
Effect of Government Expenditure on Human Capital Development in Nigeria

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Abstract

The phenomenal fall in the level of Nigeria's governmental expenditure in education and health has generated a lot of interest and debate among scholars and investors alike. As a result, this paper focuses on the long run relationship between the governmental expenditure in education and health and Human Capital Development in Nigeria. The result of the VAR model show that the tests point out that HDI is significant in the current year (-1) but tends to converge insignificantly in the previous years. On the other hand, the value of the joint significance indicates that the current values of EDU and HTH are most influencing factors that determine the current values of HDI (-1). This is economically evidence that what influence Human Capital Development in Nigeria are the nature, pattern and level of governmental expenditure in education and health because the model reveal their insignificant direct impact on the HDI.

Keyword: Human Development Index, Causality effect, VAR, Education, Health

Introduction

The level of human development in Nigeria as a developing economy is quite un-encouraging considering the level of human capital and enormous resources available in Nigeria. The fiscal policies and engagement of Nigerian government expenditure have overtime failed to address the necessary human development within the economy. This prompted and generated series of debate among scholars as to the relationship between government expenditure and economic development. According to the study of Abu and Abullahi (2010), Al-Yousif, (2000), Abdullah, (2000) and Cooray, (2009), they all concluded that expansion of government expenditure induce economic development positively. In their study, they discovered that government expenditure on health and education raises the productivity of labor and increase the growth of national output. However, the levels of human development are contradicted by the rate of government expenditure over time in Nigeria. This poor developmental growth are captured in the study of Omankhalen, Oghene, Emmanuel and Okorie (2014) when they discovered that there has been significant reduction in the efficiency of government expenditure since 1990 up till 2012 and its effect are not farfetched on human capital development in Nigeria. Based on this problems

established, the study aim at determining the effect of Government expenditure on human capital development in Nigeria.

Empirical Review

According to Ejere (2011), human capital formation is undoubtedly the pilot for any meaningful Programme of socio-economic development of an economy. Scholars like Adedeji and Bamidele (2003), World Bank (1995), Barro (1991) and Ilegbenosa (2013) acknowledged that education is the primary source of human capital development. The works of Oluwatobi and Ogunrinola (2011), Schultz (1992), Adawo (2011), Bloom & Canning (2003) supports health as a component of human capital development. Lyakurwa (2007) also reported that human capital development has the capacity to enlarge people's choices and opportunities, improve healthy living through acquired skills and knowledge and eventually enhance growth in the nation's gross domestic product through increased productivity. This means that education and health are engine room and key instrument in the development of the human capital of any nation. Wadad and Kamel (2009) posits that by providing new opportunities and expanding the capabilities of people, government spending on education play an imperative role in ensuring productivity and hence a sustainable economic growth. Lucas (1988), supported the ongoing argument by stating that the growth rate of human capital is dependent on the amount of time an individual puts into acquiring skills. Thus, government and multinational investment in education and health results in the development of human capital which has been described as the key determinant of economic development which multiplier effects reflect in economic growth.

The World Bank (2010) specify that Nigeria has found it difficult to grow her economy in her quest to become a knowledge-based economy because of the challenges faced in the national educational system. The organization categorized these problems into poor access to education which is evident in high cost of education, poor quality of education, poor ICT infrastructures and poor governmental funding of education. According to African Development Bank (1998), human capital development is an essential means for sustaining growth and poverty reduction and as an end itself. Schultz (1960) however, categorized human resources into six methods: (i) Health facilities and services (ii) On – the job training (iii) organized education system (iv) Study programmes for adults (v) migration of individual and families to adjust to changing job opportunity (factor mobility) and (vi) Finally, transfer or importation of technical assistance and expertise.

The share of education in Nigeria's total government expenditure between 1980 and 2010 was less than 26 percent of the GDP, which was below the minimum standard recommended by the UNESCO. Since the oil crisis in the 80s, the proportion of capital budget allocated to education has been consistently lower than the proportion of recurrent expenditure (Oraikhi and Ameh, 2014). This is further stressed by Adenuga (2002) who pointed to the fact that Nigeria's government spending has been totally inadequate or that the amount purported to have been expended on education was not actually spent, while Olaniyi & Adam (2002) observed that government expenditure on education and the share of total spending to the Gross Domestic Product (GDP) have been declining. Hinchliffe (2002), also stressed that low budgeting persists till 2000 when the Federal Government spends about 2.4% of her Gross National Product (GNP) on education in 2000. The CBN (2007) also elaborated on the position of government expenditure on education as a percentage of the GDP was 1.5% in 1960 (the era of independence), 1.7% between the period of 1985 to 1987 and 0.7% in 1995, 2.4% of GDP in 2002 and 14.3% of government expenditure in 2006. The Central Intelligence Agency (CIA,

2013), states that the literacy rate in Nigeria is 61.3% thereby buttressing the poor governmental expenditure to increase the literacy rate in Nigeria.

