

Effects of health and education public spending on human development in Chad

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Received: 25/03/2025

Accepted: 01/04/2025

Published: 02/04/2025

Abstract

The aim of this paper is to examine the effects of health and education public spending on human development in Chad. We used the autoregressive distributed lag model and data sourced from World Bank and United Nations Development Program (UNDP) spanning the period 1990 to 2022. The findings reveal that health and education public expenditures have a significant positive effect on human development in Chad. Based on these results, it is recommended that, alongside the implementation of effective policies in these sectors, public spending on health and education be increased, in line with the 2030 education agenda and the Abuja declaration for health.

Key words : Human Development, Health Public Spending, Education Public Spending, Autoregressive Distributed Lag Model, Chad.

Jel Classification : O15, H51, H52

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1-Introduction

Human development is one of the most controversial concerns in economic history. The experience of research on the development in recent years has shown that development is possible, but not automatic. While few developing countries have achieved rapid social and economic growth, narrowing the gap between themselves and the advanced nations and lifting millions of their citizens out of poverty, many others have seen the development gap widen and poverty increase, accentuating their low level of human development.

The Organization for Economic Cooperation and Development (OECD, 1993) highlights that human capital, encompassing education and health, is a crucial factor influencing a nation's economic growth and development. According to Oakley and Garforth (1993) and Ouddida Jihad and Alaoui lala (2021), development process should have three main aspects, economic (creation of the productive economic base that any society needs to produce goods essential to life) ; social (providing facilities and services in areas such as health, education and social protection that will satisfy society's non-productive needs) ; human (development of human resources, both individual and collective, so that people can make full use of their potential, build on their knowledge and skills, and play their part in shaping their own society).

New development strategies aimed combating poverty, hunger, declining GDP, poor human development indicators and inequality have placed a premium on health and education public spending sectors, which are now the pillars of sustainable and inclusive human development, particularly in Chad and developing countries in general (Eljabri Saloua and Elkhider Abdelkader, 2020). Fouad and Anass (2016), state that investment in education and health is presented as a necessary condition for economic take-off. This is borne out by the emerging economies of East Asia, which have always invested heavily in human capital formation (education and health). Human development is a multifaceted process that involves the interplay of factors such as income, productivity, health, and education, along with how these elements are distributed across the population (Marmot et al., 2008).

Chad's socio-economic indicators are among the lowest in the world, largely due to 40 years of armed conflict and political instability, preventing human and physical capital accumulation and the establishment of institutions essential to development. Chad remains one of the ten poorest countries, with an HDI of 0.401 in 2018, ranking 187th out of 189 countries. Between 2000 and 2018, the HDI rose from 0.298 to 0.401, an increase of 34.6%. However, population ratio living below the poverty line fell slightly, from 55% in 2003 to 46.7% in 2016. Life expectancy also rose from 49.6 years to 51.9 years between 2010 and 2016. However, the literacy rate, which stood at 22.4% in 2009, remains one of the lowest in Africa, revealing persistent difficulties in accessing basic social services¹.

¹ Source : PND 2017-2021

In addition to education, which is one of the main resources of human capital, health of society is also important. It can therefore be said that there is a close relationship between a society's level of health and its human development (Moussane et al., 2023). Education and health are the foundation of human development (Ngoy Banza Kajimbika et al., 2022; Diawara Daman and Traore Modibo, 2023).

One of the differences between countries with advanced human development and others lies in public spending on education and health, which is higher in the former than in the latter. What's more, emerging countries in terms of human development are those which, during the 1980-1990 decades, restructured their public spending in favor of these essential social sectors, as in Sri Lanka, Mauritius, etc... (Saha, 2015). In Chad as in almost all countries with low and slow human development, public spending on these sectors has tended to decline. public spending allocated to education fell from 2.45% of GDP in 2017 to 2.29% in 2019, while those allocated to health never crossed 8% threshold until 2022. Based on this, our main research question is : can we say that the decline in spending on essential social services is the reason for the slow pace of human development in Chad?

