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FOREIGN AID AND EDUCATIONAL DEVELOPMENT IN SUB-SAHARAN AFRICA: DOES DOMESTIC INSTITUTIONAL CAPACITY MATTER?

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Absract

In this study, the effect of foreign aid on educational development is examined for countries in the sub-Saharan Africa region while taking into consideration the effects of policy capacity as intervening in the connection between aid and the education sector. Using data for 34 countries and for the period 1998 to 2017, the Fully Modified OLS technique is applied for the empirical analysis. The direct and indirect effects of both aid to education and educational expenditure are considered in terms of policy dimensions. It is found that aid to education directly improves educational access and efficiency but does not have a direct impact on either educational quality or share of budgets devoted to education by the countries in SSA. On the other hand, educational expenditure significantly improves both access and quality in the educational sector, but not efficiency. We also found that better policy capacity of SSA governments tends to improve the extent of aid effect on educational development (in terms of access, quality, efficiency or budgetary allocation). The major policy implication of the results is that the establishment and sustenance of quality institutions that support policy making and implementation in SSA is a veritable means of attaining effective linkages between educational resource use and outcomes in the region.

JEL Classification: *F35, H52, I22, I28, O43*

Keywords: *Aid to education, educational expenditure, policy capacity pupil-teacher ratio, school enrolment, school life expectancy*

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1.0 INTRODUCTION

Foreign support in the educational sector has particularly been concerned about how funding is being used, the development outcomes in the sector, as well as the institutional environment surrounding aid receipts and educational system (Hubbard, 2007; Fuchs, Dreher & Nunnenkamp, 2014; Hippe & Fouquet, 2019). In line with this consideration, recent educational development drives among SSA countries have tended to pursue policy-based realignments as a tool for reviving the educational sector, especially for international competitiveness. As noted in an IMF review, progress in the educational sector depends on effective capacity-building, policy resolution, strong country leadership, and sustained commitment by development partners (IMF/IDA, 2012). In the same vein, the AU educational development project under "AGENDER 2063" and the Continental Education Strategy for Africa (CESA) bear a major concern for triggering policy shifts in educational development and management in order to reposition the sector and ensure international competitiveness.

A significant direction of educational policy in many SSA countries has been influenced by considerations for achieving universal enrolment patterns (Daun, 2000; Nishimura & Byamugisha, 2011; Baghdady & Zaki, 2019). There are however concerns that the emphasis on access (enrolment) by many SSA countries may have been achieved by higher government spending at the expense of quality (Stasavage, 2005). Worsening quality in the educational sector, are mainly due to the mismatch between sharp increases in enrolment and complementary resources to support maintenance of quality standards. While foreign aid has been noted to improve the volume of resources available to the sector, only domestic policy dimensions have the capacity to stimulate quality and sustainability in the system. Thus, there is the need for effective synergy between aid inflows and policy capacity and effectiveness in promoting the effect of aid on educational development. Moreover, many of the studies on aid-development nexus in SSA have considered aid inflows as mostly homogenous, without taking into account either the heterogeneity of aid donors in terms of intentions and capacity or heterogeneity of recipients in terms of application. This dimension of the research involves the pattern of data used in analysis. In this study, data on educational aid rather than total aid is employed in the analysis. This is a major highlight in the study that distinguishes it from previous studies which use total aid inflows in relation to sectoral performance.

The main aim of this study is to examine the role of policy capacity in influencing foreign aid effectiveness in the development of the educational sector in Sub-Saharan African (SSA) countries. First, we examine how foreign aid to education affects

government educational spending in the region, then the direct effects of educational aid on educational quality and development is examined. The argument is that institutional quality in recipient countries has strong effects on the outcomes of such spending. Moreover, the study seeks to show that foreign aid directed at the education sector could have different effects depending on the educational outcome being considered. Thus, the study presents educational development in terms of educational access and educational quality using different measures based on the World Bank and UNESCO estimates.

2.0 The Literature

The major aim of foreign aid by development partners is to improve economic conditions and quality of life in developing countries (Addison, Mavrotas & McGillivray, 2005; Adamu, 2013; Asongu, 2014; Kargbo & Sen, 2014; Edwards, 2015; Mahembe & Odhiambo, 2019). Although argument on the actual efficacy of foreign aid has remained inconclusive, there is some evidence that institutional factors may condition the relationship between aid and the recipient economic performances. For instance, Burnside & Dollar (2000) found that foreign aid was more effective on economic growth in developing countries that exhibited better fiscal, monetary, and trade policies, noting that good policies form a veritable condition for boosting aid effects. In the same vein, Gomanee, Girma and Morrissey (2005) found evidence that foreign aid works better in countries with good investment systems, while McGillivray (2003) found that the level of development performance and resilience to macroeconomic shocks in recipient countries determine aid effectiveness in developing countries. Essentially, Wako (2018) grouped the findings on the effectiveness of aid into four arguments: the effective aid, the conditionally effective aid, the ineffective aid, and the harmful aid camps. Following the vastness of the literature, the conditionally effective aid position appears to be quite relevant for many developing countries.

In terms of the effectiveness of educational aid, empirical studies appear to have generated three strands of outcome. The first and most early results is that "foreign aid is most often used for largely wasteful public consumption" (Remmer, 2004). These studies demonstrate that rather than boosting development and social conditions, foreign aid only helps to inflate government size and attendant wasteful expenditures by developing countries. The second strand of results show that countries with good social policies tend to be more favoured by foreign aid, although the probability that a "country adopts good policies is not influenced by the amount of foreign aid received". This outcome was found by the seminal study of Burnside and Dollar (2000) where the role of policy and institutional quality on aid effectiveness was brought to light for developing countries. For Africa, Asongu (2015) employed the panel quantile

regression technique to evaluate institutional thresholds that may exists in foreign aid effectiveness. The study found that existing institutional levels in the 53 countries are beneficial for foreign-aid effects on the recipient economies and that "foreign-aid is more negatively correlated with countries of higher institutional quality than with those of lower quality". The third spectrum consider that aid donors are mostly motivated by strategic and geo-political considerations, rather than real needs of the receiving countries (Alesina & Dollar, 1998; Fuchs et al., 2014; UNESCO, 2017).

Empirical research on the relationship between aid and educational development follows a strong delimitation based on the use of specific data on aid to education or the pattern of estimating the relationships. For instance, Ziesemer (2016) emphasized that the type of dataset matters when examining the aid-educational development relationship. Indeed, the effect of aid on educational development is highly susceptible to the pattern of estimates and extent of variable applications (Riddell & Nino-Zarazua, 2016). Moreover, Glewwe and Muralidharan (2016) found that the extent to which the estimate from a well-identified evaluation of a change in educational development reflects re-optimisation depends critically on the duration of the study. Foreign aid to education has been channeled into a variety of interventions including "school feeding programmes, classroom construction, teacher education, girls' scholarships, programmes to reduce student drop-out, curriculum development, targeting different educational levels and utilizing different aid modalities" (Riddell & Nino-Zarazua, 2016, p.18).

