

# Official development assistance granted by the EU and economic growth in Sub-Saharan African countries\*

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**Abstract.** Aid has been extensively debated with regard to its effects on growth of the recipient countries, its efficiency and effectiveness, as well as the donors' motives for granting it, resulting in a wide array of points of view. This paper is intended to add to the discussion by focusing on the Official Development Assistance (ODA) granted by the EU member states to Sub-Saharan African (SSA) countries. The SSA countries covered in this study are Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, Uganda, and Zimbabwe. The paper tests and confirms the hypothesis that there is a positive relationship between the ODA granted to SSA countries and the latter countries' economic growth, keeping everything else constant. A considerable part of this exercise is to identify what factors are needed to be kept constant in order to isolate the effect of ODA on growth.

## 1. Objective of the paper

Aid has been extensively debated with regards to its effects on growth of the recipient countries, its efficiency and effectiveness as well as the donors' motives for granting aid, resulting in a wide array of standpoints. This paper is intended to add to the discussion by focusing on the Official Development Assistance (ODA) granted by the EU member states to Sub-Saharan African (SSA) countries.

The paper tests the hypothesis that there is a positive relationship between the ODA granted to SSA countries and the latter countries' economic growth, keeping everything else constant. A considerable part of this exercise is to identify what factors need to be kept constant in order to isolate the effect of ODA on growth.

In testing the hypothesis of the paper, a panel data regression approach is used. This approach utilises information for each country and for each year covered, thereby obtaining a large number of data points and increasing the degrees of freedom. Panel data was preferred over a single-year cross-sectional analysis given that economic growth requires an analysis over time.

The paper covers 20 low-income SSA countries for the period 2000-2014. The SSA countries covered in this study are Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, Uganda, and Zimbabwe. The focus in this study is ODA originating from the EU given that the EU is a major aid contributor to the SSA countries, which, though registering solid

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developmental gains during the period covered, significant economic challenges remain.

This paper is organized in five sections. Following this introduction, the second section delves into the literature where the theoretical and empirical relationship between official development assistance and economic growth are analysed. Section 3 describes the methodology used for the empirical analysis, which is the panel data regression method, to assess the impact of ODA on economic growth of the SSA. The results of the regression analysis and relevant diagnostic tests are presented in Section 4. A discussion on results accompanied by policy implications are put forward in the concluding section.

## **2. Literature Review**

### **Meaning of aid and motives for granting aid**

According to the Organization for Economic Cooperation and Development (OECD), ODA Official development assistance (ODA) is defined by the OECD Development as government aid that promotes and specifically targets the economic development and welfare of developing countries.<sup>1</sup> To be considered as ‘aid’ these transfers should have a concessional financial component, such as grant element. Technical co-operation is also considered as aid, while grants, loans and credits for military purposes and transactions that have a primarily commercial objectives are excluded.

The motives of countries for granting aid vary. According to Chenery and Strout (1966) the primary objective of foreign aid granting should be social and economic development measured by improvements in per capita income. However, in reality, as Griffin and Enos (1970) and many other authors contend, economic and political interests of powerful countries are often the motives for ODA with social justice or any other ethical criterion being subordinate to the national interest. Alesina and Dollar (2000) discussed these opposing motives for granting aid and concluded that although aid may be given on the basis of poverty levels of recipient countries, strategic interest, colonial history, trade and political institutions play an important part. Easterly (2003) adds the possibility that developed countries also give aid to reward allies. Wars and terrorist attacks also played a role with regard to the motives for granting aid. Meernik et al. (1998) showed that at the end of the cold war there was a declining importance of security concerns, a significant decline in aid transfers, and an increased emphasis on poverty in allocation decisions. Berthélemy and Tichit (2004) argue that the geopolitical concerns of aid allocation during the cold war have been replaced not by increased poverty concerns but by trade relationships.

