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# SOCIAL SECTOR EXPENDITURES AND ECONOMIC WELLBEING IN NIGERIA: AN EMPIRICAL ANALYSIS

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**Abstract:**
Ensuring improved economic wellbeing is a vital requirement for a peaceful and stable society. However, leaving the responsibility of providing the needed ingredients for enhancing economic wellbeing to a self-interest driven institutional arrangement in a developing economy will most likely result in market failure. It is then necessary that the extra-market institution of Nigeria, given its resource capacity, intervene to provide critical social goods to enhance the economic wellbeing of its citizens. Thus, this paper empirically studied social sector expenditures' effects on Nigerians' economic wellbeing, over the sample period 1981 to 2022. Specifically, social sector expenditures are indicated by defence, health, education and transportation expenditures, while the Human Development Index is employed as a proxy for economic wellbeing. Data from the World Bank's World Development Indicators and the statistical data bulletin of Nigeria's Central Bank are utilised by applying the 'Autoregressive Distributed Lag' analytical procedure. Accordingly, the estimation established that the federal government's social outlays in defence, health, and education positively and significantly influenced economic wellbeing (Human Development Index) over the short and the long runs, while transportation spendings positively and insignificantly impacted the regressand. Based on the research findings, it is concluded that social sector expenditures are indispensable and vital for improving the economic wellbeing of Nigerians. Following the empirical evidence, the researchers recommended that the federal government should, inter alia, allocate a significant portion of the defence expenditure to strategic planning and modernization efforts by investing in advanced technology, equipment, and training to ensure that the armed forces are adequately equipped to handle evolving threats.

**Keywords:** social sector expenditures, economic wellbeing, human development index, ARDL

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## 1. Introduction

Public supply of social overheads for the enhancement of a country's nationals' and other inhabitants' wellbeing as well as the realization of desired real growth and development, are some indispensable objectives of any government. However, taking collective allocative action to adequately address such social needs is hinged on scarce resource availability and their distribution pattern to prime sectors. Services within the domain of community, education and health, among others, are components of the social sector facilities that are pivotal on the pathway to sustainable economic wellbeing (Nwodo and Ukaegbu, 2017).

In addition, Owino (2017) opined that, in both developing and developed countries, the social sector, being generally comprised of activities in education, health, and social protection/security, is one of the broad areas of social investments that receive reasonable public financial outlays. Such appreciable attention to the sector may be ascribed to the fact that investments in the aforementioned social subsectors for supplementing other human capital development efforts are what any economy needs in its drive to achieve real economic growth and wellbeing improvement objectives. Accordingly, economic wellbeing denotes the inclusive financial health and prosperity of individuals, households, or society in totality. This is inclusive of sundry factors such as income, employment opportunities, access to basic needs and the overall living standard. Hence, one major way to improve economic wellbeing is through social sector expenditures. In support of this, Olukemi and Bolatito (2015) stated that social sector expenditures are critical stimulants for bolstering economic wellbeing and societal development.

Thus, the government's social sector expenditures represent the allocation of government resources to various programs and services aimed at improving the lives of citizens. Social sector expenditures directly advance individuals' and communities' quality of life. Investments to educate man, care for man's health and enhance social welfare can lead to better health, broader chances for opportunities, as well as enhanced standard of living. Also, social sector spendings often target vulnerable and disadvantaged populations, helping to reduce economic and social inequalities. Programs such as social safety nets and educational support can uplift marginalized groups. Furthermore, investments in education and healthcare are critical for developing a skilled and healthy workforce. This, in turn, fosters economic growth and competitiveness on a global scale, all of which improve economic well-being. More importantly, social sector expenditures can promote social cohesion by providing essential services that allow citizens to participate fully in society. This includes access to education, healthcare, and support for those in need (Olamileke, Olufemi and Oludare, 2019).

Olawuni and Oyeladun (2020) asserted that social sector expenditures are fundamental components of governments' financial policy. When effectively managed and targeted, it can yield substantial benefits for society, including improved human capital, reduced inequality, and generally enhanced well-being in society. In addition,

some scholars have argued that increasing social sector expenditures is vital for stimulating the consumption or demand side of an economy as well as the supply side by crowding-in private sector investments. Relatively high social sector expenditures generate employment and galvanizes productivity and investment through the transmission effects of multiplied aggregate demand, leading to improved economic wellbeing (Nkiru and Daniel, 2013).

