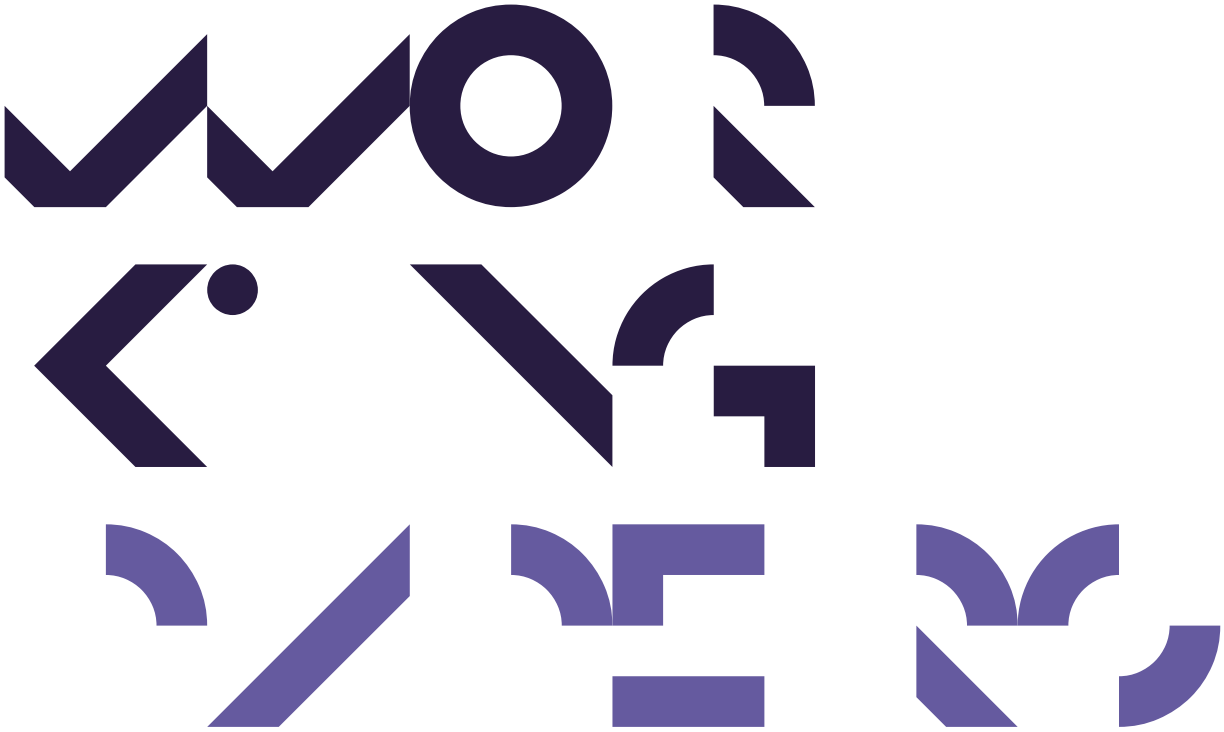

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Types of Foreign Aid

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TYPES OF FOREIGN AID

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Abstract: Foreign aid is given for many purposes and different intentions, yet most studies treat aid flows as a unitary concept. This paper uses factor analysis to separate aid flows into different types. The main types can be interpreted as aid for economic purposes, social purposes, and reconstruction; a residual category captures remaining purposes. Estimating the growth effects of separable types of aid suggests that most aid has no effects while reconstruction aid has direct positive effects. Although this type only applies in special circumstances, it has become more prevalent in more recent years.

Keywords: Foreign aid, dimensionality, development, economic growth

JEL Codes: O11, F35

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1. Introduction

The likely consequences of foreign aid have led to heated discussions among economists since the 1950s (Friedman, 1958; Bauer, 1976). While the intentions from the very beginning were that foreign aid would finance productive investments in order to help developing countries achieve 'take-off' (cf. Rosenstein-Rodan, 1957; Rostow, 1960), the first studies to assess the returns to aid yielded mixed results (Griffin and Eno, 1970; Papanek, 1972, 1973). Since Mosley, Hudson and Horell (1987), a long series of studies that have estimated the effectiveness of aid, either on growth, investments or a set of social outcomes, has found no robust effects. Small parts of the profession continue to argue either that aid in general works or that aid is always harmful (Hansen and Tarp, 2000, 2001; Chauvet and Guillamont, 2001; Minoiu and Reddy, 2010; Ovaska, 2003; Kourtellos, Tan and Chang, 2007; Djankov, Montalvo and Reynal-Querol, 2008). However, systematic surveys document that the converging consensus in the literature is that aid overall has no significant growth effects (Rajan and Subramanian, 2008; Doucouliagos and Paldam, 2008, 2010, 2011; Nowak-Lehman et al., 2012). The aid literature proposes two main explanations for this result while the present paper follows an emerging literature in exploring a third option.

As an example of the first explanation, Roodman (2008) tries to settle the discussion by arguing that there is an effect of aid, but that it is so small that econometric problems prevent clear identification. Basically, this type of explanation assumes that aid and central variables are measured with so much noise in developing countries that real effects and noise are statistically indistinguishable. The alternative explanation is that foreign aid has positive direct effects but also comes with several negative indirect effects yielding an average net development effect of zero.