Indeed, access to basic services such as education and healthcare remains a luxury in Chad for the vast majority of the population, and is the result of some of the country's poorest social indicators. These indicators merely reflect the overall situation of the country, which is one of the poorest in the world. Investments made are mainly aimed at capital-intensive projects, rather than high value-added investments such as those in the health and education sectors. Poor governance, characterized among other things, by high levels of corruption remains one of the main factors explaining that underperformance (Eljabri Saloua and Elkhider Abdelkader, 2020).

Human development can be defined according to several sources, on the one hand by institutional bodies and on the other by researchers. Issolah et al (2021) defined human development as an instrument for measuring and evaluating the degree of success of countries in meeting the socio-economic needs of their populations. According to the UNDP 1990 report and some authors such as (Omar and Abdallah, 2019; Boutaleb and Boutaleb, 2020), human development is a process that results in the broadening of opportunities accessible to all individuals. In theory, these opportunities are boundless and can develop and change over time.

After the Second World War, underdevelopment was characterized as the situation of countries with a low income. Remarkable efforts were made to translate this approach into terms of GDP measurement. The limitations of that approach have always been underlined, giving rise to attempts to integrate other dimensions into the measurement of development, but always within a macroeconomic framework. A prominent measure stemming from this approach is the Human Development Index (HDI), which has been released yearly by the United Nations Development Programme since 1990 (Raffinot, 2015). as well as human development, public spending on health and education is a subject of numerous definitions in the literature. However, the generally accepted definition is that of Elotmani and Bensbahou (2021), public spending is spending by the State, social security administrations, local authorities and their related bodies. This is expenditure by the State on social sectors. They include spending on health, education, nutrition, sanitation and infrastructure. In this study, we focused solely on public spending on education and health. According to OECD's (2008), public expenditures on health is defined as public spending on health care incurred by public funds" (Chakroum, 2012 and Fadia, 2021). It has been confirmed by Anyanwa and Andrew (2019) that financing health sector significantly supports the economy. This implies that spending on the healthcare system improves people's health, creates job opportunities, increases social and political stability and, ultimately, leads to the growth and development of the economy as a whole (WHO, 2017).

In 21 years, the proportion of the budget allocated to health in Chad has never exceeded 6%. The reasons for this underperformance are to be found in insufficient political will, weak resource mobilization capacity and poor use of available funds. It's a failure that marks the mind of anyone interested in the implementation of the Abuja Declaration of April 2001 in Chad, which calls on African states to devote annually 15% of their national budget to the health sector. According to Chongwang (2021), during these 21 years, Chad has never once succeeded in meeting this target. Concerning public expenditure on education, the Education 2030 Framework for Action aligns with one of the 17 global objectives of the agenda. This is closely tied to Goal 4, which seeks to guarantee inclusive and equitable quality education for everyone while fostering opportunities for lifelong learning. Effective and transparent management of public funds allocated to education is a key strategy for reaching this objective (Diallo, 2020). According to Grossman (1972), education promotes access and understanding of medical information, because better-educated individuals will be better able to allocate their resources between the various inputs of the health production function.

The primary objective of this paper is to examine the effects of health and education public spending on human development in Chad. The remainder of the paper is structured as follow : the section 2 provides brief literature review, section 3 is the presentation of the methodology, section 4 presents the results and the last section 5 is the conclusion.

2.Literature review

From a theoretical point of view, classical economists identified land, labor and physical capital as the three basic factors of economic growth or development. Neoclassical economists Schultz (1961) and Becker (1964) added human capital. They argued that the endowment of a well-educated society, well trained and healthy workers enabled the efficient use of orthodox factors. Thus, human capital development in economic theories truly emerged thanks to (Schultz, 1961; Becker, 1964; Mincer, 1974 and Lucas, 1988), themselves inspired by Adam Smith and others (Barro, 1993; Mankiw and Sala-I-Martin, 1995), placing human capital as the central variable explaining macroeconomic evolution (Issolah et al., 2021).

