Foreign Aid and Out-of-Pocket Health Expenditure in SSA Countries: Does Institutional Development Matter?

Mohammed Elhaj Mustafa[1]*, Ebaidalla Mahjoub Ebaidalla*[2] *&Reham Rizk Kamel*[3]

Abstract

Out of pocket health expenditure (OOPHE) represents a substantial share of health spending in Sub-Sahara Africa (SSA). It consumes a large proportion from population's incomes and, therefore, pushes them into sever poverty with its all negative consequences. In this paper, we examine whether and to what extent foreign aid and its interaction with recipient country's institutional quality reduce OOPHE. We apply fixed-effects instrumental variables (FE-IV) panel regressions for data set on 45 SSA countries over the period 1995-2015 to test the causal effect of aid and its interaction with institutional quality on OOPHE in SSA region. We find that aid does not robustly affect OOPHE. Neither does the effect of aid depend on institutional quality. Finally, we test whether aid affects public health expenditure (PHE) in the region, which is arguably the dominant transmission channel through which aid should affect OOPHE. We find that aid had no effect on PHE indicating the rejection of fungibility hypothesis.

.

JEL Classification: F35, P37, I15, O55
Keywords*: Sub-Saharan African countries, Out of Pocket Health Expenditure*

Acknowledgements

We wish to express our deep appreciation and gratitude to the Global Development Network (GDN) for the financial support to carry out this research. We also thank Axel Dreher for his valuable comments and suggestions which have considerably improved the quality of this paper. Views expressed here are those of the authors and do not necessarily represent those of the GDN.

[1]Assistant Professor of Economics, University of Kassala, Sudan, Email: mohdaj1976@gmail.com
[2]Assistant Professor of Economics, University of Khartoum, Sudan,Email: ebaidallamahjoub@yahoo.com
[3]Assistant Professor of Applied Economics, British University in Egypt, Egypt, Email: rehamrizk82@gmail.com

1. Introduction

It has been widely recognized that the disbursement of foreign aid targets assisting recipient countries to develop well-functioning healthcare systems that able to protect people from diseases and health catastrophic matters. In this regard, along with its feasible contributions to people' healthiness, aid inflows can also do a great deal in diminishing OOPHE undertaken by population (World Bank, 1993). However, the current statistics don't support these claims.To date, people in developing countries suffer from diseases and expose to skyrocketing OOPHE that cut significant proportions from their incomes and, therefore, push them into severe poverty (Xu et al., 2003; Van Doorslaer et al., 2006; McIntyre et al., 2006; Li et al., 2012; Shahrawat and Rao, 2011 and Van Minh et al., 2013). According to OECD (2016), the disbursement of humanitarian aid to developing countries has doubled more than three and half times during last three decades. In contrast, the patterns of OOPHE did not see any similar reductions. As reported by World Bank, OOPHE in least developing countries (LDC) represents 78 percent from total private health expenditure demonstrating the heaviest financial burden being encountered by population in this group of countries (World Bank, 2016).

Nevertheless, despite the fact that this situation is largely dominant in developing world, SSA has experienced larger and similar gap between OOPHE and aid inflows. Over the period 1995-2015, OOPHE (as a percentage of private health expenditure) climbed from 56.75 percent in 1995 to 61 percent in 2015 (World Bank, 2016). This rapid growth rate in this branch of health expenses occurs although the region used to receive huge amounts of aid on an annual basis. According to OECD (2016), the inflows of humanitarian aid and total aid to SSA grew, respectively, from U$$ 1339 and U$$14108 in 1995 to U$$ 6035.32 and U$$ 24204 in 2015 (OECD, 2015). Similarly, the region's per capita aid has gone up from US$ 2.61 in 1960, to US$ 4.02 in 1970, to US$ 35.08 in 1990 and to US$ 47.77 in 2014 (OECD, 2016).

The obvious contradiction between aid presence and the patterns of OOPHE experienced by SSA raises a question about the factors that may possibly undermine the effectiveness of aid in overcoming this backbreaking health spending. Undeniably, the failure of aid on this front can be attributed, in part, to the remarkable weaknesses in SSA's institutional framework. In this regard, a voluminous number of studies have frequently indicated the role of poor institutional quality in making aid ineffective in achieving the desirable economic transformation in the region (e.g. Boone, 1996; Burnside and Dollar, 1997; Beynon, 2002; Jeffery Sachs, 2003; Burnside and Dollar, 2004; Gomanee et al., 2005; Whitaker, 2006; Baliamoune-Lutz and Mavrotas, 2009 and Ogundipe et al., 2014). However, the role of institutional quality in making aid works effectively in lowering OOPHE seems to be neglected. The neglect occurs although most of SSA countries are plagued with corruption, democratic weaknesses and lack the rule of law which may obstruct the function of foreign aid in curbing OOPHE. According to International Transparency Organization's report on Corruption Perceptions Index (CPI), the score of SSA (48 countries under CPI model) was on average 33 out of 100 in 2013 and 2015, which indicates a poorer institutional quality (World Bank and International Financial Corporation, 2015).

In such poor institutional environment, the absence of accountability in public institutions in general and healthcare systems in particular is likely to reduce the effective delivery of health care services to their true demanders. Moreover, the presence of corruption may possibly divert aid resources from targeting humanitarian needs. A significant portion of these resources can be, for instance, paid to corrupt providers against delivering health care services that mostly fail to meet the needs of targeted people. Moreover, when corruption becomes institutionalized, government may become unaccountable particularly with respect to the aspects related to aid

allocation. In the area of health, such misallocation of resources would lower the affectability of aid in reducing OOPHE. Furthermore, the failure of aid in moderating OOPHE in SSA context can be interpreted based on the fact that aid might exercise a fungible impact on PHE. This claim can be defended by the prolonged stagnancy in PHE as a percentage of health spending. According to the statistics by the World Bank, PHE in SSA has accounted to 2.45% of the total health spending during 1995-2015 (World Bank, 2015). This may indicate that SSA's governments tend to relax healthcare duties and became reliant on aid as a principal source to finance the provision of healthcare services.

With all these concerns, three questions can be raised here: (i) what is the role that could be played by aid in controlling OOPHE in SSA? (ii) To what extent does the interaction between institutional quality and aid decide the effect of aid on both OOPHE and PHE in SSA? And (iii) does aid crowd out PHE in SSA.

To address these questions, this study develops two core models. The first examines the impact of aid on OOPHE, while the second tests whether foreign aid crowds in or crowds out PHE (i.e. to test aid's fungibility hypothesis). In both models, the interaction between aid and the level of accountability has been introduced to detect the effect of institutional quality on both OOPHE and PHE. The study applies the fixed-effect instrumental variable (FE-VI) method to time series cross-sectional data for 45 SSA countries[4] to carry out the empirical investigation. We adopt this approach to overcome two core problems that frequently encounter analyzing panel data, particularly when aid effectiveness is considered. The first problem arises from the timing of causal relationships between aid and outcomes, while the second occurs due to the presence of endogeneity and the reverse causation that usually come with such type of analysis. To address the first problem, we follow the specification developed by both Clemens et al. (2012) and Derher and Langlotz (2015) who have used four-year averages for each of the variables used in the analysis. Correspondingly, to account for endogeneity, we rely on the work of Derher and Langlotz (2015) by employing the interaction between donor government's fractionalization and the country's probability of receiving aid as an instrument for aid.

In our opinion, this study differs from previous ones in several aspects. First, the study is unique in that it jumps over traditional investigation of aid effectiveness in the area of health. We found that most of the previous studies have focused primarily on analyzing the role of aid in improving health outcomes in recipient countries. However, one may argue that such improvements may be attributed to enhancements in livelihoods realized by recipient economies and not due to aid reception. Using such indicators to vindicate that aid has or has no effects on healthiness remains, to some extent, inaccurate and needs further verification. As an alternative, taking OOPHE to measure the effectiveness of aid in improving healthiness of people would be more suitable. This is because experiencing high levels of OOPHE can lead to substantial decreases in expenses on food, education and other necessary items. In the end, the exposure to such conditions would push a large portion of population into poverty trap.