Studies in the second strand of the literature first of all document that aid causes Dutch Disease, which undermines competitiveness and the export and manufacturing sector (Arellano et al., 2009; Werker, Ahmed and Cohen, 2009; Bjerg, Bjørnskov and Holm, 2011). In particular, aid inflows and

larger projects may induce inflation and relative price changes that distort the economy (Tornell and Lane, 1999; Torvik, 2001; Acharya, Fuzzo de Lima and Moore, 2006; Doces, 2011; Rajan and Subramanian, 2011). Second, inflows of aid allow governments and politicians to spend aid on popular, as opposed to productive, purposes, and to ignore structural problems for substantially longer than if benefits as well as costs accrued only to the country and its own decision-makers (Boone, 1996; Moss, Pettersson and van De Walle, 2007). As such, aid may undermine a number of political incentives and institutional reforms that would be beneficial to long-run growth (Remmer, 2004; Knack, 2001, 2004; Djankov, Montalvo and Reynal-Querol, 2008; Heckelman and Knack, 2008; Bjørnskov and Schröder, 2010). The problems of political incentives also relate to the issue of fungibility: that as aid inflows finance activities within the set of priorities of the government, politicians can rationally decide to reprioritize the budget allocation as aid merely finances something that would otherwise have been partly covered by ordinary budget means. Fungibility thus has the consequence that aid may contribute to activities well outside the interest of donors (Feyzioghlu, Swaroop and Zhu, 1998; Swaroop and Devarajan, 2000; Collier and Hoeffler, 2007; Werker, Ahmed and Cohen, 2009).

However, recent studies have sketched a third argument: that foreign aid is given with such different purposes in mind that though precisely measured, the sheer diversity of disbursements makes identification of effects almost impossible (cf. Calderisi, 2006; Dreher, Nunnenkamp and Thiele, 2008b; Wright and Winters, 2010). A few studies have therefore begun to examine the likely effects of specific types of foreign aid.[1] Clemens et al. (2012) argue that "early-impact" aid, which includes budget and balance of payments support and aid intended to support infrastructure and industrial development, affects growth within a time horizon detectable in standard regression design. Kilby and Dreher (2010) instead attempt to separate aid inflows depending on the motives of different donors, suggesting that aid given with political motives is less likely to contribute to development. Other studies focus

[1] It is worth mentioning that this point was a staple of the earliest critique of foreign aid brought up by both Friedman (1958) and Morgenthau (1962).

specifically on the effects of aid for education and health (Michaelowa and Weber, 2007; Dreher, Nunnenkamp and Thiele, 2008b; Mishra and Newhouse, 2009; Christensen, Homer and Nielson, 2011).

The purpose of this paper is to address the particular problem of aid diversity and to explore the dimensionality of foreign aid disbursements and the consequences of treating foreign aid as a multi-dimensional international transfer. The paper addresses one particular potential problem stressed by Roodman (2007): that substantial multicollinearity can create the appearance of significance, which may be a substantial problem if specific types cannot meaningfully be separated. If types of aid in general are disbursed together, studies of the effectiveness of specific types may not count all relevant disbursements and thus underestimate the effect.

To alleviate this problem, I use the AidData database, which is becoming a standard alternative to OECD / World Bank data in the aid literature (Nielson et al., 2010; Nielsen et al., 2011). Doing so allows me to separate aid into different types, based on the 24 purpose codes in which AidData reports all development projects. This choice implies that aid effectiveness can be estimated without the heterogeneity problem inherent in most previous studies. The analysis shows that most foreign aid disbursements to developing countries between 1970 and 2005 can be split into three clearly identifiable and separable groups and a residual group. Separating types of foreign aid thus allows for substantially more precise estimates of the consequences of aid. When accounting for endogeneity problems, GMM panel estimates suggest that most aid is without consequences. Yet, aid with the purpose of reconstruction exhibits a positive significant effect on growth, suggesting that aid is only effective under such specific circumstances.

The rest of the paper is structured as follows. Section 2 briefly outlines the statistical problem and describes the data and estimation strategies. Section 3 reports the results of estimating the dimensionality of foreign aid and outlines the structure of the separated data. Section 4 re-estimates two claims from the existing literature on aid effectiveness while section 5 concludes.

2. Data and estimation strategy

2.1. Main data

The data on aid used in the following are all from the recent PLAID (Project Level Aid) database, as reported by AidData (Nielson et al., 2010), which offers a more inclusive account of global aid flows. The organization, which was originally set up as a partnership between Brigham Young University, the College of William and Mary, and the non-profit development organization Development Gateway, aims at counting all aid flows regardless of their source. Relative to the common OECD-DAC database, AidData offers nearly twice as large flows of aid when recorded as commitments and excluding concessional loans, not least by adding projects from NGOs and other additional sources not included in OECD statistics. All data are recorded in project form, categorized in 24 purpose codes listed in Table I and a 25th purpose code, "Administrative costs of donors". This feature of AidData allows the separation of different types of aid in a more comprehensive way than in previous studies. I elect to use data on actual disbursements instead of commitments, as some commitments are known not to be fulfilled. While AidData thus counts larger promised inflows of aid, it also allows exclusively measuring actual, documented inflows. For similar reasons, I only include aid given to specific countries and thus exclude regional aid flows that cannot be assigned to one country.