Das et al. (2013) investigated the effects of aid on education in India using randomly assigned school grant program over a 2-year period and found significant positive effects on test scores at the end of the first year but found no effect in the second year, even though the grant was provided again in the second year and was spent on very similar items in both years. They therefore concluded that the aid effects only represented the "first year" effect on educational development, while any "second year" effect would have to result from policy collaborations with the aid provision. Sabarwal, Evans and Marshak (2014) showed that when an insignificant impact of aid on education is estimated, there are often two policy-related interpretations that may be given. The first is that the assistance has been poorly implemented, perhaps due to "corruption or administrative failures, which are often the binding constraint in many developing countries". Second, there may be absence of, or inadequate complementary reforms that may be needed for the intervention to be effective. In this direction, Ziesemer (2016) assessed the effects of different forms of aid on health and education indicators in developing countries using GMM estimates and found

that growth rates or levels of aid per capita actually led to lower rates of illiteracy in the system.

Yogo (2017) assessed the effectiveness of aid and its efficient use in achieving universal primary education using a sample of 35 Sub-Saharan Africa for the period 2000 to 2010. Using various estimation methods and instruments to account for the endogeneity of aid, results from the study revealed that more aid inflows to education had a significant positive impact on primary completion rate. The study demonstrated that aid itself can form part of policy strategies to improve social development among the SSA countries. Wako (2018) studied aid-effectiveness using a panel of 43 sub-Saharan African countries for the period 1980 to 2013 using institutional quality as an intermediary in promoting effectiveness. He found that the long-run growth effect of aggregate aid from "traditional" donors was weak and the indirect effect was negative. Disaggregating the data into Chinese aid, and traditional aid revealed heterogeneity in the donor effects, especially when institutional quality is included in the analysis. There are other aspects of education that foreign aid has been found to influence in developing countries. For instance, Asongu and Tchamyou (2019) examined the direct and incremental impacts of foreign aid on education and lifelong learning using data for 53 African countries for the period 1996-2010 and the GMM technique. They found that aid had positive effects on primary school enrolment and lifelong learning (measured as "the combined knowledge acquired during the primary, secondary and tertiary levels of education") and that such impacts tend to last incrementally over the learning cycle.

Much of the studies on aid and domestic institutions or policy capacity have mostly considered the effects of aid on the policy environment and not the other way around. For instance, Boone (1996) found that aid only tends to increase the size of government without significantly increasing investment or improving human development. For the policy dimensions, Boone (1996) found that the policy environment of recipient countries does not change the pattern of aid inflows, although more liberal and democratic policy regimes have higher human capital indicators. The result was supported by Remmer (2004). Similarly, Busse and Gröning (2009) examined how aid receipts affect corruption and overall governance quality in developing countries and found that aid tends to limit governance capacity and promote corruption among the countries. Also, Svensson (2000), using quantile regression technique for data on developing countries found that expectations of aid in the future may suffice to increase rent dissipation and reduce the expected level of public goods provision. On the other hand, Okada and Samreth (2012) demonstrated that foreign aid leads to marked reduction in the desire for public policy to be influenced by corruption.

The focus of the study is on how the quality of policy environment affects aid into the country. In this direction, Alesina and Weder (2002), considered the relationship between institutional quality and aid inflows by asking whether corrupt governments receive less foreign aid or not. The general answer they provided was that institutional quality, on the basis of government corruption, does not enhance foreign aid receipts in developing countries. Rather, according to some measures of corruption, more corrupt governments receive more aid. They also found that increases in foreign aid do not necessarily reduce corruption. Wane (2004) found that highly capable and accountable governments accept only well designed projects, whereas governments with low accountability may accept poor quality projects either because they are unable to assess the worth of the projects or they will benefit personally. This indicates that policy capacity tends to strengthen the category of aids received and the effects on the economy. Morales-Gomez (1991) emphasized that the establishment of policies and priorities is central to the effectiveness of aid and assistance in the education sector.

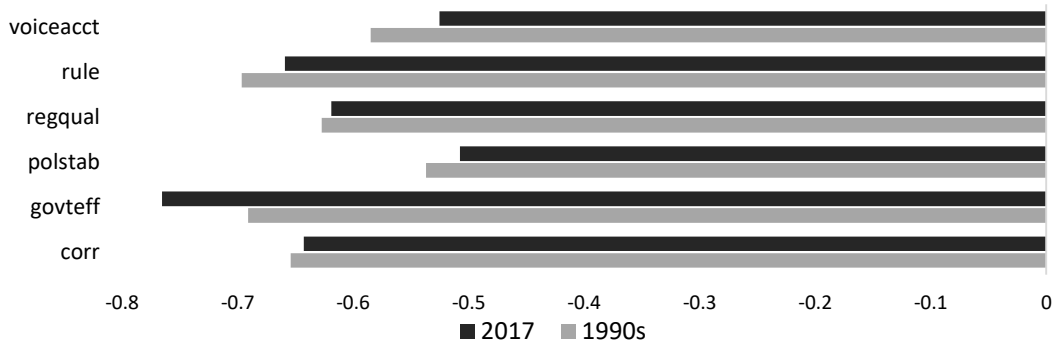
The role of policy (often considered in relation to institutional quality) have been found to be strong preconditions for domestic social or macroeconomic performance (Acemoglu, 2005; Chag, 2011). The policy environment is often considered from a political-economy perspective. For instance, Lane and Tornell (1998) showed that "certain political arrangements could result in institutions that tend to inhibit domestic social performances through rent seeking". This direction of relationship was expanded by Fan, Lin and Treisman (2009) by considering the characteristics of political decentralisation as a means of attaining institutional quality since decentralisation leads to less corruption. According to them, "closer contact between decision-makers and beneficiaries allows the latter more control and leads to stronger accountability on the part of the former, while at local level decisions are made in a more transparent manner than in central ministries" (p. 13). Thus, a decentralised political system may deliver better policy outcomes that improve education over time (Padovano, Fiorino & Galli, 2011; Kuncic, 2014). On the other hand, decentralisation has been shown to create room for graft, given that proximity facilitates arrangements between corrupt parties (Hallak & Poisson, 2006; Hubard, 2007).

3.0 Institutional Capacity and Educational Aid in SSA: Stylized Facts

Patterns and direction of institutional quality indicators among SSA countries are considered in Figure 1. It can be initially noted that the scores remained negative for each of the indicators for both periods, highlighting the poor institutional and policy capacities among SSA countries. The region has performed best in terms of political stability and voice & accountability for both periods. The steady better scores shown

for these indicators may perhaps be due to the new wave of democratic governance and institutional framework that swept the region during the latter part of the 1990s. The biggest improvement between the 1990s and 2017 among the indicators occurred in voice & accountability. The importance of voice & accountability in both policy environment and social development is hinged on wide acknowledgement that "citizens as well as state institutions have a role to play in delivering governance that works for the poor and enhances democracy" (Sharma, 2008, p.3). Indeed, the capacity of citizens to express and exercise their views has the potential to influence government priorities, governance processes and public use of resources, including a stronger demand for transparency and accountability. When such views are attended to, governments can then be held accountable for their actions and policy statements thereby responding better to the needs and demands thus articulated by their population (O'Neil, Foresti & Hudson, 2007; Han, Khan & Zhuang, 2014). The result for average scores for quality of regulation across the region for the 1990s and 2017 indicates only a very slight improvement over time as against the worsening government effectiveness indicator. As has been noted in Mankiw (2009), and Sorensen and Whitta-Jacobsen (2010), weak regulatory institutions encourage poor educational, entrepreneurial and technical development in a country. There is also only a little improvement in the control of corruption between the 1990s and 2017.

