ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

Determinant of Human Development in Nigeria

Wahab Afolabi Azeez
Business School, Zhengzhou University
Zhengzhou, Henan China

Abstract:- The research investigates the factors influencing human capital development (HCD) in Nigeria. Historically, the Nigerian government has overlooked the significant deterioration in both human capital development and infrastructure, which leads to decreased productivity in the country's economy. The primary goal of this study is to explore the factors influencing human capital development in Nigeria. The study investigated the patterns and trends of human capital development in Nigeria over a span of 35 years, encompassing the period from 1988 to 2022. Top of Form; examined the factors that determine human capital development in Nigeria. The time series analysis was used to investigate the effect of fertility rate, gross domestic product, inflation rate, human development index. The data utilized in this study were sourced from the World Bank database (WDI) the Central Bank of Nigeria (CBN). The study utilized descriptive measurements, which included mean, median, skewness and kurtosis; just as inferential statistics which included correlation analysis, unit root test, Autoregressive distributed lag model (ADL) and error correction estimates as the estimation tools. The study found proof of short run connection among the variables. The study further found that gross domestic product exhibits a positive effect on the Human Development Index, although this effect is found to be statistically insignificant. (t = 1.32; p = 0.206), fertility rate demonstrates a negative and statistically significant effect on the Human Development Index. (t = -1.66; p = 0.002), inflation rate has positive and significant effect on human development index (t= -0.8; p= 0.0215). This, accordingly, suggests that fertility rate and inflation rate contribute more significantly to human capital development in Nigeria. From the study it is concluded that the fertility rate and inflation rate are the variable that mostly determines human capital development in Nigeria. From the findings, the study suggests enhancing the quality of healthcare services through increased government expenditure in the health sector in other to enhance the quality of human development.

Keywords:- *Fertility, Gross Domestic Product, Inflation, Inferential Statistics and Human Development Index (HDI).*

I. INTRODUCTION

Humans are regarded as the most valuable assets in both developing and developed countries. Consequently, the effective management and utilization of these assets are imperative. This can be attained by providing the capable investment is made at all levels by the government in human capital development. As articulated by (Oluwatobi & Oluranti 2018), human capital encompasses the intangible assets of individuals, knowledge. and collective skills which can be harnessed to create economic value. The significance of human capital development (HCD) in fostering sustained growth and development within contemporary economies is underscored by Amassoma and Nwosa (2011). They assert that HCD plays a crucial role in achieving essential and ongoing progress. Moreover, Uchendu (2018) emphasizes that human capital development is a fundamental requirement for a nation's socioeconomic and political transformation goals.

Nigeria, as a nation, boasts abundant resources, encompassing both natural riches and a reservoir of human talent. A lot of resources across the country cannot be quantified, this abundance of resources suggests that Nigeria should have attained good leadership and economic accomplishments. but reverse is the case (Nwokoye, Chukwuka, Ozoh, Onugha & Odebode, 2020). Nigeria relies heavily on physical capital for its growth and development, often overlooking the crucial role played by human capital in the developmental process. Human capital has gained recognition as an intermediary for national development in countries worldwide in recent years.

(Isola & Alani, 2012) emphasized that as the global economy transitions towards more knowledge-based sectors, such as the manufacturing of ICT devices, pharmaceuticals, and telecommunications, human capital development becomes a critical concern for policymakers and practitioners involved in economic development at both regional and national levels also, (Adelakun, 2011). This shift has the potential to rejuvenate the Nigerian economy.

Jolliffe (2001) affirms that human capital development in most African developing countries does not translate into improved industrial output, leading to issues such as poverty, illiteracy, high school dropout rates, and low standards of living. Ferreira (2014) argued that West African economies, including Nigeria, lack policies promoting the efficient utilization of abundant natural resources. This hinders the region from meeting basic human capital needs necessary for enhancing economic output. These challenges have

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

decreased more significantly in Africa compared to other world regions. The United Nations (2019) suggests that poverty is not a natural phenomenon. Interestingly, the coexistence of abundant natural resources with widespread poverty implies that poverty is a global creation that can be addressed with effective local economic policies.

The ongoing debates within the context of Nigerian economic development revolve around the inadequacy of natural resource exploitation to meet employment and social inclusion expectations, particularly concerning youth development. Faced with this challenge, governments often make commitments to economic diversification with a focus on job creation to enhance human capital development (Son, 2010). To realize these goals, leaders aim to align with the industrialization objectives outlined in Goal Nine (9) of the Sustainable Development Goals, adopted by world leaders in September 2015 (United Nations, 2019). The primary emphasis is on building robust infrastructure, fostering innovation, and promoting sustainable industrialization. However, as noted by the World Bank (2012b), Nigeria's economic production base is relatively weak, characterized by outdated facilities and an unrealistic capital plan. Consequently, the industrialization of Nigeria poses a significant challenge.

Aliyu and Adamu (2018) that for an economy to survive and foster growth, education is imminent. Schultz and Denison as cited in Akaakohol and Ijirshar (2018) Investment in education has been recognized as a crucial driver for increasing per capita Gross National Product (GNP), reducing poverty, and fostering the growth of knowledge, ultimately contributing to the reduction of inequality. Scholars argue that investments in education and training significantly influence an individual's productivity. Hence, education is deemed a vital component of human capital development, and leaving it solely to individual choice is considered impractical.

Moreover, health plays a fundamental role in economic growth and development, serving as a key determinant of economic performance at both micro and macro levels. Scholars such as Bloom and Canning (2003) and Aigbokhan, Imahe, and Ailemen (2017) emphasize that health is a direct component of human well-being and a form of human capital that enhances an individual's capabilities. Akaakohol and Ijirshar (2018) argue that a healthy population is crucial for productive capacity, highlighting the advantages of investing in health. They posit that health is a catalyst for economic growth, as healthy individuals are more efficient in acquiring knowledge, leading to higher productivity levels. Similarly, Ogujiuba (2013) contends that without robust human capital development (HCD), no country can achieve significant economic growth.

