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Dynamics of Human Capital Development and Economic Growth in Nigeria.

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ABSTRACT

This paper investigates the dynamics of human capital development and economic growth in Nigeria using time series data spanning from 1981 to 2022. The major sources of the data were from the World Development Index (WDI) and Central Bank of Nigeria (CBN) statistical bulletin various issues. The macroeconomic variables selected were Gross Domestic Product (GDP) as a proxy for economic growth, government expenditure on education (GEE), government expenditure on health (GEH), tertiary school enrolment (TSE) and gross capital formation (GCF). The paper engages the technique of Vector Error Correction Model (VECM) and the result indicates that expenditure on education and tertiary enrolment were positively related to economic growth while expenditure on health and gross capital formation exert negative though significant in the short run. The implication of the above findings suggests that human capital development has not been well attended to in the case of Nigerian economy and thus causing human capital to impact insignificantly on per capital income. Based on the above findings, the paper recommends that government should increase its revenue allocation to the development of human capital through education, tertiary enrolment, health and gross capital formation. More so, government should guarantee that expenditure on education in all levels is paramount in ensuring inclusive growth in Nigeria.

Introduction

The importance of human capital in driving economic growth cannot be overemphasized. Economists recognize that the development of human capital is a fundamental requirement for a country's social, economic, and political transformation (Ruggeri & Yu, 2023). No nation has achieved sustained real growth and development without making substantial investments in its human capital. Human capital encompasses the acquired and valuable skills of all members of society, measuring the capabilities of the labor force, including skills, capacity, education, health, and intelligence (Sima, Gheorghe, Subic & Nancu (2020). It underscores the idea that not all resources are equal, but through proper training and investment, the gap can be bridged (Nurmahmudah & Putra, 2020). Globally, human resource is widely acknowledged as a major determinant of a nation's prosperity (Madukwe, Okwo & Nwabuisi, 2022).

However, human capital is recognized as an agent of national development in all countries of the world including Nigeria. It is evident that no country has achieved sustained economic growth and development without substantial investment in human capital. Therefore, the role and importance of human capital in advancing the pace of economic growth cannot be exaggerated. Human capital takes center stage in the theory of endogenous economic growth because of its potential to foster innovation, and education, which is considered the cornerstone of human capital development (Giouli, 2022). Consequently, numerous researchers have explored the relationship between human capital and economic growth and development. Some have focused on individual countries, while others have examined cross-country evidence (e.g. Mamoloko & Ngwakwe, 2019; Mekoro, 2020). Economic theorists also concur that the quality of the labor force has a profound impact on economic growth. This perspective argues that both the quality and quantity of labor are crucial determinants of production, as labor is a critical factor of production. Based on the forgoing, the main objective of the study is to investigate the dynamics of human capital development on inclusive growth in Nigeria.

1. Literature Review
2.1 Theoretical Framework

The paper adopted the theory of modernization in its analysis. This theory focuses on how education transforms an individual's value, belief and behavior. Exposure to modernized institutions such as schools, factories, and mass media inculcate modern values and attitudes. Such attitude includes openness to new idea, independence from traditional authorities, willingness to plan and calculate further exigencies and growing sense of personal and social efficacy. According to the modernization theorists, these normative and attitudinal changes continue throughout the life cycle, permanently altering the individual's relationship with the social structure.

2.2 Empirical Literature Review

Oloke, Usman & Adebayo (2023) examined human capital development and economic growth in Nigeria using secondary data obtained from CBN statistical bulletin for the period of forty years between1981-2020. The paper shows that expenditure on human capital development on civil servants, education, manufacturing and health were significant with exception of agriculture and transportation that were not significant. Diebolt & Hippe (2022) made use of the ordinary least square techniques to study the impact of human capital improvement on innovation and economic growth in European regions from 1860-2020. Variables such as literacy rate, investment, number of patients, human capital, fertility, infant mortality, and population density were showed to be significant. Ubaka, Nwaonuma & Ifeaka (2022) examined the impact of human capital development on economic growth in Nigeria from 1986 to 2019, using co-integration test and Vector Error Correction Model (VECM) and showed that life expectancy, total government expenditure on health, external debt and private domestic investment has a positive impact on growth. Babangida &

Usman (2022) used multivariate Vector Auto regression (VAR) to investigate on human capital development and economic growth in Nigeria using time series data from 1981-2020 and using government expenditure on education (GEE), government expenditure on health (GEH), life expectancy rate (LER), primary school enrollment (PSE), secondary school enrollment (SSE), and tertiary school enrollment (TSE) as proxies for human capital development, and gross domestic product (GDP) as proxy for economic growth. Findings reveal that increase in human capital increases economic growth in Nigeria.