There is some evidence that Nordic Countries (namely Norway, Denmark, Sweden and Finland) have a more ethical motive for granting aid than most other donors. Alesina and Weder (2002) focus on the link between corruption and aid allocation over the period 1975-1995, both in aggregate and by individual donors. They find Nordic donors tend to give less aid to corrupt recipients, whereas for other donors there is no robust relationship. They postulated that Nordic donors are freed from colonial ties and can

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<sup>1</sup> <https://www.oecd.org/dac/stats/What-is-ODA.pdf>

thus be more sensitive to other considerations. Gates and Hoeffler (2004) explicitly tested and confirmed the idea that Nordic donors are different, finding them to be more influenced by democracy and less influenced by trade, compared with other donors.

### **Aid and economic development**

In the post-war literature, aid was central to development discussions within the so-called capital bottleneck theories (Meier and Stiglitz, 2001; Chenery and Strout, 1966). In these theories, capital scarcity was considered as a major contributory factor to economic backwardness. External finance was seen as a way out of poverty and stagnation by providing developing countries with much needed and scarce investment. Early growth models stressed the role of capital formation in development (Papanek, 1972).

Growth was associated with additional resources for the availability of capital goods that could increase the productive potential of the economy. Due to the fact that underdeveloped countries tended to be capital deficient, it followed that financial support from developed countries was needed. Rosenstein-Rodan (1961) used the above argument with regards to the allocation of foreign aid to the economically backward countries. To Rosenstein-Rodan foreign aid enables the recipient country to make so-called “transition from stagnation to self-sustaining economic growth”. The logic underpinning this development theory was simple: capital investment is determined by savings and savings are determined by per capita income. Since in poor countries incomes were generally low, savings were also low, and leads to the “vicious circle of poverty” (Nurkse, 1952). Thus, it was argued, this is why investment financed by foreign aid would break-up the vicious circle.

### **Does aid lead to economic growth?**

Many studies conclude that aid is good for growth, under certain circumstances, such as good economic policy in the recipient country. However, the alternative view that aid is not conducive to growth has also been put forward in studies on this subject. This is a hotly debated issue and, as will be shown below, it cannot be said that there is consensus on this matter.

#### *Aid promotes economic growth*

Hansen & Tarp (2011) examined this relationship across countries and conclude that in all likelihood aid is good for economic growth, mostly through its impact via investment. Morrissey (2001) also identified the effect of aid on investment in physical and human capital leading to economic growth as the most beneficial effect of aid. The author argued that there was evidence that aid does work, conditional on other variables in the growth regression, arguing that recipient countries that are more susceptible to economic shocks will tend to have a poor growth performance for that reason.

Burnside and Dollar (2000) also contended that aid can be conclusive to growth, but emphasised the point that this requires good economic governance in the recipient countries, involving fiscal, monetary, and trade policies. The authors further contended that there was a marked trend toward better policy among poor countries, which means that the climate for effective aid was improving. These authors also investigated there

was a difference between bilateral and multilateral aid in this regard. They found that multilateral donors tend to allocate on the basis of good policy, whereas bilateral aid donors do not. These findings, combined with a separate finding that bilateral aid is strongly positively correlated with government consumption, may help to explain why the impact of foreign aid on growth is not as effective as it could be. These results would seem to suggest, as argued in argument is also supported World Bank (1988) that making aid more systematically conditional on the quality of policies would likely increase its impact on developing country growth.

Dalgaard et al (2004) associated aid inflows with productivity and therefore beneficial to growth, depending on various factors including structural characteristics of the recipient country and climate-related circumstances. The climate factor, according to the authors may, to an extent, explain why aid works better in some countries compared with others. They contended that over the thirty years prior to 2004, aid seems to have been far less effective in tropical areas and therefore accounting for climate conditions would seem to be a worthwhile topic for research on this matter.

#### *Aid does not promote growth*

The positive effect of aid on growth has been contested in many studies. Easterly (2003) states that the common finding that aid promotes growth in a good policy environment is not robust, given that there are various definitions of aid, policy and growth, concluding that this finding therefore rests on shaky ground. The author argued that too much was expected from aid, stating that in virtually no other field of economics do economists and policymakers promise such large welfare benefits. According to the same author, although transfer of income from rich to poor is a worthy cause, the goal of aid should simply be to benefit some poor people some of the time and improving the quality of aid should come before increasing quantity.