Achieving the goal of eradicating illiteracy, as outlined in the Millennium Development Goals (MDGs), will remain elusive without substantial attention to educational expenditure by the federal government. In Nigeria, persistent challenges such as inconsistent governmental policies, inadequate infrastructure, unsupportive agricultural practices, a stagnant manufacturing sector, and inefficient resource management have hindered progress in this regard (Olatunji, Anthonia & Ndubisi, 2018).

In conclusion, the accumulation of human capital, involving investments in education, training, and health, emerges as a determinant influencing the fluctuations in economic growth in Nigeria. Consequently, this study seeks to investigate the impact of fertility rate, gross domestic product (GDP), and inflation as indicators or determinants of human capital development (HCD) in Nigeria spanning the years 1988 to 2022.

Based on empirical findings, research by scholars such as Dauda (2010), Torruam and Abur (2014), , Adeyemi and Ogunsola (2016), , Jaiyeoba (2015), Osoba and Tella (2017), Hakooma (2017), Akaakohol and Ijirshar (2018), and Tsaurai (2020) has revealed a positive impact of human capital development on economic growth. Conversely, studies conducted by Paul and Akindele (2016), Maku, Ajike, and Chinedu (2019), Nwokoye, Chukwuka, Ozoh, Onugha, and Odebode (2020), as well as Popogbe and Adeosun (2020), have suggested contrasting findings. discovered negative effect on growth. Discoveries from literature indicates that there is evidence of conflicting result which could be attributed to selected variables used, scope of study, source of data and estimation techniques applied. Moreover, what prevails in the literature are fertility rate and inflation rate commonly identified as key determinants of human capital development (HCD). with less empirical documentation on fertility rate and inflation rate and gross domestic product. Based on this fact, the study will incorporate all these variables jointly as determinants of human capital development (HCD) in Nigeria.

Additionally, previous studies have primarily gauged human capital development (HCD) using gross domestic product (GDP), which is deemed insufficient. This study distinguishes itself from earlier research by adopting the Human Development Index (HDI) as an alternative measure for human capital development. The HDI is a composite index encompassing factors such as a long and healthy life, cost of living, and a well-rounded standard of living, considerations that were overlooked in past studies.

The primary objective of this study is to examine the determinants of human capital development in Nigeria. The specific goals include:

- Analyzing the pattern and trend of human capital development in Nigeria.
- Determining the effect of fertility on human capital development in Nigeria.
- Investigating the impact of inflation on human capital development in Nigeria.
- Evaluating the relationship between human capital development (HCD) and gross domestic product in Nigeria.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

II. THEORETICAL REVIEW

A. Sen's Capabilities Approach

The theoretical underpinning of human development is rooted in Sen's capabilities approach (Sen, 1979; 1999). According to this perspective, a person's well-being is best measured by their capability to achieve various functioning vectors, encompassing aspects such as income, education, and health. Sen emphasizes that individuals with greater capabilities have more choices and a higher level of well-being. This goes beyond traditional measures like income and underscores the importance of feasible opportunities for individuals.

The capabilities approach challenges the notion that education alone is the sole driver of economic transformation. It highlights the significance of institutions in facilitating human development. According to De Muro and Tridico (2008), the relationship between institutions and human development is complex, as human development involves various dimensions. Institutions and development policies play a crucial role in smoothing the path for development and ensuring equal opportunities for all, ultimately enhancing the overall standard and quality of life.

In light of these insights, the algebraic model for this study can be specified as:

$$HD = f(Z) \quad (1)$$

Where,

HD is human development,
Z is a vector of exogenous capability shifters.

Equation (1) encapsulates Sen's theory of development, which revolves around the expansion of capabilities. This forms the foundation of the human development approach, positing that the primary goal of development is to improve human lives by broadening the range of activities and opportunities available to individuals. This encompasses aspects such as being well-nourished and healthy, educated, and actively participating in community life. The equation serves as a representation of Sen's conceptual framework, emphasizing the multidimensional nature of development beyond traditional economic measures.

B. Human Capital Investment Theory

Human capital investment theory was put forward by Kenhman in the year 1952. The theory illustrates that human capital development plays a crucial role in boosting productivity. As researched by Jacob (2008) highlights that as the stock of human capabilities increases, so does investment. This emphasizes the significance of investing in productive human capital, which is comparable to investing in physical capital. The idea is that enhancing human capabilities through education, skills development, and health contributes to a more productive and skilled workforce, ultimately driving economic investment and growth. However, the research of popular human capital theorists like Hicks (1989), Solow (1970), Debreu (1956) and Becker (1981) all cited in Andabai and Eze (2018) already confirmed that investments in human capital enhance the growth and development of modern economies. They emphasize that human capital investments provide technical and specialized knowledge, contributing to increased productivity in the economy. The process of human capital formation, including improvements in health standards, is associated with increased output due to enhanced labor productivity and capital accumulation. In summary, human capital investments play a crucial role in driving economic progress and productivity.

C. Human Capital Theory

The theory put forth by Becker (1964) and expanded upon by Rosen (1976) elucidates the impact of human capital on enhancing the economic growth of individuals and nations. This theoretical framework posits that individuals, driven by the pursuit of future well-being, contribute not only to their current welfare but also to the overall economic growth of a country (Blaug, 1976). The emphasis on personal development increases individual productivity, thereby fostering economic growth.