Euphemia (2022) using Autoregressive Distributed Lag (ARDL) examined human capital development and economic growth in Nigeria. The time series data was sourced from Central Bank of Nigeria Statistical Bulletin and World Bank data base from 1981-2020. The study showed that total government expenditure on education has positive and insignificant long run relationship with GDP. Also, Shobowale, Olopade, & Oladeji (2022) evaluated the direct effects of human capital development and chosen total factor productivity components (technology and infrastructure) on economic growth in chosen Sub-Saharan African Countries during the period 1981-2020 using the Panel Least Square Method. The study suggested that human capital development on its own is not sufficient to bring about the needed growth in an economy, and so there is a need for complementary factors such as technology and infrastructure for human capital to actualize its full potential. Finally, Bachama, Hassan & Ibrahim (2021) examined the role of human capital on economic growth in Nigeria using time series data covering the period from 1970-2019. The study applied ARDL and showed that expenditure on health and education are found to be positively and significantly related with economic growth both in the short-run and long-run.

3. Methodology

3.1 Theoretical Framework

The theoretical framework which this study is anchored on stems from the generalization of the human capital production technology as determinants of growth and the accessible channels of human capital investment in developing countries in which associated consensus is still controversial in the literature. From the above, the paper considers an economy where final output is dependent on two distinct factors of production, physical capital and labour. For a Cobb-Douglass production function with constant return to scale technology:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\beta} \qquad (3.1)$$

Where $0 < \beta < 1$ and Y_t, K_t and L_t denote gross domestic product, physical capital stock, and total labour force at time t, Time-variant technological level (A_t) is influenced by factors contributing to the enhancement of efficiency and knowledge environment. Following Park (2004), endogenous growth models of Lucas (1988), Romer (1990), and Jones (1995) provided theoretical frameworks where human capital enhances productivity growth.

3.2 Model Specification

This study therefore adopted the above framework and specified as follows:

$$GDP = f (GEE, GEH, TSE, GCF) \qquad (3.2)$$

Where; GDP = Gross Domestic Product
     GEE = Government Expenditure on Education.
     GEH = Government Expenditure on Health.

TSE = Tertiary School Enrollment
GCF = Gross Capital Formation

The mathematical model is given as:

$$GDP_t = \alpha_0 + \alpha_1 GEE_t + \alpha_2 GEH_t + \alpha_3 TSE_t + \alpha_4 GCF_t \qquad (3.3)$$

The econometric model is given as:

$$GDP_t = \alpha_0 + \alpha_1 GEE_t + \alpha_2 GEH_t + \alpha_3 TSE_t + \alpha_4 GCF_t + \mu_t \qquad (3.4)$$

Where μ_t is the white noise, while other variables remain as previously defined.

Taking the natural logarithm of the variable in the model in order to prove their linearity, the model becomes:

$$lgGDP_t = \alpha_0 + \alpha_1 lgGEE_t + \alpha_2 lgGEH_t + \alpha_3 lgTSE_t + \alpha_4 lgGCF_t + \mu_t \qquad (3.5)$$

The is the intercept parameter/constant, which signifies that even if all the independent variables are equal to zero, GDP will still grow by the value of the intercept due to the effect of other variables not captured in the

model. While $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ are the coefficient of the independent variables that shows the level of change of the dependent variable as a result of a unit change in the independent variable (Romer, 1990). The error term

(μ) is used to capture the impact of other variables that are not included in the model.

3.3 Sources of Data

The main sources of the data were from the World Development Index (WDI) and Central Bank of Nigeria (CBN) statistical bulletin various issues, form 1981 to 2022 and the econometric software used for the estimation was E-view 12.0

4. Results and Discussion

When using macroeconomic time series data, it is substantial that a unit root test be conducted to examine its stationarity state. The paper adopted the Augmented Dickey-Fuller (ADF) approach to unit root and the result is as shown in Table 4.1

Table 4.1. Summary of Unit Root Test

@Level			@First Difference			Order of Integration
Variables	ADF Stat	5% Critical Value	Variables	ADF Stat	5% Critical Value	
LNGDP	-0.860782	-2.938987	LNGDP	-4.038624	-2.936942	I(1)
LNGEE	-2.55818	-2.94343	LNGEE	-7.969588	-2.936942	I(1)
LNGEH	-1.99289	-2.94343	LNGEH	-10.30762	-2.936942	I(1)
TSE	-0.297092	-2.935001	TSE	-6.755625	-2.936942	I(1)
LNGCF	-2.035415	-2.938987	LNGCF	-5.133611	-2.938987	I(1)

Source: Authors' Computation (EVIEWS 12.0)

From Table 4.1, all the variables, (i.e. LNGDP, GEE, GEH, TSE, LNGCF) were not stationary at level but became stationary after first differencing them once. Thus, a test for co-integration test was conducted.

