What are the Short-run and Long-run Drivers of Human Capital Development in Nigeria?

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2019

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Abstract

This paper investigated the drivers of human capital development in Nigeria in the short and long run. Using an ARDL approach over the period 1980 to 2015, the results show that expenditure on education and interest rate have positive significant impacts on human capital in the long but not in the short run. Similarly, exchange rate, another policy variable, has significant negative impacts on human capital in the long but not in the short run. On the contrary, trade openness has insignificant positive impacts on human capital. Therefore, the estimated coefficients of our model show that macroeconomic policies such as fiscal, monetary, and exchange rate policies have significant impacts on human capital while trade policies have insignificant impacts. That is, the fluctuations in human capital in Nigeria depend and respond to fiscal, monetary, and exchange rate policies. The key conclusion is that any policy advice should be sensitive to the level of human capital in the country and ideally complemented by policy effectiveness that will determine the long-term success of human capital development.

1. Introduction

What are the policy drivers of human capital development in Nigeria in the short run and in the long run? How can the Nigerian government create an environment conducive to human capital both in the short run and in the long run? While the answers to these questions have changed fundamentally over the last decades, the relationship between policy and human capital raises a host of issues that deserve careful analysis.

It is estimated that, by 2050, Nigeria will be world's 3rd most populous country, providing endless opportunities for economic development, if the talents of this rising youth are harnessed towards the productive sectors of the economy (Goldstone, 2010, Gerland et al, 2014; Reed and Mberu, 2014). With 173.6 million people today and 398.5 million people projected for 2050, Nigeria's greatest asset in the coming decades will be in its capacity to harness this swiftly increasing pool of human capital in the short run and in the long run (Reed and Mberu, 2014).

However, Nigeria competes on primarily unskilled labor and natural resources (Birdsall, Pinckney, and Sabot, 2001). Moving up the value chain to efficiency and innovation-driven economy will require continued, high impact investments in education, nutrition and health, and creating the enabling environment for job creation in the short run and in the long run (Bhargava, Jamison, Lau and Murray, 2001; Adamu, 2003). Nigeria is supposed to reap the demographic dividend that benefited most of East Asian economies. East Asian economies captured the window where fertility and dependency ratios fell dramatically, taking advantage of demographic opportunities with a conducive policy environment (Bongjoh et al, 2011).

Many policy decisions and underlying economic factors influence human capital development; public policies that enlarge opportunities for "knowledge workers" can accentuate human capital-related economic effects (Son, 2010). On the other hand, human capital formation and utilization is affected, in a multitude of ways, by macro-economic policies. Labor market conditions, especially the "education premium" of higher earnings and lower risk of unemployment enjoyed by those with more education, directly affect the incentives for investment in human capital. "Direct and indirect public expenditures and tax policies in support of educational institutions, individual students and their families, and workplace-related training and skill developments exemplify the types of policies that can affect the demand for and cost of investment in human capital. Through their effects on labor supply, including intensity of work effort, choice of occupation, and age of retirement, tax and expenditure policies also affect labor supply over the life cycle, and thus the utilization of human capital" (Wildasin, 2014, p. 1).

While there are many dimensions of macro-economic policies, our interest, in this paper, is in fiscal, monetary, exchange rate and trade policies. That is our interest is in how the government can harness its macro-economic policies to promote human capital development in the short run and in the long run. For example, fiscal policy can stimulate human capital development. When the government increases spending through fiscal policy, it means more funds for education and increased human capital development. Further, when the government raises the interest rates, foreign currencies flow into the country, leading to increased flow of capital into the economy, inclusive of the education sector. Similarly, when money supply rises, household incomes increase, making more funding available for education and increased human capital development.

The remainder of this work is organized as follows: section 2 deals with a review of the literature. Section 3 discusses the methodology. Section 3 also sketches an explicitly dynamic framework within which human capital is modeled as a function of policy. Section 4 discusses the empirical analysis. Section 5 provides a brief summary and conclusion.