An important aspect of aid effectiveness relates to the use made of it by governments of the recipient countries, given that almost all aid is given to governments. The World Bank (1998) in considering the fungibility of aid, referred to the possibility that aid intended for investment is diverted to non-productive uses. Morrissey (2001) is of the view that such corruption certainly happens, but its incidence may be exaggerated.

Rajan and Subramanian (2008) in assessing the effects of aid on growth across a number of developing countries found little robust evidence of a positive (or negative) relationship between aid inflows and its economic growth, even when keeping policy or geographical environments constant. In a later paper, the same authors (Rajan and Subramanian, 2011) attribute the lack of impact of aid on growth to the effect of aid on the exchange rate of the currency of the recipient country (the Dutch disease), which could in turn work against growth. In examining the effects of aid on the manufacturing sector they found that aid inflows had systematic adverse effects on a country's manufacturing competitiveness and provided evidence that the reason for this is the real exchange rate appreciation caused by aid inflows. They conjectured that this may explain, in part, why it was hard to find robust evidence that foreign aid helps countries grow.

The ineffectiveness of aid has been discussed by Hout (2018) through an account of a number of critics over time. The author refers to Moyo (2009) to explain the vicious

cycle of aid, which, according to Moyo, chokes off desperately needed investment, instils a culture of dependency, and facilitates rampant and systematic corruption, all with deleterious consequences for growth, guaranteeing economic failure. Hout contends that the problems associated with the ineffectiveness of aid has led to short-run solutions which do not address more fundamental causes related to the persistence of global poverty, essentially related to the power differences characterising international political and economic relations, barriers to reform of the international trade and financial system.

#### *Lack of aid harmonisation*

A matter identified in the literature as having a negative influence on the effectiveness of aid relates to lack of harmonisation by donors. This line of argument was put forward by Knack and Rahman (2007) when stating that the use of separate and parallel donor-funded systems can reduce the quality of a national bureaucracy by siphoning off qualified staff. According to Lawson (2013) the primary argument for better donor coordination was the concern that even as aid levels increase, aid effectiveness was becoming increasingly undermined by fragmentation. More donors were giving ODA than in previous decades, and many donors were spreading their assistance across a growing number of recipients.

Lawson (2013) argues that coordination advocates stress that this profusion of donor agencies in many developing countries causes problems for donors and recipients alike. Such problems include issues related to duplication and cross-purposes. Examples in this regard are that a donor agency may invest significant time and resources into a geological survey for a road or water project, unaware that a similar survey was completed sometime earlier by a different donor. The issue of cross-purposes arises when the activities of various uncoordinated donors may actually conflict and undermine development objectives. Additional problems associated with lack of coordination by aid donors are loss of scale, administrative burden and unclear leadership.

Àlvarez and Acharya (2012) and Riddell (2012) who review the evidence on the effectiveness of aid on health and education, respectively, discussed the desirability of greater donor coordination and consolidation of foreign assistance activities to address fragmentation concerns. These authors find that aid has made a positive contribution in both sectors but that its effectiveness has been undermined by systemic weaknesses and failures in its provision, in particular with regards to fragmentation and insufficient coordination of aid efforts.

Yet another factor that may reduce the effectiveness of aid relates to tying, implying that the recipient is in some way restricted in the allocation of the financial resources it receives in the form of aid. The practice of aid tying has long raised concerns about the quality and the effectiveness of aid. According to Jepma (1991) one of its negative effects, which has been recognized for years, is that it may considerably increase costs to the recipient. Osei et al. (2004) argues that the restrictions imposed by aid tying reduce the degree of competition in the supply of foreign aid goods and services. According to the same author, for SSA countries, already facing external debt problems and the need to make optimal use of limited financial resources, could lead to higher prices on tied aid goods and services, could worsen the debt problems and accentuate

the aid dependency situation of the region. This matter was also discussed in Knack and Smets (2012), who point out that tying aid to purchases from the donor country reduces its effectiveness. La Chimia (2014) also raised this argument when referring to the risk that the domestic industries initially advantaged by tied aid can risk becoming dependent on exports subsidies and, as a consequence, become more vulnerable if the subsidy is abolished at any time in the future.