Using AidData comes with a further benefit: compared to non-oil developing countries with full national accounts data in the Penn World Tables and aid flows recorded by the OECD, AidData allows adding 76 observations (10 % of the sample). Many of these observations stretch further back in time, yielding a sample that is more balanced in terms of time, geography and level of development than previous datasets. This means more data from countries such as Congo (Brazzaville), Djibouti, Fiji and Vietnam, as well as substantially more data from small countries, including Dominica, Guyana, Kiribati, Micronesia and Sao Tomé and Principe. The use of a large sample size including more countries than previous studies alleviates the inherent problem in much literature that the inclusion of countries in

datasets is not random (Hollyer, Rosendorff and Vreeland, 2011; Bjerg, Bjørnskov and Holm, 2011). Indeed, Roodman (2007) finds that the major source of fragility in the aid effectiveness literature is sample expansion, which in many cases renders previous results insignificant (cf. Easterly, Levine and Roodman, 2004). By allowing a large and more diverse dataset, using this source is *a priori* also likely to yield more reliable results.

As a first example of the potential insights from using AidData, the database enables researchers to assess donors' administrative loss from delivering foreign aid. Although many commentators and several politicians claim that a major part of aid disbursements is lost in administration in donor countries before being disbursed, the reported data suggest otherwise. Administrative costs have almost entirely been reported after 2000, but the available evidence shows that in the total AidData database, only .32% of total reported aid since 2000 consists of administrative costs. Only 14 country-year observations on administrative costs are above 2% of total aid to the country in a given year, and only two of those are not small island states.[2] However, these costs clearly do not necessarily relate to the administrative costs borne by recipient governments and organizations.

Apart from administrative costs, other purpose codes vary considerably. Disaster prevention and preparedness, support to women, and support to NGOs and civil society are the smallest posts. The major posts are general budget support, agriculture, forestry and fishery, transport and storage and the general 'other' category; the average country within the sample period received 2.2% of GDP as foreign aid in one of these four categories. Yet, while the smallest disbursement categories remain the same, the

[2] The 14 country observations are the Cook Islands in 2000 (2.88%), Equatorial Guinea in 2004 (2.28%), French Polynesia in 2004 (5.47%), Mayotte in 2005 (34.36%), Mozambique in 2001 (2.12%), Sao Tomé and Principe in 2005 and 2006 (2.18% and 2.02%), the Seychelles in 2004 and 2005 (8.26% and 4.35%), Saint Lucia in 2004 and 2006 (3.54% and 3.27%), Trinidad and Tobago in 2004 (3.12%), Turks and Caicos Islands in 2003 (9.39%) and Vanuatu in 2004 (2.58%). The observation from Mayotte is almost certainly a reporting error since adjacent years do not exhibit particular administrative costs.

largest change over time, suggesting that even in a purely dynamic perspective, aid types can be separated.

Having total aid disbursements separated into purpose codes allows testing one additional potential source of effect heterogeneity. In the following, I also include the Herfindahl-Hirschmann index of aid in the 24 categories, which effectively measures the degree of concentration of aid to one purpose. This also to some extent captures the problems of aid proliferation, although across purposes instead of donors. As Kimura, Mori and Sawada (2012) show that the bureaucratic and administrative difficulties increase with the number of donors to report to, a similar problem is likely to occur when aid is spread across more purposes, each of which necessitates its own reports (Moss, Pettersson and van de Walle, 2007).

While AidData represents an improvement over existing data sources, reporting nonetheless remains a potential problem. Holding total aid disbursements in AidData up against commitments of net official development assistance (ODA) data from the World Bank (2011), i.e. comparing actual, documented flows with official promises including concessional loans, there is an average discrepancy of 4.8% of GNI. In other words, a comparison suggests that AidData on average may underestimate aid inflows by about one half, if the World Bank had accurately reported official aid disbursements. One should, however, be careful of interpreting the difference as pure underreporting since the standard data from the World Bank and OECD not only report commitments instead of disbursements, but also includes concessional loans with a grant element of up to 25% and debt relief in the concept of net ODA. According to World Development Indicators, the average grant element of new loans extended to developing countries since 1980 has been approximately 38%, which is likely to substantially inflate OECD aid inflows (World Bank, 2011).

These data first enter into a dimensionality analysis which informs of how one can separate different types of aid in a statistically valid way. In the following, I also report and use the total

aggregated aid inflows as well as aid separated according to the typology in Clemens et al. (2012). When separated, I use the data in a set of standard growth regressions.

2.2. Control variables

In the following, all data are aggregated into five-year periods in order to avoid noise, spuriously cointegrated relations occurring in annual data, and identification from business cycles and random reporting errors. The seven periods are 1970-1975, 1975-1980, 1980-1985, 1985-1990, 1990-1995, 1995-2000, and 2000-2005. The data in these five-year periods form an almost balanced panel with 110 non-oil developing countries and 753 observations with full data.

