Disaggregating the Aid and Growth Relationship

Bazoumana Ouattara*

The University of Manchester

and

Eric Strobl

Université de Paris X-Nanterre and CORE, Université Catholique de Louvain

Abstract

Empirical research on the aid and growth relationship remains inconclusive. We propose that this ambiguity may be a result of ignoring different types of aid, such as project or programme aid. Indeed, disaggregating total aid into these two categories, we find evidence that project aid flows affect growth positively whilst the impact exerted by programme aid is negative. There is no evidence that "good policy" enhances the growth effect of either of these two types.

Keywords: Aid; Growth; Dynamic Panel

JEL Classification: C2 F3

* Corresponding author. Adress: Sschool of Economic Studies, The University of Manchester, Oxford Road, Manchester M13 9PL. Tel: +44(0)161-434-7151. Email:osman.ouattara@man.ac.uk.

Section I: Introduction

The role of foreign aid in fostering economic growth and development in poor countries continues to be a subject of debate among policy makers and researchers. Earlier studies found the relationship between aid and growth to be inconclusive (see Papanek, 1973; Voivodas, 1973; Mosley, 1980, Mosley et al., 1987; Boone, 1994). More recently, Burnside and Dollar (2000) (hereafter BD) discovered that aid has a positive impact on growth in recipient countries with good fiscal, monetary, and trade policies. The important policy recommendation of this, which has been embraced by aid agencies, is that aid should only be allocated to countries with a sound policy environment. However, subsequent literature (see Hansen and Tarp, 2001; Dalgaard and Hansen, 2001; Lensink and White, 2001; Easterly, Levine and Roodman (hereafter ELR), 2003) has demonstrated the fragility of BD's findings. Nevertheless, a problem with the existing studies is that they only examine the effects of aggregate aid, although it is well documented that different categories of aid are likely to exert different macroeconomic effects.[1] The current paper contributes to the literature by its re-assessment of the aid-growth nexus using disaggregated aid disbursements data in the context of cross-country panel studies.[2]

Section II: Data Set and Summary Statistics

For all variables except our aid measures, we use the exact data set as in ELR, which is an expanded data set of the original one used by BD. These data contain a number of time invariant and time varying variables, where the time varying variables are averaged over seven four year periods from 1970-1997. The data on aggregate aid (ODA) is obtained from the OECD-DAC online statistics, which was further decomposed into project aid and financial programme aid disbursements data by McGillivray and Ouattara (2003). Specifically, the authors constructed a new database on project and programme aid (net disbursements) by converting the commitment values in the OECD Credit

[1] See Cassen, 1994; White, 1992 and 1998, Mavrotas (2002a), Mavrotas (2002b), Mavrotas and Ouattara (2003), and Ouattara (2004)

[2] There is one study by Cordella and Dell'Aricicia (2003) that examines the effect of disaggregated aid commitments (in the form of budget support and programme aid) on growth in the context of panel studies. However, commitment values are not good indicators of aid since not all aid commitments are disbursed and thus reach the recipient country.

Reporting System into disbursements. [3] Project aid is aid tied to specific identifiable projects and is destined to mainly improve the recipient country infrastructure (social and service infrastructure, economic infrastructures and production sector). This specificity gives donors generally close control over the amount of project aid disbursed. Financial programme aid, in contrast, is generally disbursed to help the recipient country overcome its balance of payment problems via debt relief, import support or free foreign exchange to support the government budget conditional on some monetary and fiscal policy reforms. Arguably, since programme aid is not separated from the recipient government's budget it is more likely to be fungible.

All aid variables are expressed as a percentage of GDP. Given that project aid and programme aid data are only available from 1973, our econometric analysis will be based on six four year periods, namely 1974-1977 until 1994-1997, covering 71 developing countries with 422 observations. Table 1 provides summary statistics of the aid variables. Accordingly, on average total aid amounts to about 4 per cent of GDP in our sample, of which over 80 per cent is due to project aid – although the standard deviations of the aid variables suggest a considerable amount of variation across countries and time. Nevertheless, from the raw correlation figures there appears to be little relation to economic growth rates.