In buttress of the above, numerous related empirical evidences agreeing with the idea that government's social sector outlays may produce dissimilar effects on output exist. There are reported positive ramifications of state's expenditures in some sub-sectors, such as education and health, on real growth and wellbeing of an economy, but spending on social (assistance) security on real economic performance may produce dampen by bi-directional effects (Owino, 2017). For example, it is concluded that in Nigeria, the education sector's expenditures by the state positively and significantly implicated in the short-run and the long-run performance of GDP growth (Ebong, Ogwumike, Udongwo & Ayode, 2016). Similarly, Nelson, Dumani and Ekokeme (2018) established that health, education and community and social services expenditures impacted directly and substantially on Nigeria's economic growth. Similarly, (Okezie & Asoluka, 2017) established that total social and community services expenditures significantly induced and positively related with the growth indicator of Nigeria. Furthermore, Korem (2021), in his study, stated that government spending in social subsectors directly and substantially influenced long-run growth and wellbeing.

Sadly, despite being blessed with abundant natural resources, Nigeria has failed in the pursuit of actualizing relatively meaningful development in line with its potential and in terms of sustainable people-oriented advancements or development of human capital like many advanced economies. Available statistics in the last three decades evidenced a continued rise in government expenditures on education, health as well as community and social services. Unfortunately, such have not occasioned palpable real growth, development and wellbeing in Nigeria, as the country is still ranked amongst the poorest at the global level while the majority of its citizens continue living in pitiable conditions of life. In addition, a high rate of illiteracy and poor access to medical facilities in Nigeria are common situations. Thus, the question posed is, to what extent have social sector expenditures played a role in gingering the desired level of growth and improved economic wellbeing? This is an empirical question that this study sought to answer. Drawing from the foregoing, this study empirically diagnosed the effects of social sector expenditures on the economic wellbeing of Nigeria. Particularly, the study analyzed the ramifications of defence, health, education and transportation expenditures on human development index (as a proxy for economic well-being) in Nigeria over the sample period, 1981 to 2022.

## 2. Review of Related Literature

### 2.1 Theoretical Literature

The study theoretically relies on the Government Expenditures Theory by Musgrave, which was propounded in 1939. Musgrave puts forward three varieties of changes in the income elasticity of demand for public services. These include resource allocation, income distribution and stabilization.

#### 2.1.1 Allocation

This category includes the allocation of resources for spending in specific economic sectors, like defense, educational, healthcare, and social welfare. In the context of this study, social sector expenditures, which encompass areas like education, healthcare, and social services, fall under the allocation category. These expenditures are designed to enhance the overall economic well-being of a society.

#### 2.1.2 Distribution

This category comprises expenditures that aim to redistribute income and wealth among the population. Examples of the distributive component include social safety nets, income support programs, and progressive taxation. These programs help reduce income inequality and enhance economic wellbeing by ensuring inclusive provision for those most vulnerable members of our society.

#### 2.1.3 Stabilization

Stabilization expenditures are intended to stabilize the economy during economic downturns or times of crisis. They include countercyclical fiscal policies, such as stimulus packages and unemployment benefits. By stabilizing the economy and preventing severe recessions, these expenditures contribute to economic well-being.

### 2.2 Conceptual Issues

#### 2.2.1 Social Sector Expenditure

Expenditures in the social sector denote government outlays on programs and/or services that directly impact the well-being and quality of life of a nation's citizens. It typically includes investments in areas such as education, healthcare, social welfare, housing, and employment generation. Sachs (2005) defined social sector expenditure as the government's financial commitment to provide basic services like education and healthcare, aiming to reduce poverty, improve human capital, and promote sustainable economic development. Banerjee and Duflo (2019) see social sector expenditure as government resources allocated to essential services such as education and healthcare, with the goal of fostering inclusive development and addressing systemic inequalities.