2. Highlights of Educational Policies in Nigeria

The Western formal education came to Nigeria in 1842 through the Missionary Societies who established the first primary school in Lagos. In 1926, this primary school and others became standardized into infant 1 and 2 and standard 1-6. By 1951, regionalization of education led to the adoption of 6-6 program by the Western region, 7-5 program by the Eastern region, 7-6 program by the Northern region and 8-6 program by Lagos metropolitan area. They later gave rise to the 6-5-2-3 system of education. In 1976, General Olusegun Obasanjo introduced the Universal Primary Education (INE). In response to the need of a more functional educational system, the 6-3-3-4 system was given birth to by the National Curriculum Conference of 8-13th September, 1969. However, this system suffered a myriad of implementation problems (Omokhodion, 2006, 2008). The 9-3-4 system of education is the current system in Nigeria and insists on a 9-year compulsory basic education.

It is worthy of note that the Universal Basic Education started in Nigeria as Universal Primary Education (UPE) in 1955, which was a regional program in the defunct south western region of country under the premiership of late Obafemi Awolowo. Nigeria launched the UPE in 1976, but, the programme failed due

to lack of funds (Boyi, 2014). The scheme was later launched in 1999 to include all parts of the country under the leadership of Olusegun Obasanjo. The scheme was established to ensure the provision of free, compulsory and uninterrupted access to 9 years of basic education for every child of school-going age. Further, it was to help in the acquisition of literacy, numeracy, life skills and values for lifelong education and useful living. The scheme was also envisioned to operate as an intervention, coordinating and monitoring agency to advance the capacity of states, local government agencies and communities in the provision of basic education in Nigeria (Tsafe, 2013). The UBE commission provides leadership and advisory roles to the states and local government who are the major implementers of the basic education program. Thus, the major duty of the federal government is the provision of policy guidelines to the providers of basic education.

The five national objectives are: a just and egalitarian society; a free and democratic society; a united, strong and self-reliant nation; a great and dynamic economy; and a land full of bright opportunities for all citizens (Federal Government of Nigeria, 2004). These may prove unachievable without human capital development (Aluede et al, 2012). As well, the National Economic Empowerment and Development Strategies (NEEDS), which is the government's strategy for poverty reduction, identifies education as an important tool to drive home NEEDS goal of transforming the entire Nigerian polity (Omoregie, 2010). NEEDS' goals of wealth creation, poverty reduction, employment generation, and value reorientation are only attainable through an efficient and functional educational system (UNESCO, 2008).

According to National Policy on Education (2004:8), "Education shall continue to be highly rated in the national development plans because education is the most important instrument for change: any fundamental change in the intellectual and social outlook of any society has to be preceded by an education revolution". However, Nigeria faces a daily decline of educational standards, as a result of many factors militating against the maintenance of standard of education in Nigeria. One of such is the imposition of intolerable or short-sighted policies on education by those exercising political authority, thus jeopardizing educational aims and objectives. According to the former president Olusegun Obasanjo in his Presidential Speech on April, 24, 2000 in Dakar Senegal, he attributed the educational falling standard to bad governance. In his speech; he stated that:

> *Nigerian educational system as it stands is a living proof of the damages that bad governance can do to our society and social structure.*

Further, inadequate finance for the implementation of the formulated policies has led to inadequate facilities, instructional materials, and equipment. There are inefficiencies and corruption in the

management of available fund; appointments and promotions of unqualified teachers on the basis of ethnicity and parochialism; inadequate instructional facilities which led to ineffective teaching; moral laxity and general insensitivity towards ethical values leading to cultism and examination malpractice; poor remunerations; and high rate of examination malpractice buoyed and perpetuated by students, parents and teachers (Boyi, 2014).

Since many educational policies of the government have failed to yield fruitful results over the years, this study suggests that the government harness its macroeconomic policies (i.e. fiscal, monetary, exchange rate and trade policies) into turning around education in Nigeria. For example, fiscal policy, which is the use of government spending or taxes to grow or slow down the economy, can affect human capital development in different ways. It can affect human capital development through income changes, price changes, and interest rates (Romer, 1990; Easterly and Rebelo, 1993; Kneller, Bleaney and Gemmell, 1999). When the government increases spending through fiscal policy, it puts more income in the pockets of households. This means more funds for education, usually resulting in overall increased demand for education and increased human capital development.