Tan (2014) emphasizes that the improvement in education or skills, constituting human capital, extends to healthcare as well. The positive enhancement of both education and health significantly influences productivity, ultimately contributing to the economic growth of nations. This is underscored by the fact that individuals in good health tend to have higher expectations of productivity. Mankiw and Weil (1992), along with Romer, supported the Solow model, which incorporates human capital development (HCD) as a key determinant of economic growth. This model builds upon the Solow model's exogenous technical progress, highlighting the crucial role of human capital in driving long-term economic growth by integrating human resources with physical capital. The proponents of this theory argue that the combined growth of human capital and physical resources is pivotal for advancing production and increasing overall economic growth.

D. Modernization Theory

Theory posits that development follows a predetermined and systematic trajectory that all nations traverse, progressing from traditional or agricultural forms to post-industrial and modern forms. Scholars such as Chirot and Hall (1982), Bradshaw (1987), Escobar (1995), and Shrum (2000) have contributed to the elucidation of this theory. According to Modernization Theory, societies evolve through distinct stages, mirroring the Western developmental model, with the assumption that modernization entails the adoption of advanced technologies, increased industrialization, and the emergence of democratic institutions. Critics, however, argue that this theory oversimplifies the complexities of development and neglects cultural, historical, and social factors that shape the diverse paths of different nations. Furthermore, every economy has once get engaged in the process of modernization, which hs its developmental process; from traditional economies to takeoff to maturity, maturity to high

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

consumption, then to the postindustrial society. The Modernization theory lays concern on forces from the internal and socioeconomic sources development which includes democracy and secular political structures, education and market-based economy, Although modernization theory also takes external influence into consideration and causes of economic development and social changes, it targets less on foreign influences (Jenkins and Scanlan, 2001; Shrum, 2000).

The modernization theory explains that modern economy has higher productivity, more child education, and welfarism of the needy is also taken as a priority. Politically, according to Coleman, the two main attributes of a modern or developed societies includes: (a) Differentiating political structure (b) Secularizing political culture -which involves equality, by enhancing the society's political system.

The main belief of the theory as elucidated by Rostow is split into five (5) stages in his theory of economic development in an economy. also, Modernization is a copy of European and American process, as stated in his research, there is a philosophy of link toward United States and the Western Europe. Because these nations are seen as having respected prosperity in their economy and political stability.

E. Dependency Theory

The theory was a research in 1950s which was made by the Economic Commission of Latin America and the Caribbean (ECLAC). In the research Raul Prebisch's originally explained that the circumstances were very genuine that underdeveloped countries (poorer countries) exported raw materials (primary product) to the developed countries (rich countries), then finished products are exported out of developed countries (richer countries) to underdeveloped and developing countries (poorer countries). The manufactured products add value to the raw materials by converting to a finished product which made it costlier. In this case, underdeveloped countries will not be able to earn enough from their export earnings to pay for their imports. His solution was to advice: underdeveloped and developing countries (poorer countries) to bring up policy on import substitution products which will made them not to buy the final products from developed countries (richer countries). The underdeveloped countries (poorer countries) will still be able to sell their raw materials products in the global market, which will make their foreign exchange reserves untouchable.

III. METHODOLOGY

A. Research Design

This research employs an ex-post facto research design, commencing the investigation after the events have transpired without researcher interference. As a result, historical information regarding the determinants of human capital development (HCD) will be gathered through the utilization of secondary data.

B. Theoretical Framework

This research is theoretically underpinned by Sen's capabilities approach and human capital theory as earlier indicated in the review. The theories postulate that a person capability can make or pave way for him by achieving diverse opportunities that comes his way. It contended that among the opportunities available to an individual is health and standard of living. Hence, a country that invests in health, welfare, technology etc. will enhance economic performance of such country Hence, by fostering equal opportunities for development, which contributes to the enhancement of the standard of living. The developmental focus revolves around eliminating hindrances to individuals' capabilities in life, such as illiteracy, poor health, limited access to resources, or restricted civil and political freedoms. The practical implications of human capital theory extend to evaluating the value of training, enabling individuals to assess the anticipated future returns of investing in health. Additionally, the utility of human capital theory empowers individuals to measure their intangible assets, including education and social status. The underlying premise in this framework is that an improvement in the quality of workers through enhanced education leads to increased output. Consequently, human capital theory posits that the education and healthcare of workers ensure heightened productivity (Olaniyan & Okemakinde, 2008), and these variables may act as determinants of human capital.

C. Model Specification

The model employed in this study was derived from the conclusions drawn in the theoretical framework, aiming to establish a connection among the determinants of human capital development (HCD).

$$GDP = f\ (FERT, INF) - - - - \cdots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (2)$$

Where:

$GDP = Gross\ domestic\ product;$
$FERT = Fertility\ rate$
$INF = Inflation\ rate$

This research would adapt the model that was proposed by Andabai & Eze (2018) by including some essential variables that determines human capital development which includes fertility, inflation rate, gross domestic product (GDP) and human development index. The rationale behind this is to specifically examine the direct impact of these proxies on human capital development. Consequently, the proposed model for this study is articulated as:

$$HDI = f\ (FERT, GDP, INF) - - - - \quad (3)$$

$HDI = Human\ development\ index;$
$FERT = Fertility\ Rate$
$RGDP = Real\ gross\ domestic\ product$
$INF = Inflation\ rate$
$f = functional\ notation$

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

D. Estimation Technique

The regression estimation technique involving trend analysis and Autoregressive Distributed Lag Model were the main test to be employed in the study. Before conducting the ARDL regression test, it is necessary to perform other tests such as descriptive statistics which involve mean, minimum, maximum, skewness, kurtosis etc. was first examined, thereafter Augmented Dickey Fuller test for stationarity of the data was examined before the main test which is ARDL to test the short run effect of determinants of human capital development (HCD) in Nigeria. The regression test is stated as:

$$HDI = \alpha_0 + \alpha_1 FERT_t + \alpha_2 GDP_t + \alpha_3 INF_t + \mu_t - \quad \ldots (4)$$

Where:

$\alpha_0 = constant\ term$
$\alpha_1 - \alpha_3$ = Coefficient of the parameters
μ_t = error term

The remaining variables were retained with their previously defined specifications.

