

Aid, Macroeconomic Policy Environment and Growth: Evidence from Sub-Saharan Africa

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Abstract: This study is a contribution to the growing debate on aid-growth nexus. It examines the role of macroeconomic policy environment in aid-growth nexus the area of which has received less attention in Sub-Saharan Africa (SSA). In a panel regression model covering 20 Sub-Saharan African countries, estimated with the use of OLS and TSLS over the period 1970-2001 (in 9-4 years sub-periods), the study finds that a sound macroeconomic environment is a sine qua non for the effective contribution of aid to sustainable growth. The results also show that macroeconomic policy environment is an important determinant of growth. Overall, the study concludes that the incessant socio-political crisis, policy inconsistencies, bad governance and macroeconomic instability evident in many SSA countries have crippled the effectiveness of aid in these countries.

Key words: Foreign aid, economic policy, economic growth, export price, negative shocks, Sub-Saharan Africa

INTRODUCTION

Developing countries are indeed characterized by low level of income, high level of unemployment, very low industrial capacity utilization and high poverty level, just to mention a few. The increasing prevalence of these economic problems has been ostensibly blamed on the low revenue base of most developing countries depriving them from meeting basic development goals. Sequel to this view, the provision of foreign aid has been suggested as a veritable option for augmenting meagre domestic resources. While some countries that have benefited from foreign assistance at one time or the other have grown such that they have become aid donors today (South Korea, North Korea and China etc.), majority of countries in Africa have remained backward.

Sub-Saharan African countries (SSAs) have continued to benefit from all sorts of foreign assistance and in fact still collect at least as much as the amount collected in the early 1980s, yet socio-economic indicators have remained dismal (Fig. 1). This therefore, suggests that there is more to the economic problems prevalent in Africa than the low revenue base or may be there is a disconnection between aid and growth in SSA.

While there could be so many factors both qualitative and quantitative, explaining these unfavourable trends, the incessant socio-political crisis, policy inconsistencies, macroeconomic instability and bad

governance prevalent in many SSAs which are indeed indicators of poor macroeconomic policy and institutional environment should make one pause for reflection. To this end therefore, this study seeks to answer the following questions:

- What is the relationship between aid and growth in Sub-Saharan Africa?
- To what extent has the state of macroeconomic policy environment in SSA affected aid-growth relationship?

Evidences in the literature on aid-macroeconomic policy environment-growth have remained inconclusive. On one side of the arguments are those who believe that aid is effective only in a stable macroeconomic environment (Burnside and Dollar, 1998, 2000, 2004). On the other side are those who conclude that macroeconomic environment has no significant influence on the link between aid and growth (Dalgaard *et al.*, 2004). Burnside and Dollar (2000) research was the first notable study to have generated debates on aid-policy-growth relationship. As Easterly (2003) puts it, I believe the Burnside and Dollar (2000) study meets high academic standards and is intuitively plausible. Their conclusions are appropriately hedged and the study has become a healthy stimulus to further research. Burnside and Dollar utilized a new data base on foreign aid to examine the