Further, when the government takes an expansionary fiscal approach, it has to get that money from somewhere. To do that, it sells bonds, which raises the interest rates (Arrow and Kruz, 2013; Palley, 2015). This higher interest rates cause foreign currencies to flow into the country because foreign investors are attracted to the higher interest rates, which give them a better return on their money (Magud, Reinhart and Vesperoni, 2014; Bocola, Bianchi, Perri and Amador, 2016). This increased flow of capital has important implications on all aspects of the economy, including education and human capital development.

Similar to fiscal policy, monetary policy, which involves changing the money supply and credit availability to individuals, can also affect the human capital development (Heckman, 2000). Monetary policy acts in much the same way as fiscal policy in relation to human capital development. When the money supply rises or credit gets easier (for example, the ability to get a loan), household income increases. As household incomes get bigger, more money is available for education and human capital development (Becker, 1994).

3. Theory and Review of Literature

The standard approach in labor economics views human capital as a set of characteristics that increase a worker's productivity (Acemoglu, 2008). However, there are alternative ways of conceptualizing human capital:

(1) The Becker view: Human capital is directly valuable in the production process. Human capital increases a worker's productivity in different tasks, organizations, and situations. The role of human capital is quite complex, and is represented by the stock of knowledge or skills which is part of the production function (Becker, 1994).

(2) The Gardner view: Human capital is multi-dimensional, and emphasizes mental vs. physical abilities as differentiated skills. Gardener's multiple-intelligences theory emphasizes how many geniuses were "unskilled" in other dimensions (Gardner, 1996).

(3) The Schultz/Nelson-Phelps view: Human capital is viewed as the capacity to adapt. Human capital is viewed as useful in dealing with "disequilibrium" situations, or with situations where workers have to adapt to a changing environment.

(4) The Bowles-Gintis view: Human capital is the capacity to work in organizations and adapt to life in a hierarchical and capitalistic society. The role of schools is to instill the correct ideology and approach towards life.

(5) The Spence view: Observable measures of human capital are more measures of capability than characteristics used in the production process.

These views show that human capital is valuable because it increases profitability. In fact, in many applications, human capital would be a mixture of these approaches (Acemoglu, 2008). Therefore, human capital is the ability and efficiency of people to change raw materials and capital into goods and services (Son, 2010). These abilities—such as numeracy, literacy, cognitive, and analytical skills—can be learned through education. According to Son (2010), human capital plays "a critical role in economic growth and poverty reduction. From a macroeconomic perspective, the accumulation of human capital improves labor productivity; facilitates technological innovations; increases returns to capital; and makes growth more sustainable, which, in turn, supports poverty reduction. Thus, human capital is regarded at the macro level as a key factor of production in the economy-wide production function. From a microeconomic perspective, education increases the probability of being employed in the labor market and improves earnings capacity. Thus, at the micro level, human capital is considered the component of education that contributes to an individual's labor productivity and earnings while being an important component of firm production" (p. 2).

A few studies have delved into the issue of policy in relation to human capital. For example, Lim, Lee and Kim (2015) examined the regional impact of educational investment policies on migration and economic growth using an interregional computable general equilibrium model with a human capital module. Developed for three industrial sectors of two regions in South Korea, the CGE model specified the behaviors of two regional households, six producers, two regional governments, a national government, and the rest of the world. The authors showed that the impact of the human capital investment on GRP growth was higher for the 30s age cohort than for any other age cohort, and this holds for both the Seoul Metropolitan Area and the rest of Korea.

Using data for 146 countries over 60 years, Son (2010) showed that a wide gap exists in human capital accumulation between industrialized and developing countries. The average working-age adult in industrialized countries has 11 years of schooling compared with less than 6 years in sub-Saharan Africa and South Asia. While human capital has been converging over the past six decades (i.e. human capital accumulation is faster in developing countries than in industrialized countries), estimates of time to convergence showed that it may take decades for poor countries to catch up with the 2010 levels of human capital of rich countries. In South Asia, it will take almost 30 years for the region to catch up with the 2010 levels of human capital in industrialized countries, based on its historical performance during 1950–2010.

