

# How Effective Is the Official Development Assistance in the Education Sector? Evidence from the WAEMU Countries

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## Abstract

This study aims to determine the impact of Official Development Assistance on school performance within the West African Economic and Monetary Union (WAEMU). Aid to education is disaggregated by education subsectors. We have seven (07) countries and a time period of 20 years spanning from 2002 to 2021. We are therefore faced with a panel data setup with  $N = 7$  and  $T = 20$ . The time series characteristics of the data which is made up of a mixture of  $I(0)$  and  $I(1)$  variables, indicated that the appropriate model to use is a panel ARDL. Thus, an ARDL model is to be estimated using the Pooled Mean Group method. The results showed that, in the long run, ODA allocated to education in the WAEMU contributes to improving school performance in the primary and secondary education sub-sectors; governance in the WAEMU has a negative and significant impact on both the primary completion rate and the gross enrollment rate in secondary education. The results also showed that in the short run, governance has a negative impact on the gross enrollment rate in tertiary education. Thus, African countries in general, and those in the WAEMU in particular, would therefore benefit by improving the quality of their institutions, their education system, by fighting corruption and creating a stable political environment free of violence.

## Keywords

Official Development Assistance, Education, School Performance

## 1. Introduction

According to Chenery and Alan (1965), in most underdeveloped countries, sig-

nificant increases in per capita income are largely dependent on the availability of external resources. The authors also stated that a crude measure of this dependence is the net flow of some nine billion US dollars a year from the advanced to the less developed countries, equivalent to a quarter of their gross investment and almost a third of their imports. The provision of skilled labour and the transfer of technical skills are equally important, they argued.

This skilled workforce can only be achieved through education, which is the fourth of the Sustainable Development Goals (SDG 4), whose 2030 agenda was adopted in 2015 by the United Nations. Education is recognized as a fundamental right and a potentially very important factor in global economic development. SDG 4 aims to ensure inclusive and equitable quality education, and to promote lifelong learning opportunities for all.

International public funding plays a vital role in achieving this specific objective for education, complementing the efforts made by countries to mobilize domestic public resources. To this end, developed countries have committed to allocating 0.7% of their Gross National Product to Aid for developing countries. Also, the benchmarks/indicators for education indicate that countries should devote at least 4% to 6% of their Gross Domestic Product (GDP) and/or at least 15% to 20% of total public expenditure to education (UNESCO, 2015).

OECD data (OECD, 2023) show that, between 2005 and 2021, the Development Assistance Committee (DAC) granted more than USD 34 billion in Official Development Assistance (ODA) for education in sub-Saharan African countries. Furthermore, school results recorded over the same period show that the net primary school enrolment rate has gradually increased in these countries, rising from 69.67% in 2005 to 75.23% in 2009. The literacy rate among young people (as a percentage of the population aged 15 to 24) also rose gradually in these countries between 2005 and 2020, from 68.4% in 2005 to 76.7% in 2020 (World Bank, 2023). In addition, 2018, 2019 and 2020 were particularly marked by an increase in the volume of aid to education in sub-Saharan African countries.

In fact, this aid amounted, in gross payments, to USD 2.24 billion, USD 2.23 billion, and USD 2.28 billion in 2018, 2019 and 2020 respectively (OECD, 2023). Similarly, the upward trend in the volume of Aid to education in 2018, 2019 and 2020 in Sub-Saharan Africa is also observed within the Economic Community of West African States (ECOWAS), where aid to education reached USD 775.79 million, USD 830.02 million, and USD 814.63 million respectively. Looking at the West African Economic and Monetary Union (WAEMU), this aid reached USD 412.57 million in 2017 and gradually increased to reach USD 518.21 million in 2021, i.e. an average gross payment of USD 470.08 million per year.

At a time when the volume of ODA earmarked for education in sub-Saharan African countries, particularly in the ECOWAS and UEMOA zones, is reaching

historic levels, the assessment carried out in 2019 in 14 French-speaking sub-Saharan African countries by the “*CONFEMEN Educational Systems Analysis Program (PASEC2019)*” on the “Quality of the education systems in French-speaking sub-Saharan Africa” showed that at the end of primary education, more than half of pupils (52.1%) were below the reference level in reading and therefore had difficulty learning to read. In mathematics, more than 60% of pupils at the end of primary school were below the reference level.

There are several reasons for this poor performance, including socio-economic inequalities, lack of access to pre-school education, parental illiteracy, and lack of access to books at home (PASEC, 2020). It is in the light of these findings that our study focuses on *the effectiveness of Official Development Assistance in the education sector: evidence from WAEMU countries*. The mediocre educational performance recorded in the ECOWAS region could raise questions about the effective contribution of Official Development Assistance in terms of improving the quality of education. Thus, we wonder what could be the effect of ODA allocated to the education sector on school performance in the WAEMU countries?

This question is of vital importance insofar as education is an inescapable aspect of a country's level of development which is assessed using the Human Development Index (HDI). As, developing countries are generally characterized by low domestic savings rates, it seems necessary to analyze their source of funding for human capital development.

In recent years, increased attention has been paid to the distribution of development Aid between recipient countries. After decades of generally inconclusive results, studies of the macroeconomic impact of Aid now conclude, almost without exception, that Aid is effective in promoting growth (Hansen & Tarp 2000, 2001; Dalggaard & Hansen 2001; Hudson & Mosley, 2001; Gounder 2001).

However, some studies have concluded that this impact depends on the quality of the recipient country's political regime (Burnside & Dollar, 2000; Svensson, 1999).

Thus, the main objective of this study is to contribute to a better understanding of the relationship between Official Development Assistance allocated to the education sector and educational output in WAEMU countries.

This study would make two important contributions. It aims to enrich and complement work on the subject in the WAEMU area, by introducing political stability and non-violence as control variable for analysis of the impact of ODA on education performance. It also contributes to the debate on the effectiveness of ODA by decomposing the education sector into subsectors. These are primary, secondary, and tertiary (higher education).

The rest of the paper is structured as follows. The next section presents some stylized facts, while Section 3 is devoted to a review of selected literature. Section 4 deals with the method of analysis and the data used. Section 5 presents and discusses the empirical results. Section 6 is devoted to the conclusion and rec-

ommendations.

## 2. Stylized Facts

According to the OECD, aid to education includes education policy and administrative management, school facilities and training, teacher training, educational research, basic education, secondary education, and post-secondary education.

**Figure 1** shows that the sum of gross disbursements of aid to education between 2002 and 2021 within the West African Economic and Monetary Union amounts to USD 8150.140 million, which represents an average of USD 407.507 million per year. Furthermore, over the period of analysis (2002-2021), aid to education granted to WAEMU countries increased, particularly for the following periods: 2002-2004, 2005-2008 and 2015-2021. The average annual disbursement over this period is USD 438.75 million. It has risen from USD 342.40 million in 2015 to USD 518.21 million in 2021, i.e. a positive variation of 5.77% compared with the level of disbursements recorded in 2020.

