talent: Implications for Growth", *Quarterly Journal of Economics*, 106.
5. Pradhan, R.P. (2009). Education and Economic Growth in India: Using Error Correction Modelling. *International Research Journal of Finance and Economics*, 25: 139-147. http//www.eurojounals.com/finance.htm.
6. Yogish, S.N. (2006), Education and Economic Development. *Indian Journal of Social Development*, 6 (2): 255-270.


## APPENDIX

**STEP –I: ORDINARY LEAST SQUARE METHOD**

Here it is assumed the hypothesis that there is no relationship between educational expenditure (EDU) and Economic Growth in terms of GDP. To confirm about our hypothesis, primarily, we have studied the effect of education expenditure on economic growth and vice versa by two simple regression equations:

$EDU_i = a + b*GDP_i$-------------------------------------------- (2)

$GDP_i = a_1 + b_1*EDU_i$----------------------------------------- (3)

GDP = Gross domestic product. EDU = Educational expenditure of government in India. t= time subscript .The same equation apply for other variable. The first step for an appropriate analysis is to determine if the data series are stationary or not. Time series data generally tend to be non-stationary, and thus they suffer from unit roots. Due to the non-stationarity, regressions with time series data are very likely to result in spurious results. The problems stemming from spurious regression have been described by Granger and New bold (1974). In order to ensure the condition of stationarity, a series ought to be integrated to the order of 0 [I (0)]. In this study, tests of stationarity, commonly known as unit root tests, were adopted from Dickey and Fuller (1979, 1981). As the data were analyzed, we discovered that error terms had been correlated in the time series data used in this study.

**STEP –II: THE STATIONARITY TEST (UNIT ROOT TEST)**

It is suggested that when dealing with time series data, a number of econometric issues can influence the estimation of parameters using OLS. Regressing a time series variable on another time series variable using the Ordinary Least Squares (OLS) estimation can obtain a very high $R^2$, although there is no meaningful relationship between the variables. This situation reflects the problem of spurious regression between totally unrelated variables generated by a non-stationary process. Therefore, prior to testing Co integration and implementing the Granger Causality test, econometric methodology needs to examine the stationarity; for each individual time series, most macro-economic data are non-stationary, i.e. they tend to exhibit a deterministic and/or stochastic trend. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. A series is said to be stationary if the mean and variance are time-invariant. A non-stationary time series will have a time dependent mean or make sure that the variables are stationary, because if they are not, the standard assumptions for asymptotic analysis in the Granger test will not be valid. Therefore, a stochastic process that is said to be stationary simply implies that the mean [(E (Yt)] and the variance [Var(Yt)] of Y remain constant over time for all t, and the covariance [covar(Yt, Ys)] and hence the correlation between any two values of Y taken from different time periods depends on the difference apart in time between the two values for all t≠s. Since standard regression analysis requires that data series be stationary, it is obviously important that we first test for this requirement to determine whether the series used in the regression process is a difference stationary or a trend stationary. The Augmented Dickey-Fuller (ADF) test is used. To test the stationary of variables, the Augmented Dickey Fuller (ADF) test is use, which is mostly used to test for unit root. Following equation checks the stationarity of time series data used in the study:

$\Delta Y_t = \beta_1 + \beta_2 t + \alpha Y_{t-1} + \gamma \Sigma_{i=1} \Delta Y_{t-i} + \varepsilon_t$

Where εt is white nose error term in the model of unit root test, with a null hypothesis that variable has unit root. The ADF regression test for the existence of unit root of $Y_t$ that represents all variables (in the natural logarithmic form) at time t. The test for a unit root is conducted on the coefficient of $Y_{t-1}$ in the regression. If the coefficient is significantly different from zero (less than zero) then the hypothesis that Y contains a unit root is rejected. The null and alternative hypothesis for the existence of unit root in variable $Y_t$ is H0; α = 0 versus H1: α < 0. Rejection of the null hypothesis denotes stationarity in the series.

If the ADF test-statistic (t-statistic) is less (in the absolute value) than the Mackinnon critical t-values, the null hypo-thesis of a unit root cannot be rejected for the time series and hence, one can conclude that the series is non-stationary at their levels. The unit root test tests for the existence of a unit root in two cases: with intercept only and with intercept and trend to take into the account the impact of the trend on the series.

**STEP–III: THE GRANGER CAUSALITY TEST**

Causality is a kind of statistical feedback concept which is widely used in the building of forecasting models. Historically, Granger (1969) and Sim (1972) were the ones who formalized the application of causality in economics. Granger causality test is a technique for determining whether one time series is significant in forecasting another (Granger, 1969). The standard Granger causality test (Granger, 1988) seeks to determine whether past values of a variable helps to predict changes in another variable. The definition states that in the conditional distribution, lagged values of $Y_t$ add no information to explanation of movements of $X_t$ beyond that provided by lagged values of $X_t$ itself (Green, 2003). We should take note of the fact that the Granger causality technique measures the information given by one variable in explaining the latest value of another variable. In addition, it also says that variable Y is Granger caused by variable X if variable X assists in predicting the value of variable Y. If this is the case, it means that the lagged values of variable X are statistically significant in explaining variable Y. The null hypothesis (H0) that we test in this case is that the X variable does not Granger cause variable Y and variable Y does not Granger cause variable X. In summary, one variable ($X_t$) is said to granger cause another variable ($Y_t$) if the lagged values of $X_t$ can predict $Y_t$ and vice-versa.

EDU and GDP are, in fact, interlinked and co-related through various channel. There is no theoretical or empirical evidence that could conclusively indicate sequencing from either direction. For this reason, the Granger Causality test was carried out on EDU and GDP.

The spirit of Engle and Granger (1987) lies in the idea that if the two variables are integrated as order one, I (1), and both residuals are I (0); this indicates that the two variables are co integrated. The Granger theorem states that if this is the case, the two variables could be generated by a dynamic relationship from GDP to EDU and, vice versa.

Therefore, a time series X is said to Granger-cause Y if it can be shown through a series of F-tests on lagged values of X (and with lagged values of Y also known) that those X values predict statistically significant information about future values of Y. In the context of this analysis, the Granger method involves the estimation of the following equations:

$dLn\ GDP_{it} = \Sigma\alpha_i\, dLn\ GDP_{t-i} + \Sigma\ \beta_j\, dLn\ EDU_{t-j} + \varepsilon_{1t}$---------------------------- (4)

If causality (or causation) runs from GDP to EDU, it takes the form:

$dLn\ EDU_{it} = \Sigma a_i\, dLn\ EDU_{t-1} + \Sigma b_j\, dLnGDP_{t-1} + +\varepsilon_{2t}$--------------------- (5)

Where, $GDP_t$ and $EDU_t$ represent gross domestic product and educational expenditure respectively, $\varepsilon_{it}$ is uncorrelated stationary random process, and subscript t denotes the time period. In equation (4), failing to reject: H0: $\alpha_i = \beta_j = 0$ implies that educational expenditure does not Granger cause economic growth. On the other hand, in equation (5), failing to reject H0: $a_i = b_j = 0$ implies that economic growth via GDP growth does not Granger cause educational expenditure. The decision rule:

From equation (4), $dLnEDU_{t-1}$Granger causes dLn GDPit if the coefficient of the lagged values of EDU as a group ($\beta_j$) is significantly different from zero based on F-test (i.e., statistically significant). Similarly, from equation (5), $dLnGDP_{t-1}$ Granger causes dLn $EDU_{it}$ if $b_j$ is statistically significant.

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