Many studies have largely focused on investment in education capital as an important factor contributing to human capital accumulation, thus neglecting the role that investment in the health sector could play in the process of improving human development (Mamadou Coulibaly, 2013; Elbousairi and Eddassi, 2019). However, authors such as (Schultz, 1961; Mushkin, 1962; Grossman, 1972; Fadia Habchi, 2021), will show that investment in health is one of the major components of well-being and human reproduction, and therefore constitutes a form of human capital as important as education. Public spending on health, seen as an integral part of human capital, has grown significantly in the economic literature over recent decades (Aka and Dumont, 2008). At the macroeconomic level, endogenous growth theory (Romer, 1986; Lucas, 1988; Barro, 1990; Aghion and Howit, 1992), recognizes the primordial role of economic players in the development and growth process. According to this theory, health, like education, are an essential factor in improving labor productivity and, consequently, human development (Traore et al., 2021; issolah et al., 2021; Kouassi Ya Assanhoun Guillaume, 2021; Ngoy Banza Kajimbika et al., 2022; Sabri et al., 2023).

Numerous theoretical analyses have been conducted on public spending in health and education, resulting in two distinct perspectives on endancing the Human Development Index (HDI). The first perspective highlights a positive correlation between public spending on health and education and the Human Development Index (HDI). Studies by Emecheta et al. (2017) and Boachie and Polajeva (2018) reveal that increased health expenditures significantly and positively enhance the HDI. Similarly, Wijayanto et al. (2015) and Sanggelorang et al. (2015) found that higher allocations to education budgets have a notable impact

on the HDI. Furthermore, Fattah and Muji (2012) and Edeme (2014) underscored that public investments in education, health, and infrastructure significantly influence the HDI. Conversely, the second perspective challenges this view, suggesting that public spending on health and education does not always translate into meaningful improvements in human development. Prasetyo and Zuhdi (2013) concluded that public expenditures do not consistently result in effective advancements in human development.

Indeed, public expenditures on health and education can enhance the Human Development Index through various pathways. According to Cusset Pierre-Yves (2021) and Pakpoom Saengkanokkul (2018), the evolution of healthcare spending depends on three types of factors: economic factors (standard of living), demographic and health factors (ageing and health status) and technological and institutional factors (technical progress, price of healthcare services, organization and financing of the healthcare system). According to endogenous growth theory, health can stimulate human development. Better health enables individuals to work more days, which increases productivity in terms of both quality and quantity. Increased public spending on health not only benefits individuals, but the overall economic system by improving the Human Development Index. From a demographic point of view, better health can change the population pyramid. Innovative medical technology leads to a reduction in mortality rates, notably maternal mortality and infant mortality rates in the baby-boom period, thus enlarging the base of the population pyramid. Conversely, medical technologies also improve birth control, thereby reducing the fertility rate. In addition, medical technologies increase life expectancy. Institutions, economic policies, governance and the provision of public goods directly affect human development.

Regarding the pathways through which public spending on education improves HDI, Hanusheka and Woessmannb (2020), highlight that the existing literature identifies at least three mechanisms through which education can affect human development. Firstly, public spending on education can enhance the human capital embedded in the workforce, thereby boosting labor productivity and driving transitional growth towards a higher equilibrium level of output (Mankiw, Romer and Weill, 1992). Secondly, investments in education through public spending can enhance a nation's innovative potential, driving the development of new technologies, products, and processes, which ultimately supports economic growth and development (Lucas, 1988; Romer, 1990; Aghion and Howitt, 1998). Thirdly, public expenditure on education can facilitate the dissemination and transfer of knowledge necessary to comprehend new information and effectively implement new technologies developed by others, further advancing economic development (Nelson and Phelps, 1966; Benhabib and Spiegel, 1994).

The subjects of public expenditure on education and health have long been a fertile ground for extensive research and analysis by various scholars (Thierno Ndao Gueye, 2021).