E. Test for Stationarity or Unit Root Test

Before conducting the cointegration test, it is essential to evaluate the time series properties of the variables. Non-stationary time series data is a common concern in empirical analysis, as working with non-stationary variables can lead to spurious regression results and render further inferences meaningless when these variables are estimated in their levels. To address this issue, it is crucial to test the stationarity of the economic variables.

The unit root and cointegration tests are performed on relevant economic variables to assess their time series characteristics. In general, economic variables that are stationary are referred to as I(0) series, while those requiring differencing once to achieve stationarity are labeled as I(1) series. The standard Augmented Dickey-Fuller (ADF) test, as proposed by Dickey and Fuller (1979), and Phillips and Perron (1988), is employed to test for the presence of a unit root and establish the properties of individual series. The Augmented Dickey-Fuller (ADF) test for unit root regression is estimated by equation (4), as follows:

$$\Delta Y_t = \alpha_0 + \beta Y_{t-1} + \gamma_1 \Delta Y_{t-1} + \gamma_2 \Delta Y_{t-2} + \gamma_3 \Delta Y_{t-3} + \gamma_k \Delta Y_{t-k} + \varepsilon_t \quad \ldots\ldots (5)$$

Here, Δ denotes the difference operator, Yt represents the series under examination, k is the number of lagged differences, ε_t is the error term, and γt accounts for a linear time trend. The ADF test evaluates the null hypothesis H_0: δ=0 against the alternative hypothesis H_1<0: δ<0 in the regression. In the presence of a unit autoregressive root (δ=0), Yt exhibits a stochastic trend under the null hypothesis, while it is stationary under the alternative hypothesis. The Augmented Dickey-Fuller statistic corresponds to the t-statistics of the OLS estimation testing δ=0. The lag length k can be determined using information criteria such as the Bayesian Information Criterion (BIC) or Akaike Information Criterion (AIC) (Stock & Watson, 2003).

F. ARDL Approach

To investigate the long-run relationships among the determinants of human capital development (HCD) in Nigeria, this study employed the autoregressive-distributed lag (ARDL) model proposed by Pesaran, Smith, and Shin (2001) as a recent co-integration analysis approach. Initially, the study conducted tests to assess whether there is co-integration, indicating the presence of a long-run relationship. Unlike other methods, the ARDL model accommodates variables at different levels of stationarity. This approach offers several econometric advantages, including:

- Simultaneous estimation of long and short-run parameters of the model.
- Applicability of the ARDL approach for testing long-run relationships regardless of whether the underlying regressors are stationary (I(0)), integrated of order 1 (I(1)), or partially integrated.
- Superior small sample properties of the bounds testing approach compared to multivariate co-integration. The study utilized the bounds testing approach proposed by Pesaran et al. (2001) to assess the existence of co-integration relationships among the variables.
- The Pesaran et al. procedure involves examining the presence of a long-run relationship through the unrestricted error correction model for each variable. In accordance with the ARDL procedure, the unrestricted model of our current function is depicted as follows:

$$\ln(HDI)_t = \lambda_0 + \sum_{i-1}^{n} \lambda_1 + \Delta ln(HDI)_{t-1} + \sum_{i-1}^{n} \lambda_2 + \Delta \ln(FERT)_{t-1} + \sum_{i-1}^{n} \lambda_3 + \Delta ln(GDP)_{t-1} + \sum_{i-1}^{n} \lambda_4 + \Delta ln(INF)_{t-1} + \beta_0 \ln(HDI)_{t-1} + \beta_1 ln\,(FERT)_{t-1} + \beta_2 ln\,(GDP)_{t-1} + \beta_3 ln\,(INF)_{t-1} + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where Ln (HDI) is the natural logarithm of the human development index deflator, Ln (FERT), Ln (GDP), Ln (INF) are the natural logarithms of the fertility rate, gross domestic product, and inflation rate, respectively. Δ is the difference operator, and μ_it is the stochastic error term.

The F-test is employed to examine the existence of long-run relationships. Thus, the Pesaran et al. (2001) approach calculates two sets of critical values for a given significance level. One set assumes that all variables are I(0), and the other set assumes they are all I(1). If the determined F-statistic is above the upper critical bounds value, the null hypothesis (H0) is rejected. If the F-statistic falls within the

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

bounds, the test becomes inconclusive. Finally, if the F-statistic is below the lower critical bounds value, it implies no co-integration. When a long-run relationship exists, the F-test indicates which variable should be normalized. Moreover, when the order of integration of the variables is known and if all the variables are I(1), then the decision is based on the upper bound value. Similarly, if all the variables are I(0), then the decision is based on the lower bound.

IV. RESULT AND DISCUSSION

This part deals with the empirical analysis on determinant of human capital development (HCD) in Nigeria. It is structured into descriptive analysis, correlation statistics, unit root test, and test for optimal ARDL specification, test for cointegration, short run analysis, and the diagnostic checking.

A. Descriptive Statistics

The data presentation for this description analysis consists of annual time series data spanning between 1988 through 2022 is shown in Table 1.

