The Impact of Aid and Public Investment Volatility on Economic Growth in Sub-Saharan Africa

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Summary. — This study investigates the effects of aid inflows and the volatility of public investment on economic growth in 26 Sub-Saharan African countries over the period from 1992 to 2011. Three volatility variables comprising aid, government revenue, and public investment are incorporated into an aid-growth model to test for their effect on economic growth. Using the Generalized Method of Moments (GMM) technique and averaged data for five four-year sub-periods, we show that although foreign aid has a positive impact on growth once potential endogeneity has been accounted for, aid effectiveness may have been eroded by volatility in public investment.
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Key words — aid, economic growth, public investment, Sub-Saharan Africa, volatility

1. INTRODUCTION

One of the most debated issues in development economics is whether Official Development Assistance (foreign aid) promotes GDP per capita growth in aid recipient countries. Two factors currently make this debate especially relevant to both aid donors and its recipients in Sub-Saharan Africa. Firstly, indications are that the principal objective of the United Nation's Millennium Developments Goals, which is to reduce poverty to half the 1990 level by 2015, will not be met in Sub-Saharan Africa despite continued aid inflows (Addison, Mavrotas, & McGillivray, 2005). Secondly, there are increasing signs of donor fatigue, especially in the context of the current global economic crisis that has had a particularly negative effect on many of the traditional aid donors to Sub-Saharan African countries (OECD. Development: Aid to developing countries falls because of global recession., 2012).

In recent decades there has been much research focused on the effects of aid inflows on growth rates, as well as on determining which socio-political, climatic, institutional, and economic factors undermine or enhance the effectiveness of foreign aid with respect to growth. However, overall, there is no consensus regarding aid effectiveness and disagreement remains as to what constitutes sufficient conditions for aid to have a positive impact on the GDP per capita growth of aid recipient countries. Nevertheless, there is emerging consensus that the impact of aid on economic growth works through public investment.

Recent literature shows that volatility in taxes in Sub-Saharan Africa reduces public investment levels [1] (Ebeke & Ehrhart, 2011). Since aid is, like taxes, a source of public investment, heightened aid volatility may therefore in similar fashion negatively impact economic growth.

Although the impact of aid on growth has been extensively researched, there are to our knowledge very few papers that examine the effect of aid volatility on growth (for examples of such papers, see Bulír & Hamann, 2008; Fielding, Mavrotas, & discussion paper, 2005; Lensink & Morrissey, 2000; Hudson & Mosley, 2008). In contrast to these papers, our study is not only concerned with the effect of aid volatility on growth, but in addition also introduces public investment volatility and government revenue volatility into the aid-growth framework. As public investment is a function of aid, central government revenue, and internal and external borrowing, there may be other stabilizing determinants of public investment even in the presence of aid volatility. To the best of our knowledge, this is the first study that incorporates public investment volatility in the aid-growth relationship. In addition, unlike most previous aid-growth studies on Sub-Saharan Africa, our study uses a sample period (1992–2011) that includes the recent period of global economic uncertainty.

The remainder of this paper is structured as follows. Section 2 provides a brief overview of the previous aid-growth literature. Section 3 discusses the methodology employed in this study. Section 4 examines the data. Section 5 discusses the descriptive statistics. Section 6 presents a discussion of the results, and Section 7 concludes.

2. LITERATURE REVIEW

Academic research on the impact of aid on economic growth can be divided into three distinct phases. The first generation literature studied the aid-growth question within the context of so-called gap models. These focused on the effects of financing constraints on economic growth (termed "gaps") in low-income countries, and how aid interacted with, and could alleviate, these gaps. In the original gap model, [2] Domar (1947) saw aid as a way of alleviating the growth restriction resulting from low savings. Thus, if a government wishes to increase the growth rate, it has to increase savings. In the case where national savings (private and public savings) are too low (constrained), aid permits increased investment and growth (Morrissey, 2001). Early literature made no effort to measure the aid-growth nexus directly. These studies instead tested the aid-savings link empirically by making savings the dependent variable and aid the independent variable in their regressions.

The original saving-gap model did not survive closer scrutiny and in the later two-gap model Chenery and Strout (1966) introduced import capacity (the "foreign exchange gap") as a separate potential constraint on growth. The authors

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contended that a country will transform its economy successfully via a simultaneous increase in skills, domestic saving, and export earnings. Despite this extension, the spirit of the two-gap model remained similar to the Domar-model, i.e., investment spurs growth. Since national savings and imports are constrained in low-income countries, aid has the potential of filling these gaps and hence fueling growth. However, the impact of additional foreign finance will vary depending on which gap is binding. The foreign finance gap, rather than the savings gap, is deemed to have a greater impact on investment when foreign exchange is the constraint.

Finally, using a theoretical argument, Bacha (1990) introduced a third gap—the fiscal gap. This stemmed from the idea that growth prospects of highly indebted developing countries are severely hampered by the resulting fiscal constraints. As debt "lingers" on, the primary source of growth problems is derived from budget limitations rather than foreign exchange or savings constraints. As the majority of aid is extended directly to governments, the fiscal constraint should be relaxed, provided that aid is used for productive investments.