Social sector expenditure encompasses a wide range of areas aimed at improving the well-being and quality of life of a nation's citizens. These expenditures, according to Sen (1999) and Banerjee and Duflo (2019), can be broadly categorized into several types as highlighted below:

- **Education Expenditures:** This category includes spending associated with primary, secondary, and higher levels of education. It covers monetary outlays resources for constructing and maintaining schools, teacher salaries, educational materials, scholarships, and initiatives to improve educational quality.
- **Healthcare Expenditure:** This involves funding for hospitals, clinics, medical personnel, medicines, vaccines, and public health programs. It aims to provide accessible and affordable healthcare services to the population.
- **Social Welfare and Assistance:** This category includes various programs aimed at providing financial support and assistance to vulnerable populations, such as social security, unemployment benefits, food assistance, transportation, housing support, and disability benefits.
- **Housing and Urban Development:** Expenditures in this area focus on housing programs, affordable housing initiatives, urban development projects, and efforts to address homelessness and improve living conditions in urban areas.
- **Elderly and Senior Citizen Support:** This involves areas of expenditures directed towards programs that support the elderly population, including pensions, healthcare services for seniors, and social engagement programs.
- **Community Development:** These programs focus on strengthening local communities through initiatives like community centers, youth programs, and initiatives aimed at reducing crime and improving community well-being.

### 2.2.2 Economic Wellbeing

Sen (1999) defined economic wellbeing as a multifaceted concept that goes beyond income and wealth. It includes people's capabilities to lead on their own, the kind of lives they consider valuable, opportunities for choice, and the ability to participate in society. According to Deaton (2013), economic well-being encompasses not only material living standards but also health, education, and a sense of individual and societal purpose, emphasizing the importance of holistic measures of human welfare. According to Helliwell, Layard and Sachs (2019), economic well-being reflects a combination of income and life satisfaction, emphasizing the importance of both material wealth and people's subjective well-being.

## 2.3 Empirical Literature

In this section, an excursion into the empirical contributions of other scholars as related to the current study is undertaken. This exercise traverses research of Nigeria's frontiers covering cross-country studies, those of India as well as Nigerian-specific studies. The objective is to ensure exposure to a significant number of associated empirics to unravel notable research gaps that serve as a direction and present the uniqueness of this study. Thus, Madhabendra, Durlav, Anjan and Arindam (2023) diagnosed how the government's social-sector expenditure and governance comparatively impact the economic development of developing and developed countries across the world during the era of globalization. By employing the dynamic panel difference GMM method over the emerging period of economic reform from 2000 to 2019, the study established that

governance is more effective than social-sector expenditures in promoting developing economies' development as compared to developed nations. Korem (2021) investigated how the government's social spending, measured as education and health outlays, influenced economic growth in the West African Economic and Monetary Union in the short and long runs over the sample period 1985 - 2019. Applied for analyses is a panel data-based Auto Regressive Distributed Lag (ARDL) process, and it was established that in the short-run, government spending in the sector insignificantly impacted growth but had significantly positive long-run implications on economic growth.

Madhumita and Minaketan (2021) studied to unravel whether causal link(s) exist between social sector expenditures and India's economic development, utilizing yearly data for the period 1972-73 to 2019-2020. The analysis established that a bi-directional substantial causal association flanked per capita GDP and government's outlays to enhance education, welfare of families, housing provision, sanitation and water supply, urban centres development, social security and welfare, nutritional provisions, labour and labour laws and scheduled caste and tribes' welfare. On the other hand, unidirectional causation exists, as evidenced by expenditures for improving health and galvanized economic development. Their findings suggest that significant public spending in India's social sector spurs economic growth, and the outcome will be invaluable to policymakers in devising appropriate policies. Underpinned by the neoclassical growth theory and utilizing the panel unit roots analysis method, (Ramesh & Enrico, 2020) examined the convergence of expenditures in the social sectors of the Indian states over the sampled period 1980–81 to 2017–18. It was thus established that the states insightfully achieved absolute and conditional $\beta$ and $\sigma$ convergence in per capita social expenditure.

Kaberi (2019) conducted a social sector expenditures and economic growth causality check in ASSAM. Utilizing secondary data sourced from the Reserve Bank of India publication and directorate of economics and statistics. The finding showed that expenditures by the government in the social sector significantly impacted the growth of the Assam economy. Using simple correlation and regression estimation analytical method, Mittal (2016) examined the response of selected Indian States' Human Development Index to the Indian government's Social Sector Expenditure for two sample periods, 2004-05 and 2011-12, for correlation analyses while data sample from 2000-01 to 2014-15 were employed for trend examination. The study established that public spending in the country's social sector produced a progressive impact on the index of human development.