Table 1: Descriptive Result

	log_HDI	**log_INF**	**log_GDP**	**log_FERT**
Mean	-0.7491	2.7303	1.4011	1.7849
Median	-0.7571	2.5654	1.6409	1.8050
Maximum	-0.6198	4.2882	2.7297	1.8714
Minimum	-0.9137	1.6841	1.0262	1.6292
Std. Deviation	0.0824	0.6872	0.8530	0.0645
Skewness	0.1039	0.8858	-1.1999	-0.7733
Kurtosis	1.8515	2.8540	4.2033	2.6914
Observations	35	35	30	35

Source: Author's Computation (2021), STATA 17 Statistical Package

Table 1 showed the descriptive statistics of the data series employed in the study. Human development index (log_HDI) has a mean of -0.7491 and varies from a minimum of -0.9137 to a maximum of 0.000000 and a standard deviation of 0.1596. Also, Inflation rate (log_INF) has a mean of 2.7303 and varies from the minimum of 1.684176 to a maximum of 4.8536 and standard deviation of 0.6872. Gross domestic product (log_GDP) has a mean of 1.4011 and varies from the minimum of 1.0262 to a maximum of 2.7297 with a standard deviation of 1.1423. Fertility Rate (log_FERT) has a mean of 1.7849 and varies from minimum of 1.6292 to a maximum of 1.8714 with a standard deviation of -0.0645.

Consequently, Gross domestic product (GDP) and Fertility Rate were negatively skewed which implied that they have long left tails while human development index, and Inflation were positively skewed and implied a long right tail.

If the kurtosis is greater three, the distribution is considered peaked relative to the normal distribution. Conversely, if the kurtosis is less than three, the distribution is deemed flat or platykurtic relative to the normal distribution. Table 1 further revealed that log_HDI, log_INF and log_FERT are not greater than 3, thus implying flat or platykurtic which is flatter than a normal distribution with wide peak whereas log_GDP has kurtosis which is greater than 3 thus implying peaked or leptokurtic distribution which is sharper than a normal distribution for extreme value.

B. Inferential Analysis

The inferential analysis in this research includes reporting the statistical values and implications of each variable. This process initiates with correlation statistics.

C. Correlation Analysis

Table 2: Correlation Statistics

	log_HDI	**log_FERT**	**log_GDP**	**log_INF**
log_HDI	1.0000			
log_FERT	-0.9225	1.0000		
log_GDP	-0.0619	0.1682	1.0000	
log_INF	-0.3450	0.2233	-0.0038	1.0000

Source: Author's Computation (2021), STATA 17 Statistical Package

Table 2 showed that there is a mixed relationship amidst the variables in the study. Precisely, Fertility rate, gross domestic product and Inflation negatively associates with human development index in Nigeria. Hence, there is a negative relationship between human development index (HDI) and fertility rate to the tune of -0.9225, thereby

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

reflecting that human development index and fertility rate does not move towards the same direction. The same explanation holds for the relationship between human development index government expenditure on gross domestic product coefficient of -0.0619 also the relationship between human development index government expenditure on Inflation coefficient of -0.3450. The relationship between all the predictor variables was not positive, reflecting that the variables did not maintained a positive relationship with human development index throughout the period.

D. Unit Root Test

The unit root test was conducted to ascertain the stationary state, i.e., the time series properties of the variables. It reveals the order of integration of each variable and whether or not there is a presence of a stochastic trend. The presence of a unit root implies that the time series under investigation is non-stationary, while the absence of a unit root indicates that the stochastic process is stationary. The time series behavior of each series using the Augmented Dickey-Fuller(ADF) tests of unit root is presented in Table 3.

Table 3: Unit Root Test

Variables	Test statistics	Critical value			Order of Integration
		1%	5%	10%	
log_HDI	-3.540	-4.306	-3.568	-3.221	I(0)*
log_FERT_d	-1.396	-2.462	-1.699	-1.311	I(1)**
log_GDP_d	-2.753	-2.583	-1.746	-1.337	I(1)***
log_INF	-3.773	-4.306	-3.568	-3.221	I(0)**

Note: * (**) (***) Denotes Null Hypothesis at 10%, 5% and 1% Level of Significant Respectively
Source: Author's Computation (2021), STATA 17 Statistical Package

Table 3 shows the result of the Augmented Dickey-Fuller unit root test. Evidence from the result explicitly made known that Inflation attained stationarity at level at 5% level of significance. Furthermore, Fertility rate (log_FERT_d), Gross domestic product (log_GDP_d), variables attained stationarity at first difference and at 1% and 5% level of significance respectively, also Human development index (log_HDI) attained stationarity at level 10%. The economic implication of this is that any shock i.e government policy to the variables cannot hold for a longer period of time, meaning such a shock will dissipate quickly. Based on the rule of thumb, if all the variables attained stationarity at the same order of integration, Johansen co integration should be applied and if otherwise Autoregressive Distributed Lag model (ADRL) should be applied. Notably, there is mixtures of I(0) and I(1) in the model which nullified the application of Johansen cointegration and adopt the application of Autoregressive Distributed Lag model (ADRL). Hence, bound test is used to capture the presence of co integration for objective 2, 3, 4 and 5 respectively.

E. ARDL Bound Cointegration

Table 4: ARDL Bound Test

Null Hypothesis	F - Statistic	Critical Values Bounds		
		Significance	Lower Bound	Upper Bound
No Long-Run Relationships Exist	1.127	L_1 (10%)	2.72	3.77
		L_05 (5%)	3.23	4.35
		L_025 (2.5%)	3.69	4.89
		L_01 (1%)	4.29	5.61

Source: Author's Computation (2021), STATA 17 Statistical Package

The table 5 showed that the calculated F-stat of 1.127 is lower than the Upper Bound table value at any % level of significance. The study accepts the null hypothesis. This is explained as there is short-run relationship among the variables, which means that, the variables move together on the short run. This means that study may proceed further to the short run analysis.

F. Short Run Estimation Coefficients on Objective 2

Having known that there is existence of short-run relationship among the variables, the research will estimate short run parameters by ARDL model.