Empirical studies suggest that increased public investment in education and health can improve associated indicators (Baldacci et al., 2008). However, when such spending becomes excessive, it may result in substantial budget deficits, macroeconomic instability, and slower economic growth, potentially undermining education and health outcomes. Baldacci et al. (2004) emphasize that education and health play a particularly crucial role in driving growth in low-income countries. Meanwhile, empirical literature on the same subject has highlighted the distinction between productive and unproductive public spending (Aschauer, 1989; Barro, (1990, 1991)). One of the main conclusions of these studies is that output growth is negatively related with the share of public consumption in GDP. Aschauer and Barro also highlight a positive correlation between public investment and economic growth. Research by Robert Barro (1991), Benhabib and Spiegel (1994), and Barro and Xavier Sala-i-Martin (1995) indicates that education is positively associated with the growth rate of GDP per capita. Additionally, Traore et al. (2021) show that, both in the short and long term, expenditures on education and health, along with the gross enrolment ratio (GER) at the tertiary level—used as a measure of human capital—have a favorable impact on economic growth in Mali.

Empirical studies examining the effect of health expenditure on human development are based on controversial results at both macroeconomic and microeconomic levels. At the macroeconomic scale, numerous studies have proposed that poor health within a population may contribute to slower economic development. Sachs et al. (2001) demonstrated the significant adverse effects of malaria on economic growth. While Acemoglu and Johnson (2007) found that the effects of health on per capita growth is not significant and could even be slightly negative due to its strong influence on population growth and limited effect on GDP, Bonds et al. (2010) revealed that the dynamic interplay between health and poverty can create cycles of underdevelopment. Conversely, at the microeconomic level, it is easier to account for endogenous factors when analyzing the relationship between health and development (Strauss, 1986; Strauss and Thomas, 1985).

Another study by Levinsohn et al. (2013) demonstrates, after addressing simultaneity concerns (particularly those related to poverty), the substantial and significant effect of HIV/AIDS on labor market participation in South Africa. These results corroborate those of Aka (2008); Isola and Alani (2012); Atilgan et al. (2016), who proved that health stimulates development and economic growth. However, they differ from numerous studies, such as those by Amassoma and Nwosa (2011) and Balaji (2011), which found no long-term relationship and no causality between these variables. Authorities should therefore create the preconditions for improving health, by increasing the budget allocated to the health sector (Kouassi Ya Assanhoun Guillaume, 2021).

Farlinda Nur (2016), shows that public spending on healthcare has a positive and significant impact on the Human Development Index (HDI) in Indonesia.

Likewise, Gogo (2021) demonstrated that public health expenditures have a significant and positive effect on the Human Development Index (HDI) in Nigeria. These findings are further supported by Moussane et al. (2023). Additionally, Ndaguba and Hlotywa (2021) analyzed the impact of public health spending on economic development in South Africa, concluding that there is a strong positive relationship between public health expenditure and the HDI, and that such investments play a beneficial role in advancing economic development.

African countries have made great strides in terms of education levels, income and the overall health of their populations, even with modest levels of public spending. In view of the controversy in the literature and in the image of these Asian models, human development driven by the health and education sectors should be a primary focus for developing countries like Chad, underscoring the importance for this study.

The aim of this study is to examine the effects of public expenditures on health and education on human development in Chad.

3. Methodology

In this section we present the model, discuss the choice of variables, present the estimation technique and data.

The model we use come from those of Ndaguba and Hlotywa, (2021) and also Li et al. (2017), and also recent studies of Thierno Ndao Gueye, 2021 ; Diawara et Traore, 2023. These authors adopted a constant elasticity of the substitution production function. We modify their model to have the following model :

$$HDI_t = \beta_0 + \beta_1 HPS_t + \beta_2 EPS_t + \beta_3 RDPS_t + \beta_4 INV_t + \beta_5 INF_t + \beta_6 UNEMPL_t + \beta_7 CORRUP_t + \varepsilon_t \quad (1)$$