Using levels of policy variables, Fatás and Mihov (2013, p.) showed that policy volatility exerts "a strong and direct negative impact on growth. In a cross-section of 91 countries, policy volatility emerges as a key determinant of macroeconomic performance. An increase in the volatility of fiscal policy corresponding to one standard deviation in the sample reduces long-term economic growth by about 0.75 percentage points"

Using three-equation structural system by two stage least squares, Oketch (2006) studied the two-way links between human resource development produced by formal schooling and economic growth, measured in per capita terms, and between investment in physical capital and growth. He found that that high investment in physical capital and in human capital are the sources of labor productivity growth in the medium term in African nations.

The general finding in the literature is that individuals with more education tend to have better employment opportunities, higher incomes, and more productivity than those who are less educated (Son, 2010). These findings provide a strong rationale for government policy to be oriented towards

investment of substantial portions of their resources in human capital, with the expectation that higher benefits will accrue over time. In this context, "education is deemed an investment, equipping individuals with knowledge and skills that improve their employability and productive capacities, thereby leading to higher earnings in the future" (Son, 2010, p.1).

The major gap in the literature therefore is to determine the policy drivers of human capital development. It is therefore to ask if the level of macroeconomic policies in Nigeria is appropriate for the needed human capital development both in the short run and in the long run.

4. Data & Methodology

Data and Model

This study posits that the link between policy effectiveness and human capital can be identified with the following modification of Bildiriciet al. (2005) and Oketch (2006) model:

$$Lr_{it} = \beta_0 + \beta_1 Expedu_{it} + \beta_2 Intr_{it} + \beta_3 Excr_t + \beta_4 openness_t + \beta_5 Gdpc_t + \beta_6 Capform_t + \xi_t \quad (1)$$

In this regression Lr is the literacy rate. In the empirical literature, there are many proxy measures of human capital, such as literacy rates (Azariadis and Drazen 1990); years of schooling (Cohen and Soto 2007); school enrollment rates (Mankiw et al. 1992); and test scores (Hanushek and Woessmann 2009). Thus, for this study, we adopt literacy rates as the measure of human capital because (i) it is the most common measure of human capital in the literature, and (ii) it is fairly comparable across countries.

Our key regressors are the interest rate (Intr), government expenditure (Expedu), exchange rate (Excr) and trade openness (Openness). Throughout the paper, we will refer to these four variables as policy variables with the obvious caveat that the measures relate to instruments of monetary, fiscal, exchange rate and trade policies respectively. Also included is GDP per capita. ξ are the residuals.

Table 1. Description of Variables

	Variable Name	Definition
Gdpc	GDP per capita (constant 2010 US$)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated

		without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.
Intr	Lending interest rate (%)	Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector. This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing.
Litr	Literacy rate, adult total (% of people ages 15 and above)	Adult literacy rate is the percentage of people ages 15 and above who can both read and write with understanding a short simple statement about their everyday life.
Expedu	Education expenditure	Education expenditure refers to the current operating expenditures in education, including wages and salaries and excluding capital investments in buildings and equipment.
Openness	Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.
Excr	Official exchange rate (LCU per US$, period average)	Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

Source: World Development Indicators, 2016The ARDL Bounds Testing Approach

As developed by Pesaran, Shin and Smith (2001), the ARDL bounds testing approach has a number of benefits, such as validity even when the variables are a mix of I(0) or I(1); capability to measure both

long-run and short-run effects at once (Bentzen & Engsted 2001); and appropriateness even for small sample size (Ghatak & Siddiki 2001).

A two-step procedure was followed in the ARDL estimation. The first step is the F-test for the joint significance of the lagged level variables. Conventionally, it is assumed that $H_0: \lambda_1 = \lambda_2 = 0$ is the null of the absence of a long-run relationship against $H_a: \lambda_1 \neq \lambda_2 \neq 0$ which is the alternative hypothesis of the presence of a long-run relationship. The null is accepted if the calculated F-statistic is less than the lower bound; the null is rejected if the calculated F-statistic is more than the upper critical bound. The second step is the estimation of the short-run and long-run parameters of the error correction model.