Over the sample period (1981 to 2021), (Ahonkhai, Osuji, & Erhijakpor, 2023) analyzed the government's expenditures in health and the health sector performance. Infant mortality and life expectancy are used to capture Nigeria's health sector indicators. Applying the analytical processes of Autoregressive Distributed Lag's method, the researchers concluded that the rate of newborn death was reduced and life expectancy improved in response to public spending in the health sector. In examining the effects of social expenditures of government on Nigeria's unemployment level, using the data sample period of 1981 to 2016 and employing the method of Ordinary Least Squares

(OLS) regression analysis on recurrent and total capital expenditures in health and education on unemployment, (Ndubueze, Okoli, Onwuka & Mba, 2020) established that public recurrent and capital spendings in health sector, educational sector and other social and community's activities targeted at employment generation did not significantly abridge joblessness in our country over the sampled period. Nelson, Dumani and Ekokeme (2018), in their findings about the implications of government's social expenditures on the growth of the Nigerian economy from 1981 to 2016, reported significantly positive influence of expenditures in the health sector on outputs of Nigeria's agricultural sector, insignificantly negative effect of educational outlays on agricultural outputs and positively significant spendings in other community and social services on the regressand by using the processes of causality and ordinary least square tests' methods. Onuoha (2018), in analyzing sectorial expenditure composition and the economy of Nigeria, adopted ex-post data from 1981 to 2017 and used Ordinary Least Squares (OLS) and Granger causality estimation methodology. As revealed, the variables showed a positive influence on real gross domestic product; thus, it was concluded that all the utilized regressors have a strong relationship with the regressand. Okezie and Asoluka (2017) examined the effect of the government's annual total expenditures in social and community services on the growth of the Nigerian economy. Utilizing yearly data from the Central Bank of Nigeria's Annual Reports and Statement of Accounts from 1961 to 2013, the outputs of the error correction model's (ECM) analysis revealed statistically insignificant and positive long-run impacts of yearly total expenditures in social and community services on growth, while the regressor had significantly positive implications on growth in the short run. In diagnosing the empirical link between educational social expenditures, health social expenditures and the Nigerian economy's growth from the year 1990 to 2009, Akwe (2014) application of the causality-based Vector Error Correction (VEC) analysis established unidirectional causation from growth to health expenditures, which is in consonance with Wagner's Law. The research report also submitted causation from growth to educational and aggregate social expenditures. The study thus concluded that the public's social expenditures are augmenting growth in Nigeria.

The preceding studies and their highlighted findings have though improved knowledge but revealed that scarcely is there any which analyzed the government's outlays in the social sector on economic wellbeing indicated by the Human Development Index. Moreover, the measures of social sector spending by the central extra-market institution of Nigeria are not broadly captured by other reviewed studies. Following these expositions, the current research is analyzed to ascertain what the federal government's social sector expenditures from 1981 to 2022 implicate for Nigeria's economic wellbeing by employing defense, health, education, transportation expenditures as the causal variables.

## 3. Material and Methods

Following the adoption of the ex-post-facto method of research design, which expresses cause-effect connections between/among dependent and independent variables in dealing with already existing information, material and data used for this study were gathered from secondary sources. Particularly, the utilized yearly data are time series in nature, spanning 1981 to 2022, and were collected from Nigeria's Central Bank's Statistical source.

### 3.1 Research Model's Specification

The theoretical underpinning for the model construct of this study is rooted in 1939 Musgrave's public expenditure theory, which buttressed that growing allocative, distributive and stabilization demands by the public sector transmits through provided social goods and services to influence countries' economic outcomes (wellbeing). In addition, this study is empirically adapted to that conducted by Ndubueze *et al*, (2020), which studied the effects of the government's social expenditures on Nigeria's unemployment level over the data period 1981 to 2016**.** They applied the method of Ordinary Least Squares (OLS) regression analysis on their model expressed as:

$$UNEMP. = f(REXPH, REXPE, CEXPHE) \quad (3.1)$$

where the respective independent quantities are defined as recurrent outlay in health, recurrent spending in education and combined capital outlay in health and education. However, in tune with this study's specific objectives, Equation (3.1) is significantly modified to convey the conceptualized idea of the current study. Thus, the adjusted model is expressed in functional form as:

$$HDI = (DEX, HEX, EEX, TEX) \quad (3.2)$$

Further, Equation (3.2) is econometrically constructed for the examination of social sector expenditures' ramifications on Nigeria's economic wellbeing as presented below:

$$HDI_t = \beta_0 + \beta_1 DEX_t + \beta_2 HEX_t + \beta_3 EEX_t + \beta_4 TEX_t + \mathcal{O}_t \quad (3.3)$$