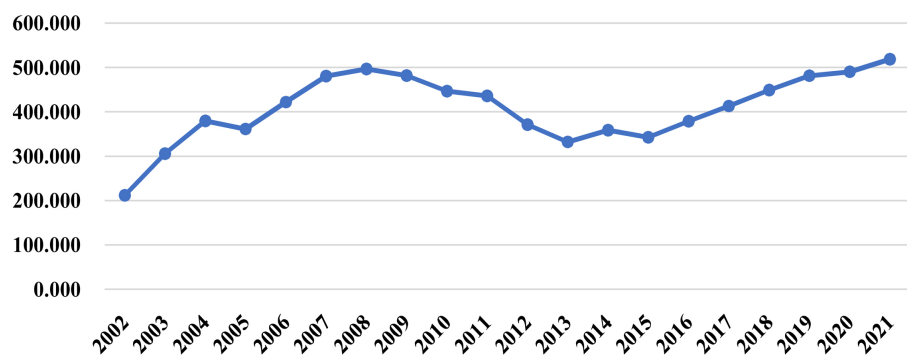
A country-by-country analysis of average gross ODA disbursements to education in the WAEMU shows that Senegal is the country that has benefited the most from the inflow of Official Development Assistance to the education sector between 2002 and 2021, with an average of USD 121.59 million.

### 2.1. Analysis of School Performance Indicators

Several performance indicators exist in the education sector. However, due to difficulties with data availability, only two indicators will be discussed in this section, namely the primary completion rate and the gross enrolment ratio.

### 2.2. Primary School Completion Rate

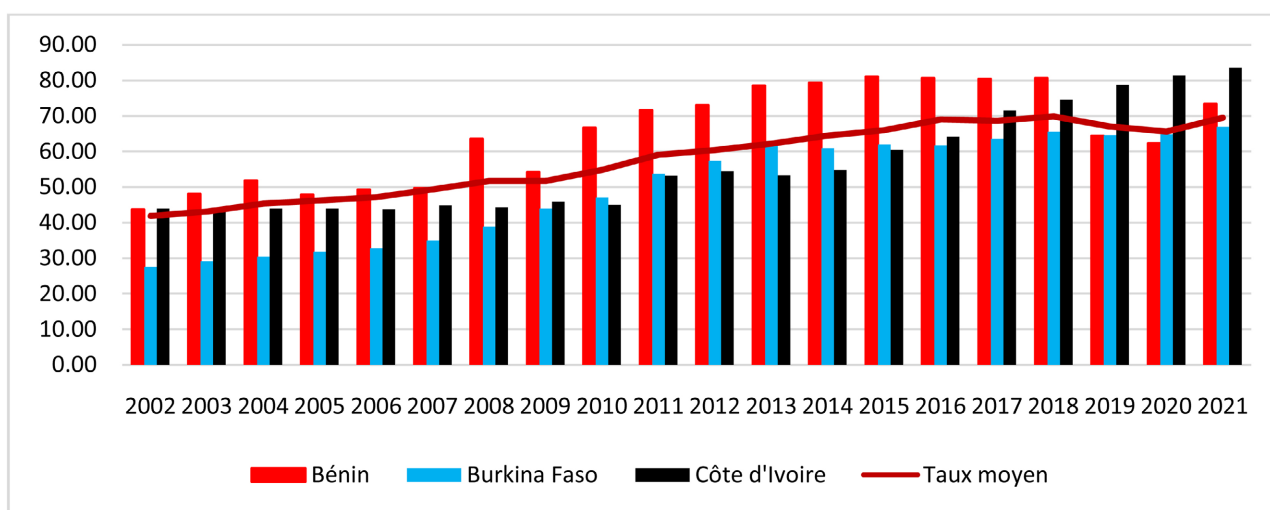
The primary completion rate is the percentage of pupils in a given cohort enrolled in the first year of primary school who reach the end of primary school. In other words, the total number of children who successfully complete the last year of primary school expressed as a percentage of the total number of children



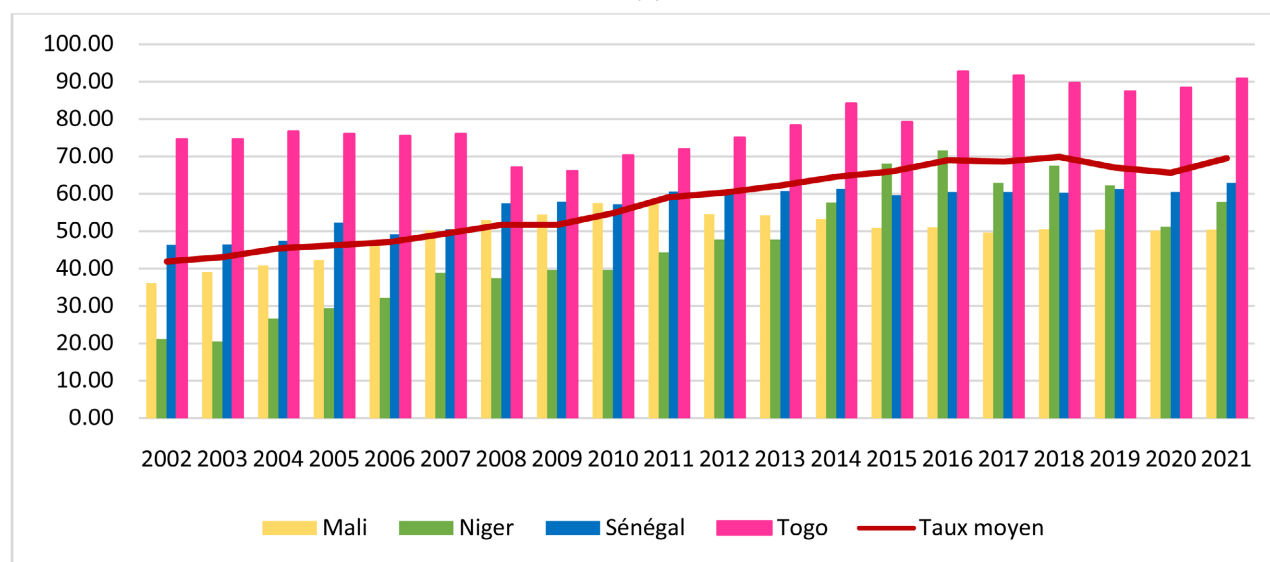
**Figure 1.** Trend of gross disbursements of Official Development Assistance granted to the education sector in the WAEMU from 2002 to 2021. Source: Data from the OECD.

of the theoretical age corresponding to this last year. The primary school completion rate in developing countries rose from 57% in 2002 to 71% in 2014 for girls and from 68% to 75% for boys. For sub-Saharan Africa, the rate is 61.7% (World Bank). For the seven countries in our study, on average, the primary completion rate is on the rise, reaching 57.82% between 2002 and 2021.