Second, majority of previous studies did not consider factors such as institutional quality as non-traditional determinants for aid effectiveness particularly in the mitigation of OOPHE. Thus, this study fills a gap by identifying the effect of institutional quality in making aid more effective in curbing OOPHE in SSA. Third, due to institutional weaknesses in SSA, aid has been claimed for the manifestation of fungibility. Hence, by exploring the probable fungible effects of aid, donors

[4]See Appendix A

can be enlightened about the extent to which aid can protect people from poverty arising from OOPHE.
The rest of this paper is designed as follows: after this introductory section, some argument on the role of institutional quality in deciding the effectiveness of aid on health expenditures is presented in Section2. Section 3 sketches some stylized facts on health spending, institutional environment and presence of aid in SSA. The methodology to analyze empirical models is presented in Section 4. Section 5 introduces empirical results and finally, Section 6 concludes and offers some recommendations.

2. The mechanisms through which institutional quality affects OOPHE?

The linkages between aid and institutional quality and OOPHE are expected to work through several mechanisms. First, the existence of sound institutions can help greatly in allocating aid resources effectively. Both OECD's Development Assistance Committee and Paris High Level Forum on Aid Harmonization and Alignment have emphasized the role of institutional quality in improving the effectiveness of aid on the aspects related to health sector (WHO, 2006 and Moss et al. 2006). Similarly, the UN Commission for Africa argued that good institutional quality makes aid effective because it allows absorbing larger amounts of aid inflows. Eventually, absorbing aid resources would supplement the provision of public utilities, among them is health care services, leading to low OOPHE. In contrast, in countries with fragile institutions, aid may possibly be used inefficiently or diverted to finance projects with political ends instead of humanitarian projects for which the potential outcomes can be reaped in the long run. Second, the heavy dependence on aid as a source to finance public utilities would make aid ineffective in reducing OOPHE particularly when recipient countries' institutions are occupied by corruption. As documented by many authors, in institutionally corrupted settings, the high inflows of aid may weaken the ability of recipients to tax domestic sectors (Kaldor, 1963; Azam et al. 1999; Pivovarsky et al. 2003 and Brautigam and Knack, 2004). Accordingly, the failure to collect tax revenues up to maximum economically accepted ceilings will jeopardize the capacity of government to spend on public health facilities and, as a consequence, pushes OOPHE to grow rapidly. In this respect, a voluminous literature has revealed that aid disbursed to developing countries may turn out to be fungible (Heller, 1975; Khilji and Zampelli, 1991; Pack and Pack 1993, Feyzioglu et al., 1998 ; Devarajan et al.,1999; Djankov et al., 2005; Gottret and Schieber, 2006; Farag et al., 2009; Lu et al., 2010; Ke et al., 2011; Ke et al., 2011 and Liang and Mirelman, 2014).

Third, as a signal for institutional quality, preserving the rule of law makes governments in aid recipient countries accountable for deficiencies in the provision of public utilities including health. More specifically, instead of escaping their tasks to foreign donors and charitable bodies, these governments take decisions on health expenditures independently from external resources. Moreover, sustaining rule of law nurtures media and civil society organizations each of which can act as a crucial disciplinary device to control the performance of governments particularly in the area of health. Enforcing such screening facilities would safeguard aid resources from the abuse that might possibly be conducted by governments' employees and public agencies. Accordingly, preserving rule of law would strengthen the effectiveness of aid in delivering adequate public health care services and, as a desirable outcome, reduces OOPHE.

Finally, the solid democratic commitment, as a feature for institutional quality, would also complement the contribution of aid to overcome OOPHE in aid recipient. The implementation of

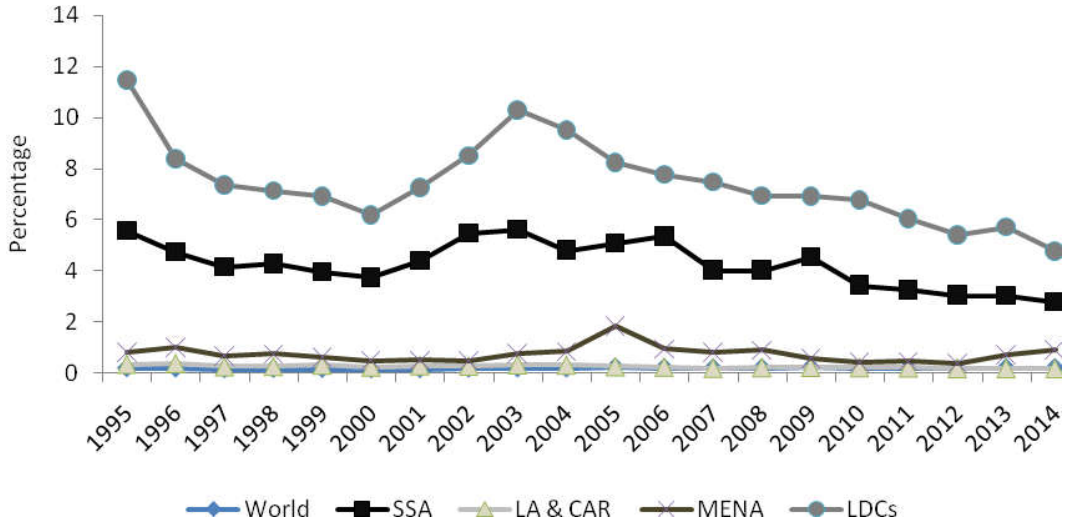
democracy, particularly in developing countries' contexts, may indicate that all political parties (actors) are represented in governments and the power is exchanged peacefully. In such institutional environment, the governments will not be in need to exploit domestic resources to finance security measures enacted to overcome political clashes that usually arise from lacking democracy. In other words, instead of mobilizing resources to deal with political disputes and social unrests, these scarce resources can be tracked directly to attain high levels of healthiness and, thus, curb OOPHE. Moreover, from donors' perspective, heightening democratic commitment, which is indicative for good institutional quality, represents one of the feasible criterions that donors may depend on to disburse aid to a particular recipient. That is the stronger the commitment of a country toward democratic values, the higher would be the amount of aid to be disbursed to that country. Hence, disbursing higher amounts of aid would contribute directly and indirectly to cut OOPHE.

Empirically, numerous studies have repeatedly stressed the negative impact of bad institutional quality on aid effectiveness (Burnside and Dollar 2000; Knack and Rahman 2003 and Addison and Baliamoune-Lutz, 2006). However, these studies have focused mainly on investigating the role of institutional quality in making aid more effective in achieving the attributes of economic development such as sustaining economic growth rates, lowering morbidities and increasing longevities. Given the familiarities and interactions between these attributes and healthiness, one can easily guess the likely impact of institutional quality in moderating OOPHE in aid recipient countries. That is to say, the probable interplays between aid and institutional quality on one hand, and aid and health spending on the other will not diverge considerably from outcomes emerge with these aspects of economic development.

3. Some facts on aid presence in SSA region

Compared to other developing regions, donors tend to disburse more aid to SSA. This claim can be indicated by Figure 3.1 which displays the net ODA inflows as a percentage of GNI in SSA with some comparable regions during 1995-2014. As can be seen, excluding the group of less developing countries (LDCs), the annual average of net ODA (% of GNI) received by SSA was higher than that of MENA, Latin America and the Caribbean (LA & CAR) regions as well as the world. However, after the year 2007, the net ODA (% GNI) has dropped below the level of four percent demonstrating the consequences of international financial crises that hit global economy in 2008.