In addition, the log-linear transform of model (3.3) is constructed as:

$$InHDI_t = \beta_0 + \beta_1 InDEX_t + \beta_2 InHEX_t + \beta_3 InEEX_t + \beta_4 InTEX_t + \mathcal{O}_t \quad (3\text{-}4)$$

Where: *HDI* = Human Development Index, DEX = Defence Expenditure, HEX = Health Expenditure, EEX = Education Expenditure, TEX = Transportation Expenditure $\beta_0$ = regression intercept, $\beta_1$ - $\beta_4$ = Coefficients of the regressors. $\mathcal{O}_t$ = Stochastic term for capturing the effects of regressors exogenous of the specified model.

The expected theoretical outcomes are: $\beta_n > 0$. Where $n = 1, 2, 3$ and $4$.

### 3.2 Data Analyses Techniques

Initially carried out in this study are the pre-tests such as the unit-roots estimations by applying Augmented Dickey Fuller's (ADF) approach and the ARDL Bounds Cointegration diagnosis, which are respectively aimed at checking the stationarity (Dickey & Fuller, 1981) and the long-run idiosyncrasies of the variables. To achieve this, the general specification of the ADF equation is as presented below:

$$\Delta Y_t = \lambda_0 + \lambda_1 + \delta Y_{t-1} + \sum_{i=1}^{n} \lambda_1 \Delta Y_{t-1} + \mathcal{Q}_t \quad (3.5)$$

Where the depictions are: $Y$ is the time series variables to be estimated, $t$ is linear time trend, $\Delta$ is the operator of the first difference, $\lambda_0$ is a constant term, $n$ is optimum number of lags on the independent variables, and $\mathcal{Q}_t$ *is* the random error term.

Also, the ARDL Bounds Cointegration testing approach was applied to test for the possible existence of cointegrating-long-run association in the dependent variable (regressand) and the explanatory variables (regressors). The Bounds analysis technique for cointegration is employed in principle when I(0) and I(1) mixed orders of unit roots' integrations are the outcomes (Pesaran, Shin & Smith, 2001). Furthermore, predicated on the nature of pre-diagnostic outcomes, the long and the short runs estimations were conducted by using the method of Autoregressive Distributed Lag (ARDL) analysis. Its configuration for this study is presented below:

$$\Delta In(HDI_t) = \beta_0 \Delta In(HDI_{t-1}) + \beta_1 \Delta In(DEX_{t-1}) + \beta_2 \Delta In(HEX_{t-1}) + \beta_3 \Delta In(EEX_{t-1}) + \beta_4 \Delta In(TEX_{t-1})$$
$$+ \sum_{i=1}^{n} b_0 \Delta ln(HDI_{t-1}) + \sum_{i=1}^{n} b_1 \Delta ln(DEX_{t-1}) + \sum_{i=1}^{n} b_2 \Delta In(HEX_{t-1}) + \sum_{i=1}^{n} b_3 \Delta In(EEX_{t-1})$$
$$+ \sum_{i=1}^{n} b_4 \Delta In(TEX_{t-1}) + \sum_{i=1}^{n} \lambda ECM_{t-1} + \mathcal{E}_t \quad (3.6)$$

As denoted, the variables' notations, Δ and n are as earlier defined; $b_0$, $b_1$, $b_2$, $b_3$, and $b_4$ are coefficients for short-run dynamics in the framework; $\beta_0$, $\beta_1$, $\beta_2$, $\beta_3$ and $\beta_4$ measures of long-run elasticities and $\mathcal{E}_t$ is the error term. More so, $ECM_{t-1}$ defines the error correction term determined in the short-run analysis and $\lambda$ measures the error coefficients, defining how fast the co-integration model adjusts from its previous period's disequilibrium to reestablish the long-run stable (equilibrium) relationship. This coefficient indicator of the ECM term is theorized to appear negative and statistically significant. When $ECM_{t-1}$ appears as expected, negative and significant, it portrays that any short-run movements between the regressand and explanatory variables will reconverge to long-run stability.