A country-by-country analysis of changes in the primary completion rate (Figure 2) shows that between 2002 and 2007, the lowest rates were observed in Burkina Faso and Niger, while Senegal and Togo had a high number of children successfully completing the last year of primary school. Between 2008 and 2013, the percentage of children reaching the end of primary school remained low in Niger, and the highest rates were achieved by Togo and Benin. On the other hand, Mali and Niger have the lowest primary completion rates over the period



(a)



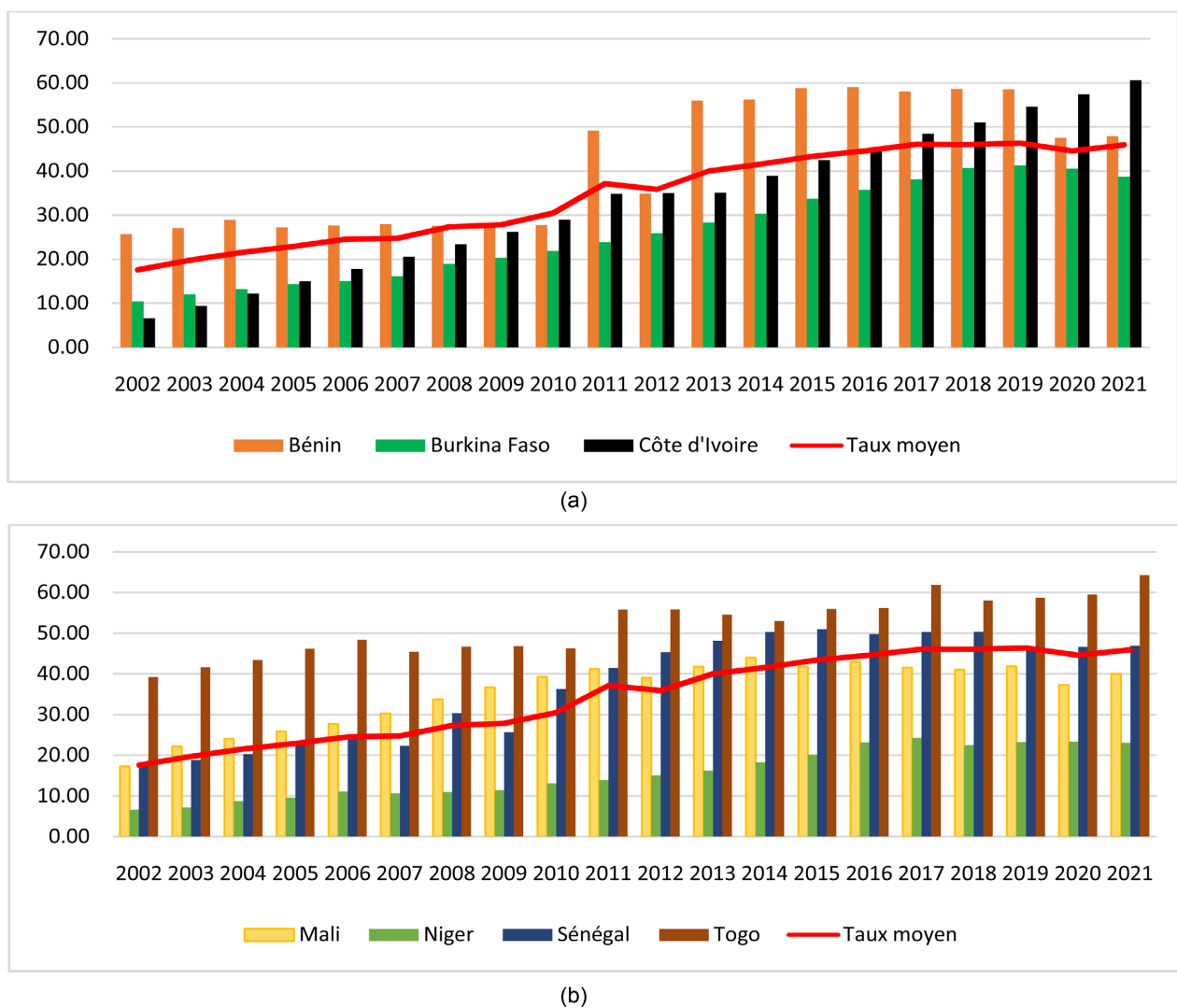
(b)

**Figure 2.** Trend of primary completion rate in the WAEMU countries from 2002 to 2021. Source: Author based on OECD data (2022).

2014-2021. In terms of improvement of the primary completion rate, a great deal of effort seems to have been made in Togo, Benin and Côte d'Ivoire, where the rates are highest from 2015 to 2021. These figures show that it is not enough just to get children into school, but also to ensure that they learn.

### 2.3. Gross Enrolment Rate

The main purpose of this indicator is to show the general level of participation in each specific level of education. The gross enrolment rate is defined as the total enrolment in a specific level of education, regardless of age, expressed as a percentage of the officially school-age population at the same level in a given school year. In other words, the gross enrolment rate indicates the capacity of the education system to enroll pupils or students of a particular age group. We analyze trends in the gross enrolment rate at both secondary and higher education levels (Figure 3).

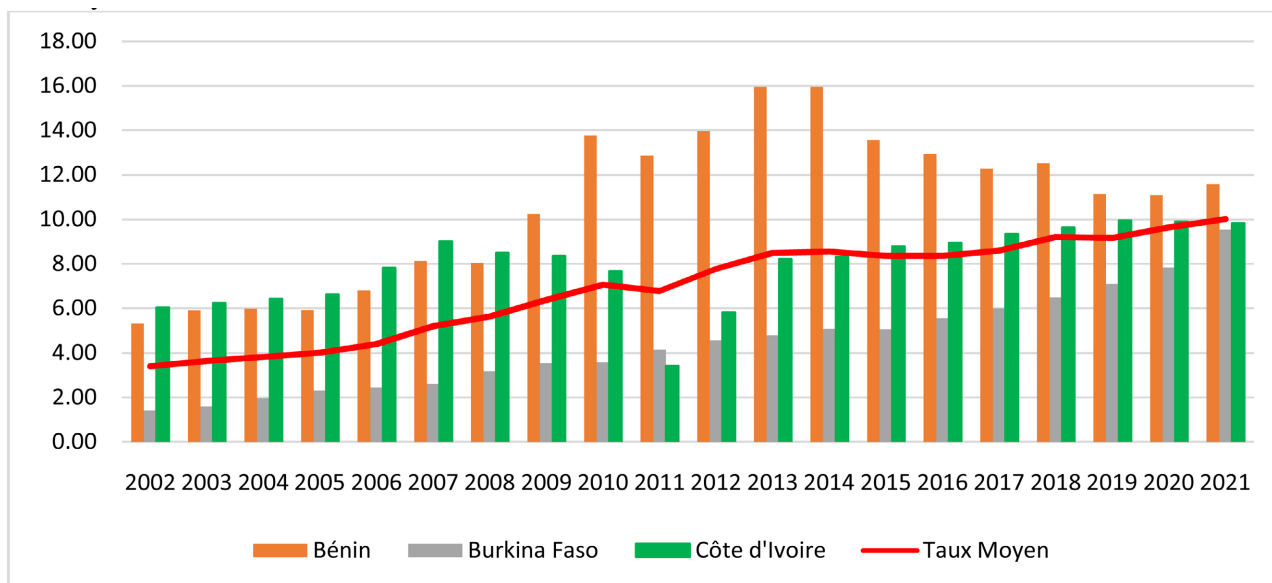


**Figure 3.** Average change in the gross secondary school enrolment ratio in the UEMOA member States from 2002 to 2021. Source: Author based on OECD data (2022).