According to the DAC, tying aid not only reduces its value to the recipient, but is considered to be inconsistent with the Paris Declaration<sup>2</sup> principles of country ownership and alignment with country priorities and systems. The share of aid that is untied is thus included as one of the 12 Paris Declaration Indicators for improved aid effectiveness (OECD, 2011). The outcome document of the Third International Conference on Financing for Development, held in Addis Ababa in 2015, also called for the untying of Aid.<sup>3</sup>

### **Additional factors that need to be kept constant when assessing the effect of aid**

#### *Economic stability*

According to the African Development Bank Group (2009) in countries exposed to external shocks, aid can prevent a standstill in imports and growth as well as the downward spiral that often ensues. The higher the volume of aid is, the greater the relative extent to which it dampens the macroeconomic impact of shocks will be. Collier and Dehn (2001) argue that an increase in aid when a country suffers from a negative terms of trade shock is evidently favourable. Though aid is not systematically countercyclical, it remains a stabilizer, provided it is less variable than exports, as it is the case in countries suffering major exogenous shocks (Chauvet and Guillaumont 2009).

This argument is reiterated in UNDP (2010), where it is stated that adverse shocks and crises that emanate from various sources such as conflicts, natural disasters, climate risks and financial and economic collapses. In fact, as analysed by the UNDP, reversals in MDG progress have been witnessed in a number of countries subsequent to the multiple crises (from food to energy to financial and economic shocks). Thus, building resilience to such shocks through aid is a key aspect of sustaining progress. Therefore, this implies that in countries where there is economic stability this should lead to a positive impact on economic growth leading to a lower need for aid.

#### *Governance and political stability*

Some authors have investigated whether political instability in the recipient country matters for the effectiveness of aid. Political instability refers to irregular changes in the political system due to such matters as coups and political violence, possibly leading to unpredictable changes in laws, regulations, government policies, taxation and property rights. Islam (2002), investigating this issue, added a political instability measure and its interaction with aid to a Burnside-Dollar type of growth model and concluded that

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<sup>2</sup> The Paris Declaration, agreed upon in 2005 in Paris by a large number of developed and developing countries, laying out a practical, action-orientated roadmap to improve the quality of aid and its impact on development.

<sup>3</sup> See [https://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA\\_Outcome.pdf](https://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf), article 58.

aid is only effective when the political situation of the recipient country is stable and vice versa, in politically unstable environments, aid does not have any effect on growth. A similar study was carried out by Chauvet and Guillaumont (2009). In estimating a growth model which included a political instability measure, the authors found evidence that aid is more effective in politically stable environments.

Kosack (2003) analysed whether aid is able to improve the quality of life, measured by the human development index (HDI) of the recipient countries. Again, using a version of a growth model, the author showed that while aid does not generally improve the quality of life, it does lead to higher HDI growth rates when the extent of democratisation is higher. Hence, Kosack concluded that in autocratic countries aid is ineffective and possibly even harmful, thereby suggesting that to make aid more effective, donor and recipient countries should at the same time aim at stimulating democratisation. Accordingly, the focus here will be political stability in order to ascertain its impact on economic growth and therefore aid.

#### *Natural disasters*

Natural disasters are likely to lead to economic instability and therefore affect the aid recipients' economic growth, *ceteris paribus*. In an extensive study of the linkages between macroeconomic performance and natural disasters, Baritto (2008) tested the hypothesis that economies that are highly impacted by natural disasters are also highly susceptible to economic and financial shocks. Similarly, Raddatz (2007) investigated geologic, climatic and human disasters (i.e. famine and epidemic) in low-income countries and found that climatic and human disasters were associated with 2 per cent and 4 per cent declines in GDP in the year following the event, whereas geological disasters had a small and insignificant effect.

#### *Export of Primary commodities*

Primary commodities often make a major contribution to the exports of low-income countries. The Overseas Development Institute (2001) indicates that many countries, especially in Africa, derive more than 90 per cent of their export earnings from commodities. In turn, export dependence on commodities may render a country vulnerable to exogenous economic shocks, as commodity prices are notoriously volatile in the short- to medium-term, sometimes varying by as much as 50 per cent in a single year (IMF, 2016). In those countries that depend heavily on exports, export volatility is thought to negatively affect economic growth {Guillaumont et al., (1999) Chaudhary & Qaisrani, (2002)}.