The 2015 Human Development Report of the United Nations Development Programme shows that Nigeria's human development index increased, but her ranking continued to be at the low levels of human development. The report showed that, Nigeria was ranked 152 out of 185 countries that were ranked. This added more impetus to the findings of Ogujiuba and Adeniyi (2004), who examined the impact of government education expenditure on economic growth. Their result showed a statistically insignificant contribution of government capital expenditure on HCD. Law Anson (2009) took this study further by including both the health and education expenditures in her model. Her objective was to examine the role of human capital investment (proxied by total government expenditure on education and health) on economic growth in Nigeria. After regressing GDP on government expenditure on education, government expenditure on health and the enrolment rates, she found out that a clear relationship exists between human capital development and economic growth. However, unlike the study by Ogujiuba and Adeniyi (2004), the study did not disaggregate expenditure figures on health and education into the recurrent and capital components. Sanusi (2012) in his study pictured the implication of poor expenditure on HCD in Kano state. The study made use of both qualitative and quantitative method of analysis. The results of the study showed that there was insufficient funding and inappropriate expenditure in education service. Conclusively, Ilemona, Jibrin and Elejo (2015) in their study of HCD on economic growth using the OLS regression model discovered that the more the government expenditure on HCD, the more progress that will be recorded. Based on the overall empirical review; little emphasis were made on the effect of government expenditure on HCD proxied by Human Development Index (HDI).

Hence, the study establishes the following hypotheses;

H₀₁: Government Expenditure on Education has no significant effect on Human Development Index.

H₀₂: Government Expenditure on Health has no significant effect on Human Development Index.

Research Methodology

This section specifically deals with the methodology of the study attention has been focused on source of data, model formulation and method of data analysis. The data used in this study were mainly secondary data. They covered the period of (1986 – 2015) and obtained from CBN statistical bulletin (2015 and 2016) and economic journals. Others were obtained from textbooks and websites.

Model Specification

The study adopted the econometric model in evaluating the Human Capital Development in Nigeria. The econometric model used was to determine the relationship between Government expenditure in Education and Health on Human Capital Development towards adopting a policy option. In the modification, human capital investments were broken into two, which are educational expenditure and health expenditure. In addition, the study adopt and modify the model of Lawanson (2009), HDI was included because it captures the level of human development.

Based on this specification, a functional model was specified as follows:

$$\text{HDI} = f(\text{EDU}, \text{HTH}) \quad (\text{i})$$

$$\text{HDI} = \beta_0 + \beta_1 \text{EDU} + \beta_2 \text{HTH} + \mu \quad (\text{ii})$$

Where;

HDI = Human Development Index

EDU = Government Expenditure on education sector in Nigeria.

HTH = Government Expenditure on health sector in Nigeria.

β_0 = intercept; β_1 , and β_2 are the coefficients of each variable of the regression whereas μ represents the error term.

Estimation of Model Procedure

We shall apply VAR model for multivariate analysis of government expenditure in education and health on Human development Index to determine the long run relationship and also to test the significance effect of HDI on the duo education and health expenditure between the years (1986-2015). To further investigate the influence (effect and causes) of education expenditure and health expenditure on HDI granger causality was adopted. Unit root test procedure was used to find out the order of time series variable stationarity. The statistical package used for the study is Eviews 9.5.

EMPIRICAL ANALYSIS RESULT

The results of the empirical study are discussed as follows:

Table1: Summary of Result of Unit Root Test using Augmented Dickey Fuller Unit root Test (ADF)

Variables	ADF Test	Critical Value @ 5%	Level/Difference	Decision	Conclusion
EDU	-4.103875	-2.967767	I(0)	No Unit root	Stationary
HTH	-4.762254	-2.971853	I(1)	No Unit root	Stationary
HDI	-7.717037	-2.971853	I(1)	No Unit root	Stationary

Source: E-Views 9.5

**significant at 5% level, ADF test > Critical value, then the variable is stationary*

The table 1 showed that there is no unit among the time series variables when subjected to ADF test at various level and order difference 1. EDU is statistically significant and stationary at level while HTH and HDI are statistically significant and they are stationary at first order difference all at level at 5% level as the value of ADF-test statistic is greater than the critical value at 5%.