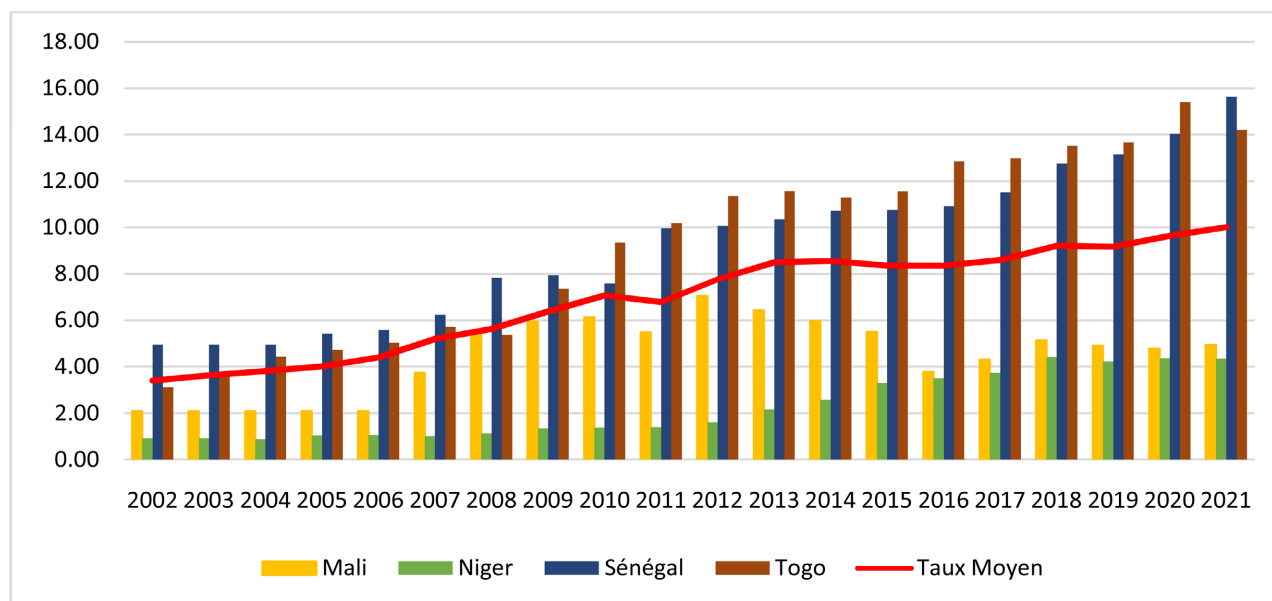
At secondary level, the gross enrolment rate in the WAEMU region stagnated between 2002 and 2009. However, the rate has been gradually improving since 2010. On average, for the 07 countries, the gross enrolment rate at secondary level stood at 12.58% in 2021 (see **Figure 3**).

As for tertiary education, the average gross enrolment rate is gradually increasing, rising from 2.94% in 2002 to 12.58% in 2021 (see **Figure 4**).

A high gross enrolment rate indicates a high level of participation, whether pupils are in the official age group. When the value of the gross rate approaches or exceeds 100%, it indicates that the country can enroll its entire school-age



(a)



(b)

**Figure 4.** Trends in the Gross Tertiary Enrolment Ratio in the WAEMU by year and by country from 2002 to 2021. Source: Author based on OECD data (2022).

population, but it does not indicate the proportion of that population attending school.

### 3. Literature Review

This paper is anchored in the theoretical works of Adam Smith, Theodore Schultz, and Garry Becker. Indeed, [Smith \(1776\)](#) in the “*The Wealth of Nations*” emphasized the importance of education and skills in increasing individual productivity and contributing to economic growth. He argued that an educated and skilled workforce can lead to innovation, higher wages, and overall economic prosperity.

[Schultz \(1961\)](#), expanded on Smith’s ideas by introducing the concept of human capital. He defined human capital as the knowledge, skills, and abilities that individuals possess, and argued that investing in human capital through formal education and training can increase individual productivity and economic output.

Building on Schultz’s work, [Gary Becker \(1964\)](#), developed the concept of the “human capital theory”. According to Becker, individuals make rational decisions regarding their investments in human capital based on the expected returns they will receive in terms of higher wages, better job opportunities, and improved quality of life.

It is the above theoretical anchorage that guided this work. Several empirical investigations have also been undertaken to assess the extent to which making Aid available to countries helps them improve their human capital and thus better their productivity and quality of life. The academic literature on the impact of Aid to education suggests that the overall effect of ODA depends mainly on the characteristics of the recipient and the level of education to which resources are directed ([Birchler & Michaelowa, 2016](#); [Riddell & Niño-Zarazúa, 2016](#)). For example, the impact of international Aid allocated to primary education appears to be greater in low-income countries, while middle-income nations may benefit more from ODA for tertiary education ([Asiedu & Nandwa, 2007](#)).

The works of [Michaelowa and Weber \(2007\)](#), [Gyimah-Brempong & Asiedu \(2008\)](#) showed significant and positive effect of Aid to education on primary school enrolment and completion rates, but of a relatively small magnitude. The findings by [Dreher et al. \(2008\)](#) suggested some effectiveness of Aid to education, but the effect was also relatively small. Public spending on education did not appear to have a significant impact, nor did governance or democracy variables.

Both [Riddell and Niño-Zarazúa \(2016\)](#), and [Birchler and Michaelowa \(2016\)](#) found positive contribution of Aid to education in recipient countries through increased enrolment in basic education. The most robust effect was obtained by Aid for educational equipment and training.

[Yogo \(2017\)](#) assessed the effectiveness of Aid and its efficient use to achieve universal primary education in sub-Saharan Africa. He found that an increase in



Aid to education would significantly increase the primary completion rate. He thus suggested that Aid to education be used as a policy instrument to achieve SDG 4.

Seim et al. (2020) investigated how foreign aid shifts public spending. They conducted an experiment with 460 elected politicians in Malawi by providing information about foreign aid projects in local schools. They found evidence indicating that politicians allocate the development goods in line with equity concerns. Thus, foreign aid in this instance did not divert the resources from their targets.