#### *Country size*

Many studies argue that small economic size poses a number of constraints on growth and this has to be kept constant in studies on the impact of aid on growth.

According to Briguglio (2016) small country size poses constraints to economic growth in view of the high degree of exposure and to external shocks. This was found to be mainly due to the fact that small countries are characterized by a high degree of openness and export concentration.

Jansen (2004) also contends that smaller economies tend to be characterized by both higher openness and higher export concentration, leading to a high degree of income and terms of trade volatility. The more volatile a country's terms of trade are likely to be, in particular if exports are concentrated in commodities. GDP per capita has a significantly negative effect on income volatility. Empirical growth literature has shown that income volatility is bad for economic growth.

Some authors refer to the high cost per unit in small states, mostly due to the problems of overhead costs indivisibility and the high incidence of monopolies and oligopolies. Winters (2005), referring to Winters & Martins (2004) show that the private costs of manufacturing activity are considerably higher for small economies than for larger ones.

The cost of government and public utilities also tend to be relatively high per capita in a small state given that such costs are mostly overhead ones for society. Added to this are transport costs due to the fact that small economies' import and export small quantities and a small cargo is likely to be more costly per unit than large one (Briguglio, 1995).

This view that small country size constrains growth is contested with some authors suggesting that it is an advantage to be a small state. Easterly and Kraay (2000) find that, controlling for location, small states have higher per capita growth rates than other states. The authors argue that the greater openness of small states is on balance a positive net payoff for growth. Likewise, Armstrong & Read (2002) argue that it is not true that the growth performance of small states is constrained by their vulnerability to exogenous shocks because of their size.

### **Synthesis of literature**

The results and theoretical arguments contained in studies on aid and its effect on economic growth have led donor organizations to change the profile of their aid. In the 1960s the dependency theory was popular, and filling the savings gap was the major objective for the need of ODA. In the 1980s, there was a change in this reasoning given that the World Bank promoted 'structural adjustment' lending, the objective of which was to adjust economic structures and policies in poor countries to steer them towards economic development. In the 1990s, the trend shifted towards the embracing of conditionality, better selectivity and policy environment in the recipient countries, in theory as well as in practice. In addition, during the first decade of the 21<sup>st</sup> century, aid harmonization between donors was identified as a major requisite for aid effectiveness. The thrust of the current arguments would seem to focus on the need for good institutional quality and adequate policy frameworks to enhance aid effectiveness. In fact, there is a growing awareness that aid itself can be instrumental in promoting good economic governance, which in turn leads to improved aid effectiveness.

### **3. Methodology**

As already indicated, this paper tests the hypothesis that there is a positive relationship between the level of European Union ODA granted to SSA countries and these countries' economic growth, keeping other factors that affect growth constant.

#### **Regression model**



The estimation method adopted in this study is the Panel data regression approach. The general specification of the model employed in this study is the following:

$$GRT_{it} = \beta_0 + \beta_1 ODA_{it} + \sum \beta_j CON_{itj} + \varepsilon_{it}$$

where GRT is economic growth, ODA is official development assistance, CON is a set of control variables, which will be listed and described in the next section and  $\varepsilon_{it}$  is an error term with the usual desirable properties. The subscript “it” denotes that each observation of each of the variables refers to country  $i$  in year  $t$ . The subscript “j” denotes the number of each control variable, which need to be kept constant in order to assess the effect of ODA on economic growth.<sup>4</sup>

The use of panel-data method provides the benefit of having a large number of data points, thereby increasing the degrees of freedom and reducing the collinearity among explanatory variables hence improving the efficiency of econometric estimates. The larger number of observations and the richer variability provides more informative data, allowing for more precisely estimated parameters and for a more reliable use of the statistics’ asymptotic properties. The reduced collinearity problems, as a result of the large variability, allows for efficient estimates and for improved ability in discriminating among different hypotheses. In sum, as stated by Baltagi (2001), ‘panel data give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency.’

### **Diagnostic tests**

To assess the reliability of the estimates of the regression coefficients a number of diagnostic tests were conducted, namely those relating to multicollinearity, autocorrelation, stationarity and co-integration.