Section III: Econometric Specification and Results

In estimating the impact of aid on economic growth on the data set we specify an empirical equation in the spirit of the original one estimated by BD and subsequently employed by, amongst others[4], ELR:

$$GR_{it} = \alpha + \beta X_{it} + \gamma POLICY_{it} + \delta AID_{it} + \varepsilon_{it} \qquad (1)$$

where GR is the country specific growth rate, POLICY is a measure of policy 'goodness', AID is the variable(s) measuring aid to a country over the period, X is a vector of other control variables, and ε is an i.i.d. residual term. The variables included in X in the original BD and later in ELR are: log of the initial GDP per capita (LGDP), a measure of ethnic diversity (ETH), the number of assassinations

[3] One should note that project aid and programme aid only exist in commitment form in the OECD database.
[4] See, for instance, also Hansen and Tarp (2001).

(ASS), institutional quality, a measure of money supply (MONEY), and Sub-Saharan Africa and East-growing East Asia dummies. POLICY was constructed by regressing GR on all variables in X and measures of the budget surplus (BS), inflation (INF) and openness (OPEN), and using the latter three to construct a 'policy induced' predicted growth rate.

BD and ELR estimate a number of variants of (1) using simple OLS and 2SLS, where for the latter all variables in X are assumed to be exogneous. There are a number of potential econometric problems in doing so, however. First of all, as pointed out by Hansen and Tarp (2001), many of the variables in X are likely to be endogenous. More importantly, one can easily make an argument that even if AID itself is contemporaneously pre-determined with regard to the growth rate, it may still be endogenous simply by its construction into time averages as is done in the BD and ELR data sets; see Daalgard et al (2004). Finally, the variables used to construct the POLICY measure are also likely to be endogenous.[5] In order to avoid biased estimates resulting from using OLS or 2SLS as in BD and ELR, we thus follow Hansen and Tarp (2001) and first difference (1) and the equation used to construct POLICY to purge time invariant country specific effects and then employ the GMM systems estimator developed by Blundell and Bond (1998) that allows one to control for the endogeneity of the explanatory variables. [6, 7] We assume here that all explanatory variables are potentially endogenous, including those in the regression used to construct the POLICY variable. One should also note that all time invariant variables are purged from (1) since under our estimator the data is first differenced.

We first present in Table 2 the results used to construct the POLICY variable. As can be seen, the coefficients on the variables, namely INF, BS, and OPEN used to construct POLICY are all statistical significant and are of the expected sign. One should note that the size of coefficients of these differ, in particular with regard to the latter two, from those found and used by BD.[8] Part of the reason

[5] See also Daalgard (2004).
[6] Actually, Hansen and Tarp (2001) used the GMM estimator suggested by Arellano and Bond (1991). We use here the GMM systems estimator since it has been shown to be perform better for small samples; see Blundell and Bond (1998).
[7] The validity of these instruments can be tested using Arellano and Bond's (1991) Sargan test in all specifications we found support for our instruments. One should also note that this estimator crucially depends on the lack second order autocorellation. The AR(2) test, as proposed by Arellano and Bond (1991), produced no evidence of such. Both of these tests are reported in the tables.
[8] The coefficients in BD were 6.85, -1.40, and 2.16 for BS, INF, and OPEN, respectively.

for this, however, is a feature of the expanded nature of the ELR data set – when we used simple OLS the estimated coefficients for INf, BS, and OPEN were –2.185, 0.809, and 7.432, respectively.[9]

Using the coefficients in Table 2 to construct the POLICY variable we then estimate (1) first without including any measure of AID; the results of which are shown in the first column of Table 3. As can be seen, like in BD and ELR the policy variable has a positive and significant variable on growth, indicating that good policies foster growth. Of the other variables only the assassination proxy is significant. In the second column we then included the total aid measure (TOTAL_AID). However, as can be seen it has no significant effect on countries' economic growth rates.[10] The lack of a relationship between aid and growth holds even if we interact this aid variable with POLICY, allowing for aid to have a different impact in countries with 'good' policies, as shown in the third column.