The second generation literature attempted to directly investigate the aid-growth relationship, instead of addressing this aspect only indirectly through the aid-savings link. However, results are often contradictory, and depend heavily on the sample and period covered.[3] Levy (1988) is one of the few second generation studies specifically devoted to low income countries within Sub-Saharan Africa (with populations of over a million people). Using two samples, one with annual data (to avoid eliminating substantial random annual effects by averaging), and the other with averaged data (to mitigate the effects of lagged responses), the results of his study over a 15-year period shows that there is a positive and significant effect of aid on growth, and that fixed capital formation is a contributor to the rate of growth.

The third generation literature developed in the late 1990s as a means to bring two principle innovations to the existing literature. Firstly, data sets now covered an increasing number of developing countries as well as longer sample periods; and secondly, in line with the new growth theory, studies included explanatory variables to control for the economic and institutional environment. Thus, these variables are incorporated directly into reduced form growth regressions alongside the more traditional macroeconomic variables. In addition, the aid-growth relationship is explicitly seen as nonlinear, as it is argued that aid has diminishing returns (Hansen & Tarp, 2000).

A key debate in the third generation literature is whether the impact of aid on growth is (on average) unconditionally positive, or only conditionally positive, and if the latter, the question becomes: what are the necessary conditions that make aid effective in different subsets of countries in varying periods? Burnside and Dollar (2000) test the hypothesis that the effectiveness of aid is dependent on a country's economic policies and institutional framework. These authors use a sample of former Eastern Bloc countries over the period of 1970–2003, and find that aid only effectively promotes economic growth in a good policy environment.[4] Consequently, additional studies examined whether the aid-growth relationship is a conditional or an unconditional one. However, the results of empirical studies are mixed. Collier and Dollar (2002), Collier and Hoeffler (2004) and Dalgaard, Hansen, and Tarp (2004) report a conditional relationship, while Hadjimichael, Dhaneshwar, Muhleisen, Nord, and Uçer (1995), Durbarry, Gemmell, and Greenaway (1998) and Rajan and Subramanian (2008) find an unconditional relationship. According to Clemens, Radelet, and Bhavnani (2012), the main objection of the proponents of the unconditional view is that they argue

that Boone's (1996) assumption of a linear impact of aid on growth is less realistic than a nonlinear relationship, because aid is subject to diminishing returns partly due to aid receiving countries having a fixed absorptive capacity.

In tandem with the development of the third generation literature, another strand of research has focused on the effect of aid volatility on economic growth. Hudson and Mosley (2008) use a sample of 131 developing countries over the period 1977–2001 to test the effects of positive and negative aid volatility, these being respectively defined as sudden surges and declines in aid. The argument made is that positive volatility has the potential of reducing aid effectiveness due to absorptive capacity constraints, while negative aid volatility can disrupt government budgetary planning, and may result in projects being abandoned, thus reducing aid effectiveness. These researchers ultimately find that surges in aid significantly reduce the shares of government expenditure, investment, and consumers' expenditure. However, Lensink and Morrissey (2000) hypothesize that it is aid uncertainty rather than the overall instability of aid that affects growth. Since aid commitments are generally predetermined, and due to the expected continuity of donor-recipient relations, knowing past values of aid inflows enables recipients to anticipate some variability in aid. In order to examine this hypothesis, Lensink and Morrissey use the standard deviation of the residuals of aid forecasting equations as a proxy for aid volatility in a sample of developing countries over a 25 year period. The results show that there is a strongly significant, positive, linear relationship between aid and growth, but only after controlling for aid uncertainty.

In summary, it is widely accepted that aid influences growth through public investment. Ebeke and Ehrhart (2011) deviate slightly from aid literature by examining the hypothesis that tax revenue instability has had a negative impact on the level of public investment among 37 Sub-Saharan Africa countries over the period 1980–2005. They find that the instability of tax revenues in these Sub-Saharan African countries led to public investment volatility which reduced public investment levels. Hence, the authors conclude that the instability of tax revenues was detrimental to long term economic growth. However, public investment is in part financed by government revenue and aid itself. Therefore, like revenue volatility, it is envisaged that aid volatility may also lead to public investment volatility which reduces levels of public investment, and may hence be detrimental to growth. However, not all sources of financing public investment are as volatile. Furthermore, because public investment is financed by aid, central government revenue, and internal and external borrowing, there may be other stabilizing sources of public investment even in the presence of aid and revenue volatilities, and therefore it is the overall volatility of public investment that matters and not that of its individual financing sources in isolation.

Incorporating public investment volatility into the standard aid-growth framework within the Sub-Saharan African context will provide an indication of the degree to which public investment volatility may have eroded per capita growth over the covered period, where SSA has received significant aid inflows. Our research tends to provide an alternative way of thinking about the aid-growth conundrum in SSA. Where most recent aid-growth research has focused on trying to explain conditions that make aid work (e.g., good policy or geography), the present research shows that the problem with aid's impact on growth is at its main transmission mechanism, and the volatility thereof. To the best of our knowledge, this is the first study to incorporate public investment volatility into the aid-growth framework. In doing so, we address the question of whether public investment volatility, which has been