Table 2: Vector Autoregression Test Result

Vector Autoregression Estimates			
Date: 04/27/17 Time: 21:12			
Sample (adjusted): 1988 2015			
Included observations: 28 after adjustments			
Standard errors in () & t-statistics in []			
	HDI	EDU	HTH
HDI(-1)	0.532810	4.900447	-0.308824
	(0.21019)	(3.84537)	(4.04989)

	[2.53485]	[1.27438]	[-0.07625]
HDI(-2)	0.363561	-0.039598	1.967534
	(0.20745)	(3.79523)	(3.99708)
	[1.75250]	[-0.01043]	[0.49224]
EDU(-1)	0.024306	-0.090332	0.164135
	(0.01321)	(0.24162)	(0.25447)
	[1.84033]	[-0.37387]	[0.64501]
EDU(-2)	-0.002030	-0.529363	-0.233048
	(0.01423)	(0.26027)	(0.27411)
	[-0.14267]	[-2.03394]	[-0.85021]
HTH(-1)	0.012040	-0.003942	0.841742
	(0.01351)	(0.24715)	(0.26030)
	[0.89122]	[-0.01595]	[3.23377]
HTH(-2)	-0.008428	-0.026258	-0.282990
	(0.01343)	(0.24560)	(0.25867)
	[-0.62781]	[-0.10691]	[-1.09403]
C	-0.077694	6.825520	0.567421
	(0.11802)	(2.15918)	(2.27402)
	[-0.65829]	[3.16116]	[0.24952]
R-squared	0.768320	0.259814	0.392336
Adj. R-squared	0.702126	0.048332	0.218718
Sum sq. resids	0.016749	5.605466	6.217583
S.E. equation	0.028241	0.516650	0.544128
F-statistic	11.60705	1.228542	2.259767
Log likelihood	64.17282	-17.21181	-18.66275
Akaike AIC	-4.083773	1.729415	1.833054
Schwarz SC	-3.750722	2.062466	2.166105
Mean dependent	0.430347	5.485229	1.964879
S.D. dependent	0.051744	0.529607	0.615598

Source: E-Views 9.5 Result Output

Estimation Proc:

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LS 1 2 HDI EDU HTH

VAR Model:

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$$\text{HDI} = C(1,1)*\text{HDI}(-1) + C(1,2)*\text{HDI}(-2) + C(1,3)*\text{EDU}(-1) + C(1,4)*\text{EDU}(-2) + C(1,5)*\text{HTH}(-1) + C(1,6)*\text{HTH}(-2) + C(1,7)$$

VAR Model - Substituted Coefficients:

$$\text{HDI} = 0.532810400401 \cdot \text{HDI}(-1) + 0.36356123316 \cdot \text{HDI}(-2) + 0.0243055632923 \cdot \text{EDU}(-1) - 0.00202970030255 \cdot \text{EDU}(-2) + 0.0120401292766 \cdot \text{HTH}(-1) - 0.0084284271232 \cdot \text{HTH}(-2) - 0.0776943453547$$

The result of the VAR model show that the tests point out that HDI is significant in the current year (-1) and also in the previous years. On the other hand, the value of the joint significance indicates that the current values of EDU and HTH are most influencing factors that determine the current values of HDI (-1) and HDI (-2). This is economically evidence that what influence Human Development Index (HDI) in Nigeria is the nature, pattern and level of government Expenditure on human capacity development (HCD) because the model reveal direct impact on the HDI while EDU and HTH have positively affected HDI in the current year than previous which didn't converge as a result of negative sign. The estimated model present individual magnitudes effects of the independent variable on the dependent variable by a unit change in the exogenous variables: EDU and HTH can capture correspondent 2.4% and 1.2 % increase in HDI in the current year while relative change in EDU and HTH will result in about 0.2% and 0.8% decrease in HDI respectively in the previous years.

Adjusted R-squared value implies that the independent variables can explain the dependent variable by 70.2% and the model of the estimated parameter are fitted at 70%. In addition, the possibility of convergence from the short run dynamics to the long-run equilibrium between the selected variables; however, the speeds of adjustment among the variables were observed to be slow but empirically evidenced.

