Effects of Aid Volatility in Niger

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Abstract

This paper investigates effects of aid volatility on Niger’s economy.

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I. INTRODUCTION

- Brief information about Niger.
- Importance and possible effects of aid volatility in Niger
- Some statistical analysis
- Brief information about the model

The remainder of the paper is organized as follows. Section II gives information on the aid volatility literature. Section III gives statistical information on aid volatility in Niger and some other low-income countries. Section IV presents simulation results of policy experiments investigating effects of aid volatility, and also summarizes the main policy lessons of the analysis. Section V concludes.

II. LITERATURE REVIEW

In recent years, the number of papers investigating aid volatility has been increased since it is believed that aid volatility may play an important role in determining whether countries could reach the Millennium Development Goals (MDGs). Aid volatility and unpredictability are one of important reasons for instability in low-income countries. There are many different negative effects of aid volatility on economies of low-income countries. The welfare cost of macroeconomic fluctuations, including aid volatility, is larger in developing countries. For example Pallage and Robe (2003a) indicate that the welfare cost of output fluctuation is larger in Sub-Saharan Africa. The uncertainty about the level of aid or volatility of it negatively affects budgetary revenues of recipient countries and limits spending on projects. Lensink and Morrissey (2000) indicate that uncertainty related to aid damages growth. When uncertainty is accounted for, aid has a significant positive effect on growth, largely because of its effect on the volume of investment. Shortfall in aid leads to lower government spending and/or higher taxes (Gemmell and McGillivray, 1998); as a result private
investment might be crowded out. It may also raise inflation if governments tend
to finance shortfall in aid by printing money (Hadjimichael et al., 1995). Gemmell
and McGillivray (1998) also show that aid volatility is higher than government
revenue volatility, and aid is generally procyclical, which restricts the efficiency of
policy tools during cycles. A paper by Pallage and Robe (2001) supports these
arguments. Pallage and Robe (2003b) introduce a model of investment financing
and aid provision under adverse selection in order to point out that aid
procyclicality might be caused by difficulty of contributing counterpart funds
during economic downturns. Gabriele, Boratav, and Parikh (2000) show that as
the volatility of capital flows, including aid, increases, macroeconomic instability
may increase as well, which may lead to financial crises.

Possible sources of aid volatility are also studied in the literature. Eifert
and Gelb (2005a, 2005b) investigate possible ways to tackle the aid volatility
problem, which might be caused by outside or domestic changes. They point out
that aid volatility is expected to rise due to shifts in donor view such as changes
in coordination and selectivity of aid recipients; donors are shifting away from
project aid to program aid. In order to improve aid predictability, they show that a
reserve buffer may smooth the impact of short-run fluctuations; performance-
based aid has greater predictability than in the past; and some degree of
emphasis on performance trends is appropriate. Bulir and Hamann (2005) also
point out possible sources of aid volatility. These are conditionality of aid and the
way donor budgets are approved and administered.

There are several papers empirically investigating the volatility of aid in
different countries. Bulir and Hamann (2003) focus on empirical evidence on the
volatility and uncertainty of aid flows and their policy implications. They show that
the degree of aid volatility is higher than fiscal revenue volatility, especially in
heavily aid-dependent countries, which is defined by the aid-to-revenue ratio.
Their dataset includes 72 countries including Niger over the period of 1975-97.\footnote{While relative volatility of aid and revenue (in percent of GDP) is 3.94 on average, it is 15.13 in Niger. Similarly, while relative volatility of aid and revenue (in U.S. dollars per capita) is 1.33 on average, it is 2.25 in Niger.} Aid and domestic revenue tend to move in the same direction. Countries suffering from high aid volatility tend to exhibit high revenue volatility. They show that aid volatility need to be accounted properly while designing adjustment programs. The measures can be taken by donors and aid recipients to reduce aid uncertainty and volatility. Fielding and Mavrotas (2005) also study on the volatility of aid using data for 66 countries between 1973 and 2002. They disaggregated total aid flows into sector and programme aid. They show that the institutional quality of the aid recipient affects basically the stability of sector aid, which is designed to promote investment in physical and social crises. They also indicate that more open economies are associated with more volatile sector aid. Osei, Morrissey, and Lensink (2002) examine measures and trends of the volatility of capital inflows in developing countries including Niger over the period from 1970 to 1997. They use three different alternative measures of instability as explained below.\footnote{The values of all three measures of aid volatility are higher for Niger compared to their values on average in low income countries. For example, while the average value of the first measure of aid volatility is 31.89 for low income countries, it is 39.43 for Niger.} They show that instability has increased in the 1990s and official flows (aid) are less volatile compared to private flows. Levin and Dollar (2005) investigate aid volume and volatility in difficult partnership countries (DPCs) over the period of 1992-2002. They show that DPCs not only get less aid, but aid flows to DPCs also more volatile even after controlling for improvement or deterioration in policies and institutional strength. They emphasize that high aid volatility may affect DPCs in a negative way given the fact that DPCs have greater development challenges and need a longer duration for aid-finance programs to produce results.