HDI is the human development index. HPS are health public spending, EPS is education public spending (Thierno Ndao Gueye, 2021 ; Nya et al., 2021), INF is the inflation rate measured as the consumer price index (Moussane et al (2023), INV represents gross fixed capital formation as a proxy for investment, UNEMPL is the unemployment rate measured by the number of unemployed graduates (Moussane et al (2023), and CORRUP represents corruption is measured by the Corruption Perceptions Index (Thierno Ndao Guèye, 2021). β_0 is the constant ; β_1 , β_2 , β_3 β_4 β_5 β_6 β_7 are coefficients to be estimated, ε_t is the error term and t indicates the time index. As control variable we include INV, Investment measured by the gross fixed capital formation which is supposed to have a positive and significant effect on economic growth and economic development (Moussane et al., 2023). RDPS is research and development public spending, which measure the ability to innovate (Nya et al., 2021). Due to the fact that after unit root test somme

variables are stationnary in level and other in first difference, we transform our model in an autoregressive distributed lag model.

The data utilized in this study come (HPS, EPS, RDPS, INF, INV and UNEMPL) from the World Bank's World Development Indicators (WDI, 2023), (CORRUP) from the Transparency International annual reports and (HDI) from the United Nations Development Programme (UNDP), covering the period from 1990 to 2022.

4.Presentation of results

We begin by presenting the results of the Augmented Dickey-Fuller (ADF) unit root test, followed by the estimation results and robustness checks. Table 1 below shows the results of the unit root test. We can see that Human development index, health public spending, investment, research and development public spending, unemployment rate and corruption are I(1), meaning that there are integrated in first order or stationnary in first difference, while education public spending and inflation rate are I (0) meaning that they are integrated in zero order or stationnary in level. As the variables are integrated in different order we can estimated a ARDL model which can allow us to analyze short run and long run relationship (Pesaran, 2003).

Table 1: Unit root test results (ADF)

Variables	Level	First difference	Order of intégration
Human development index	1.619994 (0.9714)	-6.521694 (0.0000)	I(1)
Health public spending	0.155989 (0.7244)	-8.899952 (0.0000)	I(1)
Education public spending	-4.80752 (0.0005)	–	I(0)
Investment	-0.55442 (0.4685)	-5.186499 (0.0000)	I(1)
Research and development public spending	-3.55178 (0.0130)	-4.065690 (0.0036)	I(1)
Unemployment	2.909250 (0.9985)	-6.149975 (0.0000)	I(1)
Inflation	-4.06161 (0.0002)	–	I(0)
Corruption	-1.11690 (0.2341)	-6.633728 (0.0000)	I(1)

Source : The authors using Eviews 10

Table 2 in the appendix displays the results of the boundary test. This allows us to either accept or reject the null hypothesis that there is no long-term relationship among the variables. The Fisher statistic, which is 3.965106, exceeds the lower critical value and is above the 5% threshold. Therefore, we can reject the null hypothesis and conclude that a long-term relationship, or cointegration, exists between the variables.

The graph 1 in the appendix shows how we determine the optimal number of lags. We can see that the AIC values are quite close to each other, indicating that all these models are competitive in terms of performance. The best model is the one with the lowest AIC value (around -4.60). This model is chosen because it provides the best fit with a minimum of complexity compared to the other models. We therefore estimate an ARDL (1, 2, 0, 1, 2, 1, 2, 0).

The optimal ARDL model that was selected on the basis of the Akaike Information Criterion (AIC) is ARDL (1, 2, 0, 1, 2, 1, 2, 0) (confers graph 1). Based on the delay selection criteria, the ARDL model was estimated with a maximum of 2 delays for all variables.

4.1 Results and discussion

Table 3 presents the long and short term results.