Table 3: Granger Causality Test-result

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause HDI	28	1.56685	0.2302
HDI does not Granger Cause EDU		2.80295	0.0814
HTH does not Granger Cause HDI	28	0.10200	0.9034
HDI does not Granger Cause HTH		0.34555	0.7114
HTH does not Granger Cause EDU	28	0.04616	0.9550
EDU does not Granger Cause HTH		0.76354	0.4775

Source: E-Views 9.5 Result Output

The causality points out effect of government expenditure in education (EDU) and Health (HTH) are insignificant in explaining the causal effect on the HDI. In other words, EDU and HTH do not Granger causes HDI and HDI also doesn't granger cause EDU and HTH. This means that there is no bi-directional relationship and unidirectional relationship between Government expenditure on education and health in Human capital Development in Nigeria.

Summary of Findings

The findings of the research are summarized as follows:

- i) The empirical analysis shows no direct relationship between Human Development Index and Government expenditure in education and health.

- ii) The study has also show that an inverse relationship exists between HDI and EDU and HTH in the previous years.
- iii) HDI was also observed to be positively related to government expenditure in EDU and HTH in the current year.

CONCLUSION

The empirical results demonstrated a direct relationship between some government expenditure (EDU and HTH) and HDI in Nigeria. EDU and HTH in the current year can capture correspondent 2.4% and 1.2 % increase in HDI while previous years showed that EDU and HTH will result in about 0.2% and 0.8% decrease in HDI respectively. Adjusted R-squared value implies that the independent variables can capture and explain the dependent variable by 70.2% and the model of the estimated parameters are fitted at 70%. In addition, the possibility of convergence from the short-run dynamics to the long-run equilibrium between the selected variables; conclusively, the inverse relationship between HDI and Government expenditure (EDU and HTH) do not portend effectiveness of expenditure on Human Capacity Development (HDI) in Nigeria. The findings demonstrated that there is no causal effect of Government expenditure (EDU and HTH) on HDI. Hence, long run relationship does not exist among Government expenditure (EDU and HTH) and Human Capacity Development in Nigeria.

RECOMMENDATIONS

From the empirical findings of the study, the following recommendations were made:

1. Human Capacity Development is found not to relate to Government expenditure (EDU and HTH). It is therefore important for appropriate policy formulation and implementation of policies to encourage and increase more funds for Human Capacity Development in Nigeria. Hence, direct relationship between increased Government expenditure (EDU and HTH) is needed to boost Human Capacity Development in Nigeria and economic growth at large.
2. From the result, an inverse relationship is established between HDI and Government expenditure (EDU and HTH) in the long run. To this end, government should be proactive in ensuring that the literacy rate and survival of Human Capital Development is encouraged by channeling more funds to educational development and the health sector to boost the nation's industries and productivity. This will in turn facilitate economic growth.

REFERENCES

- Abdullah, H. (2008). Effects of government expenditure, fiscal policy and institutions on the economic growth of Asian economies, Doctoral dissertation, *University of Putra, Malaysia*.
- Adam, P. A. (2002). The impact of human capital on economic growth in Nigeria in human resource development in Africa, *proceedings of the Nigeria economic society*, Ibadan Pp 53 – 78.
- Adamu, P. A. (2003). The impact of human capital formation on economic development in Nigeria: An error correction approach in human resource development in Africa: selected papers for the year 2002 annual conference, *The Nigerian Economic Society (NES)*, Part Two, pp.53-77.
- Adedeji, S. O. & Bamidele, R. O. (2003). Economic impact of tertiary education on human capital development in Nigeria in: *Human resource development in Africa*. Selected Papers for 2002 Annual Conference, Nigerian Economic Society, Ibadan, 499-522.