Johansen Co-integration Test

In relation to the result of the unit root test, co-integration test was done using Johansen Co-integration Test approach. The choice of this approach is premised on the fact that our variables are integrated on the same order I(1). See table 2 below;

Table 4.2. Co-integration Test Result

```
Date: 01/26/24   Time: 14:40
Sample (adjusted): 1986 2022
Included observations: 37 after adjustments
Trend assumption: Linear deterministic trend
Series: LOG_GDP LOG_GEE LOG_GEH TSE LOG_GCF
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)
```

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.921598	221.7017	69.81889	0.0000
At most 1 *	0.824412	127.5030	47.85613	0.0000
At most 2 *	0.656986	63.13721	29.79707	0.0000
At most 3 *	0.429001	23.54779	15.49471	0.0025
At most 4	0.073239	2.814204	3.841466	0.0934

```
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
```

Source: Authors' Compilation Using EVIEWS 12.0

Since we have at least one situation where the trace statistic is greater than the critical value we can say that there are 4 co-integrating equations. This indicates the possibility of rejecting the null hypothesis that says there are no co-integrating vectors at 5% level of significance. This confirms the existence of long run equilibrium relationship between the variables.

Error Correction Model
VECM Results
Table 4.3 shows the VECM results which is used to determine the speed of adjustment of the short- run dynamics to the long run. Therefore, the previous year's deviation from the long-run equilibrium is corrected in the current period at an absolute adjustment speed of 0.003378.

Table 4.3. Long- Run impact

Dependent Variable	Log(GDP)		
Variable	COEFF	SE	TS
LOG_GEE(-1)	2.758770	(0.23489)	11.745*
LOG_GEH(-1)	-3.182522	(0.25177)	-12.6407
TSE(-1)	0.128091	(0.04133)	3.09889
LOG_GCF(-1)	5.93384	(0.78964)	7.51466

Table 4.4. Short-run impact

ERROR CORRECTION VARIABLES	D(LOG_GDP) COEFF	SE	TS
CointEq1	-0.003378	(0.02575)	-0.13118
D(LOG_GDP(-1))	0.327069	(0.21951)	1.48997
D(LOG_GEE(-1))	0.065901	(0.04841)	1.36138
D(LOG_GEH(-1))	-0.066935	(0.06148)	-1.08874
D(TSE(-1))	0.000687	(0.01557)	0.04414
D(LOG_GCF(-1))	-0.16574	(0.17386)	-0.95328
C	0.000621	(0.02477)	0.02509
R-squared	0.699395		
Adj. R-squared	0.278547		
Sum sq. resids	0.014591		
S.E. equation	0.031189		
F-statistic	1.661871		
Log likelihood	92.50687		
Akaike AIC	-3.811182		
Schwarz SC	-2.853339		
Mean dependent	0.040122		
S.D. dependent	0.03672		

Source: Author's Compilation Using Eviews 12.0

Stability Test.

The stability of the long run coefficient and the short run movement is examined using the cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ). The decision is that if the plots of the CUSUM and CUSUMSQ statistics stays within the critical bounds of the 5% significance level, the model is said to be stable. In line with this condition, a critical look at the plots in the figures below shows that the variables were stable.
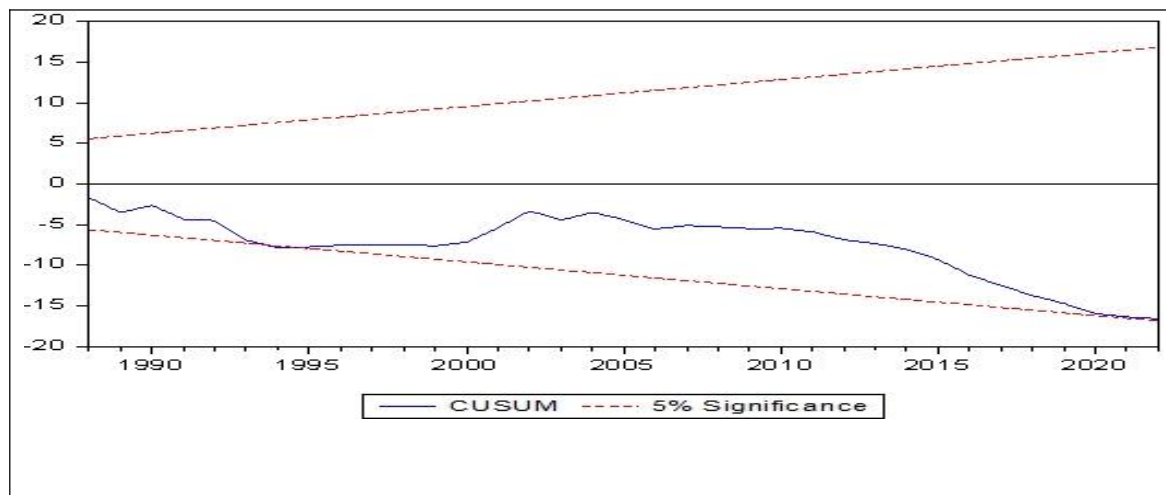