Long run relationship		
Variables	Coefficients	Probability
CointEq(-1)*	-0.668035***	0.0000
Health Public Spending HPS	0.044847***	0.0041
Health Public Spending HPS(-1)	-0.005880	0.5037
Health Public Spending HPS(-2)	-0.047660***	0.0010
Education Public Spending EPS	0.062108***	0.0057
Investment	0.000807	0.4022
Research and development public spending RDPS(-2)	0.004028***	0.0038
Corruption	-0.003176**	0.0281
Unemployment	-0.005291	0.9098
Unemployment (-2)	0.093607*	0.0757
Inflation (-1)	-0.001785***	0.0024
Constant	0.246096**	0.0392

Short run relationship		
Variables	Coefficients	Probability
Health Public Spending D(DPS)	0.044847***	0.0041
Health Public Spending D (DPS (-1))	0.047660***	0.0010
Research and development public spending D(DPRD)	-0.0001028***	0.8155
Research and development public spending D(DPRD (-1))	-0.004028***	0.0038
D (Unemployment)	-0.005291	0.9098
D (Unemployment (-1))	-0.093607**	0.0757
D(Inflation)	0.000172	0.7006
Constant	0.164401**	0.0315

Source : The authors using Eviews 10

(***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$ indicate significance at 1, 5, and 10 percent.

We can see in the table 3 that the coefficient of the restoring force towards equilibrium (-0.668035) is negative and significant. Therefore, there is an error correction mechanism. The negative sign on the error correction term confirms the anticipated convergence process in the long-term dynamics. Specifically, 66.80% of last year's imbalances are corrected in the current year, suggesting a good speed of adjustment in the relationship process following a shock during the last year. Our results show globally that, health expenditure (DPS) and education expenditure (DPE) have positive effects on human development (HDI). Investment (GFCF) and DPRD have positive effects on human development (HDI). While unemployment, corruption and inflation have negative effects on human development (log HDI).

Post estimation tests are good. In fact, Jarque-Bera statistic is 0.165194 and its probability of 0.9207722 is greater than the 5% threshold, so we can conclude that the residuals follow a normal distribution. The Breusch-Godfrey test has a statistic of 0.2680 and a probability of 0.0472 greater than the 5% threshold. We can therefore reject the autocorrelation hypothesis, meaning that the errors are homoscedastic. The Ramsey RESET test has a probability of 0.8283 which is greater than the 5% threshold, so we can conclude that our ARDL model is well specified and stable over time.

The short-term empirical results reveal a statistically significant positive association between public health expenditure and human development outcomes in Chad. The estimated coefficient of 0.0448 ($p < 0.01$) indicates that health

spending exerts a robust influence on the Human Development Index at the highest significance level. These findings suggest that, holding other factors constant, a marginal 1% increase in public health investment would yield a corresponding 0.045% enhancement in HDI values during the short-run period. We also see that, public education expenditure does not influence human development. This raises the problem of the effectiveness of public education expenditure. Public education expenditure is not directed effectively in key education sectors such as basic education, scientific research and training and vocational training. The coefficient of inflation is 0.000172 with a probability of 0.7006. The analysis reveals a positive short-term relationship between inflation and human development. Notably, the study finds that public expenditures on research and development, investment activities, and corruption control measures demonstrate no statistically significant short-run impact on human development outcomes. These variables exhibit negative coefficients that fail to achieve statistical significance in explaining HDI variations.

In the long term, we see that results the coefficient of health expenditure is 0.044847 with a probability of 0.0041 which is greater than 5%. This shows that health expenditure influences the level of human development at the 5% threshold in Chad. An increase in health spending would therefore lead to an improvement in the population's health status and, consequently, long-term human development in Chad at the 5% threshold. These findings align with other studies, such as (Riayoti, 2016), which analyzed the effects of public health expenditure on development in Malaysia.