Fig. 1: Policy capacity in SSA

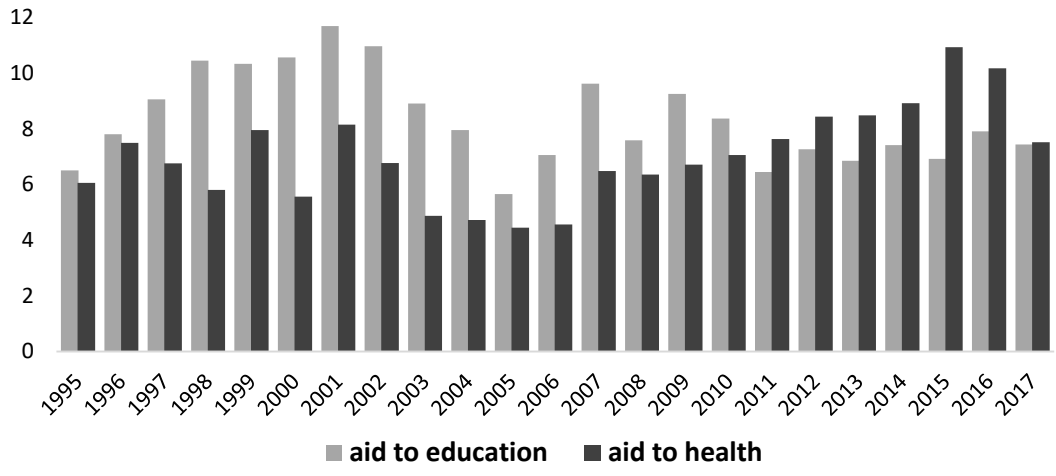


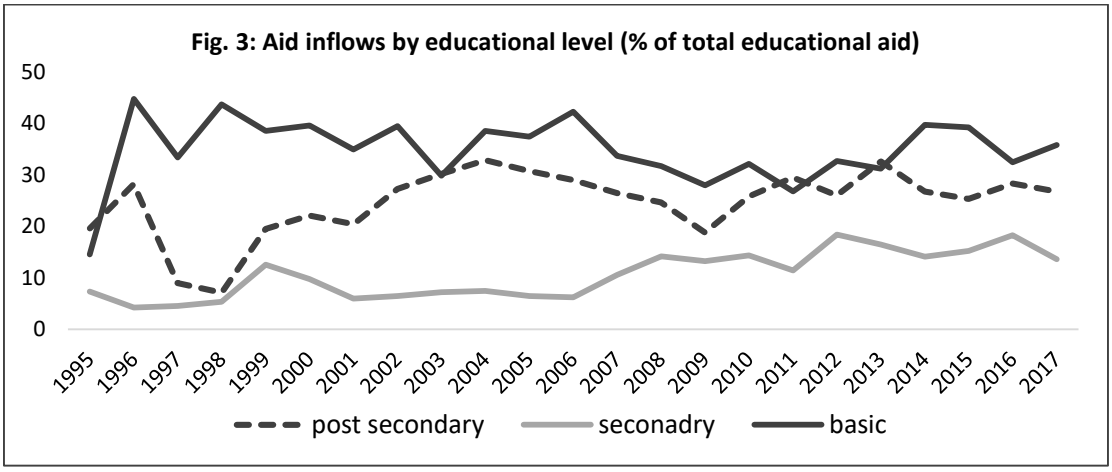
The inflow of foreign aid to education and health sectors among SSA countries is shown in Figure 2. Aid flows to both sectors appear to have experienced an unsteady pattern over the period 1995 to 2017. Between 1995 and 2010, aid to education dominated, while the period since 2010 has seen health aid rising above that of education. The fall in aid to the educational sector in SSA countries in the last decade has occurred despite the fact that "governments of low and lower middle income countries have

increased their overall spending on education since 2000" (UNESCO, 2015, p.11). There are therefore conclusions that aid to education has either dropped in priority or they are not being allocated according to need in the last few years (UNESCO, 2017). For instance, SSA, which is home to over half of the world's out-of-school children now receives less than half the aid to basic education it obtained in 2002. This amounts to 26% of total aid to basic education, barely more than the 22% allocated to Northern Africa and Western Asia, where 9% of children are out-of-school (UNESCO, 2017). Apparently, aid to the educational sector is not enough to meet the enormous educational needs of countries in the SSA region.

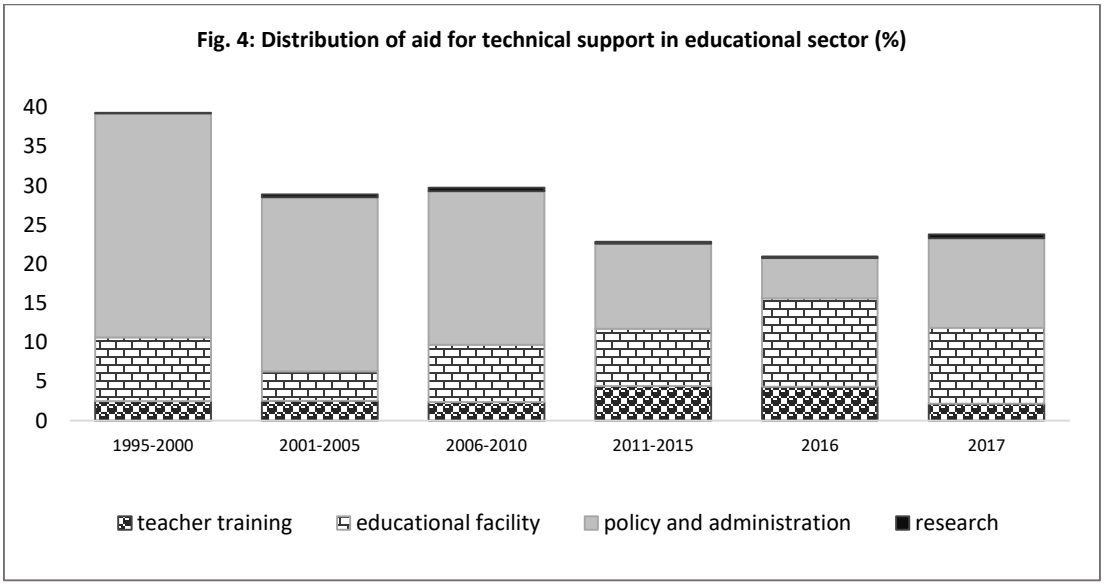
Aid to education is essentially important for SSA countries with perennial shortages in financial resources to develop the educational sector (Yogo, 2017; Wako, 2018). Thus, as shown in Figure 3, aid has been received for all levels of education, although aid for basic and primary education has dominated among SSA countries, while aid to secondary education is smallest among the levels. This shows that donors are certainly interested in the lowest tiers of the educational system in SSA countries since the level is critical for educational development in a country. However, there was a slight drop in aid to primary education from 2006.