Musa et al. (2021) studied the effect of ODA on education in Nigeria. They examined whether ODA to education increased primary school enrolment and completion rates. They found that ODA had a significant positive impact on primary school enrolment and completion rates.

Overall, it results from the above selected literature review that Aid to education has a positive and significant impact on both enrollment and primary completion rates.

#### 4. Method of Analysis and Data

The existing literature indicates that foreign aid has a positive impact on school performance in various countries around the world. Most of these studies involved panel data analyses for a large group of low- and lower-middle-income countries. These studies have used a model in which school performance is a function of foreign aid and other control variables (Birchler & Michaelowa, 2016; Riddell & Niño-Zarazúa, 2016; Michaelowa, 2004; Michaelowa & Weber, 2007; Dreher, Nunnenkamp, & Thiele, 2008). The model used takes the following general form:

$$RS_{it} = f(Aid\_Educ_{it}, X_{it}) + \mu_i + \varepsilon_{it} \quad (1)$$

where  $RS_{it}$  represents the educational outcome,  $Aid\_Educ_{it}$  the foreign aid allocated to the education sector and  $X_{it}$  is a set of control variables.  $\mu_i$  represents the fixed effects of country  $i$ ;  $\varepsilon_{it}$  represents the disturbance of country  $i$  in year  $t$ .

We use educational attainment as the dependent variable. Our variables of interest are Aid to the education sector and political stability. We included five control variables i.e., political stability, public expenditure on education, proportion of young people in the total population, inflation, and openness. ODA and public spending on education are both measured as a percentage of GDP.

The three education sub-sectors are considered: primary, secondary, and tertiary. The empirical model used is as follows:

The empirical model used is as follows for the different education sub-sectors:

$$TAP_{it} = \beta_0 + \beta_1 Aid\_Educ_{p_{it}} + X'_{it}\theta + \mu_i + \varepsilon_{it} \quad (2)$$

$$TBSs_{it} = \delta_0 + \delta_1 Aid\_Educ_{s_{it}} X'_{it}\theta + \mu_i + \varepsilon_{it} \quad (3)$$

$$TBS_{t_{it}} = \gamma_0 + \gamma_1 Aid\_Educ_{t_{it}} X'_{it}\theta + \mu_i + \varepsilon_{it} \quad (4)$$

This study uses panel data for the WAEMU countries. These are annual time series ranging from 2002 to 2021. They are extracted from several databases. Aid data are disbursements ( $Aid\_Educ_{it}$ ) as a percentage of GDP. They were obtained from the DAC's International Development Statistics. Education outcomes in the primary sector are measured by primary completion rates ( $TAP$ ). We used the gross enrolment rate for secondary education ( $TBSs$ ) and tertiary education ( $TBSt$ ). Data on educational outcomes in primary, secondary and tertiary education were obtained from the World Bank database, i.e. World Development Indicators.

To capture the extent of the national education system in the beneficiary countries, information on public expenditure on education ( $Depp\_Ed$ ), the pupil-teacher ratio ( $Ratio\_Ee$ ) and the proportion of young people in the total population ( $Pop\_Jeune$ ) were selected. The data on public spending on education and the pupil-teacher ratio were obtained from the World Bank database, and the data on the youth population from the International Labour Organization database.

Given that previous studies suggested a relationship between Aid effectiveness in the education sector and good political governance, we also included the political stability and non-violence index ( $Stab\_Pol$ ) from the Worldwide Governance Indicators database. Based on the study by [Burnside and Dollar \(2000\)](#), we also included economic governance indicators, i.e., the inflation rate ( $Infl$ ) and openness ( $Ouver$ ), which is calculated as the sum of exports and imports as a percentage of GDP.  $Aid\_Educ_{it}$  is the ODA allocated to education. This variable is disaggregated by primary ( $Aid\_Educ_{p_{it}}$ ), secondary ( $Aid\_Educ_{s_{it}}$ ) and tertiary ( $Aid\_Educ_{t_{it}}$ ) levels of education. **Table 1** summarizes the definition of the variables of interest and the sources of database.

Given the nature of our data, we estimated our model using the Pooled Mean Group (PMG) and Mean Group (MG) methods proposed by [Pesaran et al., \(1999\)](#). These estimators are considered efficient compared to classical methods. By using the MG and PMG estimators we can correct the biases associated with heterogeneity, as these estimators allow heterogeneity in the adjustment dynamics of the variables towards the long-run relationship. The MG and PMG estimators are based on Autoregressive Distributed Lag Models (ARDL). One of the advantages of ARDL models is that the short- and long-run dynamics are estimated jointly. This enables the analysis of both short- and long-run effects. In addition, these models allow the presence of variables that can be integrated of different orders, i.e.  $I(0)$  and  $I(1)$ , or cointegrated [Pesaran et al., \(1999\)](#), which is the case here.

Following [Pesaran et al., \(1999\)](#), Equations (2), (3), and (4) could be specified as  $ARDL(p,q)$  models with the general specification below:

$$y_{it} = \sum_{j=1}^p \lambda_{ij} y_{i,t-j} + \sum_{j=0}^q \delta'_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (5)$$

**Table 1.** Definition of the variable name used in the models.

Variables	Description of the variables	Source of the data (2002-2021)
$TAP_{it}$	Primary completion rates	
$TBS_{it}$	Gross enrolment rate for secondary education	World Development Indicators
$TBST_{it}$	Gross enrolment rate for secondary education	
$Aid\_Educ_{it}$	Official Development Assistance allocated to primary education as a percentage of GDP	
$Aid\_Educ_{it}$	Official Development Assistance allocated to secondary education as a percentage of GDP	DAC's International Development Statistics
$Aid\_Educ_{it}$	Official Development Assistance allocated to tertiary education as a percentage of GDP	
$Stab\_Pol_{it}$	Political stability and non-violence index	Worldwide Governance Indicators database
$Ratio\_Ee_{it}$	Teacher-Pupil Ratio	World Development Indicators
$Pop\_Jeune_{it}$	proportion of young people in the total population	International Labor Organization database
$Depp\_Ed_{it}$	Public expenditure on education as a percentage of GDP	
$Ouver_{it}$	Trade openness measured as the sum of exports and imports as a percentage of GDP	World Development Indicators
$Infl_{it}$	Inflation rate	

Source: Author's compilation.

where the number of cross section  $i = 1, 2, \dots, N$ ; the time period  $t = 1, 2, \dots, T$ ;  $X_{it}$  is the matrix of explanatory variables;  $\mu_i$  represents the country fixed effect;  $\lambda_{ij}$  and  $\delta'_{ij}$  are coefficients to be estimated;  $p$  represents the lag order for the endogenous variable and  $q$  the lag order of the exogenous variables.