- Adenuga, A. O. (2002). Economic growth and human capital development (1970-2000)", *proceeding of the annual conference of the Nigerian economic society: human resources development in Africa*, university of Ibadan.
- Adewole, T. M. (2006), "Funding of education in Nigeria" *Journal of Sociology and Education in Africa*. 5(2), 59-70.
- Akpan, N. I. (2005). Government expenditure and economic growth in Nigeria: A Disaggregated approach. *CBN Economic and Financial Review*, 43(1), 87 – 98.
- Al-Yousif, Y. (2000). Does government expenditure inhibit or promote economic growth: Some empirical evidence from Saudi Arabia, *Indian Economic Journal*, 48(2).
- Amaghionyeodiwe, L. A. & Osinubi, T. S. (2006). The Nigerian educational system and returns to education. *International Journal of Applied Econometrics and Quantitative Studies*. 3(1)
- Anyadike, N., Emeh, I. E. J. &Ukah, F.O. (2012). Entrepreneurship development and employment generation in Nigeria: Problems and prospects. *Universal Journal of Education and General Studies*. 1(4), 088-102.
- Anyanwu, J. C. (2003). Promoting of investment in Africa, *African Development Bank*. Retrieved from www.afdb.org/fileadmin/uploads/afdb/Documents/Public.
- Babatunde, M. A. & Adefabi, R. A. (2005). Long run between education & economic growth in Nigeria: Evidence from the Johansen's co-integration approach. *Paper Presented at the Regional Conference on Education in West African Constraints and Opportunities*, Dakar, Senegal. Cornell University/ CREA/Ministered L. Education du Senegal.
- Bakare A. S. (2006). The growth implication of human capital investment in Nigeria: An empirical study. *Journal of Economics and Social Studies*, University of Ado- Ekiti, 123-135.
- Barro, R. J. & Lee. J. W. (1993). International comparison of educational attainment, *Journal of Monetary Economics*, 32, 363-398.
- Bloom, D. E., & Canning, D. (2003). The health and poverty of nations: from theory to Practice. *Journal of Human Development*, 4(1),47-71.
- Chete, A. & Adeoye, S. (2002). Human resources development in Africa. *The Nigerian Economic Society Selected Papers for the 2002 Annual Conference*, 79-102.
- Chude, N. K. & Chude, D. I. (2013). Impact of government expenditure on economic growth in Nigeria. *International Journal for Business Management Review*. 1(4),64-71.
- Dauda, R.O. (2010). Role of human capital development: an empirical study of Nigerian case. Oxford business and economic conference program United Nations development programme. *Summary: Human Development Report*.
- Ehimare, O. A, Oghene, J. O. Obarisiagbon, E. I. & Okorie, U. I. (2014). The Nigerian government expenditure on human capital development: an efficiency analysis. *European journal of business and social sciences*, 3(7), 01-13 url: <http://www.ejbss.com>.
- Enueme, C. (1999). Education and technology: Implications for economic; Delta state University, Abraka
- Gujarati, D. N. & Porter, D. C. (2009): Basic econometrics. McGraw Hill, New Delhi.
- Hinchcliffe, K. (2002). Public expenditure on education in Nigeria: Issues, estimates and some implications. *Abuja, World Bank*
siteresources.worldbank.org/AFRICAEXT/Resources/no_29.pdf
- Igbuzor, O. (2006). The state of education in Nigeria, (Civil Society Action Coalition on Education for All. www.mcser.org/journal/index.php/jesr/article/download/2338/2...