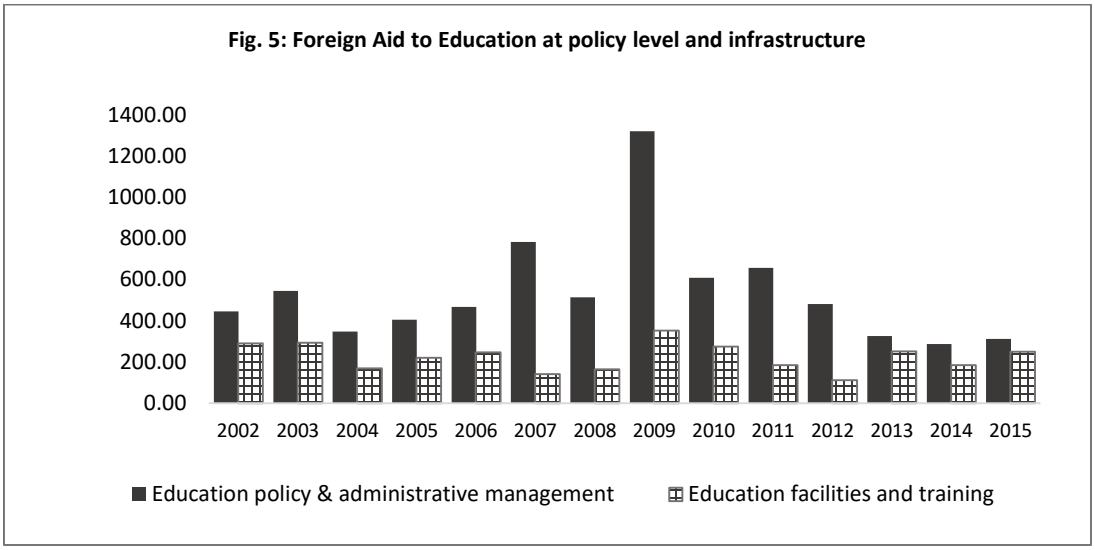
Fig. 2: Aid to education and health sectors in SSA, 1995-2017 (% of total)





Another way to evaluate aid into education is to consider the technical dimensions of aid inflows to the sector. In Figure 4, it is seen that aid to support educational policy and administrative management is higher than all other forms of the technical support from aid, though the share of such aid support has fallen drastically in recent years. On the other hand, aid to support educational research has had a very little share of total education aid for the countries. Educational aid may be limited to aspects of the sector that do not border on research, which is basically a more policy-based segment of education.

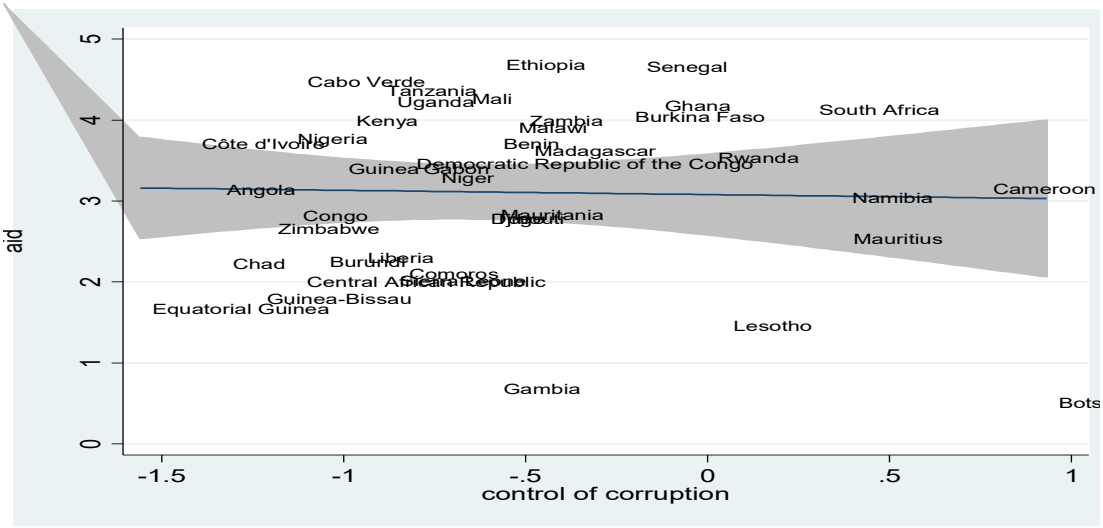


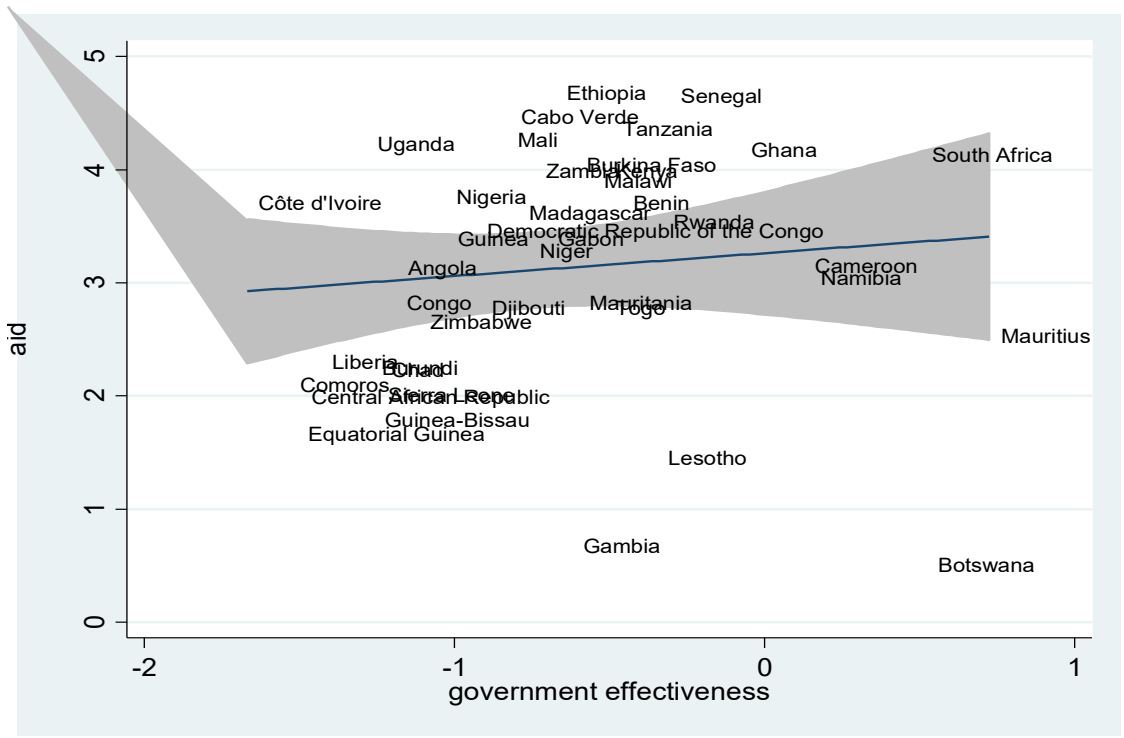


Source: Creditor Reporting System (CRS) database (OECD)

There is no clear pattern of the effects of policy capacity on aid inflows in literature. As confirmed in Figure 5, both control of corruption and government effectiveness appear to have weak relationships with aid inflows, suggesting that education aid may not actually be flowing to countries with better institutions or policy capacity. Thus, policy capacity may not be having the expected positive effects on educational aid inflows among SSA countries.