A reparameterization of Equation (5) leads to the specification below (Pesaran et al., 1999):

$$y_{it} = \phi_i y_{it} + \beta'_i X_{it} + \sum_{j=1}^{p-1} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q-1} \delta'_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (6)$$

where  $\phi_i = -\left(1 - \sum_{j=1}^p \lambda_{ij}\right)$ ,  $\beta_i = \sum_{j=1}^q \delta_{ij}$ ,  $\lambda_{ij}^* = -\sum_{m=j+1}^p \lambda_{im}$ ,  $j = 1, 2, \dots, p-1$  and

$$\delta_{ij}^* = -\sum_{m=j+1}^p \delta_{im}, j = 1, 2, \dots, q-1.$$

If the variables are cointegrated, then the error term  $\varepsilon_{it}$  is a stationary

process and Equation (6) could be respecified as an Error Correction Model as presented below in Equation (7).

$$\Delta y_{it} = \phi_i (y_{i,t-1} - \theta'_i X_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij}^* \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (7)$$

where:  $\theta_i = -\beta_i / \phi_i$  is the vector of long term coefficients between  $Y_{it}$  and  $X_{it}$ ;  $\lambda_{ij}^*$  and  $\delta_{ij}^*$  are short run coefficients; and  $\phi_i$  is the error correction term or adjustment coefficient. This coefficient should be negative and significant for the ARDL model to be valid. The PMG estimators are obtained through a maximum likelihood estimation method. The PMG coefficients are:

$$\hat{\phi}_{PMG} = \frac{\sum_{i=1}^n \phi_i}{N}; \hat{\lambda}_{jPMG} = \frac{\sum_{i=1}^n \lambda_{ij}^*}{N}; \hat{\delta}_{jPMG} = \frac{\sum_{i=1}^n \delta_{ij}^*}{N}, \hat{\theta}_{PMG} = \hat{\theta} \text{ and the MG coefficients are:}$$

$$\hat{\phi}_{MG} = \frac{\sum_{i=1}^n \tilde{\phi}_i}{N}; \hat{\lambda}_{jMG} = \frac{\sum_{i=1}^n \tilde{\lambda}_{ij}^*}{N}; \hat{\delta}_{jMG} = \frac{\sum_{i=1}^n \tilde{\delta}_{ij}^*}{N}; \hat{\theta}_{MG} = \frac{\sum_{i=1}^n \tilde{\theta}_i}{N}$$

where  $\tilde{\phi}_i, \tilde{\lambda}_{ij}^*, \tilde{\delta}_{ij}^*$ , and  $\tilde{\theta}_i$  are OLS estimators of the coefficients for country  $i$ .

If the condition  $\theta_i = \theta$  holds, the PMG estimator is consistent and efficient compared to the MG estimator (Pesaran et al. 1999)<sup>1</sup>. Because we cannot assume upfront the homogeneity of the long-term coefficients, there is a need for an empirical test. This is the Hausmann test.

### 5. Empirical Results and Discussion

Table 2 presents a summary of descriptive statistics of the variables of interest.

Table 2. Descriptive statistics.

Variables	Moyenne	Écart-type	Minimum	Maximum
<i>TAP<sub>it</sub></i>	58.932	15.776	20.467	92.715
<i>TBS<sub>sit</sub></i>	37.014	15.009	6.547	66.096
<i>TBS<sub>tit</sub></i>	7.576	4.472	0.874	19.010
<i>Aid_Educ<sub>pit</sub></i>	0.169	0.168	0.001	0.815
<i>Aid_Educ<sub>sit</sub></i>	0.059	0.051	0.001	0.309
<i>Aid_Educ<sub>tit</sub></i>	0.184	0.138	0.041	0.601
<i>Stab_Pol<sub>it</sub></i>	-0.601	0.746	-2.352	0.822
<i>Ratio_Ee<sub>it</sub></i>	41.377	6.093	31.743	62.171
<i>Pop_Jeune<sub>it</sub></i>	43.772	8.303	23.002	48.816
<i>Depp_Ed<sub>it</sub></i>	3.686	0.871	1.937	5.720
<i>Ouver<sub>it</sub></i>	56.526	15.299	30.368	112.761
<i>Infl<sub>it</sub></i>	2.543	4.140	-7.594	36.992

Source: Author's calculation.

<sup>1</sup>The PMG estimator outperform the MG estimator even when N < T (Hsiao et al., 1999).

The primary school completion rate stood on average at 58.9% with a minimum of 20.4% (Niger) and a maximum of 92.7% (Togo). The Gross Enrollment Rate for both secondary and tertiary education is below 50% on average and stood at 37% and 7.57% respectively. It is clear from this evidence that the figures on enrollment rate are low for countries that aspire to enhance their human capital to strive.

**Table 3** presents a pairwise correlation matrix between the variables of interest. It is observed that, aid to both secondary and tertiary education are positively correlated with their Gross enrollment rate, unlike primary completion rate. This indicates to some extent that Aid to the primary education subsector does not guarantee improvement in primary school completion rate.

**Table 3.** Pairwise correlation matrix of the variables of interest.

	$TAP_{it}$	$TBSs_{it}$	$TBS_{it}$	$Aid\_Educ_{it}$	$Aid\_Educ_{it}$	$Aid\_Educ_{it}$	$Stab\_Pol_{it}$	$Ratio\_Ee_{it}$	$Pop\_Jeune_{it}$	$Depp\_Ed_{it}$	$Ouver_{it}$	$Infl_{it}$
$TAP_{it}$	1.000											
$TBSs_{it}$	0.830*** (0.000)	1.000										
$TBS_{it}$	0.748*** (0.000)	0.773*** (0.000)	1.000									
$Aid\_Educ_{it}$	-0.410*** (0.000)	-0.386*** (0.000)	-0.435*** (0.000)	1.000								
$Aid\_Educ_{it}$	0.321*** (0.000)	0.257*** (0.002)	0.139 (0.102)	-0.023 (0.786)	1.000							
$Aid\_Educ_{it}$	0.148* (0.081)	0.099 (0.246)	0.287*** (0.001)	-0.030 (0.725)	0.176** (0.038)	1.000						
$Stab\_Pol_{it}$	-0.080 (0.345)	-0.060 (0.482)	0.047 (0.583)	0.346*** (0.000)	0.001 (0.990)	0.404*** (0.000)	1.000					
$Ratio\_Ee_{it}$	-0.341*** (0.000)	-0.276*** (0.001)	-0.336*** (0.000)	0.430*** (0.000)	-0.351*** (0.000)	-0.097 (0.254)	0.410*** (0.000)	1.000				
$Pop\_Jeune_{it}$	-0.548*** (0.000)	-0.474*** (0.000)	-0.501*** (0.000)	0.248*** (0.003)	-0.231*** (0.006)	-0.495*** (0.000)	-0.109 (0.202)	0.152* (0.074)	1.000			
$Depp\_Ed_{it}$	0.309*** (0.000)	0.326*** (0.000)	0.250*** (0.003)	0.060 (0.483)	0.422*** (0.000)	0.095 (0.263)	-0.070 (0.412)	-0.384*** (0.000)	-0.115 (0.177)	1.000		
$Ouver_{it}$	0.491*** (0.000)	0.551*** (0.000)	0.459*** (0.000)	-0.256*** (0.002)	0.169** (0.046)	0.365*** (0.000)	-0.081 (0.343)	-0.129 (0.128)	-0.657*** (0.000)	0.312*** (0.000)	1.000	
$Infl_{it}$	-0.015 (0.865)	-0.059 (0.490)	-0.069 (0.418)	0.122 (0.150)	0.028 (0.740)	0.039 (0.649)	0.087 (0.306)	0.136 (0.110)	-0.120 (0.159)	-0.065 (0.444)	-0.011 (0.895)	1.000

Source: Author's calculation using World Bank and OECD data base; \*asterisks are levels of significance at the 1%, 5% and 10% probability level.