#### *Multicollinearity*

As a first step the correlations between the explanatory variables were checked in order to assess whether the regression suffers from multicollinearity. With STATA14 to test for multicollinearity, the variance inflation factor (VIF) technique is used. As a rule of thumb, a variable whose VIF values are greater than 10 should imply that further investigation is needed (Institute for digital research and education, 2015). Tolerance, defined as  $1/VIF$ , is used by many researchers to check on the degree of collinearity. Thus, a tolerance value lower than 0.1, as in the case of this modelling equation, is comparable to a VIF of 10. It means that the variable could be considered as a linear combination of other independent variables.

#### *Autocorrelation*

We tested for autocorrelation, using STATA14 AC and PAC commands. Furthermore, in STATA14, with the command CORRGRAM it is possible to create a table in which presents both the outcomes of commands AC and PAC, graphically and numerically. Apart for AC and PAC, this command displays the Box-Pierce’ Q statistic, which tests the null hypothesis that all correlation up to lag  $k$  are equal to 0.

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<sup>4</sup> The software package used for analysis of the panel data set is STATA14

### *Stationarity*

STATA14 can be used for a variety of tests for unit roots or stationarity in panel datasets with the command `xtunitroot`. The null hypothesis is that the variable contains a unit root, and the alternative is that the variable was generated by a stationary process. On the basis of the Levin–Lin–Chu test which is significant at all the usual testing levels.

### *Cointegration*

In order to determine whether foreign aid leads to economic growth one must determine whether there is cointegration, which shows the existence of a long-run relationship between the variables under review. In Stata 14 `xtcointtest` performs the tests of cointegration on a panel dataset.

### *Causality test*

Causality refers to the possibility that there is a relationship in the direction of the effects between the dependent variable and the explanatory variables, which may be two way. Granger non-causality can be tested by making use of a finite order panel VAR model where a random variable can be expressed as a function of its own past values and past values of other variables in the system. Cointegration implies Granger-causality in at least one direction, implying that in Granger's characterization of causality, a stationary series  $X_t$  Granger causes another stationary series  $Y_t$  if the inclusion of past values of  $X_t$  significantly decreases the prediction error variance of  $Y_t$ . If in a regression of  $Y_t$  on its own lags and on lags of  $X_t$ , all past values of  $X_t$  are jointly statistically significant, then the null hypothesis that  $X_t$  does not Granger-cause  $Y_t$  can be rejected. Therefore, variable  $X_t$  is said to Granger-cause variable  $Y_t$ .

### *Random or Fixed-effects in Panel Date estimation.*

The Hausman test was used to check whether the model could be estimated using either the Random Effect approach or the Fixed Effects approach to see which model yields the most efficient and consistent results.

## **4. Empirical results**

### **The estimated Equation**

Various specifications of the relationship between ODA and economic growth were tested for this paper, with the best performing equation in terms of correlation and t-statistics, being:

$$GRT_{it} = \beta_0 + \beta_1 ODA_{it} + \beta_2 LAB_{it} + \beta_3 KAP_{it} + \beta_5 MEI_{it} + \beta_5 GOV_{it} + \beta_6 DIS_{it} + \beta_7 EXV_{it} + \varepsilon_{it}$$

where all the variables are measured in natural logarithms, meaning the coefficients are direct estimates of elasticity. The panel dataset consists of 20 SSA countries over the period of 14 years between 2000 to 2014.

### *Economic Growth*

**GRT** stands for the percentage growth rate in the real GDP per capita of the recipient country. The source of the data is the World Bank's World Development Indicators database.<sup>5</sup>

### *Official Development Assistance*

**ODA** stands for net disbursements of ODA as a percentage of GNI of the recipient country at current prices. Disbursements rather than commitments of ODA have been used since research indicates that this is the best measure of how much a donor is actually spending on aid. It is assumed that net ODA leads to economic growth. The data is sourced from the OECD DAC's Geographical Distribution of Financial Flows to Aid Recipients.<sup>6</sup>

### *Employment growth and capital formation*

**LAB** refers to employment growth as proxy for the labour force of the population in the recipient country. The data is sourced from the World Development Indicators database.<sup>7</sup> It is assumed that an increase in labour stimulates growth in line with standard growth theories.