In the literature, aid volatility has been measured using different methods. Bulir and Hamann (2003) use a relative volatility measure by calculating the ratio of aid volatility to domestic fiscal revenue volatility. While calculating this relative
volatility measure, they express the aid and revenue series in percent of GDP or in terms of current US dollars per capita.\textsuperscript{3} After detrending these series, they calculate the variances of them, and then take the ratios of these variances to calculate the relative volatility measure. Similarly, Gabriele, Boratav, and Parikh (2000) measure instability of capital inflows by the coefficient of variation of series, and volatility by the standard deviation of annual percentage change. Osei, Morrissey, and Lensink (2002) use three different measures of instability. The first one is the standard deviation as a percentage of the mean value of the series; the second one is the standard deviation around a simple time trend; and the last one is the standard deviation around a forecast trend. Fielding and Mavrotas (2005) introduce a variance-based measure of volatility using a symmetric distribution of the aid series in percent of GNI. They also capture aid volatility using a measure of shock to aid. They calculate shock to aid by conditioning their aid series on an information set of lagged macroeconomic variables. The volatility measure is the variance of the movements in the aid series that are orthogonal to the information set. They fit VAR for each country to determine the residuals. Levin and Dollar (2005) measure the aid series as net of emergency aid and debt relief since these components are expected to be more volatile than development aid. Aid volatility is determined by calculating the coefficient of variation by standardizing the standard deviation of aid per capita received by each country by the mean of aid per capita in each country.

As specified in the introduction section, we also simulate the possible effects of aid volatility on Niger using a macroeconomic model which studies the links between foreign aid, public investment, the supply-side effects of public capital, growth, and poverty. Similarly, Arellano, Bulir, Lane, and Lipschtitz (2005) investigate the effects of aid and its volatility on private consumption and investment, and the structure of production in a general equilibrium model

\textsuperscript{3} As indicated by Bulir and Hamann (2003), while the domestic revenue series is in local currency units, aid is in US dollar terms. Either revenue or aid series needs to be converted due to a need for using common denominator. This may lead to inclusion of exchange rate volatility, which might be high in some countries. They calculate the volatility of aid and revenue both in percent of GDP and in U.S. dollars per capita for the purpose of comparison.
framework. They show that while permanent aid is used to smooth consumption, shocks to aid are basically reflected in changes in investment. Aid shocks cause important welfare losses.

III. ASSESSMENT OF AID TRENDS IN NIGER

- How can we measure volatility?
- Aid and volatility of aid in Niger over the past 30 years
- Volatility of components of aid.
- Volatility of aid with respect to GDP
- Volatility of aid with respect to total government revenue
- Comparison of aid volatility in Niger and in similar countries
- Volatility measures for Niger in other papers.

IV. POLICY EXPERIMENTS

Our framework is the macroeconomic model developed by Agénor, Bayraktar, and El Aynaoui (2005) and extended by Pinto Moreira and Bayraktar (2005), and Agénor, Bayraktar, Pinto Moreira and El Aynaoui (2005). This model studies the links between foreign aid, the level and composition of public investment, the supply-side effects of public capital, growth, and poverty, in the context of a low-income country. It focuses on the fiscal and supply-side effects of aid, as well as the stock and flow effects of public investment disaggregated into education, infrastructure, and health. It is designed to examine possible effects of different policy experiments, such as debt relief, increased aid and aid-

4 Despite the fact that both models investigate the effects of aid volatility, their structures are different from each other. Their major weakness is that they do not take into account the government sector although the government has an essential role in the aid allocation process, especially in low-income countries. While Arellano, et. al. (2005) focus only on how private consumption and investment are affected by aid volatility, we, in addition to these variables, study how poverty and other MDG indicators are affected because of aid volatility.

5 Details about the model are given in Appendix.
funded levels of public investment, changes in the allocation of public expenditure, on growth, poverty, and other MDG indicators.

In the original model, it has been assumed that the ratio of aid to GDP was constant at 10.67 percent throughout the simulation period between 2005 and 2015. Thus, any effects of aid volatility have not been investigated. First of all, possible effects of aid volatility will be investigated and the simulation results obtained by

1. Baseline

2. Baseline with Aid Volatility (high versus lower aid volatility)

3. Historical data

3. Continuously Increasing Aid to GDP Ratio

Importance of Dutch Disease

4. Continuously Declining Aid to GDP Ratio

VI. CONCLUSIONS

This paper presented
References


Eifert, Benn, and Alan Gelb, “Coping with Aid Volatility,” Finance and Development, 42 (September 2005a), 24-27.


Osei, Robert, Oliver Morrissey, and Robert Lensink, “The Volatility of Capital Inflows: Measures and Trends for Developing Countries,” CREDIT Research Paper, University of Nottingham, No. 02/10 (September 2002).


ADDITIONAL


Bulir and Hamann (2003): Domestic Revenue is from IMF country desk officers and IFS (but not complete). Test for Augmented Dickey-Fuller, if nonstationary, detrend series using HP filter. Alternatively first differentiated can be used as well. They express aid and revenue in percent of GDP and in per capita US dollar terms.