Figure 3.1: Net ODA (% of GNI) in SSA and some comparable regions (1995-2014)

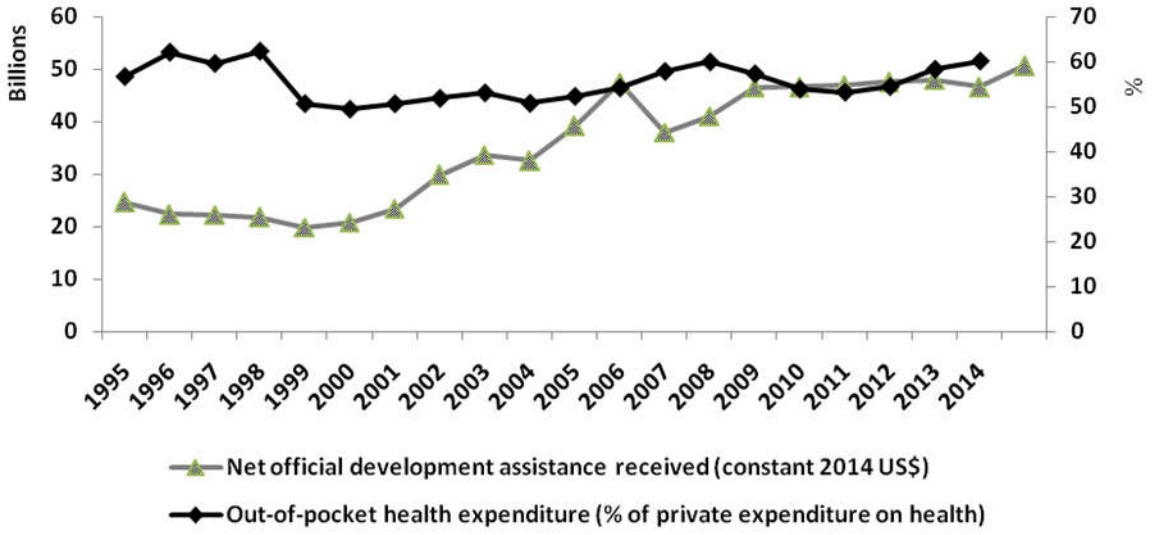


Source: World Bank, World Bank Indicators (2014)

Nevertheless, SSA maintains its relative position as a prominent receptor for ODA particularly in terms of health assistance. The Institute for Health Metrics and Evaluation (IHME) reported that development assistance for health (DAH) at global level grew at an annual rate of 11.2% during the period 2001 to 2010. Such rapid growth rates in aid disbursed to developing countries, among them is SSA countries; indicate that donors' decisions to donate for humanitarian reasons seem to be not affected by new developments in the international environment. However, this argument cannot be applied to all groups of donors. According to OECD's statistics, DAC donors tend to disburse higher humanitarian aid compared to non-DAC donors.

In general, whatever the amounts being disbursed and regardless the circumstances linked to its disbursement, aid has been claimed to accelerate the process of economic development in recipient countries, particularly in the aspects related to health care services provision. The stylized facts on OOPHE, however, don't support this supposition. A glance at Figure 3.2, which displays the relationship between ODA and OOPHE in SSA during 1995 – 2015, indicates the absence of conformity between net ODA inflows and OOPHE undertaken by SSA population. Precisely, the figure indicates that starting from the second half of the 2000s and onward, the growth in net real ODA was not coincided with equivalent decreases in OOPHE giving an impression that this measure of health spending was not affected by ODA presence.

Figure 3.2: OOPHE and ODA in SSA region (1995-2015)



Source: World Bank, World Bank Indicators (2014)

This conclusion can be defended by the fact that from 1995 and up to 2007, aid grew significantly, while OOPHE remain rotating around the levels of 50% of private health spending. Moreover, this claim can be also supported by the statistics reported in Table 3.1. As can be seen from the table, compared to regions under comparison, ODA as a percentage of GNI in SSA is on average greater than 4% during 1995 – 2014. It also appears higher compared to the ratios recorded at global levels. The statistics demonstrate that during the same period, SSA received ODA (%GNI) that was 20 times the global level; five times that of MENA region, 16 times that of the Latin America and the Caribbean region. However, although SSA has received larger amounts of ODA (% GNI), it failed to moderate the incidence of OOPHE.

Table 3.1: OOPHE and ODA in SSA and some comparable regions (1995-2014)

Year	SSA		MENA		Latin America & Caribbean		World	
	OOP (%GDP)	ODA (%GNI)	OOP (%GDP)	ODA (%GNI)	OOP (%GDP)	ODA (%GNI)	OOP (%GDP)	ODA (%GNI)
1995-1998	60.23	4.69	86.67	0.82	73.57	0.30	45.76	0.19
1999-2000	50.69	4.40	87.27	0.54	75.08	0.27	43.23	0.16
2003-2006	52.62	5.22	83.47	1.11	75.68	0.27	42.85	0.20
2007-2010	57.28	4.00	82.57	0.70	68.61	0.21	44.92	0.19
2011-2014	56.58	3.02	79.69	0.63	63.53	0.18	45.86	0.19

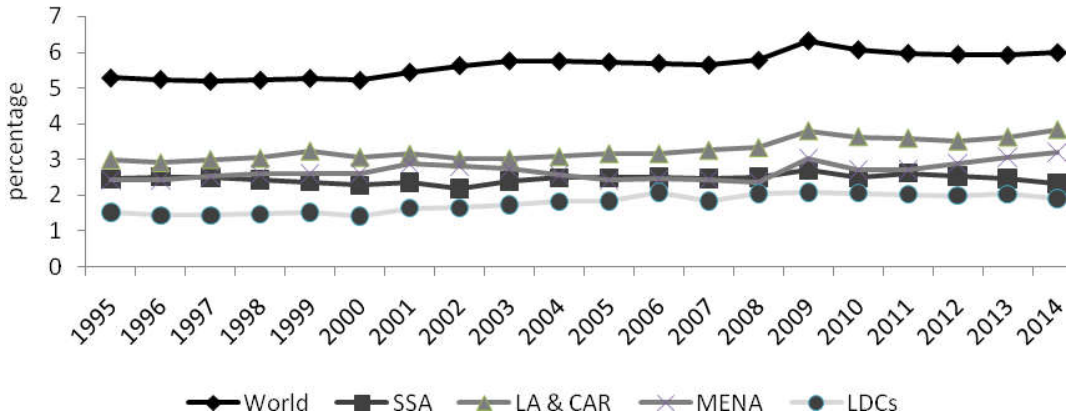
Source: World Bank, World Bank Indicators (2014)

Figure 3.3 drafts the route of PHE (% of GDP) in SSA, MENA and Latin America and the Caribbean regions. As can be observed from the figure, compared to these two regions, SSA devotes a moderate share from its GDP to the provision of healthcare services during the last two decades. Equally interesting indication, this share was extremely low when compared to the

average has been recorded at global levels. It is worth to mention that these lowest levels of public health spending have been observed although the fact that the majority of population in SSA exposes to bad health status compared to the regions under comparison.

Based on these stylized facts, an important conclusion can be drawn regarding health expenditures and aid presence in SSA. First, SSA is considered one of the heavily aided regions in the world. These aid inflows are expected to play a substantial role in overcoming, or at least reducing skyrocketing OOP health payments. However, the contribution of aid in improving health status and, thus, lowering OOPHE cannot be attained if governments rely very much on aid as a feasible source to sponsor health care services provision. This fact indicates that SSA countries may possibly relax health financing obligations and, as an easy alternative, delegate these responsibilities to foreign donors. In other words, these increases in aid inflows complemented with the stagnation in PHE may suggests that aid exercise a fungible impact on the share of domestic resources devoted to health facilities. Second, the unsatisfactory performance of aid in reducing OOPHE can be also attributed to the severe weakness in the institutional fitness being practiced by SSA countries.

Figure 3.3: PHE (% of GDP) in SSA and some comparable regions



Source: World Bank, World Bank Indicators (2014)

The World Bank's statistics on governance indicators indicate that the region did not perform well in terms of institutional quality indicators. Its records in controlling corruption remain very low, demonstrating the prevalence of corrupted institutional settings. This argument can be also vindicated by the poor performance in government effectiveness, rule of law and voice and accountability indicators. During the period extended from 1996 to 2015, for instance, the scores of these indicators are negative lending a great support to the conclusion that SSA holds a poorer institutional quality compared to other regions. Furthermore, the bad performance of institutions can be also vindicated by the region's ranking in terms of governance indicators. As statistics by World Bank indicates, the region ranks in terms of controlling corruption, government

effectiveness and the sustainability of the rule of law were, respectively, 30, 28 and 31 during last two decades. Therefore, in such corrupted environment, aid resources regardless of the area it targets, would be used inefficiently. In the area of health, for example, aid might not grant direct medical assistances for those who are in need. Moreover, in the corrupted contexts, aid may give governments a green light to escape financing healthcare services by delegating assigned responsibilities to NGOs and charities. In this case, instead of elevating the risk of OOPHE, aid may contribute in intensifying the problem instead of mitigating it.