Table 5: Short Run Co-Integrating Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
log_HDI L1	0.7534	0.1409	5.35	0.000
log_FERT	-0.3236	0.1946	-1.66	0.115
log_GDP	0.0052	0.0039	1.32	0.206
log_INF	-0.0062	0.00780	-0.80	0.436

Source: Author's Computation (2021), STATA 17 Statistical Package

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

The result of table 5 explains the short run relationship between the explanatory and dependent variables. Precisely, the coefficient of fertility rate has a coefficient of -0.3236 which signified a negative and an insignificant effect at 5% level of significance on human development index, thus, a percent change in log_FERT, will result to about 32% decrease in human development index. also, the coefficient of Inflation rate has a coefficient of -0.0062 which signified a negative and an insignificant effect at 5% level of significance on human development index, thus, a percent change in log_INF will result to about 0.6% decrease in human development index. gross domestic product has a positive and insignificant effect on human development index. This implies that, when a percent change occurs in the level of log_GDP, it will result to about 0.5% increase on human development index in the short run.

G. Auto Correlation Test

Table 6: Breusch-Godfrey Serial Correlation LM Test

Lags(p)	Chi -Square (2)	df	Prob. Chi-Square (2)
10	13.746	10	0.1849

Source: Author's Computation (2021), STATA 17 Statistical Package

The null hypothesis is that there is no autocorrelation in the error terms, while the alternative hypothesis suggests serial dependence among the error terms. The F-statistic in the autocorrelation test resulted in a probability value of 0.1849 (18.49%), which is greater than the 5% level of significance. Therefore, the null hypothesis of no autocorrelation is accepted, indicating that the results of this analysis are reliable and free from serial error correlation.

Table 7: Heteroscedasticity Test

Obs*R-squared	Prob. Chi-Square (2)
0.879	0.9524

Source: Author's Computation (2021), STATA 17 Statistical Package

The null hypothesis is that, there is homoscedasticity of variance against its alternative of heteroscedasticity of variance. The F-statistics in the result has probability value of 0.9524 (95.24%) which is greater than 5% level of significance, hence the null hypothesis of homoscedasticity is accepted, therefore the result of this analysis is reliable and free non-constant variance.

V. FINDINGS

The objective of the study is to investigate the determinant of human capital development in Nigeria using a time series data spanning from 1988 through 2022. The study employed the descriptive statistics and inferential statistics such as correlation analysis, unit root test and autoregressive distributed lag model to ascertain the short relationships of gross domestic product, fertility rate and inflation rate and human development index respectively.

Evidence from the descriptive statistics indicated that kurtosis of log_HDI, log_INF and log_FERT are flatter than a normal distribution with wide peak whereas log_GDP kurtosis is sharper than a normal distribution for extreme value. Correlation analysis discovered that there is a negative relationship among all the predictor variables. Inflation, fertility rate and Gross domestic product reflected a negative relationship with human development index. The Augmented Dickey-Fuller unit root test disclosed that log_HDI variable attained stationary at level and at 10% level of significance, log_INF variable attained stationary at level and at 5% level of significance while other variables of log_FERT and log_GDP attained stationarity after differencing, i.e. at first difference and at 5% and 1% level of significance respectively.

Additionally, result from ARDL showed that the calculated F-stat is lower than any of the upper and lower bound table value which thus indicated that there is a short-run relationship among the variables, that is, the variables moves together in the short run.

Notably, result of ARDL test in attending to the objectives disclosed that gross domestic has a positive and a significant effect on human development indexin Nigeria, the result is at variance with the *apriori* expectation of positive relationship, the result also negates the empirical finding of Solarin and Eric (2015) on positive relationship between RGDP and HDI, it thus implies that real gross domestic product is a good determinant of human development index in Nigeria. Also, fertility rate was observed to have a negative and insignificant effect on human development index in Nigeria. The result is expected; however, the insignificance implies that many females get pregnant at a young age and also don't always want to get involved in family planning. The result corroborates with the finding of Desai (2012) that fertility rate is one of the indicators of the economic situation in an economy as controlled fertility rate leads to enhancement of a country's human capital. Therefore, government needs to improvement on fertility rate in order to significantly reduce birthrate and embarrassing poverty history in the country.

Furthermore, inflation was found to have negative and insignificant effect on human development index. The result is in conformity with the *apriori* expectation and thus validates the empirical finding of Oluwatobi and Ogunrinola (2011), Obi and Obi (2014), Jaiyeoba (2015) that increased inflation has negative and insignificant effect on human development index in Nigeria. The result therefore implies that government controlling inflation will be instrumental to determine a good human development index in Nigeria. It therefore connotes that government of a nation can prosper and flourish when chief attention is placed on controlling the general price level of goods and services, still government is expected to increase its proportion of resources allotted to the financial sector of the economy that can help to shape individual, institution and corporate entity in an environment.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

Based on the results, it can be established that:

- Gross domestic product positively and significantly correlates with human development index in Nigeria in the short run.
- Fertility rate negatively and insignificantly affect human development in Nigeria in the short run.
- Inflation rate negatively and insignificantly affect human development in Nigeria in the short run.

➢ *Implication of Findings*

This research has some implications from the findings that came from the research.

Firstly, the positive and insignificant implication of gross domestic product implies GDP does not significantly promote economic development in Nigeria. Hence, gross domestic product does translate to economic development and can be used to measure human development index in Nigeria. This implies that Nigerian government has focused much attention on increasing economic growth considering the level of development in the country.

Secondly, the negative and significant implication of fertility rate implies that government attention on fertility rate of women does yield a contributive return to the government, the negative and significant outcome of the result, government of Nigerian economy is still expected to allocate more resources financially and materially to the health sector and attractive to every citizen in the country. Therefore, every citizen should be given the opportunity to formal orientation on women fertility in order for the country to attain developmental state.