Education expenditure influences human development in Chad with a coefficient of 0.062108 and a probability of 0.0057 which is lower than the 5% threshold. The findings suggest that, *ceteris paribus*, a one percent increase in public education spending yields a long-term HDI improvement of approximately 0.062%. These empirical results align with previous studies by (Benhabib and Spiegel, 1994 ; Musila and Belassi, 2004 ; Hanushek and Kimko, 2000 ; Baldacci et al., 2005 and Diallo, 2007). The coefficient for public spending on research and development is 0.004028 with a probability of 0.0038, indicating that research and development spending lagged by two periods has a positive and significant effect on human development at the 1% threshold. A 1% increase in such spending enhances human development by 0.004028%, thereby contributing to economic development in Chad. In the long term, investment influences human development at the 5% threshold. In addition, since the Chadian economy is not sufficiently structured and diversified, a high concentration of expenditure in a single sector could lead to dysfunctions in other sectors of the economy. The high unemployment rate prevailing in Chad also constitutes an obstacle to improving human development. Corruption, unemployment and inflation have negative effects at the 5% and 1% threshold on HDI.

5-Conclusion and recommendations

The objective of this study was to empirically examine the effect of education and health expenditure on human development in Chad. By employing the Autoregressive Distributed Lag Model (ARDL) and utilizing data from the World Bank's World Development Indicators and the United Nations Development Program (UNDP) spanning the period from 1990 to 2022, our results showed that public expenditure on education and health has a positive effect on human development in Chad, which is closely in line with the relative consideration (in terms of budget) of these sectors. Despite the low level of public expenditure allocated to education and health, the econometric analysis demonstrates their long-term effectiveness in promoting human development. Investment also has a positive effect on human development in Chad. It is therefore a relevant factor in human development.

In addition, since the Chadian economy is not sufficiently structured and not diversified, a high concentration of expenditure in a single sector could lead to dysfunctions in other sectors of the economy. The high unemployment rate prevailing in Chad also constitutes an obstacle to improving human development, which is in line with economic development. Based on these results, we recommend, the establishment of effective health and education policies, a significant increase in the amount of health and education expenditure in accordance with the 2030 Agenda for the education sector and the Abuja Declaration for the health sector.

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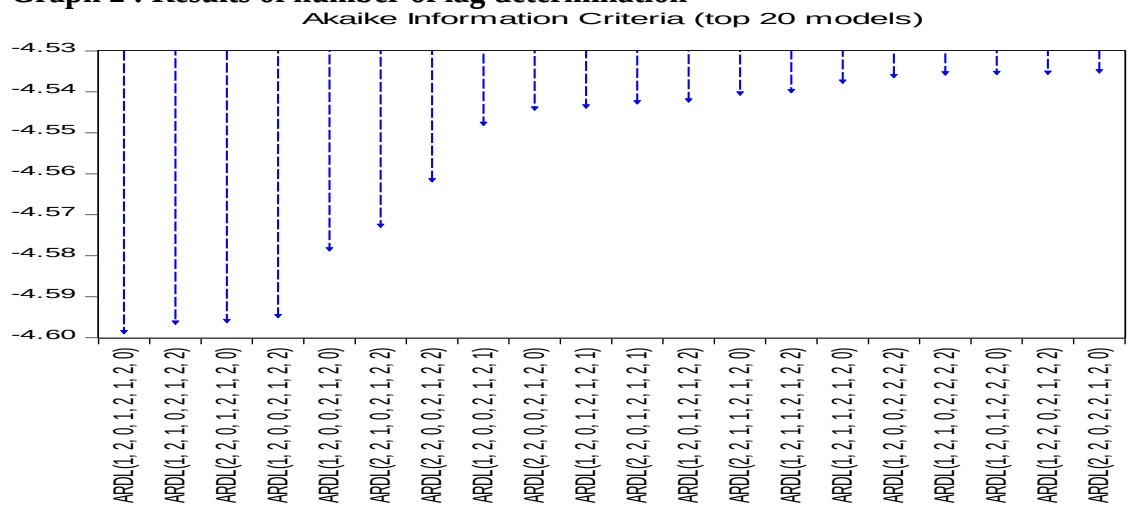
Appendix

Table 2 : Results of the Bounds test

Bound test F		Nul hypothesis : No relationship in level		
test Statistic	P -Value	Significance	I(0)	I(1)
F - Statistic	3.965106	5%	2.17	3.21
K	7			

Source : The authors using Eviews 10.

Graph 2 : Results of number of lag determination



Source : The authors using Eviews 10.