Figure 4.1 : CUSUM Test result
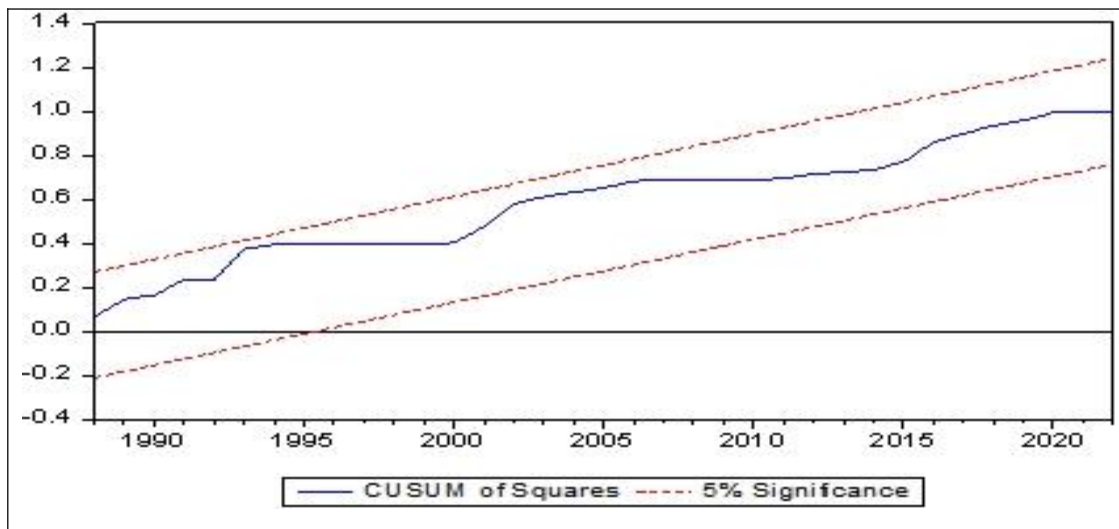**Source: Computation Using EVIEWS 12.0**

Figure 4.2: CUSUM Square Test
Source: Computation Using EVIEWS 12.0

4.2 Discussion of Findings

The findings from this paper has indicated that there is a short-run relationship between government expenditure on education and tertiary school enrollment, while in government expenditure on health and gross capital formation, there is a long run relationship. Specifically, government expenditure on education has a positive and insignificant impact on economic growth in the short run. This implies that government expenditure on health boost economic growth in the economy.

From the result, it was shown that government expenditure on health has a negative and insignificant impact on economic growth in the short run. This implies that government expenditure on health reduces economic growth in the economy. From the result too, it was shown that tertiary school enrollment has a positive and insignificant impact on economic growth in the short run. This implies that tertiary school enrollment boost economic growth in the economy. Finally, gross capital formation has a negative and insignificant impact on economic growth in the short run. This implies that gross capital formation reduces economic growth in the economy. The above finding coincided with the recent study of Oloke, Usman & Adebayo (2023) who examined human capital development and economic growth in Nigeria and documented that government expenditure on human capital development (education, manufacturing and health) were significant with inclusive growth in Nigeria.

5. Conclusion and Policy Implication
5.1 Conclusion

The paper is based on the dynamics nature of human capital development on economic growth in Nigeria. The paper applied time series data on gross domestic product, government expenditure on health, government expenditure on education, tertiary school enrollment and gross capital formation for the period of 1981-2022 which was sourced from World Development Indicators (WDI) and the Central Bank Statistical Bulletins. The paper applied VECM techniques and documented that government expenditure on education and tertiary school enrollment exert significant and positive impacts on economic growth, while government expenditure on health and gross capital formation had negative impact on economic growth in Nigeria, although statistically significant. As such, the paper is of the view that government should increase her budget on critical key sectors such as education, health and infrastructures to ensure a greater impact on inclusive growth in Nigeria.

5.2 Policy Implication

So far, the paper has found that government expenditure on education and tertiary school enrollment exert significant and positive impacts on economic growth while government expenditure on health and gross capital formation had negative impact on economic growth. The implication of the above findings suggest that there is a positive and

significant relationship between human capital development and economic growth in Nigeria.

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