I employ two different sets of control variables: one adds a set of variables used by most studies of growth in developing countries while the other is restricted to the most basic factors. The problem, and the reason for using both, is that several variables standard in the growth literature could proxy for transmission mechanisms connecting foreign aid and growth (cf. Hodler and Knight, 2012). Examples include the budget balance, added by Rajan and Subramanian (2008), which Remmer (2004) suggests is adversely affected by aid inflows; institutional quality, a standard correlate that a series of studies show is negatively associated with aid (Knack, 2001, 2004; Djankov, Montalvo and Reynal-Querol, 2008); political instability that Licht (2010) suggests may be reduced by aid inflows to dictatorships (Nielsen et al., 2011; Savun and Tirone, 2011); and inflation and terms of trade, both of which are associated with the Dutch Disease phenomenon (Doucouliagos and Paldam, 2008; Rajan and Subramanian, 2011). The simple set of control variables thus only includes the initial logarithm to PPP-adjusted GDP per capita, openness to trade, and disasters (per million inhabitants); the former two are from the Penn World Tables, mark 7 (Heston, Summers and Aten, 2011) while the latter is the number of major natural disasters per one million inhabitants within each five-year period, which derives from EM-DAT (2012). In all specifications, I also add a full set of period fixed effects.

Contrary, the variables in the full set include government expenditures as percent of GDP, the investment rate, both measured as the GDP share of total trade and population growth, all from the Penn World Tables, mark 7 (Heston, Summers and Aten, 2011). I also add life expectancy at birth, from World Bank (2011), the dichotomous democracy indicator developed by Cheibub, Gandhi and Vreeland (2010), and the number of coups and confirmed coup attempts, taken from Marshall and Marshall (2009), both of which proxy for differences in institutional quality and political instability across countries. The controls thus capture convergence effects, and most other broadly important factors. In total, I estimate growth rates of country i in period t, GR_{ti}, with a vector of common control variables X_{ti} and a set of additional variables Z_{ti} that together make up the full specification in 1). A_{ti} is either total aid or vectors of types of aid following either Clemens et al. (2012) or the typology developed in the following; D_i is a full set of period dummies, F_t are country fixed effects and e_{ti} is a noise term.

$$GR_{ti} = a + b\,X_{ti} + c\,Z_{ti} + d\,A_{ti} + f\,D_i + g\,F_t + e_{ti} \quad (1)$$

I handle potential endogeneity problems by supplementing a set of GLS regressions with fixed time and country effects with a further set of GMM estimates (Blundell and Bond, 1998) as implemented in Stata by Roodman (2009). In these regressions, additional instruments include country voting patterns from the United Nations General Assembly and whether or not countries are enrolled in the Highly Indebted Poor Countries program (HIPC). The former set includes the shares of all votes within a period in which the country voted with the US or the Soviet Union / Russia and, respectively (Voeten and Merdzanovic, 2009). This choice is dictated by a series of studies showing that aid flows are affected by countries' voting patterns and influence in the Security Council (Dreher, Nunnenkamp and Thiele, 2008a, Dreher, Sturm and Vreeland, 2009; Kegley and Hook, 1991; Kuziemko and Werker, 2006).

3. Separating types of foreign aid

The aid literature includes several studies that disaggregate aid flows into different types. All are based on some form of intuitive theoretical argument. Although ignored until recently, Morgenthau (1962, 301) starts this literature by arguing that aid should be divided into six types: "humanitarian aid, subsistence aid, military aid, bribery, prestige foreign aid, and foreign aid for economic development". Morgenthau's claim is that only humanitarian aid is non-political while subsistence aid may prevent development catastrophes and the type intended to produce development in a developing country may vary with the particular needs and the benevolence of the government of that country. In recent years, Morgenthau's approach has been implemented by a small number of studies.

3.1. Recent typologies

These papers have nevertheless approached the issue of disaggregating aid into separate types in different ways. Kilby and Dreher (2011) for example employ a two-step procedure in which they first estimate the determinants of aid flows from a set of donors. Second, based on these estimates, they separate aid inflows into a needs-based category and an 'other' category (determined by international politics), which they enter into standard growth regressions. As such, Kilby and Dreher (2011) attempt to separate aid based on the motives of donors, indicating that needs-based aid is more effective in supporting growth. Second, Rajan and Subramanian (2008) instead exemplify the most common way of dividing aid, as they separate aid flows from bilateral and multilateral donors. The implicit argument is that bilateral donors are better at targeting aid to actual needs and wants of developing countries. However, Rajan and Subramanian (2008) find no evidence of any differences in effectiveness. Third, Selaya and Thiele (2012) distinguish between program and project aid and shows that the former, in particular when given as direct budget support, is likely to undermine governance.

Finally, the most recent and most ambitious undertaking in this line of research is that of Clemens et al. (2012) who argue that the lag between aid disbursements and visible effects of aid efforts may prevent identification. They therefore separate aid into two broad categories and keep only one,

which they denote "early-impact aid". This type of aid consists of all budget support or program aid, as well as aid for infrastructure, transportation, communications, energy, banking, agriculture and industry (Clemens et al., 2012, 598). Their empirical results suggest that early-impact aid is associated with subsequent growth, i.e. that this particular type of aid is more effective than alternative modes of delivery.