- Ihugba, O. A., Odili, A. & Njoku, A. (2014). Theoretical analysis of entrepreneurship challenges and prospects in Nigeria. *International Letters of Social and Humanistic Sciences*.5, 21-34.
- Ilegbinosa, I. A. (2013). Human capital investment as an effective tool for economic development in Nigeria, *International Journal of Management and Business Studies*, 3(1), 7-13.
- Johansen, S. (1991). Estimation and hypothesis testing of co-integration vectors of Gaussian Vector Autoregressive Models, *Econometric*, 59(6): 1551-1580.
- Lustig, N. (2006). Investing in health for economic development: The case of Mexico” *UNU-WIDER Research Paper No. 2006/30*.
- Lyakurwa, W. M. (2007). Human capital and technology for development: Lessons for Africa. AfDB.
- Obi, Z. C. & Obi, C.O. (2014). Impact of Government expenditure on education: the Nigerian experience. *International Journal of Business and Financial Management Research*. 2, 42-48.
- Odukoya, D. (2009). Formulation and implementation of educational policies in Nigeria, *Educational Research Network for West and Central Africa (ERNCWA)*, www.slideshare.net.
- Oghojafor, K., Sulaimon & Okonji (2009). Empowering Nigeria Youths for National Economic Development: The Role of Entrepreneurship Education, *Journal of Research in National Development*, 7(2), 9-17.
- Ogujiuba, K. K. & Adeniyi, A. O. (2005). Economic growth and human capital development: the case of Nigeria, Central Bank of Nigeria.
- Okojie, C. E. (1995). Human capital formation for productivity growth in Nigeria. *The Nigerian Economic and Financial Review*:1(1), 43-68.
- Oladeji, S. I. & Abiola, A. G. (2009). Poverty alleviation with economic growth strategy: prospects and challenges in contemporary Nigeria”, *Journal of Social Development in Africa* 15(2), 33-53.
- Olaniyi, O. O. & Adam, J. A. (2002). Public Expenditure and Human Development in Nigeria, Economic Society Annual Conference, Ibadan. 157-198
- Oluwatobi, S. O. & Ogunrinola, I. O. (2011). Government expenditure on human capital development: implications for economic growth in Nigeria, *Journal of Sustainable Development*, 4(3), 72-80.
- Oriakhi, D. E. & Ameh, G. (2014). Government expenditure and the development of the education sector in nigeria: an evaluation, Department of Public Administration Nnamdi Azikiwe University, Awka, Nigeria and Zainab Arabian Research Society for Multidisciplinary Issues Dubai, UAE. www.arabianjbm.com/RPAM_index.php
- Risikat, S. D., (2009). Investment in education and economic growth in Nigeria: A Co-integration approach. *Global Conference on Business and Economics*. University of Cambridge, UK.
- Sankay, O. J., Ismail, R. & Shaari, A. H. (2010). The impact of human capital development on the economic Growth of Nigeria. *Prosiding Perkem V, Jilid*, 1, 63 – 72.
- Schultz T. P. (1992). The role of education and human capital on economic development“. *An empirical assessment center discussion paper, economic growth center, Yale University*.

Appendix

Data presentation for the study

SN	Year	GIH	GIE	HDI
1	1986	1.92611	5.2927	0.39325
2	1987	1.93707	5.3335	0.3802
3	1988	2.36823	5.4630	0.3705
4	1989	2.36394	5.0092	0.378
5	1990	2.13079	5.2897	0.322
6	1991	1.70853	5.1486	0.328
7	1992	1.95189	5.0092	0.348
8	1993	2.89574	5.3678	0.389
9	1994	1.98547	5.9798	0.384
10	1995	1.11641	5.2927	0.452
11	1996	0.93637	5.7362	0.39325
12	1997	1.08819	5.9186	0.456
13	1998	1.45792	5.0092	0.439
14	1999	1.5818	6.0274	0.455
15	2000	1.5265	5.5845	0.462
16	2001	1.63653	5.2948	0.463
17	2002	1.00022	5.1960	0.4
18	2003	1.45797	5.0567	0.4
19	2004	2.27501	5.2679	0.427952
20	2005	1.92611	5.8727	0.434
21	2006	1.93707	5.2657	0.444
22	2007	2.36823	5.1367	0.448
23	2008	2.36394	5.0812	0.453
24	2009	2.13079	5.4106	0.457
25	2010	1.70853	5.8625	0.462
26	2011	1.95189	6.7615	0.467
27	2012	2.8475	4.6034	0.5
28	2013	2.15274	5.1263	0.501
29	2014	2.4729	5.8268	0.504
30	2015	3.6754	6.9877	0.512

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Unit root for the study

EDU

Null Hypothesis: EDU has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=0)				
			t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-4.103875	0.0035	
Test critical values:	1% level	-3.679322		
	5% level	-2.967767		
	10% level	-2.622989		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EDU)				
Method: Least Squares				
Date: 04/27/17 Time: 20:42				
Sample (adjusted): 1987 2015				
Included observations: 29 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic Prob.	
EDU(-1)	-0.948347	0.231086	-4.103875	0.0003
C	5.199959	1.256701	4.137785	0.0003
R-squared	0.384149	Mean dependent var	0.058448	
Adjusted R-squared	0.361340	S.D. dependent var	0.663061	
S.E. of regression	0.529893	Akaike info criterion	1.634190	
Sum squared resid	7.581250	Schwarz criterion	1.728487	
Log likelihood	-21.69576	Hannan-Quinn criter.	1.663723	
F-statistic	16.84179	Durbin-Watson stat	1.689338	
Prob(F-statistic)	0.000336			