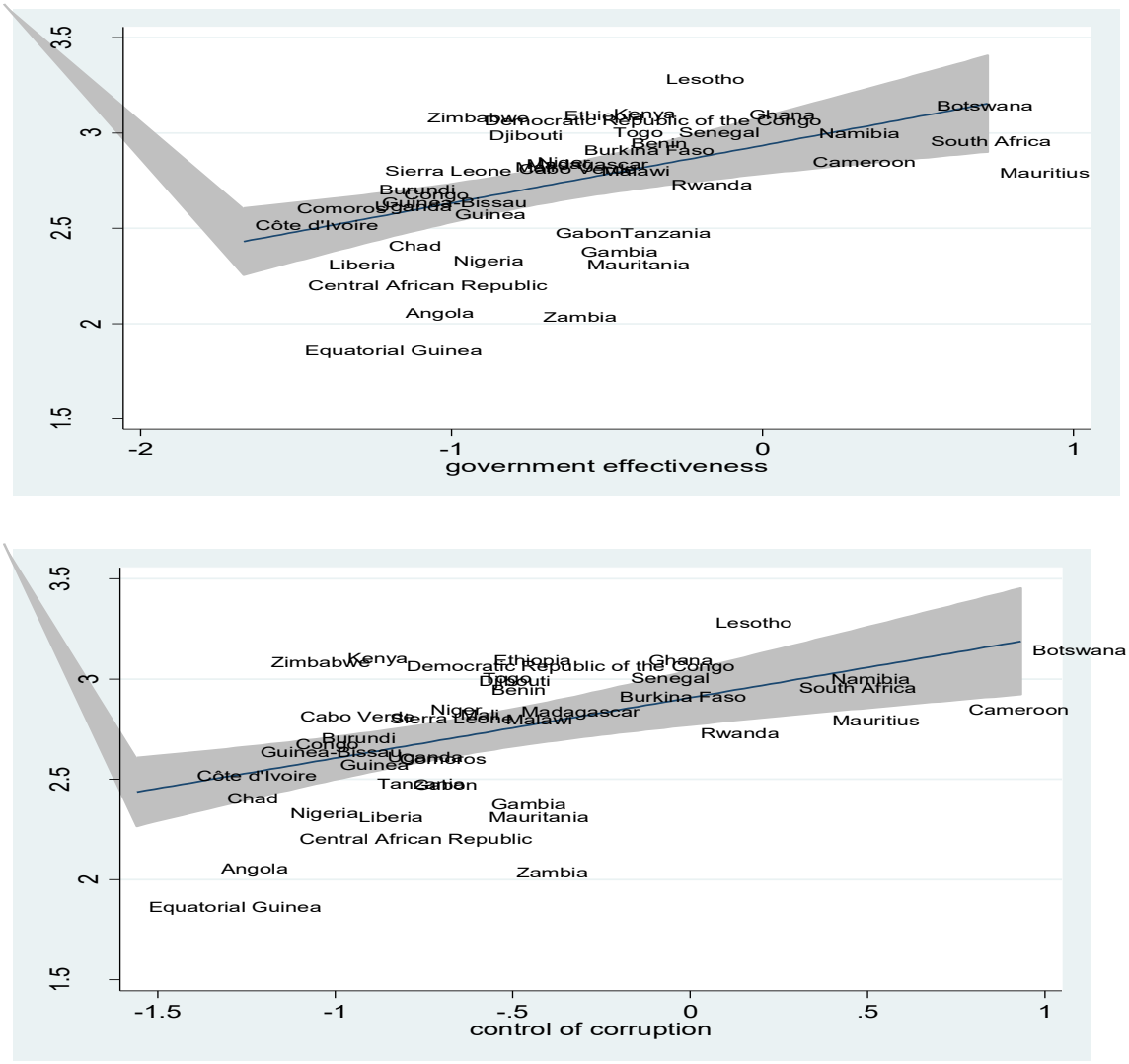
Figure 5: Policy capacity and educational aid





We also consider how policy capacity affects educational expenditure among the countries. The relationships shown in Figure 6 indicate that both government effectiveness and control of corruption have positive correlations with educational expenditure. This suggests that stronger policy capacities tend to be associated with more educational expenditure. It therefore appears that policy capacity has stronger ties with educational expenditure than with educational aid receipts. Policy will further strengthen budgetary expenditure in the sector than draw more aid into the sector.

Figure 6: Policy capacity and educational expenditure



4.0 Methodology

4.1 The Model

A panel data analysis procedure is used for the empirical investigation of the study. We estimate a reduced form equation for educational development with a general form given as:

$$y_{it} = a_0 + a_1 aid_{it} + a_2 policy_{it} + X_{it}'\beta + \delta_t + \varepsilon_{it} \quad (1)$$

where y_{it} is the measure of educational development (secondary school enrolment rate, pupil to teacher ratio, life expectancy in education, and share of government

budgets to education), *aid* is educational aid inflow, *policy* is the measure of policy capacity, *X* is a vector of control regressors that influence educational sector development and also enhance robustness of the relationship in a country, δ_t and ε_{it} are the temporal, and idiosyncratic error terms respectively. The specified model shows a one-way error component for the panel equation. This is performed because, it is demonstrated that educational policies are country-specific and are thus, fixed in their impacts on educational development. We also seek to interact policy capacity with aid in the educational development equation in order to determine the role of policy capacity on aid effectiveness in the educational sector. Hence, another form of equation (1) is:

$$y_{it} = a_0 + a_1 aid_{it} + a_2 policy_{it} + a_3 aid_{it} * policy_{it} + X'\beta + \delta_t + \varepsilon_{it} \quad (2)$$

Estimating Equation (2) with OLS leads to inconsistent estimates if foreign aid is correlated with an unobserved component that may potentially explain educational development. For instance, countries with poor educational performance could receive more aid. Moreover, policy dimensions have also been shown to be endogenously related to components of human capital development (Heckman, 2000; Adegboye & Oziegbe, 2018; Hippe & Fouquet, 2019). In these cases, the effect of aid or policy on an educational development model will be underestimated. Two major attempts have been made in literature to address the problem of endogeneity between either institutions or aid inflows and educational development. Studies like Combes et al. (2014), Bermeo and Leblang (2014) and Yogo (2017) have employed the instrumental variable method based on the 2SLS approach, while studies like Gyimah-Brempong and Asiedu (2008) and Adegboye and Oziegbe (2018) have employed the system GMM technique. For the instrumental variable methods, there are always challenges of appropriate selection of instruments whereby earlier instruments are criticized as ineffective by later studies. Hence, we will not search for instrumentation, especially given that institutional variables are used as important explanatory variables in the study.

This study proceeds to estimate the equation using the Fully Modified OLS (FMOLS) method, which is appropriate for heterogeneous cointegrated panels (Pedroni, 2000). This methodology "addresses the problem of non-stationary regressors, as well as the problem of simultaneity bias among the variables that are endogenous in a reduced-form equation" (Eregha, Irughe & Edafe, 2018 p. 66). The FMOLS is based on the assumption of a linear combination of variables which ensures that they are in proportion to one another in the long run (or panel cointegration) and it generates individual long-run estimates for the equation. The FMOLS technique yields unbiased estimates when the regressors are endogenously determined, as long as the variables

are I(1). The FMOLS is estimated based on the following co-integrated system time series (Pedroni, 2000):

$$y_{it} = \alpha_i + x_{it}\beta + e_{it} \quad (3)$$

$$x_{it} = x_{it-1} + \varepsilon_{it} \quad (4)$$

where y_{it} is the dependent variable, x_{it} is a vector of explanatory variables, and e_{it} is stationary with a constant covariance matrix represented. The FMOLS therefore solves the problem of endogenous regressors by making a semi-parametric correction to the OLS estimator. The size of the dataset, with a large time span (1995 – 2017) and a relatively small cross-section (41 countries) renders the application of the system GMM ineffective.