3.2. Forming separable types of aid

However, while these typologies may be informed by intuitive and well-founded arguments, they are nevertheless all ad-hoc in a statistical sense. Although the theoretical arguments may be sound, estimates can suffer from severe bias if the resulting aid measures are either too highly correlated or differences occur due to problems associated with particular elements. As noted by Roodman (2007), substantial multicollinearity can create the appearance of significance, which in this respect is particularly likely if specific types of foreign aid cannot meaningfully be separated. Likewise, if ad-hoc typologies mix types of aid with actual effects with ineffective types, real consequences may go undetected as invalid typologies bias estimates towards zero.

The main challenge is therefore how to separate different types of aid in a statistically valid way, which in its essence is a matter of reducing the dimensionality of the data. Some aid purposes are similar or overlapping while others are different, but pooled in the standard approach to aid regressions. For example, aid to agriculture, forestry and fisheries is similar in purpose to aid to industry and mining in that the overarching purpose is one of economic development. Similarly, general budget support, general environmental protection, a substantial part of health aid as well as most aid within the purpose code of "government and civil society" share the feature that they are all given with the aim of enabling national governments to achieve specific public goals (Guillamont, 2011). As such, aid given with different specific purposes may share an overarching purpose and thus intuitively belong to the

same overall type. One would thus expect that these types of aid tend to be packaged together by donors such that inflows of specific purposes within overarching types are correlated.

For the purpose of separating such overall types, factor analytical tools provide the best available choice. Munck and Verkuilen (2002) for example provide a now seminal illustration of their application to measurement problems by showing how democracy indices tend to fall into two separable types. I follow their approach and use principal factor analysis to sort the aid data separated into 24 purpose codes into a typology determined entirely by the structure of the data on aid disbursements. Table IIa reports the results of a principal factor analysis, using oblique rotation such that factors need not be fully orthogonal.[3] As factor scores can be difficult to interpret quantitatively, I use this analysis to sort actual disbursement data into interpretable categories. Table IIb reports the weighting scheme derived from factor analysis used to score types of foreign aid; note that I do not use the factor scores, since they cannot be quantitatively interpreted, but instead merely use it to derive a valid typology and weighting scheme.[4]

Table IIa reports a solution with five components since a rotated solution yields five interpretable components of which only three have eigenvalues above one, such that they capture more variation than one of the underlying types. A scree plot also shows a clear elbow at a solution with three components and the first three factors capture 92 % of the variation in the aid data while the next two factors jointly capture only an additional 3 %. As such, the additional factors are likely to be of relatively little importance and not robustly identified. In the following, I therefore provide analyses

[3] The particular rotation procedure is Oblimin with a gamma of .5; results are almost identical with a gamma of 0. The alternative orthogonal rotation technique Varimax, which is standard in most studies, yields fairly comparable results.

[4] While procedures exist that can rescale factor components back to the original scale of the variables entering the analysis, these procedures all rest on first performing factor analysis based on the covariance matrix. They are therefore not practically applicable in the present situation, as analyses based on the covariance matrix are highly sensitive to differences in variance of the raw variables. As the averages, and thus the variances, of the 24 aid variables vary widely, such procedures merely identify factors based on the absolute levels and thus rely on very little relevant information.

with a solution of three types; remaining purpose codes not within these three types are collapsed into a residual component.

Insert Table IIa about here

Insert Table IIb about here

This typology appears to be both statistically robust and intuitively valid. First, employing an alternative rotation technique that yields orthogonal components provides almost identical solutions. The correlations between factors 1 and 3 extracted by factor analysis and rotated with either technique are all about .95, the only main difference being the second factors for which correlations are roughly .85. Restricting the sample used in factor analysis to only observations receiving more than one percent of GDP as foreign aid, i.e. avoiding spurious correlations due to a large number of zero-observations, again yields almost identical solutions with correlations between scores from alternative techniques well above .9. Further tests yield similar results, deleting observations with very large aid flows or forming components from aid per capita instead of aid per GDP, pointing to the stability of the separation typologies, which I use in the rest of the paper. What the analysis shows is that different purpose codes split into an intuitively valid pattern. Six out of 24 purpose codes load onto two components, in which case I use the best average guess of how to separate these disbursements by weighing their contribution to each component relative to their factor loading.

Along the first dimension identified by the analysis, about two thirds of aid with the purpose of building capacity in agriculture, forestry and fishery, communications, food security, almost half of education aid, energy infrastructure, a third of health projects, industry, mining and construction, other commodity assistance, transport and storage and about two thirds of water supply all fall into a category that can be considered first-generation aid. The overall purpose of these types is directly productive economic investments or infrastructure investments thought to be complementary to industrial development. I therefore term this type "economic aid", although it might also be thought of

as very traditional development assistance along the paradigm outlined by the two-gap model and take-off models (cf., Chenery and Strout, 1966; Griffin and Eno, 1970).