5. Empirical Analysis

The descriptive statistics for policy variables (Interest rate, Expenditure on Education, Exchange rate, and Trade Openness) and human capital for Nigeria are presented in Table 2. The standard deviation, which is a measure of the amount of variation of a set of data values, is highest for expenditure on education, thus showing the volatile nature of government policies.

Table 2. Descriptive Stats

	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
Capform	12.83	11.97	6.52	2.00	7.25	46.85	0.00
Excr	67.11	22.00	64.53	0.25	1.23	4.65	0.10
Expedu	1.24×10^9	6.09×10^8	1.29×10^8	1.31	3.50	9.82	0.01
Gdpc	1624.15	1405.89	442.67	0.84	2.19	4.79	0.09
Intr	17.76	17.80	5.17	0.20	3.29	0.33	0.85
Litr	54.56	54.80	1.38	-0.49	4.20	3.28	0.19
Openness	51.88	53.03	16.23	-0.21	2.07	1.42	0.49

Table 2 shows the correlation analysis between policy variables and human capita development in Nigeria. The sample correlation coefficient quantifies the direction and strength of the linear association between the two variables. The sample correlation coefficients are very low and insignificant, showing the disconnect between policy and human capital in Nigeria.

Table 3. Correlation Analysis

	Litr	Intr	Expedu	Excr	Openness
Litr	1.00				
Intr	0.21 (0.25)	1.00			
Expedu	0.21 (0.23)	-0.43 0.01	1.00		
Excr	0.07 (0.68)	0.18 (0.33)	0.50 (0.00)	1.00	
Openness	-0.07 (0.69)	0.62 (0.00)	-0.44 (0.01)	0.22 (0.21)	1.00

Note: Probability in Parenthesis. Authors computations.

Considerable evidence abides in the literature that time series data are often non-stationary, a property which, if ignored in estimation, may lead to spurious regression (Nelson and Plosser, 1982; Chatfield, 2016). This study uses the Elliot, Rothenberg and Stock Point Optimal unit root test (ERS), which is more computationally robust than the traditional unit root tests (e.g., Augmented Dickey-Fuller,1979; Phillips-Perron, 1988). Table 1 summarizes the results of the ERS test. The results show that some variables are stationary at I(0) and some at I(1), meaning that the variables are a mix of *I*(0) and *I*(1) and appropriate for the ARDL approach.

Table 1. Elliott-Rothenberg-Stock Unit Root Test

	Nigeria	
	I(0)	I(1)
Capform	35.71	3.57**
Excr	3.74	3.41***
Expedu	7.72	2.59**
Gdpc	17.04	1.56*
Intr	2.11**	0.52*

Litr	7.54	3.19***
Openness	12.72	1.51*
Test critical values:	1% level	1.87
	5% level	2.97
	10% level	3.91

*Note: * significant at 1%; ** significant at 5%; *** significant at 10%. Lag length is selected using Spectral OLS AR based on SIC, maxlag=9. Authors computations.*

To apply the ARDL approach for estimation, a cointegrating relation must first be established among the variables (Adeola and Evans, 2017). The calculated F-statitics for the cointegration test is as shown in Table 4. The critical values are reported in the same table based on Narayan (2004) with small sample size between 30 and 80. The calculated F-statistic (F-statistic = 4.58) is higher than the upper bound critical value at 1 per cent level of significance (9.58), using restricted intercept and no trend. This implies that the null hypothesis of no cointegration cannot be accepted at 1 per cent level and therefore, there is a cointegration relationship among the variables.

Table 4. *F*-statistic of Cointegration Relationship

Test statistic	Value	lag	Significance level	Bound Critical values* (restricted intercept and no trend)		Bound Critical values* (restricted intercept and trend)	
				I(0)	I(1)	I(0)	I(1)
F-statistic	9.58*	1					
			1%	3.15	4.43	5.333	7.063
			5%	2.45	3.61	3.710	5.018
			10%	2.12	3.23	3.008	4.150

*Note: * significant at 1%. Authors computations.*

Having established the presence of a long-run relationship among the variables, we then used the Akaike Information Criteria (AIC) for the model selection. Table 5 and Table 6 shows how well policy effectiveness has helped in human capital development in Nigeria.