Lastly, the negative and significant implication of inflation rate on human development index implies that there is an increase in general price level on goods and services in the country which will in increase the cost of living and reduce the standard of living. Therefore, there is need for extra attention on the inflation rate and the price control agency in order to contribute to human development index. If government spends extra on cautioning inflation rate, provide better employment prospects, controlled prce which will give a higher socio-economic status. Controlled inflation rate will also lead to increase economic growth of the country.

VI. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

The reason of the research was to use ARDL bound test approach to cointegration to examine the determinant of human capital development in Nigeria for the period 1988 to 2022. The study regressed fertility rate, gross domestic product and inflation rate as the determinant of human capital development proxy as human development index in Nigeria. In order to attest to which of the determinants/factors affect human development index, ARDL tools was used as the main techniques.

Evidence from the ARDL bound test expressly revealed the presence of short run relationship among the determinants of human capital development. Precisely, the short run analysis denotes that gross domestic product has positive and insignificant effect on human development index, fertility rate has negative and a significant effect on human development index, inflation rate has negative and significant effect on human development index in Nigeria under the study period.

From the analysis of the research, it can be explained that fertility rate and inflation rate have significant impact to determine human capital development in Nigeria while gross domestic product is not a veritable parameter to explain human capital development in the country. Thus, the research concludes that fertility rate and inflation rate is a determinants of human capital development in the context of this study.

B. Recommendations

Based on the evidence provided by the empirical results, it is crucial to propose some policy options that could enhance the development of human capital in Nigeria.

The government should increase in building its economy in trade and technological advancement that will foster its economy through the annual budget to improve its economy growth and development and human development in Nigeria. This growth in gross domestic product can be achieved through increased domestic and foreign investment, improvement in science and technology and more trade enhancement.

- Structural reforms in the business and investment sector are imperative to enhance skills development in areas critical to economic growth. Strengthening the business sector is essential to foster a healthy nation that is receptive to acquiring new skills and capable of contributing to increased productivity.
- Public investments should prioritize education, skill acquisition, and infrastructure development. Allocating resources to these areas will contribute to the overall development of human capital in the country.
- Government expenditure on literacy programs should be increased to address the needs of a larger population. Recognizing the demand for strong literacy skills in the labor market, investing in literacy programs can improve individuals' success in their careers.
- Encouraging diversification and enhancing the export of goods and services should be a governmental focus. This strategy can contribute to boosting the country's GDP and positively impacting human capital development in Nigeria.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

REFERENCES

[1]. Adelakun, Ojo & Johnson,. (2011). Human Capital Development and Economic Growth in Nigeria. European Journal of International Management. 3. 29 -37.

[2]. Adeyemi, P. A., &Ogunsola, A.J. (2016). The impact of human capital development on economic growth in Nigeria: ARDL Approach. *IOSR Journal of Humanities and Social Science (IOSR-JHSS). 21*(3), 1-7.

[3]. Blaug, M. (1976). The empirical status of human capital theory: A slightly jaunted survey. *Journal of Economic Literature, 14*(3), 827-855.

[4]. Bloom, D. E, Canning, D., Sevilla J. (2001). The Effect of Health on Economic Growth: Theory and Evidence. *NBER Working Paper* No 8587.

[5]. Bradshaw, Y. W. (1987). Urbanization and Underdevelopment: A Global Study of Modernization, Urban Bias, and Economic Dependency. American Sociological Review, 52(2), 224–239. https://doi.org/10.2307/2095451

[6]. Central Bank of Nigeria (2019). Annual Statistical Bulletin.

[7]. Chirot, D., & Hall, T. D. (1982). World-System Theory. Annual Review of Sociology, 8, 81–106. http://www.jstor.org/stable/2945989

[8]. Dauda, R. O. (2010). Role of Human Capital in Economic Development: An Empirical Study of Nigerian Case. Oxford: Oxford Business and Economics Conference Program.

[9]. De Muro, P., & Tridico, P. (2008). The role of institutions for human development. Retrieved from https://www.researchgate.net/publication/228430665_ The_role_of_institutions_for_human_development.

[10]. Desai, V. S. (2012). Importance of literacy in India's economic growth. *Int. J. Eco. Res., 3*(2), 112-124.

[11]. Escobar, A. (1995). Encountering Development: The Making and Unmaking of the Third World (STU-Student edition). Princeton University Press. http://www.jstor.org/stable/j.ctt7rtgw

[12]. Silva, Rita & Ferreira-Lopes, Alexandra. (2012). A Regional Human Development Index for Portugal. Social Indicators Research. 118. 10.1007/s11205-013-0455-z.

[13]. SOLARİN SA, ERİC OO. Impact of Economic Globalization on Human Capital: Evidence from Nigerian Economy. IJEFI. September 2015;5(3):786-789.

[14]. Hakooma, M., &Seshamani, V. (2017). The impact of human capital development on economic growth in Zambia: An Econometric Analysis. *International Journal of Economics, Commerce and Management, 5*(4), 71-87.

[15]. Isola, W. A. and Alani, R. A. (2012). Human Capital Development and Economic Growth: Empirical Evidence from Nigeria. Asian Economic and Financial Review, 2(7),813-827.

[16]. Jacob, W. & Sutin, Stewart & Weidman, John & Yeager, John. (2015). Community Engagement in Higher Education: Policy Reforms and Practice. 10.1007/978-94-6300-007-9.

[17]. Jaiyeoba, S. V. (2015). Human Capital Investment and Economic Growth in Nigeria. African Research Review, An International Multidisciplinary Journal, 9(1), No.36.