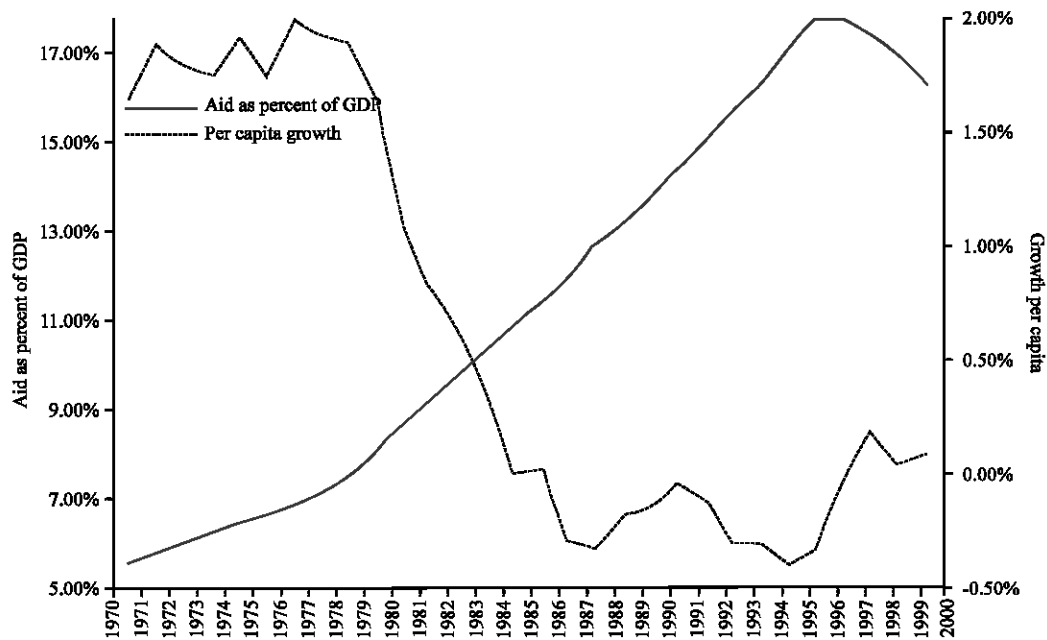


Fig. 1: Aid and growth in Africa (10 year moving averages)

relationships among foreign aid, economic policies and growth of per capita GDP. In panel growth regressions for 56 developing countries and 6-4 year period (1970-93), they assumed that the policies that have large effect on growth are fiscal surplus, inflation and trade openness. They constructed an index of these three policies, interacted it with foreign aid. They found that aid has a positive impact on growth in developing countries with good fiscal, monetary and trade policies. On the other hand, aid has no effect on growth in the presence of poor policies. This result was robust in a variety of specifications that included or excluded middle income countries, included or excluded outliers and treated policies as exogenous or endogenous. They also examined the determinants of policy and found no evidence that aid has systematically affected policies, either for good or for ill. They estimated an aid allocation equation and showed that any tendency for aid to reward good policies has often been overwhelmed by donors' pursuit of their own strategic interests. In a counterfactual manner, they reallocated aid, reducing the role of donor interests and increasing the importance of policy and found that such a reallocation would have a large, positive effect on developing countries growth rates.

Since the Burnside and Dollar (2000) study, many studies have reacted to their results including Hansen and Tarp (2001), Dalgaard and Hansen (2001), Collier and Dehn (2001), Lensink and Morrissey (2000), Collier and Dollar (2002), Easterly (2003) and Murphy and Tresp (2006). Some of these studies confirmed the message of Burnside and Dollar that aid only researches in a good

policy environment (Hansen and Trap, 2001; Collier and Dehn, 2001; Dalgaard and Hansen, 2001). While others found that when particular variables are added, the coefficient on the interaction between aid and policy becomes near-zero and/or statistically insignificant (Easterly, 2003; Murphy and Tresp, 2006). For example, Collier and Dehn (2001), as part of their contributions to entrench the brilliant research work of incorporated export price shocks Burnside and Dollar had showed a significant and negative relation between negative shocks and economic growth. They argued that the adverse effects of negative shocks on growth can be mitigated by offsetting increases in aid. Therefore, they suggested that targeting aid towards negative shock depressing countries could be more effective than towards good policy countries. Using a 2.5% cut off in their sample size of 113 countries, they found 179 positive shocks and 99 negative shocks episodes.