On the whole, it can be fairly concluded that SSA has a poor level of institutional quality compared to other developing countries. This fact would certainly levy negative effects on the quality and quantities of public utilities being served by governments. In particular, the deeply rooted corruption in the institutions is likely to obstruct the contributions of aid in providing health care services and protecting people from being victimized by OOPHE.

4. Research Method

4.1 Model Specification

To make the objectives of this study achievable, we employ the panel regression method. Specifically, we develop two empirical models: the first addresses the effect of aid on OOPHE, while the second investigates the impact of aid on PHE. Both models emphasize the role of institutional quality as a crucial factor in determining effectiveness of aid on health expenditures.

However, before proceeding with empirical investigation, some tasks need to be considered. These include the two main problems that frequently confront the analysis of aid effectiveness and often generate a wide divergence in the empirical outcomes (Clemens et al. 2012). The first problem is the timing of causal relationships between aid and its potential outcomes, as aid-funded projects might take a long time to achieve their desired goals (Clemens et al. 2012 and Galiani et al. 2017). The second problem arises from the fact that the analysis targets investigating the potential effects of aid on economic outcomes sometimes encounter endogeneity and the reverse causation problems, which need instrumental variable scheme.

Many attempts in literature have been directed to address the issue of timing causal relationships. These include, but not limited to, the usage of first difference and the lags of dependent variables (e.g. Clemens et al. 2004 and Clemens et al. 2012). In this paper, the intended analysis follows the specifications developed by Clemens et al. (2012) and Derher and Langlotz (2015). Based on this specification we take three-year averages for all variables under study assuming that aid needs this period to be effective.

To address the second problem, we found that most of the previous studies have relied greatly on adopting instrumental variables method to eliminate the so-called endogeneity problem (e.g. Clemens et al., 2012 and Werker et al., 2009). However, choosing valid and excludable instruments is, to some extent, controversial since there is no consensus among researchers regarding the inclusion of best instruments. Most of the influential studies (e.g. Boone, 1996; Burnside and Dollar 2000 & 2004; Rajan and Subramanian; 2008; Werker et al. 2009, and Clemens et al. 2004) used different instruments such as, political ties with donors, lagged aid and the size of aid's recipient country. Nevertheless, some authors argue that both validity and plausibility of these instruments are questionable (Clemens et al., 2012 and Galiani et al., 2017). Accordingly, and due to conflicting judgments on instrumentation, we follow the most recent

work of Ahmed (2016) and Derher and Langlotz (2015) by using interaction between donor's government fractionalization and a country's probability of receiving aid as instrument for aid.

Based on the above arguments and previous literature such as Ke et al. (2011), Wagstaff and van Doorslaer (2003), Clemens (2011) and Galiani et al. (2016), the estimable model that can be used to investigate the effects of aid and institutional quality on OOPHE in SSA can be specified as follows:

$$\mathbf{OOPHE}_{i,t} = \beta_0 + \beta_1 \mathbf{Aid}_{i,t-1} + \beta_2 \mathbf{X}_{i,t} + \beta_3 \mathbf{Inst}_{i,t} + \beta_4 \eta_i + \beta_5 \nu_t + \varepsilon_{i,t} \qquad (1)$$

Where $\mathbf{OOPHE}_{i,t}$ is the country's out of pocket health expenditure (as a percentage of private health spending), which is assumed to be related to a set of explanatory variables including the amount of net aid inflow (as a ratio to total population) in previous period ($\mathbf{Aid}_{i,t-1}$), a set of control variables ($\mathbf{X}_{i,t}$), as well as institutional quality in recipient countries ($\mathbf{Inst}_{i,t}$). Specifically, these variables include recipient country's macroeconomic, demographic factors such as per capita GDP, inflation, availability of banking credit, educational equality, health equality, population density, rural population, population under 15 years, population above 65 years, population' accessibility to improved water, population' accessibility to sanitation services, population' accessibility to clean fuels and the percentage of children who take immunization against hepatitis B. The set also encompasses the prevalence of diseases such as AIDS, Anemia, Tuberculosis and undernourishment. We use the accountability index as a proxy for institutional quality. Specifically, the institutional impact is modeled by interacting aid and accountability index. Finally, η_i represents the recipient country-specific effect, ν_t is time-specific effect, and ε_{it} is the error term.

According to existing literature, aid interacted with institutional variable are assumed to be endogenous to OOPHE and, thus, need to be instrumented. First, to instrument the aid effect, aid equation is specified as follows:

$$\mathbf{Aid}_{i,j,t} = \gamma \mathbf{FRA}_{j,t} * \mathbf{P}_{i,j} + \varepsilon_{i,j,t} \qquad (2)$$

$\mathbf{Aid}_{i,j,t}$ denotes the flow of aid from donor *j* to recipient *i* in period *t.* Following Ahmed (2016) and Dreher and Langlotz (2015), we relate bilateral aid to the interaction between donor's government fractionalization *FRACj* and the probability of receiving aid $\mathbf{P}_{i,j}$, which varies across donor recipient pairs and periods. This interaction term will control the impact of potentially endogenous variable (i.e., fractionalization), thus its effect would be considered as exogenous (Bun and Harrison 2014, Nizalova and Murtazashvili 2016). Accordingly, the coefficient from the interaction term (γ) ensures that we create our instrument from using exogenous variation only (Dreher and Langlotz, 2015).

Likewise, following recent empirical studies (e.g. Ahmed, 2016; Nunn and Qian, 2014 and Dreher and Langlotz, 2015), we measure the country's probability of receiving aid as a percentage of the years the country received aid from a particular donor over sample period under consideration. Precisely, the probability of receiving aid from a particular donor j is

$P_{i,j} = \frac{1}{T}\sum_{t=1}^{T} P_{i,j,t}$. Where $P_{i,j,t}$ indicate whether recipient i received positive amount of aid from donor j in year t, and T stands for the whole period of the study (i.e. period from 1995-2015)

Second, to instrument institutional quality, we estimate a first-stage regression as following:

$$\mathbf{Inst}_{i,j,t} = \delta \mathbf{Inter}_{j,t} * \mathbf{Accountability}_{i,j} + v_{i,j,t} \qquad (3)$$

Where $\mathbf{Inst}_{i,j,t}$ is institutional quality measured by the interaction between aid flow and accountability index. The dependent variable ($\mathbf{Inst}_{i,j,t}$) is a function of interaction between the interaction term (defined in equation 2) and the accountability index.

To investigate the impact of aid on PHE, equation 1 of OOPHE is replaced by PHE as follows:

$$\mathbf{PHE}_{i,t} = \alpha_0 + \alpha_1 \mathbf{OOPHE}_{i,t} + \alpha_2 \mathbf{Aid}_{i,t-1} + \alpha_3 \mathbf{X}_{i,t} + \alpha_4 \mathbf{Inst}_{i,t} + \alpha_5 \eta_i + \alpha_6 \nu_t + \varepsilon_{i,t} \qquad (4)$$

Where **PHE** represents the public health expenditure in aid's recipient country measured by proportion of government health spending to this country's GDP. The explanatory variables affecting PHE are, to some extent, indistinguishable from the factors that influence OOPHE in equation (1). We only replace GDP per capita by real GDP because PHE depends on the country's GDP. Additionally, equation 4 is augmented by OOPHE to capture the relationship between PHE and OOPHE. Finally, the previously discussed techniques for addressing endogeneity is also applied to equation 4, as the predicted dependent variables of equation 2 and 3 enter equation 4 as explanatory variables.

Furthermore, equations (1) and (4) will be estimated by adopting different specifications. This step is carried out for the sake of comparison and to see the extent to which the results match research objectives. That is, apart from effectiveness of total aid, we disaggregated ODA according to donors, i.e. DAC (Development Assistance Committee) aid and non-DAC aid; hence a separate regression for each group of donors is also estimated. In addition, to draw concise conclusions on aid effectiveness, it is reasonable to evaluate the effects of health aid on these two types of expenditure.
We see that estimating the above models using conventional methods such as ordinary least squares may turn out to be biased and, therefore, produces inconsistent estimators. To address this problem and to account for both the variations between the sub sets of data used (data for each country) and time effects, the study adopts a panel data analysis as an appropriate method to carry out this empirical analysis. Specifically, the study uses fixed-effect instrumental variables (FE-IV) method to conduct the empirical investigation.