## 4. Empirical Results and Discussions

### 4.1 Unit Roots' Tests

Each variable's yearly series data sets were taken through stationarity property diagnosis by employing the Augmented Dickey Fuller's (ADF) testing method, and the Akaike Information Criterion (AIC) was chosen for optimum lag selection. The ADF's stationarity analyses outcomes in Schedule 1 below overtly showed Human Development Index (HDI), defence expenditure (DEX), health expenditure (HEX) and transportation expenditure (TEX) as integrated at I(1) denoting first differences stationary while education expenditure (EEX) appeared stationary at I(0), implying stability at the level. Therefore, since the individual stationarity property of the variables revealed mixed orders of first difference and level, the use of bounds co-integration analysis to ascertain if a long-run relationship exists is necessitated. This is what the researchers have done next.

**Table 1:** Unit Root Tests' Results

| | **@ Levels** | | **@ First Differences** | | | |
|---|---|---|---|---|---|---|
| **Variables** | **ADF's Stats** | **Mackinnon Critical Value @ 5%** | **ADF's Stats** | **Mackinnon Critical Value @ 5%** | **Stationarity Remarks** | **Order of Integration** |
| $lnHDI$ | 0.146822 | -2.935001 | -6.735018 | -2.936942 | @ 1st Difference | I(1) |
| $lnDEX$ | -1.289862 | -2.936942 | -8.086281 | -2.938987 | @ 1st Difference | ✓ |
| $lnHEX$ | -1.900824 | -2.943427 | -10.43139 | -2.936942 | @ 1st Difference | ✓ |
| $lnTEX$ | -1.575074 | -2.935001 | -8.546243 | -2.936942 | @ 1st Difference | ✓ |
| $lnEEX$ | -3.455738 | -2.943427 | - | - | @ Level | I(0) |

**Source:** Researchers' Computation (2023).

### 4.2 ARDL Bounds Test

The cointegration test is conducted to ascertain the existence or otherwise of long-run association between the adopted regressand and the regressors. This is achieved by applying the bounds of Autoregressive Distributed Lag (ARDL) cointegration analysis. The profound evidence is scheduled in Table 2 below.

Evident from the Bounds cointegration diagnosis presented in Table 2 revealed that as the calculated F-value of 4.614052 is greater than both lower and upper bounds respective critical values of 2.56 and 3.49 at the conventional 5 per cent level of acceptance, it necessitates the rejection of null hypothesis ($H_0$).

**Table 2:** The ARDL Bounds Test's Results

| **Null Hypothesis: No Existence of Long-Run Relationships** | | | | |
|---|---|---|---|---|
| **Critical Value Bounds** | | | | |
| | **Value** | **Significance** | **I(0)** | **I(1)** |
| F-statistic | 4.614052 | 10% | 2.20 | 3.09 |
| K | 3 | 5% | 2.56 | 3.49 |
| | | 1% | 3.29 | 4.37 |

**Source:** Researchers' Computation (2023).

This implies evidence of cointegration among the adopted variables. Therefore, it is concluded that the Index of Human Development as an indicator of economic wellbeing is cointegrated with the utilized measures of social sector expenditures in the long run. After establishing the cointegration relationship, it is, in principle, followed by the model examination to ascertain the coefficients' long-run and short-run ARDL's estimates of order 2, 0, 3, 3, 0.

### 4.3 Autoregressive Distributed Lag (ARDL) Model's Results

Following the Autoregressive Distributed Lag's (ARDL) dynamic analyses, the long and short runs' results for the adopted variables of the model are respectively tabulated in Tables 3 and 4.

**Table 3:** Long-run Analysis Results

| **Dependent Variable: 〖lnHDI〗** | | | | |
|---|---|---|---|---|
| **Variables** | **Coefficients** | **Std. Errors** | **t-Statistics** | **Probs.** |
| $lnDEX$ | 0.042884 | 0.015135 | 2.833482 | 0.0090 |
| $lnHEX$ | 0.039045 | 0.011747 | 3.323807 | 0.0027 |
| $lnEEX$ | 0.024432 | 0.009200 | 2.655778 | 0.0136 |
| $lnTEX$ | 0.044259 | 0.037910 | 1.167453 | 0.2540 |
| C | 0.494977 | 0.261041 | 1.896169 | 0.0696 |