4.2 Variables in the Model

In measuring educational development, there can be several perspectives in terms of educational access, educational quality and educational efficiency, both in terms of government spending in the sector and life expectancy in education (Vros, 1996; UNESCO, 2004; Gyimah-Brempong & Asiedu, 2008; Wolf & Department for Education, 2011; Glewwe & Muralidharan, 2016). Both theory (such as Baker 1992) and empirical literature show that these variables effectively measure development of the educational sector in aggregate terms. For this study, educational access is measured by school enrolment at the secondary level of the system. Educational quality is captured by the pupil-to-teacher ratio which is expected to show the quality of learning in the schools. The proportion of government spending in education measures government desire and effort in ensuring educational sector development. School life expectancy is also included to capture the efficiency of the schooling system in retaining pupils within the system. This variable extends beyond mere consideration of enrolment rates to evaluate more learning-related outcomes. As Glewwe and Muralidharan (2016, p. 654) noted, "high rates of enrollment often mask low rates of actual school attendance in many low-income settings". From the literature, it is expected that educational outcome variables of access, quality and efficiency should improve with larger aid inflows into the economy. Also, government spending in education should be boosted with more aid inflows in the economy.

Another justification for the use of the dependent variables in the study involves the implication of policy capacity (or environment) on the sector. In relating educational development to policy and institutional factors, both outcome and expenditure components are included in order to show if there are underlying institutional implications that may enhance aid yields and spending towards achieving outcome targets (see Hanushek, 2013; Adegboye & Oziegbe, 2018). School enrolment is taken at the secondary school level. The secondary school level of education is often

considered as the structure for building basic cognitive skills applicable for many task related functions (Wolf & Department of Education, 2008). For the expenditure variables, we use government expenditure on education as proportion of total annual budgets (*edexp*). Educational aid is measured as the share of aid inflows that is made up of educational support (*edaid*).

In measuring policy environment, there is the need to understand the issues regarding levels of regulation (which are more policy-related) and quality of regulation (which relates more to institutional quality). The focus of the policy-related factors used in this study involves performance measures which provide assessments of the quality of governance (Knack, 2000; Rauch & Evans, 2000). The measures of institutions used in the study are based on the World Governance Indicators (WGI) estimates. The institutional quality variables include government effectiveness (*goveff*), the quality of regulations (*regulation*), control of corruption (*corruption*), and voice & accountability (*voice*). These variables are used to emphasise governance capacity, which relates to policy making and consistency, level of respect for citizens (which is related to rights to education), as well as citizens' respect for the "institutions that govern economic and social interactions among them" (Kaufmann, Kraay & Mastruzzi, 2010). For instance, societies with more powerful citizen participation have been noted to have better influences on educational development. Also, voice and accountability is a strong indicator of the policy environment and can serve as a tool for influencing policy outcomes (Eterovic & Sweet, 2014). Each of the measures takes a minimum value of -2.5 for the worst performance level and 2.5 for the best performance level. Based on the measurement and calibrations, each of the institutional factors is expected to be positively related with educational development.

Besides the standard institutional quality measures above, political systems in the process of economic activities in Africa have been a source of considerable research over many years. In this paper, and as in Barro and Lee (1994), Sala-i-Martin (1997), among others, we also hypothesize that political arrangements that proxy for decentralized political power may increase efficiency of aid use, since decentralisation tends to lead to more competition among the federating units. Federal structures are assumed to be more decentralized in terms of allocation of resources to the subordinate entities than unitary states. Hence a dummy that takes 1 for federal system and 0 otherwise is used to capture political system in a country is included in the model. Other control variables included in the model are GDP per capita (*gdppc*), labour force participation rate (*lfpr*), the share of urban population (urbr), the amount of natural resource rent (*rent*), and the degree of trade openness (*topen*). Each of the variables tends to influence educational performance among

the SSA countries, either directly or by influencing the main explanatory variables in the model.

4.3 The Data

Data used cover 34 sub-Sahara African countries for which data are available. Annual data for the period 1998 to 2017 are sourced for each of the countries in the sample. all the data are taken four years non-cumulative averages, which implies that five data points were generated for each of the countries in the study. The data on institutional quality were obtained from the World Governance Indicators datasets of the World Bank, while education data were also augmented from the UNESCO Ebsco data on Education. Data on aid flows was obtained from the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) through its Creditor Reporting System (CRS) database.

5.0 Empirical Analysis

5.1 Summary Statistics

The descriptive statistics for the variables used in the analysis are presented in Table 1 below. Average secondary school enrolment rate is low, averaging 39.73 for the countries over the period, although maximum value reached as much as 97.66 percent. In the same vein, the pupil-teacher ratio at the secondary school level averaged 43.15 percent for the sample, which is quite large. The ratio is actually as large as 97.42 percent, which far exceeds all spectra for quality of education for the country. Education life expectancy for the region is 6.02 with a low standard deviation value. This indicates that, on average, pupils spend 6 years in school among SSA countries which sums to completion of primary education. The average education life expectancy value corroborates the undue focus of governments in SSA countries on the universal basic education access, without solid provisions for post-primary educational development. Average share of education in total aid is 12.4 percent, while the average share of education spending in total budgetary allocations is 15.87 percent among the countries. This average budgetary allocation to education is relatively low when compared with the UNESCO recommendation of 26 percent budgetary provision in order to meet future standards in educational development. The minimum value of 4.73 percent for educational budget percent suggests that some countries have allocated very low amounts to education. Average labour force participation rate is moderate at 70.93 percent, while the urban population share of 37.87 percent is large and shows high prevalence of urbanization among the SSA countries. As mentioned in the previous section, all the institutional quality factors are negative on average, with government effectiveness recording the least performance.

Table 1: Descriptive Statistics

Variable	*obs*	*Mean*	*Std. Dev.*	*Max.*	*Min.*
sec. school enrolment (%)	533	39.73	20.55	97.66	6.64
school life expectancy (years)	765	6.09	1.54	9.48	1.92
pupils-teacher ratio (%)	685	43.15	13.42	97.42	18.32
share of education aid in total aid	943	12.40	9.39	53.84	0.74
education spending to gdp	769	4.20	2.17	12.54	1.17
share of education in total spending	566	15.87	5.76	30.01	4.73
gdp per capita	943	1965.9	2993.0	18626.8	198.0
labour force participation rate (%)	943	70.93	10.64	89.41	46.28
trade openness (%)	943	68.09	21.82	115.12	23.62
urban population rate	943	37.87	15.40	86.92	8.14
control of corruption	943	-0.64	0.61	0.99	-1.80
government effectiveness	943	-0.73	0.60	0.99	-1.88
regulatory quality	943	-0.63	0.59	1.06	-2.17
voice and accountability	943	-0.55	0.69	1.00	-1.98

Source: Author's computation

5.2 Panel Unit Root, Cross-Sectional Dependence and Cointegration Tests

The unit root results (not shown here) strongly indicate that the variables are non-stationary in level but become stationary at first differences. Table 2 shows the outcomes of Pedroni's and Kao panel cointegration tests on the three educational development Equation. The coefficients of the Phillips and Perron and Augmented Dickey Fuller test statistics for both the panel and group assumptions are significant at the 5 percent level. Thus, there is strong evidence of panel cointegration according to both the ADF-t and non-parametric-t statistics. These results are complemented by the Kao residual-based test which also indicates that the null hypothesis of no cointegration can be rejected for each of the equations.