**KAP** is the gross fixed capital formation as a percentage of GDP, a proxy for the capital stock of the recipient country. The source of the data is World Development Indicators database.<sup>8</sup>

### *Macroeconomic stability*

**MES** stands for macroeconomic stability. It is derived from the method suggested in Briguglio (2016) and is composed of the inflation rate in the recipient country, which captures amongst other things the effect of monetary policy; the government deficit to GDP which captures the effect of fiscal policy; and current account imbalances to GDP in current prices which relates to foreign sector imbalances. The argument that is being proposed here is that, in line with the literature, macroeconomic stability has a positive effect on the economic growth of a country, *ceteris paribus*. Given that these three indicators are not in the same unit and more importantly they have different ranges, with different minimums and maximums, a rescaling procedure was adopted.<sup>9</sup> Data used for the macroeconomic stability index are sourced from World Economic Outlook database of the International Monetary Fund (IMF).<sup>10</sup>

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<sup>5</sup> Available at: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>.

<sup>6</sup> Available at: <http://stats.oecd.org/Index.aspx?DataSetCode=DACIND>

<sup>7</sup> Available at: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>.

<sup>8</sup> Available at: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>.

<sup>9</sup> The index is based on the formula  $MES_{RS} = (MES - MES_{MIN}) / (MES_{MAX} - MES_{MIN})$ , where  $MES_{RS}$  refers to the rescaled value of variable MES (macroeconomic stability),  $MES_{MAX}$  refers to the maximum value of MES and  $MES_{MIN}$  to its minimum value. It can be seen that the formula bounds the value of  $MES_{RS}$  between 0 and 1.

<sup>10</sup> Available at <http://www.imf.org/external/ns/cs.aspx?id=28>.

### *Governance and institutional quality*

**GOV** relates to governance and institutional quality which was measured by an index made up of an average of the six dimensions of governance included in the World Governance Indicators, that is, voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. This explanatory variable was introduced in the regression model in order to act as a measure of the in the recipient countries. The source of the data is Worldwide Governance Indicators produced by the World Bank.<sup>11</sup>

### *Primary exports*

**PEX** stands for primary exports. Theory indicates that the higher the share of primary goods in a country's exports, the more likely it is to be vulnerable to commodity price shocks, thus impacting on the country's economic growth. It is a priori expected that an increase in this variable leads to an increase in economic growth and this is mainly because it is the unstable commodity prices that impact negatively economic growth and not primary exports per se. Data on the primary exports of all food items is sourced from United Nations Conference on Trade and Development (UNCTAD).<sup>12</sup>

### *Disaster proneness*

**DIS** stands for disaster proneness, measured by the ratio between the total amount of disaster damage and GDP (for 2000-2014). The data was sourced from the Emergency Events Database (EM-DAT).<sup>13</sup>

The expected signs of the explanatory variables are shown in Table 1.

**Table 1: expected sign on the estimated coefficients**

<b>Explanatory variable</b>	<b>Expected sign</b>
ODA	+
LAB	+
KAP	+
MES	+
GOV	+
PEX	+
DIS	-

### **The estimated equation**

Table 2 presents a summary of the estimated coefficients obtained from the panel data regression

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<sup>11</sup> Available at <https://datacatalog.worldbank.org/dataset/worldwide-governance-indicators> .

<sup>12</sup> Available at: <http://unctad.org/en/Pages/statistics.aspx> .

<sup>13</sup> Available at <https://www.emdat.be/> .

analysis<sup>14</sup>, in order to test the hypothesis that aid affects growth in the SSA countries. The dependent variable is GRT and represents the real GDP per capita of the recipient country.

**Table 1 - The estimated coefficients**

Explanatory terms	Estimated Coefficient	t-statistic
Constant	- 0.26	
ODA	+ 0.014	2.37
LAB	+ 0.015	1.92
KAP	+ 0.009	2.18
MES	+ 0.006	3.11
GOV	+ 0.004	1.34
EXV	+ 0.015	2.65
DIS	- 0.003	-1.96

It can be seen that the estimated coefficients possess the expected sign. The t-statistics are significant at the 95% level, with the exception of that representing political stability (GOV), which was left in the results due to its presumed importance.