**Source:** Researchers' Computation (2023).

The estimated coefficient for defense spending is 0.042884, which established a positive association with the Index of Human Development. Also, the p-value for defence expenditure (0.0090) is less than 0.5, indicating that this explanatory variable significantly influenced the dependent variable, economic wellbeing measured as Human Development Index. This implies that one Naira upsurge in defense expenditure led to long-run boosting of economic wellbeing (Human Development Index) by 0.042884. Similarly, the estimated slope indicator of health expenditure, which is 0.039045, shows a positive association with the regressand. The calculated p-value of the health sector's outlay of 0.0027 is less than 0.5, which is indicative of its significant driving on Human Development Index. It suggests that health expenditures rose by one Naira, orchestrating a 0.039045 long-run improvement in economic wellbeing (Human Development Index). In addition, the estimated coefficient of education expenditure, which is 0.024432, suggests a positive implication from education expenditure to economic wellbeing (Human Development Index), and with a p-value of 0.0136, which is less than 0.5, it infers that education expenditures significantly encouraged Human Development Index. This apparently reveals that over the sampled period, one Naira rise in education expenditure long-run economic wellbeing (Human Development Index) improvement by 0.024432. Lastly, the estimated 0.044259 value of transportation expenditure's coefficient indicated a resulting positive impact from it the Human Development Index. The empirical output further showed a p-value of 0.2540 for transportation expenditure, which is greater than 0.5, suggesting an insignificant impression of transportation outlays on the Human Development Index. This is implicative that one Naira addition to transportation

expenditure in the long run generated 0.044259 improvement in economic wellbeing (Human Development Index).

**Table 4:** Short-run Analysis Results

| **Dependent Variable: 〖lnHDI〗_** | | | | |
|---|---|---|---|---|
| **Variables** | **Coefficients** | **Std. Errors** | **t-Statistics** | **Probs.** |
| $lnDEX$ | 0.279397 | 0.131644 | 2.122362 | 0.0439 |
| $lnHEX$ | 0.019093 | 0.007679 | 2.486471 | 0.0199 |
| $lnEEX$ | 0.024432 | 0.007617 | 3.207517 | 0.0036 |
| $lnTEX$ | 0.013902 | 0.009155 | 1.518484 | 0.1414 |
| CointEq(-1)* | -0.118337 | 0.020531 | -5.763781 | 0.0000 |
| R-squared Adjusted = 0.395851; D-W Stat. = 2.027090 | | | | |

**Source:** Researchers' Computation (2023).

### 4.4 Interpretation of the Coefficients of the Regressors

The estimated short-run coefficient of defense expenditure, 0.279397, evidenced that this causal variable is positively related to economic wellbeing measured as Human Development Index. Also, its probability value of 0.0439, which is relatively lower than the conventional 5 percent critical level, shows that expenditures in defence significantly enhanced economic wellbeing in Nigeria over the sampled period, implying that raising defense expenditure by one Naira led to 0.279397 enhancement in economic wellbeing (Human Development Index) in the short-run. Additionally, the coefficient's outcome of spendings in the health sector is 0.019093, revealing the variable as positively impacted the regressand. Accordingly, its probability value appeared as 0.0199, which obviously is lower than 5 percent portraying health outlays as significantly driven economic wellbeing over the study period, suggesting that one Naira rises in health expenditure led to 0.019093 improvements in economic well-being within the short-term. Furthermore, the estimated education expenditure's coefficient, which is 0.024432 indicates the existence of a positive effect from spendings on education to economic wellbeing. Its calculated p-value appeared as 0.0036, which is less than 0.5 percent means a significantly impactful educational expenditure on the Human Development Index as the adopted measure of economic wellbeing. The implication is that a Naira growth in educational spending will significantly lead to a 0.024432 boost in economic well-being in the short term. Lastly, the coefficient's estimate of transportation expenditure appears as 0.013902 with a p-value of 0.1414, which is greater than 5 percent evidencing positive and significant impacts on economic wellbeing. The implication of one Naira transportation expenditure increase enhanced economic well-being by 0.013902, in the long run, cannot be overemphasized.

### 4.5 Interpretation of Adjusted R-Squared

The ARDL's empirical analysis results, presented in Table 4 above, revealed the adjusted R-squared value as 0.695851, which means that approximately seventy percent (70%) of the changes in economic well-being are attributable to changes in defence expenditure, health expenditure, education expenditure and transportation expenditure, while the

remaining thirty percent (30%) of the variation in the model is captured by the error term (other factors/variables outside the model).