We next included our two disaggregated aid measures, project aid (PJ_AID) and programme aid (PG_AID) in the fourth column. Importantly, significant coefficient on both indicates that disaggregating aid is an important factor to consider when investigating the impact of aid on growth. Specifically, our results indicate that project aid has a positive, while programme aid has a negative effect on growth. We also experimented with whether good policies by interacting POLICY with our two aid variables. However, as can be seen from the last column, the interaction terms are not significant and only act to make the coefficient on project aid insignificant. This suggests no role for good policies, at least as measured by this proxy, in terms of enhancing the effect of either type of aid on growth.

Section III: Concluding Remarks

We find that project aid flows promote growth, while programme aid act as a negative stimulant. Neither of these two factors are, however, influenced by 'good policy environments'. These findings suggest that politicians of developed countries and more importantly donor agencies which have

[9] For this we included all time invariant variables in BD and ELR that were dropped in our GMM because of their time invariant nature. One should note that this slightly reduced the sample size to 375.

[10] We also experimented with higher order terms of this and the disaggregated aid variables, but these were in no cases significant.

prematurely embraced the aid selectivity argument, may need to rethink their aid allocation strategy in terms of altering the composition of aid rather than cutting it to poor (policy) performers.

Acknowledgements: Thanks to D. Roodman for sending the ELR dataset.

References

Blundell, R. and S. Bond, 1998, 'Initial Conditions and Moment Restrictions in Dynamic Panel Models', *Journal of Econometrics*, 87, pp. 115-43.

Boone, P., 1994, 'The Impact of Foreign Aid on Savings and Growth', *Centre for Economic Performance Working Paper 1265*.

Burnside, C. and D. Dollar, 2000, 'Aid, policies, and growth', *American Economic Review*, 90, 4, pp. 847-68.

Cordella, T. and G. Dell'Ariccia, 2003, 'Budget Support versus Project Aid', *IMF Staff Papers*, 14 August.

Dalgaard, C., H. Hansen, F. Tarp, 2004, 'On the Empirics of Foreign Aid and Growth', *Economic Journal*, 114, 496, pp. 191-216.

Dalgaard, C. and H. Hansen, 2001, 'On Aid, Growth and Good Policies', *Journal of Development Studies*, 37, 6, pp. 17-41.

Easterly, W., R. Levine, D. Roodman,. 2004. "Aid, Policies and Growth: A Comment", *American Economic Review*, 94, pp. 774-780.

Hansen, H. and F. Tarp, 2001, 'Aid and Growth Regressions', *Journal of Development Economics*, 64, pp. 547-70.

Lensink, R. and H. White 2001, 'Are There Negative Returns to Aid?' *Journal of Development Studies*, 37, 6, pp. 42-65.

Mavrotas, G., 2002a, 'Aid and Growth in India: Some Evidence from Disaggregated aid Data', *South Asia Economic Journal*, 3, 1, pp. 19-49.

Mavrotas, G., 2002b, 'Foreign Aid and Fiscal Response: Does Aid Disaggregation Matter?' *Weltwirtschaftliches Archiv*, 138, 3, pp. 534-59.

Mavrotas, G. and B. Ouattara, 2003, 'Aid Disaggregation, Endogenous Aid and the Public Sector in Aid-Recipeint Economies: Evidence from Côte d'Ivoire.WIDER Discussion Paper 2003/15. World Institute for Development Economics Research, Helsinki.'

McGillivray, M. and B. Ouattara, 2003, 'A New Database on Project and Programme Aid Disbursement and its Application the Savings Displacement Hypothesis', *Mimeo, World Institute of Development Economics (Helsinki) and The University of Manchester*.

Mosley, P., 1980, 'Aid, savings and Growth Revisited', *Bulletin of the Oxford Institute of Economics and Statistics*, 42, 2, pp. 79-95.

Mosley, P., J. Hudson and S. Horrell, 1987, 'Aid, the Public Sector and the Market in Less Developed Countries', *Economic Journal*, 97, 387, pp. 616-41.