4.2 Data and Data Sources

This study relies on annual data consisting of the full sample of SSA countries, over the period 1995-2015. Data on both OOP and PHE as well as the data on economic and demographic variables are sourced from World Development Indicators compiled by World Bank. We take the data on different types of aid (i.e. total real ODA, real ODA from DAC and Non-DAC donors and real health aid) directly from the OECD database. The data on government fractionalization is sourced from Political Institutions database. We resort to the Varieties of Democracy Database (V-Dem) to obtain data on accountability index which used as a proxy for institutional quality.

Alike, the data on health and educational equality is also obtained from V-Dem database. The data sources and definitions of variables used are presented in Appendix C.

5. Findings and Results

Table 5.1 reports the results on the model designed to investigate the probable impact of aid and institutional quality on OOPHE in SSA after controlling for socioeconomic, demographicand morbidity factors. As displayed in the table, the coefficients of the interaction between institutional quality variable in Model I, Model II, Model III and Model IV, which respectively examine the effect of total aid, aid from DAC donors, aid from non-DAC donors and health aid on OOPHE, are all statistically insignificant at conventional levels. This indicates that institutional quality fails to raise aid effectiveness to the extent that curbs OOPHE. Obviously, such an outcome contradicts the existing evidence which have repeatedly confirmed the importance of institutional quality in boosting aid effectiveness in (World Bank, 1998 and Burnside and Dollar, 2000). However, among other factors, this outcome can be attributed to the weakness in institutional quality that characterized the majority of SSA countries. The relative smallness of aid being disbursed to SSA may also limit the contribution of institutional quality to maximize the effectiveness of aid with respect to OOPHE reduction. Furthermore, the high morbidity rates and the epidemic nature of SSA region might also disturb the mechanism through which institutional quality affects OOPHE. Specifically, the wide spread of diseases among SSA communities increases this type of expenditure, mean while the institutional quality may stay as it is or at least exhibits sluggish improvements.

Similarly, the reported results show that in the four specifications of the first model, i.e. Model I, Model II, Model III and Model IV, the estimated coefficients of aid variables are not statistically significant. Thus, it can be inferred that total aid, aid disaggregated to DAC and non-DAC donors and health aid are ineffective in cutting back OOPHE undertaken by people in SSA. Strange as it may seem that aid allotted to health sector doesn't yield any desirable effects on the course of OOPHE. As the result in column 5 of Table 5.1 indicates, health aid variable in Model IV emerges with a statistically insignificant coefficient demonstrating that foreign aid has nothing to do with OOPHE in SSA even when it is channeled directly into health sector.

Table 5.1: FE- IV estimates for the impact of aid and institutional quality on OOPHE in SSA:

Dependent variable: Log of OOPHE				
Variable	**Model I**	**Model II**	**Model III**	**Model IV**
Ln aid	0.068	0.037	0.015	-0.029
	(0.300)	(0.084)	(0.138)	(0.456)
Ln aid *institutional quality	-0.035	-0.074	0.221	0.196
	(0.094)	(0.051)	(0.277)	(0.224)
Health equality	-0.057	-0.254**	-0.451	0.060
	(0.105)	(0.113)	(0.476)	(0.387)
Ln GDP per capita	-0.147	-0.542***	-0.864	0.435
	(0.481)	(0.208)	(0.855)	(0.958)

Credit	-0.000	0.005	0.004	0.009
	(0.006)	(0.005)	(0.009)	(0.006)
Educational equality	0.175	0.363***	0.131	0.091
	(0.116)	(0.112)	(0.223)	(0.379)
Population above65	-0.083	0.162	0.332	0.130
	(0.103)	(0.112)	(0.352)	(0.198)
Population under14	-0.081**	-0.126***	-0.159**	-0.160***
	(0.038)	(0.023)	(0.068)	(0.032)
Rural population	-0.024*	-0.021	-0.009	-0.007
	(0.014)	(0.017)	(0.024)	(0.032)
Undernourishment	0.009	0.021***	0.016*	0.024*
	(0.007)	(0.008)	(0.009)	(0.012)
Sanitation	-0.024	-0.061***	-0.045	-0.080**
	(0.035)	(0.013)	(0.039)	(0.037)
Water accessibility	0.007	0.026***	0.054*	0.022
	(0.007)	(0.008)	(0.028)	(0.021)
Electricity	-0.013**	0.006	-0.005	-0.006
	(0.007)	(0.006)	(0.029)	(0.027)
Population density	0.002	-0.004	-0.007	-0.008
	(0.002)	(0.004)	(0.007)	(0.006)
fuel	0.007	-0.013	-0.017	-0.012
	(0.018)	(0.011)	(0.020)	(0.024)
immunization	0.002	0.006**	0.001	0.003
	(0.002)	(0.002)	(0.003)	(0.005)
New-born tetanus	-0.003	-0.004	-0.013	-0.009
	(0.002)	(0.003)	(0.014)	(0.012)
Ln tuberculosis	-0.166	-0.269	-0.245	-0.412
	(0.239)	(0.167)	(0.274)	(1.134)
HIV	0.339***	0.402***	0.598***	0.483***
	(0.094)	(0.081)	(0.179)	(0.094)
Anemiachildren	0.013	0.016**	0.023*	0.013
	(0.008)	(0.007)	(0.013)	(0.011)
Inflation	-0.001*	0.002	-0.001	-0.005
	(0.001)	(0.003)	(0.005)	(0.009)
F-statistic	6.63***	132.46***	26.87***	11.04***
N. of observations	170	134	124	129

Note: Data are averaged over three years at the recipient-period level. Recipient- and period- fixed effects are included. Standard errors are in parentheses and ***p<0.001, **p<0.01, *p<0.05 are significance levels.

Many justifications can be called up to explain the failure of aid in mitigating the incidence of skyrocketing OOPHE in SSA. First, the institutional capacity in SSA is quite weak and fragile. The institutions fail to meet the minimum thresholdsof quality needed to boost aid effectiveness particularly with respect to health issues. In this regard, most of SSA countries are cited with high levels of corruption and institutional weakness. This fact makes domestic institutions unable to raise the utilization of aid to the levels that could possibly moderate OOPHE. Second, aid inflows into SSA are mostly come as a response to the occurrence of health disasters (i.e. the

sudden outbreaks of diseases) which frequently hits the region. Accordingly, aid inflows leave the patterns of OOPHE unaffected. Specifically, in the presence of health crises, aid inflows are gearedto cover the urgent needs of population such as medication, medical checkups and drugs provision. Under these circumstances, aid disbursements might target smoothing catastrophic health expenses resulting from health disasters, leaving annual average OOPHE as it was prior to foreign intervention.

Third, the fragile infrastructural development can be also counted among the reasons behind infectiveness of aid. For instance, due to unavailability of modern transportation networks, people in SSA used to bear higher costs in order to reach health centers. Fourth, the health systems in most of SSA countries are characterized by inequitable distribution of health care facilities, weakness in managerial practices and the lack of coordination mechanisms. Health systems with such characteristics would certainly fail to absorb aid resources in a manner that could possibly contribute to lessen OOPHE. Countless studies have repeatedly argued that the lack of coordination between healthprojects funded by aid is likely to deteriorate the effectiveness of aid disbursed to health sector (Justice, 1987; Cliff, 1993; Zaidi, 1994; Fryatt, 1995 and LaFond, 1995).

Fifth, the insignificant effects of aid on OOPHEcan be also attributed to the smallness of aid being disbursed to SSA countries. It is well known that SSA has achieved a great leap in economic development during the last two decades. These improvements may motivate donors to cut the amounts of aid being disbursed to the region. As a consequence, the smallness of real aid decreases its contribution in reducing OOPHE (Keet al, 2003 and Dalal, 2017).Finally, the failure of aid in dropping OOPHE might result from the moral hazard that usually associates the management of aid resources in recipient countries. That is the staffs and agencies managing aid resources feel that they are not fully responsible if these resources fail to control the financial burden of poor healthiness being tolerated by targeted people.

