Target at the Right Level: Aid, Spillovers and Growth in Sub-Saharan Africa

Yi Duan, Department of Economics, University of Oklahoma

This project uses spatial analytical skills to investigate aid effectiveness and aid spillovers at the sub-national level in sub-Saharan Africa over the period 1995-2013.

Contributions:
- aid effectiveness at sub-national level; aid spillovers.

Model Specification:

\[ \text{growth}_{i,t} = \alpha + \beta_1 \ln(1 + \text{aid}_{i,t}) + \beta_2 \text{ln}(1 + \text{aid}_{i,t-1}) + \beta_3 \text{ln}(1 + \text{aid}_{i,Ai,t}) + \beta_4 \text{ln}(1 + \text{aid}_{i,Ai,t-1}) + \gamma X_{i,t} + \delta_i + \epsilon_{i,t} \]

\( \text{growth}_{i,t} \) is the growth rate of income per capita (measured as growth of night lights per capita) in ADM2 at t-1.

\[ \ln(1 + \text{aid}_{i,t}) \] represents the logarithm of logged level of aid received in ADM2 at t-1.

\[ \text{aid}_{i,t} \] is the amount of aid received by ADM2 at t-1.

\[ \text{aid}_{i,Ai,t} \] is the fair share of total amount of aid received by the country where ADM2 i locates at t-1, excluding the amount of aid received at ADM2 i and ADM1 levels.

\( \text{aid}_{i,Ai,t} \) is the total amount of aid received by i’s neighbors. \( \text{aid}_{i,Ai,t} \) is the fair share (total amount divided by the number of ADM2s) of total amount of aid received by the ADM1 where ADM2 i locates at t-1, excluding the amount of aid received at ADM2 i and ADM1 levels.

All the aid variables are measured in current US dollars. \( X_{i,t} \) is a matrix of lagged control variables, including general government final consumption expenditure, inflation rate, openness to trade, ICRG institutional score and conflicts intensity.

However, there exists simultaneity problem: countries with faster growth may systematically receive more or less aid. So the direction is from growth to aid. Use the method of Brückner (2013), to solve this problem:

\[ \ln(1 + \text{aid}_{i,t}) = \alpha + \beta_1 \ln(1 + \text{aid}_{i,t}) + \beta_2 \text{ln}(1 + \text{aid}_{i,t-1}) + \beta_3 \text{ln}(1 + \text{aid}_{i,Ai,t}) + \beta_4 \text{ln}(1 + \text{aid}_{i,Ai,t-1}) + \gamma X_{i,t} + \delta_i + \epsilon_{i,t} \]

where \( \ln(1 + \text{aid}_{i,t}) \) is the general form of logged level of aid received at t-1, and includes \( \text{aid}_{i,Ai,t} \) and \( \text{aid}_{i,Ai,t-1} \), and \( \text{aid}_{i,Ai,t} \) is the amount of aid received at ADM2 and ADM1 levels.

The exclusion restriction is that current weather conditions should not affect any lagged aid flows.

\[ \ln(1 + \text{aid}_{i,t}) = \beta_1 \ln(1 + \text{aid}_{i,t}) + \beta_2 \text{ln}(1 + \text{aid}_{i,t-1}) + \beta_3 \text{ln}(1 + \text{aid}_{i,Ai,t}) + \beta_4 \text{ln}(1 + \text{aid}_{i,Ai,t-1}) + \gamma X_{i,t} + \delta_i + \epsilon_{i,t} \]

This adjusted aid series is assumed to be exogenous to \( \text{growth}_{i,t} \) and is used as instruments for \( \ln(1 + \text{aid}_{i,t}) \) in equation (1).

Baseline Conclusions:
- Aid targeted at the local level tends to promote local economic growth, while aid received at more aggregate levels depresses local economic activities.

One possibility is that more specifically targeted aid tends to be less fungible compared to “general” aid, while aid generally given to a more aggregated level is more likely to be misappropriated for other purposes, thus creating rent-seeking opportunities to cause corruption and hurt institutional environment.

Aid at Different Levels

- **ADM2 (Second Order Administrative Division)**
- **ADM1 (First Order Administrative Division)**
- **Country**

Policy Implications:
The findings have very profound policy implications that to promote local economic growth, we should focus more on specifically targeted and less-fungible aid projects rather than aid generally given to governments at more aggregate levels; also we should reduce barriers to these activities within the country to promote positive spillover effects.

Data Processing Details:
- **Spatial Data Processing Details**
- **Non-Spatial Data Processing Details**

Extensions:
- **Aid at the Local Level**: Aid at the local level promotes total economic flourish and slows down population growth, while aid at more aggregate levels depresses total economic activities but stimulates population growth. Aid directly received at all levels exhibits diminishing returns, which is consistent with the theory that aid directly stimulates investment and adds capital accumulation. While aid spillovers show weak increasing returns, which suggests the spillover effects partly function through technology and knowledge dissemination. As to the conditional aid effectiveness, no systematic story is found that aid is effective conditional on policy or institutions, probably due to data limitations that local policy and institutions data are unavailable in Sub-Saharan Africa.

Note:
- This project is based on my job market paper “Target at the Right Level: Aid, Spillovers and Growth in Sub-Saharan Africa.” Further information is available upon request.

Contact:
- Yi Duan
  - Department of Economics
  - University of Oklahoma
  - 108 Cate Center Drive Room 158 CCD1
  - Norman, OK 73019
  - Email: yiduan@ou.edu
  - Website: https://sites.google.com/site/yiduanecon/