The second overall aid type consists of about a third of projects in the 'agriculture, forestry and fishery' purpose code, business and other services, the other half of education aid, general budget support, environmental aid, half of the support for government and civil society, two thirds of health, the 'other' category, social infrastructure aid, half of the projects in the 'population policy' purpose code, and roughly a third of investments in water fall within this category. As all these investments can be construed under the heading of 'social aid', i.e. aid with the purpose of non-pecuniary social development through government policy, this is the term and interpretation of this type. The third type clearly focuses on reconstruction after some type of emergency or preparations for future emergencies and emergency management, as it includes all financing of emergency responses, half of all aid to government and civil society and all reconstruction relief. Reconstruction aid is thus very easy to place as a separate type of foreign aid.

Finally, the remaining purpose codes – aid to the banking and financial sector, disaster prevention (i.e. not traditional emergencies), the other half of aid for population policy, support for NGOs and civil society, trade and tourism and aid to women fall outside of the typology. These types of aid that on average form 2.4% of total aid disbursements are therefore pooled into a residual category.

A potential problem solved in the present context is that Clemens et al. (2012) – which provide a comparison typology – use OECD-DAC data and do not report disbursement data on types of aid, only commitments. Despite this difference, the way Clemens et al. (2012) separate types maps easily onto the AidData purpose codes. Their early-impact aid category consists of aid for infrastructure, including transportation, communications, energy, banking, agriculture and industry, and also includes budget support (Clemens et al., 2012, 598). It is therefore easy to form two measures of aid, following this typology, which is compared to the 3+1 typology of the present paper. I define early-impact aid as reported in Table IIb as the aggregate of agriculture, banking, business, communications, energy,

budget support, industry and mining, and transport aid; the remaining purpose codes form the Clemens et al. residual category.

Treating the 3+1 typology as a set of indices, an immediate test of the statistical validity of the typology is to calculate Cronbach's Alpha for the four types. Doing so yields very strong support for economic and social aid with alphas of .84 and .77, respectively, and fair support for reconstruction aid, which yields an alpha of .63. Not surprisingly, the residual category is not a good index with an alpha of only .18. In comparison, Cronbach's Alpha for the two types from the Clemens et al. (2012) typology is .71 and .75, respectively, although both include items with relatively low intra-test covariance.

The correlation between the two types of aid separated in Clemens et al. (2012) is .64. In comparison, the largest correlation between types within the present typology is .59 between economic and social aid, while correlations between the remaining elements are between .15 and .35. A final way of validating these solutions, apart from yielding a readily interpretable pattern and passing a standard test, is to trace the development over time of the typology. Figure 1 therefore provides an illustration of the share of total aid to an average country that fell into either of four types during the period between 1970 and 2005.

Insert Figure 1 about here

The figure rather clearly demonstrates that the purpose and intentions of foreign aid have changed over time similar to those traced by Easterly (2009), reflecting changes in international aid 'paradigms' (Hodler and Dreher, in press). The most dramatic change documented by the figure is the decline of aid for purely economic purposes, i.e. aid with the intention of creating 'old-fashioned' economic development, and thus the death of 'big push' mentality. From the mid-1980s, economic aid declined from an average of 3% of GDP to about 1% in the early 2000s. At the same time, aid with social purposes was stable before the 1981-1982 debt crises, but has increased steadily since. In other words, economic aid constituted more than 60% of all aid in the 1970s, but was by the mid-2000s less than 30%. Conversely, social aid has increased from about 30% to more than half of all aid, and

reconstruction aid now takes up approximately 15% of total aid. Most of the decline in economic aid since 1990 is thus a reflection of aid flows shifting towards social purposes and reconstruction. The residual category, which includes business support, NGOs, trade and tourism, women as well as a small share of total aid disbursed as disaster aid has decreased since 1990. There is therefore evidence of a refocusing of foreign aid since the early 1980s and the series of development failures that became obvious with the debt crises in Latin America. This shift of focus is moreover consistent with the changing official priorities of the international community (Easterly, 2002, 2009). However, whether this has led to a concentration of aid efforts or contributed to distributing aid disbursements thinly across more purposes is indicated by Figure 2.

Insert Figure 2 about here

Figure 2 clearly depicts that foreign aid has become less concentrated over the years, at least until the mid-1990s, as more issues came on the aid agenda and intentions broadened (Easterly, 2009). Prima facie, the development of aid in all 24 purpose codes suggests that aid efforts have become more diverse. When separating aid into types, the evidence of diversification remains similar with a typology of four components; evidently, the reduction of dimensionality does not alter the broad pattern. As such, this rejects a popular tale told among aid workers that no diversification occurred, but that as more intentions arose on the international agenda, more projects have become categorized in specific purpose codes despite not being objectively different from previous projects. In other words, the figure rather clearly shows that regardless of whether aid is separated according to specific project descriptions or statistically separable types, foreign aid is now distributed across more purposes and intentions than in previous decades.

Table III provides a final impression of the data. The table reports the average aid inflow in half-samples split according to growth rates, GDP per capita, disasters per million inhabitants, and in Sub-Saharan African countries and other countries. As such, the table gives a first impression of the distribution of types of aid, as well as total aid flows in the upper panel.