**Table 4** presents the results of the Unit Root test in the presence of cross-section dependence. The results showed that the variables  $TBSs$ ,  $AID\_EDUCp_{it}$ ,  $AID\_EDUCs_{it}$ ,  $AID\_EDUCt_{it}$ ,  $STAB\_POL_{it}$ ,  $RATIO\_EE_{it}$ ,  $DEPP\_ED_{it}$  and  $INFL_{it}$  are  $I(0)$ , whereas the variables  $TAP$ ,  $TBS_t$ ,  $POP\_JEUNE_{it}$  and  $Ouver_{it}$  are  $I(1)$  i.e. they are stationary after first differencing.

**Table 5** and **Table 6** summarize the empirical results obtained from estimating Equation (7). In the short term, **Table 5** shows that ODA and political stability have no significant effect on the primary school completion rate. Similarly, the youth, public spending on education and the inflation variables have no significant effect on the primary completion rate. We note that any imbalance between the desired and actual level of the primary completion rate and the ODA, political stability, youth population, public spending on education and inflation rate variables is fully resolved after 03 years 08 months (1/0.265).

Our results show that, in the short run, ODA to secondary education and governance have no significant effect on the gross enrolment ratio. The same is true for the control variables (the proportion of young people in the total population, public spending on education and the degree of trade openness). In addition, at the secondary education level, any imbalance between the desired and actual level of the gross enrolment ratio and the variables ODA, political stability, youth population, public spending on education and the degree of openness is fully resolved after 02 years 08 months (1/0.355).

The Aid allocated to higher education has a negative and significant influence on the gross enrolment rate in higher education in the short term. The same effect is observed for political stability. The young population, public spending on

**Table 4.** Results of the unit root test with cross-sectional dependence.

Variables	Level		First difference		Order
	Stat CIPS	Crit. Val.	Stat CIPS	Crit. Val.	
$TAP_{it}$	-1.349	-2.21 (10%)	-3.313***	-2.6 (1%)	I(1)
$TBSs_{it}$	-2.256 <sup>a</sup>	-2.21 (10%)			I(0)
$TBS_t$	-1.047	-2.21 (10%)	-3.348***	-2.6 (1%)	I(1)
$Aid\_Educ_{it}$	-2.816***	-2.6 (1%)			I(0)
$Aid\_Educ_{it}$	-2.853***	-2.6 (1%)			I(0)
$Aid\_Educt_{it}$	-4.426***	-2.6 (1%)			I(0)
$Stab\_Pol_{it}$	-2.236*	-2.21 (10%)			I(0)
$Ratio\_Ee_{it}$	-2.741***	-2.6 (1%)			I(0)
$Pop\_Jeune_{it}$	-1.456	-2.21 (10%)	-3.523**	-2.6 (1%)	I(1)
$Depp\_Ed_{it}$	-3.110***	-2.6 (1%)			I(0)
$Ouver_{it}$	-1.363	-2.21 (10%)	-4.415***	-2.6 (1%)	I(1)
$Infl_{it}$	-3.392***	-2.6 (1%)			I(0)

Source: Author's calculation. <sup>a</sup>asterisks are levels of significance at the 1%, 5% and 10% probability level.

**Table 5.** Estimation results for the short-term dynamics.

Dependent variable: Educational outcome			
Variables	Primary	Secondary	Tertiary
<i>Aid_Educ<sub>it</sub></i>	-1.805 (0.746)	45.288 (0.161)	<b>-6.911*</b> (0.059)
<i>Stab_Pol<sub>it</sub></i>	2.083 (0.629)	0.092 (0.856)	<b>-1.274**</b> (0.045)
<i>Pop_Jeune<sub>it</sub></i>	16.279 (0.203)	3.824 (0.688)	-10.767 (0.255)
<i>Depp_Ed<sub>it</sub></i>	-0.539 (0.267)	-1.552 (0.290)	-0.252 (0.100)
<i>Ouver<sub>it</sub></i>	- -	-0.025 (0.780)	- -
<i>Infl<sub>it</sub></i>	-0.030 (0.537)	- -	-0.032 (0.326)
<i>Adjustment coefficient</i>	<b>-0.265**</b> (0.070)	<b>-0.355**</b> (0.012)	<b>-0.255*</b> (0.067)

Source: Author's calculation. \*asterisks are levels of significance at the 1%, 5% and 10% probability level.

**Table 6.** Estimation results for the long-term dynamics.

Dependent variable: Educational outcome			
Variables	Primary	Secondary	Tertiary
<i>AID_EDUC</i>	<b>11.171***</b> (0.000)	<b>48.172***</b> (0.001)	<b>-2.614*</b> (0.053)
<i>STAB_POL</i>	<b>-10.637***</b> (0.000)	<b>-4.003***</b> (0.000)	-0.304 (0.387)
<i>POP_JEUNE</i>	<b>-6.725***</b> (0.000)	<b>-5.727***</b> (0.000)	<b>1.363***</b> (0.000)
<i>DEPP_ED</i>	0.520 (0.280)	<b>3.661***</b> (0.000)	0.144 (0.215)
<i>OUPER</i>	<b>0.332***</b> (0.000)	<b>-0.146***</b> (0.001)	- -
<i>INFL</i>	- -	-	-0.001 (0.962)
P-value for Hausmann's test	0.056	0.952	0.751

Source: Author's calculation. (\*\*\*) , (\*\*) et (\*) are levels of significance at the 1%, 5%, and 10% probability levels.

education and the inflation rate variables have no significant effect on the gross enrolment rate in tertiary education in the short term. Furthermore, at the level of the tertiary education sub-sector, any imbalance between the desired and actual level of the Gross enrollment rate and the variables ODA, political stability, young population, public spending on education, and inflation rate is fully resolved after 03 years 9 months (1/0.255).