Table 2: Panel Cointegration Test Result

school enrolment equation	**Panel Statistics**	**Group Statistics**	**Kao (ADF)**
Variance ratio	-0.654	--	
Rho	3.532	5.092	-4.73***
PP	-2.121*	-2.872*	
ADF	-2.625**	-3.033**	
pupil-teacher ratio equation	**Panel Statistics**	**Group Statistics**	**Kao (ADF)**
Variance ratio	-1.449	--	
Rho	3.249	4.961	-2.646**
PP	-4.149**	-5.206**	
ADF	-3.857**	-4.950**	
school life expectancy equation	**Panel Statistics**	**Group Statistics**	**Kao (ADF)**
Variance ratio	-0.592	--	
Rho	2.717	4.947	-2.175*
PP	-6.267**	-3.086**	
ADF	-6.885**	-4.106**	

Note: **, * indicates the rejection of the null hypothesis of no cointegration at the 0.01 and 0.05 level of significance respectively

The number of cross-sectional units (34) exceeds the time period (20 years for each of the countries). Thus, cross-sectional dependence (CD) test developed by Pesaran (2004) – which uses a pair-wise average of a sample correlation to test the existence of cross-sectional dependence – is applied. The results of the cross sectional dependence test for the datasets are presented in Table 3. The Peseran CD coefficients fail the significance test and the null hypothesis of no cross-sectional dependence among the datasets cannot be rejected. This therefore suggests the absence of cross-sectional dependence for the estimation structure.

Table 3: Cross-section Dependence Test Results

Equation	**Pesaran CD**	**P-value**	**Abs corr**
slxp	0.103	0.901	0.015
ser	0.276	0.899	0.019
ptr	-0.349	0.727	0.08

Source: Author's computation

5.3 Estimated Results

The results of the estimated models based on equations in the previous section are reported and explained in this section. In Table 4, the results of the three educational development variables are reported. The adjusted R-squared values for the results are generally moderate, although that of school enrolment is larger and shows that the selected independent variables explained over 65 percent of the variations in school enrolment. The long run variance for each of the equations is also low. The result shows that education aid has positive impacts on both school enrolment and school life expectancy among the countries and the effects are significant at the 5 percent level. Thus, education aid is shown to have the capacity of boosting school enrolment (which is access indicator) and school enrolment (which is efficiency indicator). A one percent rise in aid to education sector in the region leads to a 0.1 percent rise in school enrolment and 0.06 percent rise in school life expectancy. Apparently, aid receipts help to boost access to education among SSA countries and the aid inflows also helps to keep the children longer in school. These results are similar to those of Ziesemer (2016) and Yogo (2017) by indicating that aid spurs enrolments and increase likelihood of completing secondary education.

Table 4: Results for Education aid and educational development

Variable	**Dependent variable**		
	School enrolment	*Pupil-teacher ratio*	*School life expectancy*
edaid	0.109*	-0.001	0.056*
goveff	1.069**	-0.419**	0.370**
regulation	-0.063	-0.120	0.324**
corrupt	-0.324*	0.123	-0.305**
voice	0.316*	-0.170	0.145
urbr	-0.106	-0.360**	0.112
gdppc	0.334**	0.456**	-0.007
lfpr	0.011	0.101**	0.142**
topen	0.009**	0.005**	0.001
rent	-0.021**	0.000	0.002
edexp	0.029*	-0.019*	0.011

Adjusted R-squared	0.650	0.131	0.396
Long-run variance	0.340	0.253	0.150

Note: **, * indicate significance at at the 0.01 and 0.05 level of significance, respectively.

However, the result also shows that aid to education has no significant impact on pupil-to-teacher ratio. Though the coefficient is negative, it fails the significance test at the 5 percent level. Given that the pupil-teacher ratio is used to measure educational quality, this result shows that aid does not actually improve quality in the educational sector among SSA countries. Like Das et al (2013) and Glewwe and Muralidharan (2016) also found, aid may immediately stimulate participation in education but it may not however ensure quality within the system for the SSA countries.

Among the policy capacity variables, government effectiveness has significant effects on each of the three measures of educational development. The result shows that government effectiveness improves school enrolment and school life expectancy but reduces pupil to teacher ratios. Each of these effects are in line with *apriori* expectation and suggests that more effective governments would boost overall educational development in the region. It should be noted that government effectiveness is the variable most related to our policy capacity indicator and therefore implies that strong capacity for making and implementing policy will lead to better educational development among the SSA countries. Essentially, this is possible because better policy making and policy environment tend to free binding constraints from the public sector that may limit the strength of the effect of funding on the educational sector (de Grauwe & Lugaz, 2011; Hippe & Fouquet, 2019)."Voice and accountability" is significant for only the school enrolment equation and is positive. This shows that, like Eterovic and Sweet (2014) have shown, an environment with stronger citizen voice that helps to uphold governance accountability will aid educational development. On the other hand, control of corruption has a significant negative impact on both school enrolment and school life expectancy, thus suggesting that more corrupt governments tend to have better educational performance. This outcome is not expected. The coefficient of regulatory quality has a significant positive impact on school life expectancy, which indicates that better regulations can enforce more school completion rates among the SSA countries.

The coefficient of educational expenditure has significant impact on only school enrolment and pupil-teacher ratio, although the coefficients are less than those educational aid (as noted earlier in this study). These results are similar to the

observations of Banerjee and Duflo (2011) and Pritchett and Beatty (2012) who found that expensive expansions in inputs and resources may be having lesser impact on learning outcomes than "inexpensive supplemental instruction programs". The coefficient of urban population share is significant and negative in the *ptr* equation, suggesting that urban expansion decreases educational quality among the countries. Labour force participation rate is also seen to have positive impact on school life expectancy which shows that the desire to participate in the labour market tends to motivate higher school completion rates. This is an important aspect for policy direction because when governments ensure that jobs are readily available to the educated population, more individuals will be willing to go to school.

Table 5 shows the results of estimates to aid robustness by including certain control variables (including availability of natural resource, type of educational system, and the type of government system). The result can help identify the role of educational system (policy changes) on how aid affects educational development. In the school enrolment equation, controlling for resource availability and fiscal system led to insignificance of the coefficient of educational aid. This shows that countries with natural resources or operate a more decentralized system may either not be getting enough aid support for education or are less effective in applying aid resources. This is important because it confirms that educational policy actually affects aid effects on educational development.