### Diagnostic tests

As stated in the previous section, a number of diagnostic tests were conducted to assess the reliability of the estimates.

#### *Multicollinearity*

The lack of linear correlation between the variables is clear through the correlation coefficient matrix which implies that the regression does not suffer multicollinearity. This can be ascertained because through this matrix, with the exclusion of political stability and primary exports, there are no additional variables that have a correlation relatively higher than the critical value of 0.8. This indicates that the variables used in the regression equation are sufficiently independent of each other. Moreover, this is furthermore sustained through the VIF technique already discussed, whereby a value lower than 10 was obtained and thus implying that there is no multicollinearity in the regression equation.

#### *Autocorrelation*

In order to test for autocorrelation in our estimation we make use of the methods derived in Baltagi and Wu (1999) to circumvent the problem of autocorrelation. As already outlined, in STATA14 the AC and PAC commands, as well as CORRGRAM command can be used to investigate autocorrelation.

#### *Stationarity*

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<sup>14</sup> Given that there was a P-value greater than 0.000, then the null hypothesis, which states that variances across the entities tested are zero and that there is no significant difference across units (i.e. no panel effect), was accepted and hence, the Random effect was not used for interpretation.

Stata implements a variety of tests for unit roots or stationarity in panel datasets. The augmented Dickey-Fuller test was also used to test whether the variables follow a unit-root process. The test involved fitting an augmented Dickey-Fuller regression for each panel. To estimate the long-run variance of the series, this test by default uses the Bartlett kernel using 10 lags as selected by the method proposed by Levin, Lin, and Chu. The Levin-Lin-Chu bias-adjusted t statistic is  $-4.5308$  for the Y variable, which is significant at all the usual testing levels. Therefore, we reject the null hypothesis and conclude that the series is stationary. With regards to net ODA this is not stationary at levels but is stationary when differenced.

### *Cointegration*

In order to determine whether foreign aid leads to economic growth one must determine whether there is cointegration, which shows the existence of a long run relationship between the variables under review. From the results, the panel ADF-statistic from the residual test is significant at the 5 per cent level. The coefficient of  $GDP_t$  is negative and significant at the 5 per cent level and therefore the panel cointegration test rejects the null hypothesis of no cointegration, providing evidence in support of the belief that aid and GDP are cointegrated for the whole panel. There is evidence of a long-run relationship between foreign aid and GDP per capita growth and therefore it follows that causality tests can be carried out.

### *Granger causality results*

The results of the Panel Granger causality test provide support for the hypothesis that foreign aid leads to economic growth. There is evidence of unidirectional causality running from foreign aid to economic growth at the 5 per cent critical level. From the panel data evidence, we can conclude that there is evidence in support of the foreign-aid leg growth hypothesis for the sample of SSA countries.

## **5. Conclusion**

This paper presented an extensive literature review relating to the effect of aid on economic growth, concluding that the literature does not exhibit a consensus on this matter, although, generally speaking, when the right control variables are considered, the relationship was found to be positive.

The paper also empirically tested the hypothesis, using panel data regression method, that ODA does lead to economic growth of the recipient country, *ceteris paribus*, with 20 SSA countries as aid recipients. Several relevant control variables were utilized to respect the *ceteris paribus* condition.

### *The main findings*

The empirical results produced in this study indicate that ODA granted does lead to economic growth of the recipient country, keeping other things constant, thereby confirming the hypothesis set for this paper. The control variables were found to have the expected effect on growth, indicating that economic growth in each of the SSA countries could have been stimulated or slowed down with a change in these control variables, even though the effect of aid remains positive.

*Scope for improvement and further research.*

Although the positive relation between ODA and real growth was confirmed no attempt was made to assess whether there was a trickling down effect of aid from the whole or the vast majority of the population benefitted. This could be a very interesting area of further research in this regard. Individuals make up an economy and therefore this asks for a deeper insight on how is the well-being of individuals being impacted. As indicated in the Global Monitoring Report for the past years, in many countries, the incomes of the bottom 40 per cent declined. Ensuring that income is shared more equitably should be a priority for all countries.

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