Insert Table III about here

The table clearly shows that total aid flows seem sensitive to all factors: African countries get substantially more aid, as do poorer, slower growing countries and countries hit by more severe disasters. Separating aid according to the Clemens et al. (2012) scheme shows more detail, as flows of early-impact aid are not significantly larger to disaster-prone countries and the residual category is not significantly associated with growth. Separating aid according to the 3+1 typology above suggests that aid in the four types is so diversely distributed that there are no significant differences between high and low-growth countries. However, richer countries get significantly less economic, social and reconstruction aid, and disaster-affected countries receive more social and reconstruction aid. Likewise, African countries receive substantially more aid in all types except the residual category. As such, the aid typology behaves approximately as one would expect: countries with more disasters receive more social and reconstruction aid and all aid types except the residual category are sensitive to poverty.

However, it remains an open question whether one can separate the consequences of aid. In previous studies as in the following, the problem of fungibility may imply that one cannot separate effects of foreign aid, even though one can separate types of aid by disbursement or purpose. If a type of aid is perfectly or sufficiently fungible, aid for any purpose within that type may effectively finance projects or expenditures of any other type and intention. As such, consequences of types of foreign aid are logically only separable to the degree that they are not fungible across types. The concentration or diversification of aid may nevertheless include information on the likely severity of fungibility and Dutch Disease. In particular, price hikes leading to Dutch Disease are arguably more likely when aid is concentrated in specific sectors or purposes because such projects are more likely to demand the same type of resources and labor. Relatively more concentrated aid is therefore more likely to cause Dutch Disease stemming from bottlenecks in particular markets while appreciation of the nominal exchange rate occurs regardless of the use of aid inflows. Likewise, one would expect reconstruction aid mainly to affect countries hit by disasters, although the largest probably have consequences beyond the ability

of aid. Effects of particular types may also rest on institutional quality or countries' own political and economic ability to solve problems (cf. Guillamont and Chauvet, 2001; Chauvet, 2002).

In the following, I estimate the effectiveness of a vector of types of aid as separated according to this typology. To take care of the potential conditionality of effects, I add interactions with the Herfindahl-Hirschmann index of aid concentration, political instability and disasters.

4. Types of foreign aid and economic growth

The litmus test of the value of separating types of aid is whether separation affects the measurement of consequences of foreign aid. If previous studies have failed to pick up substantial effects because total aid flows provide a too noisy measure, using a statistically valid typology should reduce the noise and reveal a clean estimate of the 'true' effect of aid. If, on the other hand, aid skeptics are correct and the average return to aid is counterweighed by side effects, the theoretical effects may still be ambiguous although estimates on conditional effects may be more precise.

4.1. Growth estimates – fixed effects

In order to ensure that the approach in this paper can be compared to the standard of using a simple sum of all aid disbursements, I report estimates with the simple aggregate measure of aid, with aid divided according to the Clemens et al. (2012) typology, and in the 3+1 typology of this paper; throughout, growth is the dependent variable. Odd-numbered columns report the simple specification while even-numbered columns include the full specification. Table IV provides the fixed effects estimates, based on an assumption that aid flows are exogenous to prior economic performance.

Insert Table IV about here

The table first shows a set of standard findings: in the simple specification, openness to trade is strongly positively associated with growth while initial GDP is negatively so. In the full set, the investment rate is also significant, as is life expectancy, i.e. population health. The table also shows

clearly negative associations with government expenditures, coups (including unsuccessful attempts), and surprisingly the Cheibub et al. (2010) democracy indicator; disasters (per million people) are not significant.

Regarding aid, the total aid disbursements pooled into one variable as is standard in the literature yields a strongly negative association with growth. When disaggregating aid according to the Clemens et al. typology, early-impact aid remains insignificant. However, the residual categories left out in Clemens et al. (2012) turn out to be strongly but negatively significant both with and without the full set of control variables. Finally, in columns 5 and 6, the 3+1 typology also reveals different associations. Neither economic aid nor the residual category or aid concentration is significant at conventional levels. However, reconstruction aid emerges clearly significant and negative, and social aid is negatively significant at the five percent level in column 5 and the ten percent level in column 6.

The finding that reconstruction aid is clearly significant but negative in particular gives cause for some concern. Since reconstruction aid would seem to be a consequence of events that could cause temporary declines in growth such as floods, earthquakes or wars that destroy a significant share of the capital stock, causality is a particularly problematic issue here. One would think that such aid would primarily be directed towards rebuilding physical capital and infrastructure, which points to a potential problem in previous studies using instrumental-variables and GMM designs: given that a particular *type* of aid is actually negatively associated with growth, the validity of the instruments for overall aid in existing studies rests on the degree to which they identify that type. As endogeneity therefore seems even more likely in the light of results when separating aid, I now turn to that issue.