They indicated that the change in aid interacted with positive shocks is insignificant at the 1% level. Additionally, incorporating shocks into Alesina-Dollar regression, they showed that so far donors have not taken shocks into account in aid allocation. Finally, they claimed that aid effectiveness might be increased significantly if both policy and adverse export price shocks are considered in determining aid allocation. In contrast, Easterly (2003) conducting a new test on the previous research of Burnside and Dollar (2000) with a larger sample size (1970-1997 compared to BD's 1970-1993) found that the role of policy in determining the

effectiveness of foreign aid disappears when additional countries are added to the sample. Murphy and Tresp (2006) further expanding the data set of Easterly (2003) to 2001 (i.e., 1970-2001) in a bid to authenticating or refuting the position of Easterly, also found that the relationship among foreign aid, government policy and economic growth is tenuous and depends importantly on the subset of countries included in the analysis. They also acknowledged that good policy enhances the effectiveness of foreign aid in spurring growth when the original set of countries included in Burnside and Dollar is used but this relationship disappears for an expanded set of countries. Dalgaard and Hansen (2001) provided a critical analysis of the growth regressions in Burnside and Dollar (2000) study. First, they analyzed aid and government expenditure in a modified neoclassical growth model. They found that while good policies spur growth, they may at the same time lead to decreasing effectiveness of foreign aid. Second, they showed that the econometric results in Burnside and Dollar emphasizing the crucial role of interactions between aid and good policies in the growth process are fragile, being extremely data dependent. Dalgaard *et al.* (2004) examined the empirics of foreign aid and growth. Among other empirical evidence, they found that aid is generally effective, in fact even in bad environments. They however, admitted that the degree to which aid enhances growth depends on climate-related circumstances.

Burnside and Dollar (2004) revisited the relationship between aid and growth using new data set focusing on the 1990s. Their evidence supports the view that the impact of aid depends on the quality of state institutions and policies. They employed an overall measure of institutions and policies popular in the empirical growth literature. The interaction of aid and institutional quality has a robust positive relationship with growth. However, there is no support for hypothesis that aid has same positive effect everywhere has observed by Dalgaard *et al.* (2004). Burnside and Dollar also found that in the 1990s, the allocation of aid to low income countries favoured ones with better institutional qualities. Their

cross-countries evidence on aid effectiveness is supported by other types of information as well; case studies, project level evidence and opinion polls, support the view that corrupt institutions and weak policies limit the impact of financial assistance for development.

Murphy and Tresp (2006) reconsidered the role of economic policy in determining the effectiveness of foreign aid for generating economic growth in developing countries. They updated and modified the dataset originally used by Burnside and Dollar (2000) in order to more fully consider the critique presented by Easterly (2003). Their findings suggest that the relationship among foreign aid, government policy and economic growth is tenuous and depends importantly on the subset of countries included in the analysis. Good policy enhances the effectiveness of foreign aid in spurring growth when we use the original set of countries included in Burnside and Dollar but this relationship disappears for an expanded set of countries. Because the relationship among aid, policy and growth is likely to be nonlinear, they presented an alternative probit model emphasizing growth thresholds. Their results from this alternative analysis confirmed the conclusions of Easterly (2003) finding little support for the view that good policy increases the probability that foreign aid contributes to growth. As a contribution to a well known recent study by Burnside and Dollar (2000) that aid promotes growth only in a good policy environment, Alvi *et al.* (2008), addressed nonlinearity in the aid, policy and growth relationship.

By applying commonly used aid and policy variables, they revisited the relationship from a new perspective. Their semi-parametric estimation shows that aid positively affects growth in an economically meaningful range, although with diminishing returns. These findings suggest that nonlinearities if not appropriately addressed may hide some key details, providing only an indistinct information about the aid-policy-growth nexus. Evidently, this review is a strong indication that the empirical relation among aid, policy and growth has remained inconclusive and has therefore, left open vacuum for further studies to fill (Table 1). Also evident in this review is the fact

Table 1: A summary of empirical evidence on aid-macroeconomic policy environment-growth nexus