Table 5. Short Run Estimates
Dependent Variable: D(Litr)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Expedu)	0.01	0.01	1.68	0.11
D(Intr)	-0.02	0.03	-0.53	0.60
D(Excr)	0.16*	0.02	6.64	0.00
D(Excr(-1))	0.02	0.02	0.81	0.43
D(Openness)	-0.02	0.01	-0.29	0.77
D(Gdpc)	0.00	0.00	-1.57	0.13
D(Gdpc(-1))	0.03**	0.01	2.71	0.01
D(Capform)	-0.09	0.07	-1.32	0.20
Ect(-1)	-0.71**	0.28	-2.57	0.02

*Note: * significant at 1%; ** significant at 5%. Method: ARDL. Sample (adjusted): 1983 2014. Included observations: 31 after adjustments. Maximum dependent lags: 1 (Automatic selection). Model selection method: Akaike info criterion (AIC). Number of models evalulated: 729. Selected Model: ARDL(1, 0, 1, 2, 0, 2, 1). White heteroskedasticity-consistent standard errors & covariance. Authors computations.*

The significance of the error correction term shows the evidence of causality in at least one direction. The lagged error term, ECT(1), in our results is negative and significant at 1% level. The coefficient of -0.71 indicates high rate of convergence to equilibrium.

Expenditure on education and interest rate have significant positive impacts on human capital in the long but not in the short run. In other words, policy variables, in terms of expenditure on education and interest rate, have significant impacts on human capital in Nigeria. This is consistent with Schultz (1971) who showed the importance of education and research to investment in human capital. Human capital is affected directly and indirectly by education which plays an important role in accumulating human

capital. Studies such as Mankiw, Romer, and Weil (1992) and Lucas (1988) stress the essential role of education as the most important production factor in increasing human capital, by helping individuals acquire knowledge which opens doors to job opportunities, improves health, and reduces poverty.

Table 6. Long Run Estimates

Dependent Variable: LitrVariable	Coefficient	Std. Error	t-Statistic	Prob.
Expedu	0.02**	0.01	3.18	0.01
Intr	0.13**	0.04	2.92	0.01
Excr	-0.03**	0.01	-2.43	0.03
Openness	-0.01	0.02	-0.28	0.78
Gdpc	0.02	0.01	-0.03	0.98
Capform	0.13	0.08	1.63	0.12
C	53.54*	4.18	12.80	0.00

*Note: * significant at 1%; ** significant at 5%. Authors computations.*

Exchange rate has significant negative impacts on human capital in the long but not in the short run. In other words, policy variables, in terms of exchange rate, have significant impacts on human capital in Nigeria. This is consistent with Yang (2005) who found that the estimated elasticity of Philippine-peso remittances with respect to the Philippine/foreign exchange rate is 0.60. These positive income shocks lead to enhanced human capital accumulation in origin households. Favorable migrant shocks lead to greater child schooling, reduced child labor, and increased educational expenditure in origin households. More favorable exchange rate shocks also raise hours worked in self-employment, and lead to greater entry into relatively capital-intensive enterprises by migrants' origin households.

On the contrary, trade openness has insignificant positive impacts on human capital. This finding is in contrast to studies such as Miller and Upadhyay (2000) which showed that a higher openness benefits total factor productivity. As an outward-oriented country, Nigeria has not experienced significant total factor productivity, over and above the positive effect of openness. Human capital generally contributes

positively to total factor productivity, but for poor countries, such as Nigeria, however, human capital interacts with openness to achieve a positive but insignificant effect.

Now we use the test of CUSUM to test the stability of the model. Figure 2 provides the graph of CUSUM test. It is categorically evident that the plot of CUSUM is within 5% of critical bands. This infers that the estimated model is stable.