HTH

Null Hypothesis: D(HTH) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=0)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-4.762254	0.0007	
Test critical values:	1% level	-3.689194		
	5% level	-2.971853		
	10% level	-2.625121		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(HTH,2)				
Method: Least Squares				
Date: 04/27/17 Time: 20:47				
Sample (adjusted): 1988 2015				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic Prob.	
D(HTH(-1))	-1.026884	0.215630	-4.762254	0.0001
C	0.062608	0.103447	0.605222	0.5503
R-squared	0.465889	Mean dependent var	0.042555	
Adjusted R-squared	0.445347	S.D. dependent var	0.734386	
S.E. of regression	0.546934	Akaike info criterion	1.699774	
Sum squared resid	7.777570	Schwarz criterion	1.794931	

Log likelihood	-21.79683	Hannan-Quinn criter.	1.728864
F-statistic	22.67906	Durbin-Watson stat	1.833133
Prob(F-statistic)	0.000063		

HDI

Null Hypothesis: D(HDI) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=0)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-7.717037	0.0000
Test critical values:	1% level		-3.689194	
	5% level		-2.971853	
	10% level		-2.625121	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(HDI,2)				
Method: Least Squares				
Date: 04/27/17 Time: 20:52				
Sample (adjusted): 1988 2015				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HDI(-1))	-1.386112	0.179617	-7.717037	0.0000
C	0.006234	0.005291	1.178210	0.2494
R-squared	0.696094	Mean dependent var		0.000752
Adjusted R-squared	0.684405	S.D. dependent var		0.049389
S.E. of regression	0.027746	Akaike info criterion		4.262713
Sum squared resid	0.020016	Schwarz criterion		4.167556
Log likelihood	61.67799	Hannan-Quinn criter.		4.233623
F-statistic	59.55266	Durbin-Watson stat		1.893876
Prob(F-statistic)	0.000000			

Vector Autoregression result

Vector Autoregression Estimates			
Date: 04/27/17 Time: 21:12			
Sample (adjusted): 1988 2015			
Included observations: 28 after adjustments			
Standard errors in () & t-statistics in []			
	HDI	EDU	HTH
HDI(-1)	0.532810	4.900447	-0.308824
	(0.21019)	(3.84537)	(4.04989)
	[2.53485]	[1.27438]	[-0.07625]

HDI(-2)	0.363561	-0.039598	1.967534
	(0.20745)	(3.79523)	(3.99708)
	[1.75250]	[-0.01043]	[0.49224]
EDU(-1)	0.024306	-0.090332	0.164135
	(0.01321)	(0.24162)	(0.25447)
	[1.84033]	[-0.37387]	[0.64501]
EDU(-2)	-0.002030	-0.529363	-0.233048
	(0.01423)	(0.26027)	(0.27411)
	[-0.14267]	[-2.03394]	[-0.85021]
HTH(-1)	0.012040	-0.003942	0.841742
	(0.01351)	(0.24715)	(0.26030)
	[0.89122]	[-0.01595]	[3.23377]
HTH(-2)	-0.008428	-0.026258	-0.282990
	(0.01343)	(0.24560)	(0.25867)
	[-0.62781]	[-0.10691]	[-1.09403]
C	-0.077694	6.825520	0.567421
	(0.11802)	(2.15918)	(2.27402)
	[-0.65829]	[3.16116]	[0.24952]
R-squared	0.768320	0.259814	0.392336
Adj. R-squared	0.702126	0.048332	0.218718
Sum sq. resids	0.016749	5.605466	6.217583
S.E. equation	0.028241	0.516650	0.544128
F-statistic	11.60705	1.228542	2.259767
Log likelihood	64.17282	-17.21181	-18.66275
Akaike AIC	-4.083773	1.729415	1.833054
Schwarz SC	-3.750722	2.062466	2.166105
Mean dependent	0.430347	5.485229	1.964879
S.D. dependent	0.051744	0.529607	0.615598
Determinant resid covariance (dof adj.)		6.02E-05	
Determinant resid covariance		2.54E-05	
Log likelihood		28.93430	
Akaike information criterion		-0.566736	
Schwarz criterion		0.432417	

Granger Causality result

Pairwise Granger Causality Tests

Date: 04/27/17 Time: 22:49

Sample: 1986 2015			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause HDI	28	1.56685	0.2302
HDI does not Granger Cause EDU		2.80295	0.0814
HTH does not Granger Cause HDI	28	0.10200	0.9034
HDI does not Granger Cause HTH		0.34555	0.7114
HTH does not Granger Cause EDU	28	0.04616	0.9550
EDU does not Granger Cause HTH		0.76354	0.4775