The coefficients of control variables seem to be in line with prior expectations and of interpretable magnitudes. For instance, the coefficients on health equality, GDP per capita, population with ages under 14 years old, population with access to sanitation services are negative and statistically significant emphasizingthe importance of these factors in moderating OOPHE. Expectedly, the coefficient accompanied the variable of new HIV infections among uninfected population aging 15-49 appears with a positive and statistically significant sign across the four specifications, signifying the back-breaking financial burden occurs due to the highprevalenceof AIDS in SSA. The incidence of anemia among under-five children seems to be playing similar effect on OOPHE. In the same way, the coefficients in front of undernourishment, increases in the portion of population with access to improved water, and child immunization ratevariables appear to be positive and statistically significant in some of the modelsunder consideration. It is worth noting that combating under nourishment among population, heightening the levels of immunization and increasing the accessibilitytoimproved water are among the core missions of government. Accordingly, the positive association between these factors and OOPHE may indicate that SSA governments don’t give high concerns to the provision of these vital services.

Table 5.3 exhibits the results on four estimated specifications of model 2. As stated previously, these specifications attempt to investigate the impact of total aid, aid from DAC and non-DAC donors and health aid on PHE in SSA. As can be read from reported results, the coefficients of aid variable in Model V, Model IV and VIII are statistically insignificant; indicating that total aid, aid from DAC donors and aid disbursed to health has no significant effect on PHE. In contrast, the results on Model VII show that the coefficient of non-DAC aid variable is positive and statistically significant demonstrating that financial assistance from this group of donors motivates governments to deploy more resources to health sector. Seen from other perspective, this finding may stand as an indication that non-DAC aid is not fungible. That is, the coefficient of the variable indicates that an increase in aid from non-DAC donors, say, by one percent increases PHE by 0.25 percent. Interestingly, these findings lend a great support to the previous evidence on the absence of fungibility hypothesis in SSA context (Liang and Mirelman, 2014).
Unexpectedly, the coefficient of aid variable in Model VIII reveals that, health aid exerts no significant effect on PHE. Apparently, this outcome opposes the well-established evidence brought by previous studies arguing that bilateral aid and external fund for health is fungible with government health spending (Heller, 1975; Khan and Hoshino, 1992; Gbesemete and Gerdtham 1992; Brautigam and Knack, 2004; Yontcheva and Masud, 2005; Farag et al., 2009; Murthy and Okunade 2009; Ke et al., 2011 and Salgado-Vega and Salgado-Naime, 2013).

Table 5.3: FE- IV estimates for the impact of aid and institutional qualityon PHE in SSA

Dependent variable: Log of PHE				
Variable	**Model V**	**Model IV**	**Model VII**	**Model VIII**
Ln Aid	-0.236	0.082	0.252*	0.258
	0.251	[0.082]	(0.145)	(0.257)
Ln aid*Institutional quality	0.164*	0.056	0.324*	-0.161
	0.089	(0.043)	(0.178)	(0.163)
Ln OOPHE	-0.204	0.032	0.116	-0.332
	0.162	(0.126)	(0.215)	(0.274)
Ln GDP	-0.021	-0.390	0.417	-1.150
	0.505	(0.332)	(0.701)	(0.873)
Consumption growth	0.004	-0.001	-0.009	0.006
	0.005	(0.005)	(0.008)	(0.007)
Educational equality	-0.328*	-0.235	0.074	-0.130
	0.174	(0.208)	(0.292)	(0.249)
Health equality	0.531***	0.381**	-0.419	0.306
	0.182	(0.184)	(0.563)	(0.251)
pop_65	0.036	-0.097	-0.572	0.048
	0.186	(0.163)	(0.418)	(0.403)
pop14	-0.025	0.065**	-0.327**	0.146
	0.041	(0.029)	(0.148)	(0.089)
Rural population	-0.029	-0.007	0.002	-0.059
	0.034	(0.027)	(0.047)	(0.043)
Undernourishment	0.018**	0.016**	-0.008	0.025**
	0.009	(0.007)	(0.027)	(0.012)

Sanitation	-0.047	0.022	0.099*	0.012
	0.033	(0.021)	(0.057)	(0.036)
Water	0.007	-0.008	-0.041	0.007
	0.013	(0.015)	(0.050)	(0.023)
Electricity	0.014	0.001	-0.086***	0.015
	0.0109	(0.012)	(0.031)	(0.017)
Population density	0.005	0.007**	0.022*	0.011
	0.003	(0.003)	(0.013)	(0.008)
Immunization	0.006*	0.007**	0.015**	0.010***
	0.003	(0.004)	(0.008)	(0.004)
New-borntetanus	-0.005	0.002	-0.018	0.000
	0.005	(0.003)	(0.012)	(0.006)
Ln Tuberculosis	0.018	-0.013	0.503	0.193
	0.298	(0.167)	(0.556)	(0.338)
HIV	0.118	-0.249	0.175	-0.186
	0.264	(0.176)	(0.374)	(0.301)
Anemia child	0.008	-0.011	0.038	-0.001
	0.012	(0.008)	(0.024)	(0.013)
Inflation	-0.008	-0.005*	-0.014***	(0.004)
	0.004	(0.003)	(0.004)	(0.007)
F-statistic	14.28***	17.38***	68.86***	23.42***
N. of observations	139	110	102	102

Note: Note: Data are averaged over three years at the recipient-period level. Recipient- and period- fixed effects are included. Standard errors are in parentheses and ***p<0.001, **p<0.01, *p<0.05 are significance levels

The results also show that many control variables are statistically significant and associated with predicted signs confirming the good fit of the models. Remarkably, the results on Models V and VII support the hypothesis stating that institutional quality has a positive effect on the patterns of public health spending in SSA. Specifically, the coefficients of interactions between aid and institutional quality variablesin these two models are positive and statistically significant indicating that the institutional qualitymaximize the role of aid in prompting PHE in SSA. In contrast, the coefficients of this variable in Models IV and VIII are all statistically insignificant.

Several explanations can be given to justify why institutional quality work well with total and non-DAC and fail in the case of DAC and health aid. First, the effect of institutional quality on PHE is likely to be affected by experiences that donors have on dialing with aid disbursement. For instance, due to their rich heritages in disbursing aid, DAC donors are more likely to have a good experience in dealing with aid issues. This experience would help them to adoptsophisticated control mechanisms to guarantee a transparent delivery of aid to targeted areas and populations regardless the levels of institutional quality in the recipients. Recipient countries on their sides are more likely to be truthful in using aid granted by DAC donors effectively. One of the motives that may push recipients to behave this way is the fact that DAC donors are well-connected with the active international organizations such as UN, IMF and World Bank and also have a great weight in shaping international relations. Thus, to guarantee a good appearance, recipient countries are expected to use aid from DAC donors transparently. In contrast, non-DAC donors, who mostly don't possess extensive experience with aid and who

have sympathetic ties with recipient countries, are more likely to donate without giving concerns to the level of accountability needed to channel donation to its prearranged targets. Thus, since these countries are not accountable for the transparent utilization of aid being granted by those donors, preserving high institutional quality can be regarded as a necessary catalyst to make aid effective in lowering OOPHE and simultaneously boosts PHE. Second, the positive and statistically significant coefficients of aid variable in Model V and VII may signify that aid has been used to expand heath infrastructures such as hospital, diagnostic centers, dressing points, …., etc. In the end, establishing these health facilities would improve the utilization of health care services, pushing health spending by government to grow.

6. Conclusions and Policy Recommendations

This study aims at investigating three basic questions concerning the effectiveness of aid in SSA region: (1) does aid contribute in curbing OOPHE experiencedby population in SSA, (2) does aid exercise a significant impact on the PHE in the region i.e. examining whether aid disbursed to SSA is fungible or not, and (3) To what extent does institutional quality affect the patterns of OOP and PHE in the region. To address these questions, the study uses panel data spanned over the period 1995 to 2015 for 45 SSA countries.Two core econometric models have been developed to execute the empirical investigation. The first model examines the effect of aid on OOPHE; while thesecond investigates thefungible effect that could probably arise from the presence of aid. In these two models, the interaction between aid and institutional quality has been introduced as a key explanatory variable to detect the influence of institutional quality on the utilization of aid in such way that could maximize its desirable effects on health expenditures.To give more insight to the analysis, we disaggregated aid data to total aid, aid from both DAC and non-DAC donors and health aid. Specifically, the impact of total aid, aid from DAC donors, aid from non-DAC donors and healthaid on OOPHE and PHE is examined independently. We take into account the problems that frequently challenge the analysis of aid effectivenesswhen panel data is used namely, the endogeneity and the timing of causal relationships between aid and its potential outputs. Following the recent empirical work of Derher and Langlotz (2015), we instrumented aid by the interaction between donor government fractionalization and the probability of receiving aid by each of SSA countries to free our analysis from the endogeneity problem. Similarly, to overcome the problem of timing of causal relationships between aid and output, we follow the lead of Clemens et al. (2012) and Derher and Langlotz (2015) by using three-year averages, assuming that aid needs this time period to affect health expenditures.In line with this method, the instrumental variables (IV) fixed effects econometric approach has been applied to the three years-averaged panel data to run the empirical investigation.