Empirical evidence	Description of empirical evidence	References
Macroeconomic environment affects aid-growth nexus	Foreign aid does have some positive impact on growth, conditional on a stable macro-economic policy environment. In addition when country size is included the growth model, the effect of aid is positive, larger and significant	Burnside and Dollar (1998, 2000, 2004), Collier and Dehn (2001), Lensink and Morrissey (2000), Alvi <i>et al.</i> (2008)
Macroeconomic environment has no significant influence on aid-growth nexus	Aid-growth nexus is sensitive to changes in data set. If the data set of studies suggesting positive and significant role of policy in aid-growth nexus is expanded, the role of policy disappears	Dalgaard and Hansen (2001), Dalgaard <i>et al.</i> (2004), Murphy and Tresp (2006)
Mixed evidence	The effect of foreign aid on growth of recipient nations. Foreign aid significantly and negatively correlates with growth in developing countries. However, foreign aid to Inland countries as well as South Asian countries significantly and positively correlates with growth	Duc (2006)
Other salient issue	Higher aid levels erode the quality of governance and economic freedom of recipient nations	Knack (2000)

that the growing debate on aid-macroeconomic environment growth nexus seems to have received less serious attention in Africa. Most studies in Africa focus on the direct impact of aid on growth in Africa.

The present study therefore, intends to fill this research gap looking at the role of macroeconomic environment on aid-growth nexus in Sub-Saharan Africa.

MATERIALS AND METHODS

Data: Data used for estimation cover 20 SSA countries spanning the period 1970-2001. We updated Burnside and Dollar data using the world bank data, international financial statistics, national archives and moving average in situations where data are not readily available.

In Burnside and Dollar research, data used were computed over successive 6-4 year periods i.e., 1970-73, 1974-77, ..., 1990-93.

This helps to lessen the influence of short-term fluctuations in growth that are not related to longer-term forces (Murphy and Tresp, 2006).

Easterly (2003), however argues that 6-4 year period may capture business-cycle fluctuations and may not be long enough for a period of good policy to setup beneficial effects of aid. Based on this, we lengthened the sample period to 9-4 year periods. The list of the countries examined as well as the description of variables are shown in Table 2.

The model: The empirical model for this study is based on the neoclassical growth model. The standard neoclassical growth model has been modified to incorporate the following: it expresses the growth rate of per capita real GDP as a function of the initial level of income, the level of aid as a fraction of GDP, measures of macroeconomic environment (policy index) and some exogenous variables.

Also incorporated in the model is a variable which enables aid to interact with policy:

$$g_{it} = B_{g0} + y_{it} B_{gy} + a_{it} B_{ga} + P_{it} B_{gp} + a_{it} P_{it} B_{gap} + x_{it} B_{gx} + \epsilon_{it}^g \quad (1)$$

Where:

- g_{it} = Per capita real GDP
- y_{it} = Initial level of income
- a_{it} = Foreign aid (real effective development assistance) as a percentage of real GDP
- P_{it} = The policy index
- x_{it} = The set of exogenous variables
- $a_{it} P_{it}$ = Aid-policy interactions
- ϵ_{it} = The regression error

Although, aid and policy are exogenous in the growth model 1, they also affect each other. This implies that these variables also depend on a set of exogenous variables (Burnside and Doller, 2000). Thus:

$$a_{it} = B_{a0} + y_{it} B_{ay} + P_{it} B_{ap} + x_{it} B_{ax} + \epsilon_{it}^a \quad (2)$$

$$P_{it} = B_{p0} + y_{it} B_{py} + a_{it} B_{pa} + x_{it} B_{px} + \epsilon_{it}^p \quad (3)$$

The exogenous variables in the model are a measure of institutional quality that capture security of property rights and efficiency of the government bureaucracy (Knack and Keefer, 1995), ethno linguistic fractionalization variable, assassinations variable to capture civil unrest and the institutional variable (which is broad money supply over GDP) as a proxy for distortions in the financial system (King and Levine, 1993).