Looking at **Table 6**, it is observed that, in the long term, Aid granted to primary education in the WAEMU has a positive and significant impact on the primary completion rate. Governance has a negative and significant impact on the primary completion rate. With regards to the control variables, at the primary education level, the proportion of young people in the total population has a negative and significant impact on the primary completion rate, whereas public spending on education has no significant impact on the primary completion rate, while trade openness has a positive and significant impact on the primary completion rate. These results confirmed those of [Birchler & Michaelowa \(2016\)](#), [Riddell and Niño-Zarazúa \(2016\)](#), [Yogo \(2017\)](#), [Asongu and Tchamyoun \(2019\)](#) and [Musa et al. \(2021\)](#).

## 6. Discussion

Our analysis showed that in the long run, a 1% increase in Aid to primary education would increase the primary completion rate by 11.17%, which is quite substantial.

At the secondary education level, in the long term, Official Development Assistance allocated to the secondary education sub-sector has a positive and statistically significant impact on the gross secondary school enrolment rate. Indeed a 1% increase in Aid would increase the gross enrolment rate by 48.17%. This is in line with the results of [Michaelowa and Weber \(2007\)](#).

The positive contribution of long-term ODA to improving school performance at primary and secondary levels could be explained by the increase in the supply of education following Aid disbursements from EU countries. This relates to the recruitment and training of teachers, the building of classrooms and the construction of school canteens.

The non-significant effect of ODA on school performance in primary and secondary education in the short run may be linked to the time required to make investments such as launching calls for tender, building classrooms, or recruiting and training teachers. At the level of higher education, in both the long and short run, we obtained negative and significant coefficient for Official Development Assistance. These results are contrary to those obtained by [Michaelowa and Weber \(2007\)](#) but consistent with those of [Cosmas et al. \(2022\)](#). This could be explained by the high proportion of grants and study fees in ODA allocated to higher education. According to OECD statistics, the “Scholarships and study fees in donor countries” component constitutes the largest share of ODA allocated to the higher education sub-sector, i.e. USD 17 million on average between



2009 and 2021.

Under these conditions, as the volume of ODA to higher education increases, the number of students receiving grants to study abroad follows an upward trend. Given that these students leave the higher education system to continue their studies in donor countries, the gross enrolment rate for higher education should fall as the volume of gross ODA disbursements for higher education increases.

From the OECD data, over the same period (2009-2021), project-type interventions represented a small proportion of ODA allocated to higher education. On average, they are estimated at USD 1.12 million between 2009 and 2021. This reflects the low level of project funded by development partners in the higher education sub-sector. In a context where sub-Saharan African countries allocate a low proportion of their budget to education in general (3.5% of GDP on average, according to World Bank data) and to higher education, we witness insufficient university infrastructure in these countries, which can have a negative impact on the gross enrolment rate.

Political stability has a negative and significant impact on the gross enrolment ratio. For the control variables, the proportion of young people and the degree of openness variables, both have a negative and significant impact on the gross secondary school enrolment rate. These results are consistent with those of [Ahmed and Pulok \(2013\)](#).

Public expenditure on education has a positive and significant impact on the secondary gross enrolment rate. The results also revealed that, in the long term, Aid for higher education has a negative and significant impact on the gross enrolment rate. Indeed, the negative effect of aid allocated to higher education can be explained by the fungibility of ODA ([Pack & Pack, 1993](#)) allocated to higher education and the volatile nature of aid disbursements in favour of higher education. The fungibility of aid results in a relaxation of the recipient country's budget constraint, as Aid is simply added to the State's total resources ([Seim et al., 2020](#)). The relaxation of the financial constraint thus enables resources to be reallocated.

Governance has no significant impact on the gross enrolment rate in tertiary education. Moreover, the youth variable has a positive and statistically significant impact on the gross tertiary enrolment rate. Public spending on education and the inflation variables has no significant impact on the gross tertiary enrolment ratio.

## 7. Conclusion and Recommendations

The aim of this study was to contribute to a better understanding of the relationship between ODA and the improvement of school performance in the WAEMU zone. For a panel of seven (07) countries observed over the period from 2002 to 2021, we estimated an ARDL model using the Pooled Mean Group method. Four main data sources were used for this study (OECD, WDI, WGI,

ILO) and the estimations were conducted using STATA 15 software.

Our results show that, in the long run, ODA allocated to the education sector in the WAEMU contributed to improving school performance in the primary and secondary education sub-sectors. In the tertiary education sub-sector, our results show that in the long run, ODA allocated to the tertiary education has a negative and statistically significant impact on the gross tertiary enrolment rate.

In the short term, political stability has a negative and significant impact on the gross enrolment rate in tertiary education. Our analysis shows that governance does not improve school performance in the long term. However, in the short term, a positive but insignificant effect of governance on school performance was observed in the primary and secondary education sub-sectors.

At the end of this study, it is important to note that major problems undermine the effectiveness of ODA in the education sector in the WAEMU. These include the fragility of institutions, the poor quality of training, the fungibility and volatility of ODA, and governance in the Union, which is marked by political instability. Particular attention should therefore be paid to resolving these problems with a view to achieving SDG 4, which aims to ensure inclusive and equitable quality of education and to promote lifelong learning opportunities for all.

To achieve this, the development partners, the OECD countries, the World Bank and the International Monetary Fund, should coordinate their efforts to reduce the volatility of ODA to the recipient countries. The effective implementation of the commitment made in 1970 by the advanced countries to provide 0.7% of their GNP to development aid could serve as a lever for stability in the volume of aid allocated to developing countries. There is also a need to increase the share of project-based interventions in higher education, with a view to providing beneficiary countries with adequate university infrastructures and qualified human resources.

It is not realistic to expect to increase access to quality higher education without good governance and adequate funding for the sub-sector. The priorities in terms of governance and funding should therefore be as follows: Improve the governance and management of higher education at both central and institutional levels; Create an effective system for monitoring strategic plans and reforms; Restore the structural balance in funding between social expenditure and educational expenditure on the one hand, and between the operating budget and the investment budget on the other.

Regarding the fungibility of Aid, donor countries should necessarily align themselves with the priorities of the recipient countries, provided that these priorities contribute to the fight against poverty and the improvement of living conditions for the population. This would make it possible to achieve tangible and convincing results in terms of economic performance, since priorities differ according to the specific realities of each country.

With a view to creating a stable political environment in the WAEMU and

improving economic performance, member countries should strengthen their capacity to meet the challenge of terrorism and ensure the security of their populations. Regional bodies such as the Economic Community of West African States and the African Union should also be much more proactive in defending people's rights and freedoms. Corruption is one of the main obstacles to the structural transformation of the African continent.

To address this, countries should make a determined commitment to strengthening transparency and accountability, enhancing participation and ownership, and strengthening the quality of governance institutions. International cooperation should also be established, and the regional governance architecture improved. As far as the education system is concerned, more time is needed to learn and to cover the curriculum. To help teachers in their work and provide them with common standards in relation to the objectives of school programs, it would also be desirable to implement an evaluation and pedagogical monitoring of teaching.

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