Our findings indicate that the interaction between aid and institutional quality has no statistical significant effect in making aid more effective in reducing OOPHE in SSA. However, the results on the second model, which concerns with impact of aid on PHE, show different outcomes. Specifically, for the models concerned with DAC and health aid, the institutional qualityappears to have no significant effect in stimulatingaid effectiveness on PHE. Conversely, this variable comes up with a positive and statistically significant coefficient when total DAC aid and non-DAC aid are considered. This indicates that preserving higher institutional quality makes total DAC aid and aid granted by non-DAC donors play a positive role in triggeringexpansion in PHE. The results also show that aid doesn't reduce OOPHE in SSA. It is worth to note that this

outcome has been hold for total aid, aid fromDAC and non-DAC donors as well as aid allotted to health sector.

On the whole, although the institutional quality seems to be unable to determine the effect of aid on the route of health spending in SSA, however, some policy actions can be suggested. First, both policymakers and donors are advised to work honestly on building the administrative capacities of local cadresand sustaining a transparent institutional framework in order to maximize the benefits of aid with respect to health spending. Second, the insignificant impact of aid on health expenditures calls donors to revise their strategies on aid's disbursement to developing countries, particularly SSA ones. This step need to be taken to guarantee that aid disbursed has been used in sectors pertain to human welfare such education and health.Therefore, imposing more conditions on the provision of aid to recipient countries would act as an effective strategy to ensure that these resources are spent on the aspects of welfare. In these regards, donors may need to coordinate with each other and with recipients in order to guarantee that aid resources are allocated efficiently. Third, improving governance and transparency should be put on the top of development agendas in SSA countries. Sustaining high levels of governance and transparency would help in managing both domestic and foreign resources efficiently and, therefore, realize maximum potential benefits for population.

References

Addison, T. and Baliamoune-Lutz, M., 2006. Economic reform when institutional quality is weak: The case of the Maghreb. *Journal of Policy Modeling*, *28*(9), pp.1029-1043.

Ahmed, F.Z., 2016. Does foreign aid harm political rights? Evidence from US aid. Quarterly *Journal of Political Science, 11*(2), pp.183-217.

Azam, J.P., Devarajan, S. and O'Connell, S.A., 1999. *Aid dependence reconsidered* (Vol. 2144). World Bank Publications.

Baliamoune-Lutz, M. and Mavrotas, G., 2009. Aid effectiveness: looking at the aid–social capital–growth nexus. *Review of Development Economics,* 13(3), pp.510-525.

Beynon, J., 2002. Policy implications for aid allocations of recent research on aid effectiveness and selectivity. *New Perspectives on Foreign Aid and Economic Development, Praeger Publishers, Westport, CT*, pp.199-251.

Boone, P., 1996. Politics and the effectiveness of foreign aid. *European economic review, 40*(2), pp.289-329.

Brautigam, D.A. and Knack, S., 2004. Foreign aid, institutions, and governance in sub-Saharan Africa. *Economic development and cultural change*, 52(2), pp.255-285.

Bun, M. and Harrison, T.D., 2014. OLS and IV estimation of regression models including endogenous interaction terms. *University of Amsterdam discussion paper, 2*.

Burnside, C. and Dollar, D., 2000. Aid, growth, the incentive regime, and poverty reduction. *The World Bank: Structure and Policies, 3*, p.210.

Burnside, C. and Dollar, D., 2004. Aid, policies, and growth: reply. *The American Economic Review*, 94(3), pp.781-784.

Clemens, M.A., 2011. Economics and emigration: Trillion-dollar bills on the sidewalk?. *The Journal of Economic Perspectives, 25*(3), pp.83-106.

Clemens, M.A., Radelet, S. and Bhavnani, R.R., 2004. Counting chickens when they hatch: The short-term effect of aid on growth.

Clemens, M.A., Radelet, S., Bhavnani, R.R. and Bazzi, S., 2012. Counting chickens when they hatch: Timing and the effects of aid on growth. *The Economic Journal, 122*(561), pp.590-617.

Cliff, J., 1993. Donor-dependence or donor control? The case of Mozambique. Community Development Journal, 28(3), pp.237-244.

Collier, P. and Dollar, D., 2001. Can the world cut poverty in half? How policy reform and effective aid can meet international development goals. *World development, 29*(11), pp.1787-1802.

Commission for Africa, 2005. *Our Common Interest: An Argument*. Penguin UK.

Dalal, K., 2017. Evolution and patterns of global health financing 1995-2014: development assistance for health, and government, prepaid private, and out-of-pocket health spending in 184 countries. *The Lancet.*

Devarajan, S., Rajkumar, A. S., & Swaroop, V., 1999. What does aid to Africa finance? *Research Working papers*, *1*(1), pp.1-34.

Djankov, S., Garcia-Montalvo, J. and Reynal-Querol, M., 2006. Does foreign aid help?.

Dreher, A. and Langlotz, S., 2015. Aid and growth. New evidence using an excludable instrument.

Fairbank, A., 2014. *Fungibility of Donor Assistance to Liberia: Focusing on Aid to the Health Sector, a case study* (No. 88183). The World Bank.

Farag, M., Nandakumar, A.K., Wallack, S.S., Gaumer, G. and Hodgkin, D., 2009. Does funding from donors displace government spending for health in developing countries? *Health Affairs, 28*(4), pp.1045-1055.

Feyzioglu, T., Swaroop, V. and Zhu, M., 1998. A panel data analysis of the fungibility of foreign aid. *The World Bank Economic Review, 12*(1), pp.29-58.

Fryatt, R.J., 1995. Foreign aid and TB control policy in Nepal. *Lancet (London, England)*, 346(8971), p.328.

Galiani, S., Knack, S., Xu, L.C. and Zou, B., 2017. The effect of aid on growth: Evidence from a quasi-experiment. *Journal of Economic* Growth, 22(1), pp.1-33.

Gbesemete, K.P. and Gerdtham, U.G., 1992. Determinants of health care expenditure in Africa: a cross-sectional study. World development, 20(2), pp.303-308.

Gomanee, K., Morrissey, O., Mosley, P. and Verschoor, A., 2005. Aid, government expenditure, and aggregate welfare. *World Development, 33*(3), pp.355-370.

Gottret, P.E. and Schieber, G., 2006. *Health financing revisited: a practitioner's guide.* World Bank Publications.

Gupta, S., Davoodi, H.R. and Tiongson, E.R., 2000. Corruption and the Provision of Health Care and Education Services.

Heller, P.S., 1975. A model of public fiscal behavior in developing countries: Aid, investment, and taxation. *The American Economic Review, 65*(3), pp.429-445.

Justice, J., 1987. The bureaucratic context of international health: a social scientist's view. Social Science & Medicine, 25(12), pp.1301-1306.

Kaldor, N., 1963. Will underdeveloped countries learn to tax?. *Foreign Affairs,* 41(2), pp.410-419.

Ke, X., Saksena, P. and Holly, A., 2011. The determinants of health expenditure: a country-level panel data analysis. *Geneva: World Health Organization.*

Khan, H.A. and Hoshino, E., 1992. Impact of foreign aid on the fiscal behavior of LDC governments. *World Development, 20*(10), pp.1481-1488.

Khilji, N.M. and Zampelli, E.M., 1991. The fungibility of US assistance to developing countries and the impact on recipient expanditures: a case study of Pakistan. World Development, 19(8), pp.1095-1105.

Knack, S.F. and Rahman, A., 2003. Donor fragmentation and bureaucratic quality in aid recipients (Vol. 3186). World Bank Publications.

LaFond, A., 1995. Sustaining primary health care. Earthscan.