We employed the policy index created by Burnside and Dollar (2004). The policy index is a combination of fiscal policy (using budget surplus as a proxy), monetary policy (using inflation as a proxy) and trade policy (using trade openness as a proxy).

In addition to the BD's policy index, I also consider an alternative measure of policy as suggested by Easterly (2003), which involves substituting broad money supply as a percentage of GDP for trade openness.

Table 2: Variables examined and thier description

Variable name	Description	Source (s) data
Growth	Average growth rate of real capita income	WDI (2001)
Lgdppc	Initial level of real GDP per capita	WDI (2001)
Aid	Official development assistances as a share of GDP	OECD-DAC (2001)
Ethnf	Indexof ethnolinguistic fractionalization, 1960	Easterly and Levin (1996)
Assassin	Number of assassinations per 100,000 popultion	Easterly and Levin (1996)
Icrage	Institutional quality; securyity of property rights and efficiency of the government bureaucracy	Knack and Keefer(1995)
Policy index	Policy = 1.28 + 6.85 budget surplus -1.4 inflation + 2.16 openness	Burnside and Doller (2000)

RESULTS AND DISCUSSION

The results of growth regressions carried out (using both OLS and 2SLS) are shown in Table 3 and 4. The OLS regression results as shown in Table 4 show that foreignaid and policy are positively related to growth. Even when aid was interacted with policy, a positive impact was still found. The results were in fact more robust when the 2SLS is considered. The policy index, estimated here was BD's which combines inflation, budget surplus and openness as proxies for monetary, fiscal and trade policies, respectively. The findings further validated the empirical evidence of Burnside and Dollar (1998, 2000, 2004) that macroeconomic policy

environment was an important determinant of aid effectiveness. When M_2GDP is incorporated into the policy index of BD's as a substitute for Sach's-Warner trade openness-an alternative measure of economic policy as suggested by Easterly (2003), the interaction between policy and aid was still significant and positive too (Table 4). And the overall results (Table 4) did not seem to differ significantly from what we obtained when the BD's policy index was used. This confirms the evidence of Easterly that the alternative policy index can still capture some real effects. Also instructive in the findings was that an expanded data set (drawing evidence from Sub-Saharan Africa) did not seem to affect aid-policy interaction effect on growth.

Table 3: Panel data regressions (Dependent variable: per capita GDP)

Variables	OLS regression (Using BD Policy index)			2SLS regressions (Using BD Policy index)		
	1	2	3	4	5	6
Policy	0.0215 (2.635)	0.0216 (2.637)	-	0.0215	0.027 (2.402)	-
Aid	-	0.0064 (0.207)	-	-	0.316 (1.525)	-
Aid* policy	-	-	0.001 (1.178)	-	-	0.003 (2.358)
Ethnl	-0.002 (-0.131)	-0.001 (-0.065)	-0.007 (-0.452)	-0.002 (-0.131)	0.044 (1.228)	-0.018 (-1.047)
Assess	-7.096 (-0.674)	-7.167 (-0.678)	-1.435 (-0.137)	-7.096 (-0.674)	-10.643 (-0.756)	-3.151 (-0.289)
Ethnl* assess	0.083 (0.500)	0.086 (0.514)	-0.038 (-0.232)	0.084 (0.500)	0.230 (0.957)	-0.023 (-0.136)
Institutional quality	0.613 (2.053)	0.611 (2.037)	0.791 (2.687)	0.613 (2.053)	0.508 (1.271)	0.669 (2.151)
M2GDP	-0.018 (-0.415)	-0.020 (-0.439)	0.003 (0.064)	-0.018 (-0.415)	-0.083 (-1.149)	0.025 (0.515)
Initial capital	0.545 (1.729)	0.571 (1.679)	0.486 (1.479)	0.545 (1.729)	1.821 (1.950)	0.261 (0.729)
No. of observations	180	180	180	180	180	180
R ²	0.47	0.47	0.44	0.47	0.43	0.37
Adj R ²	0.43	0.42	0.39	0.43	0.39	0.32