Table 5: Results for Education aid and educational development (with controls)

Variable	Dependent variable								
	School enrolment			*Pupil-teacher ratio*			*School life expectancy*		
ledaid	0.02	0.16**	0.04	-0.13**	0.01	-0.07	0.00	0.10	0.13**
goveff	0.95**	0.31	1.05**	-0.63**	-0.07	-0.67**	0.39**	0.26*	0.47**
regulation	0.00	0.86*	0.20	-0.38*	-0.02	0.11	-0.22*	0.79**	0.14
corrupt	-0.30	-0.40*	-0.77**	0.54	-0.04	0.21	-0.24*	-0.41**	-0.56**
voice	0.50	-0.41*	-0.02	0.43	-0.05	0.18	1.01**	-0.15	0.14
urbr	0.56*	0.83**	0.26*	-0.47*	-0.95**	-0.21*	0.97**	0.45**	0.13
gdppc	0.54**	-0.15*	0.08	0.51**	0.67**	0.38**	0.03	-0.13**	-0.11**
lpr	-0.43**	0.11	0.14**	0.31**	0.11**	0.24**	-0.22**	0.14**	0.19**
open	0.11**	0.01	0.13**	0.01	0.11**	0.12**	0.01**	0.01	0.01
rent	-0.02**	0.01**	-0.03**	0.01	0.00	0.00	0.00	0.01*	0.00
edexp	0.22**	0.08**	0.05**	-0.14**	0.00	-0.02*	0.10**	-0.06*	0.02*
Resource	yes			yes			yes		
Edu system		yes			yes			yes	
Fiscal system			yes			yes			yes
Adj R-squared	0.88	0.70	0.71	0.63	0.60	0.15	0.72	0.54	0.50
L-R variance	0.11	0.18	0.27	0.07	0.07	0.27	0.02	0.09	0.13

Note: ***, ** indicate significance at the 0.01 and 0.05 level of significance, respectively.

The coefficient of *edaid* in the school enrolment equation is greater in Table 5 than in Table 4. Moreover, other studies like Fan, Lin and Treisman (2012) found that

decentralization may lead to better spending of common resources and thereby boost education. However, the study may have confirmed the findings by de Grauwe and Lugaz (2011) that decentralization may multiply corruption points and thereby increase the dissipation of educational funds, especially from aid receipts. The pupil-teacher ratio result however shows that controlling for resource availability leads to significant negative effect of aid on pupil-teacher ratios for the countries. Thus, it is only when revenues are high (from natural resources) that the negative impact of aid on pupil-teacher ratio can be felt.

In Table 6, the results of the estimates with interactions between aid and policy capacity are presented. In the results, the coefficients of education aid are only significant in the school enrolment and school life expectancy equations, further confirming the finding that aid does not affect quality in the educational system. However, the coefficient of the interaction between aid and government effectiveness is significant and negative in the pupil-teacher ratio equation. This suggests that when the policy environment is right, aid may actually improve educational quality for the countries. The interaction of aid with regulatory quality also improves school life expectancy, although the interaction of aid with control of corruption is seen to negatively affect both school enrolment and school life expectancy.

Table 6: Results for Education aid and educational development (interaction effects)

Variable	Dependent variable								
	School enrolment			*Pupil-teacher ratio*			*School life expectancy*		
ledaid	0.23**	0.09*	0.03	-0.04	-0.01	0.03	0.09*	0.10**	-0.01
*edaid*goveff*	0.14**	--	--	-0.05*	--	--	0.04*	--	--
*edaid*reg*	--	-0.03	--	--	-0.01	--	--	0.05**	--
*edaid*corr*	--	--	-0.08**	--	--	0.03	--	--	-0.06**
goveff	--	1.12**	1.11**	--	-0.44*	-0.44**	--	0.39**	0.38**
regulation	0.02	--	-0.09	-0.16	--	-0.11	0.36**	--	0.31**
corrupt	-0.18	-0.37*	--	0.06	0.13	--	-0.25*	-0.30**	--
voice	-0.35*	-0.25	-0.22	0.18	0.14	0.13	-0.15	-0.13	-0.09
lurbr	-0.13*	-0.11	-0.08	-0.35**	-0.35**	-0.37**	0.10	0.10	0.13*

lgdppc	0.27**	0.35**	0.37**	0.48**	0.46**	0.44**	-0.03	-0.02	0.02
lpr	0.01	0.01	0.01	0.08**	0.11**	0.13**	0.11**	0.11**	0.09**
open	0.07**	0.07**	0.11**	0.04**	0.03**	0.03**	0.01	0.01	0.01
rent	-0.22**	-0.23**	-0.22**	0.01	0.01	0.01	0.01	0.01	0.01
edexp	0.03*	0.03**	0.03**	-0.02*	-0.02*	-0.02*	0.01	0.01	0.01
Adj R-squared	0.62	0.65	0.66	0.11	0.13	0.14	0.37	0.39	0.41
L-R variance	0.38	0.34	0.33	0.26	0.25	0.25	0.16	0.15	0.15

***Note**: **, * indicate significance at the 0.01 and 0.05 level of significance, respectively.*

6.0 Conclusion

In this study, the role of foreign aid in promoting educational development is examined on the basis of policy capacity and policy environment among Sub-Saharan African countries. We argued that institutions, through both direct and indirect channels, can influence the effect of educational aid on educational development. Data on thirty-four (34) countries in the sub-Saharan African region covering the period 1998 to 2017 were used in the empirical analysis and the FMOLS estimation technique was employed in estimating the relationships. The study found that aid to education directly improves educational access and efficiency but does not have direct impact on either educational quality or share of budgets devoted to education by the countries in SSA. On the other hand, educational expenditure was shown to significantly improve both access and quality in the educational sector, but not efficiency. Thus, while aid does not directly affect quality, domestic expenditure has the capacity to alter quality. This suggests the need for effective collaboration between the use of aid funds and domestic budgetary allocations in ensuring effective development of education from all facets of the system. The insignificant impact of educational expenditure on school life expectancy highlights the limitation of domestic expenditures, especially when not backed by an effective policy environment. The study also found that policy capacity, with regard to government effectiveness has a significant positive impact on educational development either on its own or by interactions with educational aid. In general, better policy capacity of SSA governments tends to improve the extent of aid effect on educational development (in terms of access, quality, efficiency or budgetary allocation). Thus, institutional capacity has both direct and indirect channels through which it impacts on educational development in SSA. Good institutions were shown to lead to better use of educational resources in the region.

From the results in the study, it is shown that establishment and sustenance of quality institutions is a veritable means of attaining effective linkage between foreign aid and enhanced performance in education among SSA countries. The age-long complaint about the poor educational conditions in the region can be largely addressed by focusing on strengthening institutional policy capacity either at structural levels, political systems or with particular relations to human capital building. If the institutional and policy environment is poor, then the process of resources accumulation and internalisation for quality delivery in education will be low. In this direction, good educational policy making is required for sustained aid inflows into the educational sector among SSA countries. To achieve quality policies in education, frameworks need to be clarified and more grassroots based policy making is required in order to explore all perspectives of needs and quality enhancement. This will provide adequate templates for donors to develop aid policy and directions. Efficient management of information is also essential in enhancing policy making in the educational sector. As domestic authorities seek to ensure better control of resources and outputs, access to information in the areas of budgets and the several layers of the educational systems in the countries expands the environment for robust policy making. This tends to aid transparency and improve management decisions.

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