Ouattara, B., 2004, 'Foreign Aid, Public Savings Displacement, and Aid Dependency in Cote d'Ivoire: An Aid Disaggregation Approach', *Manchester School of Economic Discussion Papers*, 0406.

Papanek, G.F., 1973, 'Aid, foreign private Investment, Savings and Growth in Less Developed countries', *Journal of Political Economy*, 81, pp. 121-30.

Voivodas, C.S., 1973, 'Exports, Foreign Capital Inflow and Economic Growth', *J. Int. Econ.*, 3, 4, pp. 337-49.

White, H., 1992, 'The Macroeconomic Impact of Development Aid: a Critical Survey', *Journal of Development Studies*, 2, pp. 163-240.

White, H. 1998. *Aid and Macroeconomic Performance: Theory, Empirical Evidence and Four Countries Cases*. London: Macmillan Press LTD.

Table 1: Summary Statistics

	Mean	St. Dev.	Correlation with GR
TOTAL_AID	4.01	5.40	-0.09
PG_AID	0.71	1.53	-0.10
PJ_AID	3.31	4.45	-0.07

Notes: TOTAL_AID, PG_AID, and PJ_AID are total, programme, and project aid, respectively – all expressed as a percentage of GDP.

Table 2: POLICY Regression

LGDP	0.750***
	(0.056)
ASS	-0.357***
	(0.108)
ETH*ASS	0.613*
	(0.342)
MONEY	0.001
	(0.003)
BS	15.650***
	(2.098)
INF	-1.766***
	(0.282)
OPEN	0.889***
	(0.159)
Constant	-3.876***
	(0.297)
Observations	422
Number of id_code	71
Wald Test	81879.29***
SarganTest	63.28
AR(2) Test	1.04

Notes: (1) Standard errors in parantheses. (2) ***, **, and * indicate 1, 5, and 10 per cent significance levels. (3) Sargan Test is Arellano and Bond's (1991) test for instruments. (4) AR(2) is Arellano and Bond's (1991) test for second order correlation.

Table 3: Aid-Growth Regression

	(1)	(2)	(3)	(4)	(5)
LGDP	0.532	1.129**	0.492	0.720	0.532
	(0.478)	(0.549)	(0.583)	(0.444)	(0.587)
ASS	-0.666**	-0.495	-0.464	-0.743	-0.660
	(0.275)	(0.421)	(0.317)	(0.580)	(0.584)
ETH*ASS	1.186	0.986	1.161	1.370	1.494
	(0.881)	(1.347)	(1.184)	(1.758)	(1.604)
MONEY	0.017	0.006	0.022	0.024	0.030
	(0.018)	(0.023)	(0.025)	(0.018)	(0.023)
POLICY	0.956***	1.029***	1.074***	0.995***	1.020***
	(0.208)	(0.214)	(0.338)	(0.241)	(0.366)
TOTAL_AID		0.060	-0.012		
		(0.067)	(0.084)		
POLICY*TOTAL_AID			-0.009		
			(0.016)		
PG_AID				-0.554***	-1.198*
				(0.200)	(0.686)
PJ_AID				0.180**	0.193
				(0.080)	(0.207)
POLICY* PG_AID					-0.225
					(0.214)
POLICY*PJ_AID					0.034
					(0.061)
Constant	(3.363)	(3.681)	(3.831)	(3.301)	(4.188)
	0.532	1.129**	0.492	0.720	0.532
Observations	422	422	422	422	422
Countries	71	71	71	71	71
Wald Test	50.99***	97.42***	96.08***	77.63***	87.45***
SarganTest	56.04	57.01	56.82	59.34	58.77
AR(2) Test	0.79	0.70	0.69	0.72	0.33

Notes: (1) Standard errors in parantheses. (2) ***, **, and * indicate 1, 5, and 10 per cent significance levels. (3) Sargan Test is Arellano and Bond's (1991) test for instruments. (4) AR(2) is Arellano and Bond's (1991) test for second order correlation.