Table 4: Panel data regressions (Considering an alternative policy definition by Easterly, 2003)

Variable/ registration number	2SLS Regressions (using alternative Policy index)			OLS Regression (using alternative Policy index)		
	7	8	9	10	11	12
Policy	0.016 (2.255)	0.016 (2.247)	-	0.016 (2.255)	0.017 (2.181)	-
Aid	-	0.001	-	-	0.101 (0.781)	-
Aid* policy	-	-	0.001 (1.374)	-	-	0.003 (2.401)
Ethnl	0.006 (0.433)	-0.006 (-0.412)	-0.005 (0.362)	-0.006 (0.433)	0.007 (0.503)	-0.009 (-0.575)
Assass	-6.390 (-0.605)	-6.394 (-0.603)	-1.509 (-0.145)	-6.390 (-0.605)	-7.300 (-0.660)	-2.687 (-0.252)
Ethnl* assass	0.061 (0.366)	0.061 (0.365)	-0.027 (-0.168)	0.061 (0.366)	0.100 (0.554)	0.001 (0.008)
Institutional quality	0.608 (2.635)	0.608 (2.026)	0.729 (2.474)	0.608 (2.035)	0.569 (1.804)	0.539 (1.705)
Initial capital	0.579 (1.840)	0.581 (1.706)	0.668 (2.050)	0.579 (1.840)	1.002 (1.583)	0.850 (2.459)
No. of observations	180	180	180	180	180	180
R ²	0.46	0.46	0.44	0.46	0.39	0.39
Adj R ²	0.42	0.41	0.40	0.42	0.35	0.35

Figures in parentheses are the t-test results

Invariably, the findings did not support the argument raised by Easterly (2003) and Murphy and Tresp (2006) that if the data set was expanded, the significant statistical significance, economic policy is statistically significant in all the regressions while the statistical significance of aid and aid-policy interaction estimates was recorded when the 2SLS regression is computed. Other explanatory variables among which include Ethnic-fractionalization and assassination a measure of political instability, showed the anticipated negative association with growth and institutional quality a measure of the nature of governance had the expected positive sign in all the regressions carried out. The implication of this finding was that incessant incidence of political and social crises and poor institutional quality were capable of hampering the effectiveness of aid. By and large, evidence obtained from these analyses indicates that economic policy was a good determinant of aid effectiveness and growth.

Also, foreign aid was expected to enhance the actualization of sustainable growth and development in a country with a sound macroeconomic policy environment. With the increasing incidence of slow growth rates in many SSA countries, the positive association among aid, macroeconomic policy environment and growth may suggest that poor and inconsistent economic policies evident in many of these countries are responsible for the sluggish and weak contribution of aid to growth.

CONCLUSION

Aid in itself is not bad, however its effectiveness can be affected by the nature of policy and institutional environment of the recipient nation. The empirical evidence obtained in this study is an indication that effectiveness of aid flows into sub-Saharan Africa was conditional on a stable macroeconomic policy environment. In other words, the increasing flows of aid into Africa had not promoted meaningful development due to the unstable macroeconomic environment. Most SSA countries were characterized by policy inconsistencies, poor institutional framework, high level of corruption, incessant political crises, civil unrest and ethnic fractionalization. In the midst of current efforts to achieve Millennium Development Goals (MDGs) in Sub-Saharan Africa, the need for foreign assistance is inevitable. However, no amount of foreign assistance will promote sustainable growth and development in SSA if the problem of unstable macroeconomic environment persists. It is, therefore, crucial for respective governments in SSA to pursue economic policies that at least reflect low inflation rate, productive budgetary balance, competitive and unimpaired exchange rate and to attend to the incessant civil unrests and political instability, otherwise the problem of slow growth will remain unabated.

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