### 4.6 Interpretation of CointEq(-1)

The results in Table 4 correspondingly showed a negative and significant error correction term. Specifically, it appeared with a coefficient value of -0.118337, which evidenced a yearly long-run equilibrium adjustment speed of approximately 12 percent from disequilibrium in economic well-being. It is implicative that with a shock in social sector expenditures, economic wellbeing will easily be restored to long-run equilibrium. This is also seen from the low coefficient value of error correction term which indicates that faced with distortion, stability in the regressand will take only but a very short time to be restored.

### 4.7 Diagnostic Tests

The diagnostic tests conducted and their various outcomes are scheduled in Table 5 below:

**Table 5:** Diagnostic Tests Results

| Test | Test Stat. | Value | Probabilities |
|---|---|---|---|
| Jarque-Bera's Normality Test | Jarque-Bera | 1.075892 | 0.5932 |
| Breusch-Godfrey's LM Test for Serial Correlation | F-stat. | 1.480956 | 0.2502 |
| Breusch-Pagan-Godfrey's Heteroscedasticity | F-stat. | 1.114304 | 0.3964 |
| Ramsey RESET's Specification Test | F-Stat. | 1.113868 | 0.3027 |

**Source:** Researchers' Computation (2023).

The diagnostic tests' outcomes are shown as scheduled above. Interestingly, since not one test is statistically significant, then the researchers accepted the respective null hypotheses. This indicates that the result is free from serial correlation, heteroscedasticity, and specification error while the error terms are normally distributed.

## 5. Discussion of Findings

The current study analytically detected how social sector expenditures affected Nigeria's economic wellbeing. Following outcomes of the data analysis, the findings are discussed as follows: First, defence expenditure directly and significantly affected economic well-being (Human Development Index). This result agrees with (Okezie & Asoluka, 2017), whose finding stated that defense expenditure is one of the social and community service sector's expenditures that contributes positively significant effect on Nigeria's economy. Health expenditure had a positively significant boost to economic well-being. This agreed with Korem (2021) empirical result, which indicated that the effects of education and health sectors' expenditures on the economy's long-run performance are direct and significant. Further, that of (Ebong, Ogwumike, Udongwo & Ayode, 2016) also in their finding concord that public educational expenditure positively and statistically galvanized growth in both the short and long-run. Finally, expenditures for improving the transport sector had an insignificant but motivating outcome on the country's

economic wellbeing, and the result is in harmony with (Nelson, Dumani & Ekokeme, 2018), who found that transportation expenditure and outlays on other communities and social services had a positive effect on the economy in Nigeria.

## 6. Conclusion and Recommendations

### 6.1 Conclusion

Having empirically examined how social sector expenditures theoretically and statistically affected Nigeria's economic wellbeing from 1981 to 2022, it is palpable from the results that social sector expenditures quantities adopted as defence expenditure, health, education and transportation expenditures have actually contributed positively to Nigeria's Human Development Index. However, the transportation sector's expenditure contribution is not significant. In conclusion to the research outcomes, it is opined that social sector expenditures are vital for improving economic wellbeing in Nigeria.

### 6.2 Recommendations

Drawing from the empirical outcomes, the following recommendations are proffered:

1) The federal government of Nigeria should allocate a significant portion of defence expenditure to strategic planning and modernization efforts by investing in advanced technology, equipment, and training to ensure that the armed forces are equipped to handle evolving threats.
2) The Nigerian government should increase health expenditure to expand access to affordable healthcare services for all citizens as well as implement universal healthcare programs or insurance schemes to ensure that essential medical care is accessible to everyone.
3) The government should substantially invest in the development and maintenance of quality education substructures, including schools, libraries, and digital resources, as well as allocate funds for teacher training, professional development, and competitive salaries.
4) Lastly, the Nigerian government should significantly invest in the development and maintenance of transportation substructures, which notably include roads, public transit systems, and air and sea ports, as well as prioritize projects and allocate resources to promote sustainable and eco-friendly transportation options such as public transit, cycling lanes, and electric vehicle incentives.

### Conflict of Interest Statement

The authors declare no conflicts of interest.

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