Figure 1. Test of CUSUM
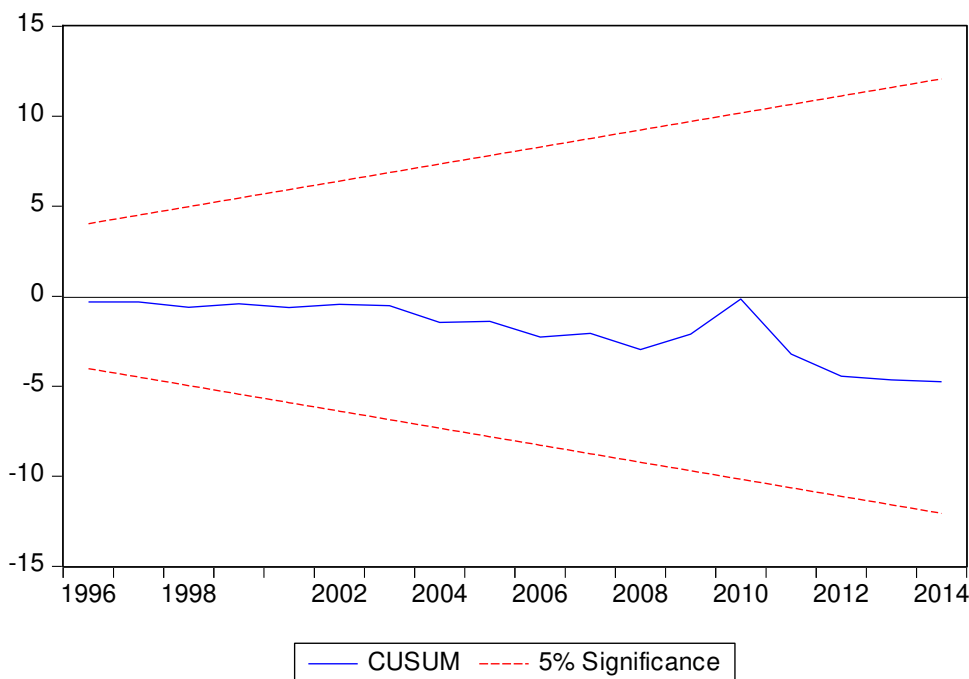
This gives credence to the fact that there exists long run stability of the human capital model of policy effectiveness in Nigeria.

6. Conclusion

This study has examined the dynamic effect of policy on human capital in Nigeria. Using an ARDL approach over the period 1981 to 2015, the estimation results show that there is long run relationship among variables of the human capital model of policy effectiveness in Nigeria. Expenditure on education and interest rate have significant positive impacts on human capital in the long but not in the short run. In

other words, policy variables, in terms of expenditure on education and interest rate, have significant impacts on human capital in Nigeria. Exchange rate has significant negative impacts on human capital in the long but not in the short run. In other words, policy variables, in terms of exchange rate, have significant impacts on human capital in Nigeria.

On the contrary, trade openness has insignificant positive impacts on human capital. As an outward-oriented country, Nigeria has not experienced significant total factor productivity, over and above the positive effect of openness. Human capital generally contributes positively to total factor productivity. For poor countries, such as Nigeria, however, human capital interacts with openness to achieve a positive but insignificant effect. When the stability of the estimated model is tested with CUSUM, it shows that there exists a significant and stable human capital model of policy effectiveness in Nigeria.

Therefore, the estimated coefficients of our model show that macroeconomic policies such as fiscal, monetary, and exchange rate policies have significant impacts on human capital while trade policies have insignificant impacts. That is, the fluctuations in human capital in Nigeria depend and respond to fiscal, monetary, and exchange rate policies.

For example, a general recommendation arising from the findings of this study is that government policy must be geared towards with labor and economic policy. The development of human capital cannot exist in a vacuum; rather, policy decisions on priorities, curricula, and budget allocation to education need to be on the basis of medium- and long-term development plans. Moreover, a comprehensive study of policy and human capital will need to consider government policies concerning the skills taught in the educational system, the institutions governing the means of production, and the dynamics of the labor market.

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