Li, Y., Wu, Q., Xu, L., Legge, D., Hao, Y., Gao, L., Ning, N. and Wan, G., 2012. Factors affecting catastrophic health expenditure and impoverishment from medical expenses in China: policy implications of universal health insurance. *Bulletin of the World Health Organization, 90*(9), pp.664-671.

Liang, L.L. and Mirelman, A.J., 2014. Why do some countries spend more for health? An assessment of sociopolitical determinants and international aid for government health expenditures. Social Science & Medicine, 114, pp.161-168.

Lu, C., Schneider, M.T., Gubbins, P., Leach-Kemon, K., Jamison, D. and Murray, C.J., 2010. Public financing of health in developing countries: a cross-national systematic analysis. *The Lancet,* 375(9723), pp.1375-1387.

McIntyre, D., Thiede, M., Dahlgren, G. and Whitehead, M., 2006. What are the economic consequences for households of illness and of paying for health care in low-and middle-income country contexts? *Social science & medicine,* 62(4), pp.858-865.

Mosley, P., 1980. Aid, savings and growth revisited. Oxford Bulletin of Economics and Statistics, 42(2), pp.79-95.

Mosley, P., Hudson, J. and Horrell, S., 1987. Aid, the public sector and the market in less developed countries. *The Economic Journal*, *97*(387), pp.616-641.

Mosley, P., Hudson, J. and Horrell, S., 1992. Aid, the public sector and the market in less developed countries: A return to the scene of the crime. *Journal of International Development,* 4(2), pp.139-150.

Moss, T.J., PetterssonGelander, G. and Van de Walle, N., 2006. An aid-institutions paradox? A review essay on aid dependency and state building in sub-Saharan Africa.

Murthy, V.N. and Okunade, A.A., 2009. The core determinants of health expenditure in the African context: Some econometric evidence for policy. Health policy, 91(1), pp.57-62.

Ndikumana, L. and Pickbourn, L., 2017. The impact of foreign aid allocation on access to social services in sub-Saharan Africa: the case of water and sanitation. *World Development*, 90, pp.104-114.

Nizalova, O.Y. and Murtazashvili, I., 2016. Exogenous treatment and endogenous factors: Vanishing of omitted variable bias on the interaction term. *Journal of Econometric Methods, 5*(1), pp.71-77.

Nunn, N. and Qian, N., 2014. US food aid and civil conflict. *The American Economic Review, 104*(6), pp.1630-1666.

OECD, 2016. Table DAC2a (http://stats.oecd.org)

Ogundipe, A.A., Ojeaga, P. and Ogundipe, O.M., 2014. Is Aid Really Dead? Evidence from Sub-Saharan Africa.

Okunade, A.A., 2005. Analysis and implications of the determinants of healthcare expenditure in African countries. *Health Care Management Science, 8*(4), pp.267-276.

Pack, H. and Pack, J.R., 1993. Foreign aid and the question of fungibility. *The Review of Economics and Statistics,* pp.258-265.

Pivovarsky, M.A., Clements, M.B.J., Gupta, M.S. and Tiongson, M.E., 2003. *Foreign aid and revenue response: does the composition of aid matter?* (No. 3-176). International Monetary Fund.

Rajan, R.G. and Subramanian, A., 2008. Aid and growth: What does the cross-country evidence really show?. *The Review of economics and Statistics, 90*(4), pp.643-665.

Sachs, J.D., 2003. *Institutions don't rule: direct effects of geography on per capita income* (No. w9490). National Bureau of Economic Research.

Salgado-Vega, J. and Salgado-Naime, F.Y., 2013. Health Expenditures in Latin America 1995-2010. International Journal of Public and Private Healthcare Management and Economics (IJPPHME), 3(2), pp.46-63.

Shahrawat, R. and Rao, K.D., 2011. Insured yet vulnerable: out-of-pocket payments and India's poor. *Health policy and planning, 27(3)*, pp.213-221.

Van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R.P., Somanathan, A., Adhikari, S.R., Garg, C.C., Harbianto, D., Herrin, A.N., Huq, M.N., Ibragimova, S. and Karan, A., 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. *Thelancet*, 368(9544), pp.1357-1364.

Van Minh, H., Phuong, N.T.K., Saksena, P., James, C.D. and Xu, K., 2013. Financial burden of household out-of pocket health expenditure in Viet Nam: findings from the National Living Standard Survey 2002–2010. *Social science & medicine, 96*, pp.258-263.

Wagstaff, A. and Doorslaer, E.V., 2003. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. *Health economics,* 12(11), pp.921-933.

Werker, E., Ahmed, F.Z. and Cohen, C., 2009. How is foreign aid spent? Evidence from a natural experiment. *American Economic Journal: Macroeconomics*, pp.225-244.

Whitaker, M.T., 2006. The impact of foreign aid on economic growth. *Bachelor of Arts in Economics Thesis Submitted to the Economics Faculty McAnulty College of Liberal Arts Duquesne University Pittsburgh, Pennsylvania.*

World Bank. 1993. World Development Report: Investing in Health. Washington, D.C.

World Bank. 1998. Assessing aid: What works, what doesn't, and why. Washington, DC: World Bank.

World Health Organization. Regional Office for Africa, 2006. *The health of the people: the African regional health report.* World Health Organization.

Xu, K., Evans, D.B., Kawabata, K., Zeramdini, R., Klavus, J. and Murray, C.J., 2003. Household catastrophic health expenditure: a multicountry analysis. *The lancet,* 362(9378), pp.111-117.

Yontcheva, B. and Masud, N., 2005. Does foreign aid reduce poverty? *Empirical evidence from nongovernmental and bilateral aid* (No. 5-100). International Monetary Fund.

Zaidi, S.A., 1994. Planning in the health sector: for whom, by whom? Social Science & Medicine, 39(9), pp.1385-1393.

Appendixes:

Appendix C: Definitions and sources

Variable	Description	Data Source

Ln aid	The real value of net ODA (total ODA, ODA from DAC and non-DAC donors and health aid) scaled by population. In the empirical analysis, Ln aid is distinguished according to aid type to be tested.	OECD , Table DAC2a(http://stats.oecd.org), World Development Indicator
Ln aid* institutional quality	The lag of real value net ODA (total ODA, ODA from DAC and non-DAC donors and health aid) scaled by population and interacted with accountability in a recipient country.	OECD (http://stats.oecd.org), Table DAC2a, World Development Indicator and Varieties of Democracy Data (V-Dem) database
Ln OOPHE	Natural logarithm of out of pocket health expenditure (% of private expenditure on health)	World Development Indicator
Ln GDP	Natural logarithm of real gross domestic product	World Development Indicator
GDP per capita	GDP per capita based on purchasing power parity (PPP).	World Development Indicator
Consumption growth	Annual growth of household final consumption expenditure.	World Development Indicator
Educational equality	Educational equality measures to what extent is high quality basic education guaranteed to all.	Varieties of Democracy Data (V-Dem) database
Health equality	Health equality measures the extent to which is high quality basic healthcare guaranteed to all.	Varieties of Democracy Data (V-Dem) database
Population above 65	Population ages 65 and above (% of total population)	World Development Indicators
Population under14	Population with ages under 14 (% of total population).	World Development Indicators
Rural population	Rural population (% of total population)	World Development Indicators
Undernourishment	Prevalence of undernourishment (% of population)	World Development Indicators
Sanitation	Improved sanitation facilities (% of population with access)	World Development Indicators
Water accessibility	Improved water source, urban (% of urban population with access)	World Development Indicators

Electricity	Access to electricity (% of population)	World Development Indicators
Population density	Population density (people per sq. km of land area).	World Development Indicators
Fuel	Access to clean fuels and technologies for cooking (% of population).	World Development Indicators
Immunization	Immunization, HepB3 (% of one-year-old children).	World Development Indicators
New-born tetanus	Newborns protected against tetanus (%).	World Development Indicators
Ln tuberculosis	Natural logarithm of incidence of tuberculosis (per 100,000 people).	World Development Indicators
HIV	Incidence of HIV (% of uninfected population ages 15-49.	World Development Indicators
Anemiachildren	The percentage of children under age 5 whose hemoglobin level is less than 110 grams per liter at sea level.	World Development Indicators
Inflation	Inflation, GDP deflator (annual %)	World Development Indicators