[18]. Jenkins, J. C., & Scanlan, S. J. (2001). Food Security in Less Developed Countries, 1970 to 1990. American Sociological Review, 66(5), 718–744. https://doi.org/10.2307/3088955

[19]. Jolliffe, D. (2001). Measuring absolute and relative poverty: The sensitivity of estimated household consumption to survey design. *Journal of Economic and Social Measurement 27*, 1-23.

[20]. Kunofiwa Tsaurai, 2020. "Foreign Direct Investment and Income Inequality in Transitional Economies," Acta Universitatis Danubius. OEconomica, Danubius University of Galati, issue 16(6), pages 7-24, DECEMBER. <https://ideas.repec.org/a/dug/actaec/y2020i5p7-24.html>

[21]. Maku, O. E., Ajike, E. O., &Chinedu, S. C. (2019). Human capital development and macroeconomic performance in Nigeria: An Autoregressive Distributed Lag (ARDL) Approach. *Etikonomi, 18* (2), 185-196.doi: http//dx.doi.org/10.15408/etk.v18i2.11701.

[22]. Mankiw, N., Romer, P., and Weil, D. (1992). A contribution to the empirics of economic growth'. A Quarterly Journal of Economics pp.407-437.

[23]. Nwokoye, E. S., Chukwuka, S. M., Ozoh, J. N., Onugha, C. B., &Odebode, O. K. (2020). Human capital development and industrial sector performance: The West Africa Experience.*International Journal of Economics, Commerce and Management, 8*(2), 14-32.

[24]. Ogujiuba, K. (2013). The impact of human capital formation on economic growth in Nigeria. *Journal of Economics and Financial Research, 4*(2), 121-132.

[25]. Olaniyan, D. A., & Okemakinde, T. (2008). Human Capital Theory: Implications for Educational Development. European Journal of Scientific Research, 24, 157-162.

[26]. Olatunji, A. S., Anthonia, T. O.,& Ndubisi, C. (2018). Human capital investment and economic development: The Nigerian Experience. *World Journal of Social Research, 1*(2), 107-115.

[27]. Oluwatobi, S. O.,& Oluranti, O. I. (2018). Government expenditure on human capital development: Implications for economic growth in Nigeria. *International Journal of Sustainable Development, 4*(3), 72-80.

[28]. Oluwatobi, S., & Ogunrinola, O. I. (2011). Government expenditure on human capital development: Implications for economic growth in Nigeria. *Journal of Sustainable Development, 4*(3), 72-80. Available at: www.ccsenet.org/jsd.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR235

[29]. Osoba, A. M. and Tella, S. A. (2017). Human Capital Variables and Economic Growth in Nigeria: An Interactive Effect. Euro Economica, 36(1).
[30]. Paul, A. A. and Akindele, J. O. (2016). The impact of Human Capital Development on Economic Growth in Nigeria: ARDL Approach. IOSR Journal of Humanities and Social Science, 21(3), 1 – 7.
[31]. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16(3), 289–326. http://www.jstor.org/stable/2678547
[32]. Peter C. B. Phillips, & Perron, P. (1988). Testing for a Unit Root in Time Series Regression. Biometrika, 75(2), 335–346. https://doi.org/10.2307/2336182
[33]. Popogbe, O., & Adeosun, O. T. (2020).Empirical analysis of the push factors of human capital flight in Nigeria. *Journal of Humanities and Applied Social Sciences, 2*(7), 1-18.Emerald Publishing Limited2632-279X. DOI10.1108/JHASS-07-2020-0093.
[34]. Praise, U. I. and George-Anokwuru, C. C. (2018). Empirical analysis of determinants of human capital formation: evidence from the nigerian data. Journal of World Economic Research, 7(2), 73. https://doi.org/10.11648/j.jwer.20180702.14
[35]. Rosen, S. (1976). A theory of life earnings. *Journal of Political Economy, 84*(4), 45-67.
[36]. Sen, A. (1999). *Development as freedom.* New York: Anchor Books Press.
[37]. Shrum, W. (2000). Science and Story in Development: The Emergence of Non-Governmental Organizations in Agricultural Research. Social Studies of Science, 30(1), 95-124. https://doi.org/10.1177/030631200030001004
[38]. Son, H. H. (2010). Human capital development. *Asian development bank economics working paper series No. 225*. Available at http://ssrn.com/abstract=1695806, retrieved 15th June, 2019.
[39]. Stock, J. H., & Watson, M. W. (2003). Forecasting Output and Inflation: The Role of Asset Prices. Journal of Economic Literature, 41(3), 788–829. http://www.jstor.org/stable/3217532
[40]. Tan, Leonard. (2014). Correlational Study.
[41]. Torruam, J.T., & Abur, C.C. (2014). Public expenditure on human capital development as a strategy for economic growth in Nigeria: Application of Co-integration and causality test analysis. *International Journal of Research in Humanities and Social Studies, 1*(2), 14-23.
[42]. Tsaurai, K. (2020). Determinants of human capital development in Africa. *International Journal of Economics and Business Administration, 8*(4), 377-391.
[43]. Ubi-Abai, I. P., &George-Anokwuru, C. C. (2018). Empirical analysis of determinants of human capital formation: Evidence from the Nigerian Data. *Journal of World Economic Research, 7*(2), 73-81. doi: 10.11648/j.jwer.20180702.14.
[44]. Uchendu FN. Hunger influenced life expectancy in war-torn Sub-Saharan African countries. J Health Popul Nutr. 2018 Apr 27;37(1):11. doi: 10.1186/s41043-018-0143-3. PMID: 29703244; PMCID: PMC5921790.
[45]. United Nations (2019). Sustainable development goals retrieved from https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-9-industry-innovation-and-infrastructure.html on the 25th of May 2019.
[46]. World Bank (2012b). African pulse: An analysis of issues shaping Africa's economic future, 6. Washington, DC: World Bank.