4.2. GMM estimates

The estimates in Table IV are likely to be biased if aid flows are endogenous to countries' growth records. While the literature disagrees on the severity of this problem, Roodman (2008) argues that it has caused biased results in previous studies. Different sets of instrumental approaches have been used

to handle the endogeneity problem with somewhat different results, although instrumentation as such has not changed the general result (cf. Paldam and Jensen, 2006; Doucouliagos and Paldam, 2008; Rajan and Subramanian, 2008). Yet, as noted above, the possibility remains that different instruments effectively have captured variation from different types of aid. If different types have dissimilar consequences and different causality patterns, instrumentation strategies for the total disbursements of aid may yield biased results that do not generalize. In Table V, I therefore revisit the endogeneity problem by providing a set of GMM estimates. The table replicates the basic results with the overall level of aid, the separation from Clemens et al. (2012) and the 3+1 typology.

First, while there is significant first-order autocorrelation, the Arellano-Bond test of second-order autocorrelation is never significant (Arellano and Bond, 1991). As second-order autocorrelation must be absent in order for GMM to be consistent, this and the Hansen-test of validity suggest that GMM estimates are unbiased.[5] Furthermore, in separate tests, the standard lagged first differences of variables (the default option for instruments) perform quite well as instrumental variables (as suggested by the significant first-order autocorrelation). The GMM estimates are thus not likely to biased by over- or underidentification.

Insert Table V about here

The results are, in general, comparable to the fixed effects estimates in Table IV. While estimates on most control variables remain stable across the table, it should be noted that democracy loses significance and even changes sign, and government expenditures are only significant in column 6.

[5] Roodman (2009) notes that the Hansen test may be particularly weak in situations with multiple instruments and may in cases approach non-credible values close to one. This is indeed presently the case, which may question the findings even if the standard moment restrictions are satisfied. In such cases, Roodman recommends performing robustness tests by reducing the set of instruments. When doing so, all main results in the following remain unchanged and Hansen tests remain far from significance. In particular, the estimate of reconstruction aid proves very stable.

However, with respect to the aid variables, taking the causality issue seriously by applying GMM makes a substantial difference.

The estimates first suggest that the negatively significant association between growth and overall aid in Table IV is due to reverse causality, as the GMM estimate is small and indistinguishable from zero. Likewise, the significantly negative association with the residual category in the Clemens et al. (2012) typology is likely to be a result of the same bias. However, early-impact aid also remains insignificant. Using the 3+1 typology, the GMM estimates first support some of the fixed effects findings. The weakly significant fixed effect estimate of social aid now becomes insignificant and the GMM estimate of economic aid remains small and far from significance. While still a large point estimate, the residual category also remains insignificant as in the fixed effect regressions.

Conversely, the estimates suggest that the significant negative association between growth and reconstruction aid is, indeed, simply evidence of reverse causality. Alleviating the endogeneity problem by applying GMM not only flips the sign, but makes reconstruction aid positive and significant at conventional levels. As such, separating types of aid and taking causality seriously indicates that the existing literature on aid may suffer from endogeneity bias, although only in a relatively small part of aid inflows. As these findings are robust to a set of additional tests (not shown), including changes to instruments and excluding observations with no or very small aid inflows, a final question to ask is whether they generalize to most situations or if they are conditional.[6]

4.3. Are aid effects conditional?

[6] The additional tests of instrument strength consist of either excluding one of the additional instruments – UN voting shares with the US and Russia and a HIPC dummy, and adding voting shares with China and a dummy for membership in the UN Security Council.

Since Svensson (1999) and Burnside and Dollar (2000), a long list of studies has explored whether aid has effects conditional on specific factors being present. Table VI provides GMM estimates that take three such conditionalities into account: political instability, natural disasters, and aid concentration.

First, political instability is likely to be associated with a number of factors suggested as conditioning aid effects, such as good policies, institutional quality, social conflict and debt burdens (cf. Doucouliagos and Paldam, 2010). Second, Chauvet (2002) finds that aid is mainly effective in countries hit by political or natural disasters. One would also strongly suspect that if reconstruction aid actually has a significant effect on growth as in Table V, this effect would only be likely to appear when countries are hit by natural disasters or conflict, though only those of a relatively manageable size. Finally, the nature of the specific data in this paper allows a direct test of whether or not aid diversification across many purposes, and thus many projects and recipient government institutions, is associated with transaction costs of a size that undermine aid effectiveness. On the other hand, while aid diversification might increase such costs, an opposite theoretical possibility exists that aid concentration causes stronger adverse price responses to increased aid inflows. In Table VI, I therefore repeat the regressions of Table V5, but adding an interaction between aid inflows in the 3+1 typology and each of these variables. Although all control variables are included, I only report the aid results.

Insert Table VI about here

The estimates in the table suggest that the overall measure of aid, reported in columns 1-3, remains insignificant regardless of the interacting factor. However, two of three interacting factors in columns 4-6 yield significant heterogeneous effects of reconstruction aid. No other type of aid exhibits any conditional effects.

First, interacting aid types with coups and evaluating conditional aid impacts at their conditional standard errors (cf. Brambor, Clark and Golder, 2006), suggests that reconstruction aid is insignificant when countries are politically stable. Yet, if countries are likely to experience at least one coup or coup attempt, reconstruction aid becomes significant and positive. Second, interacting reconstruction aid

with the number of disasters per million people suggests that aid is only effective in contributing to growth when disasters are relatively minor. Further tests (not shown) nevertheless provide additional information. When measuring the absolute number of disasters, instead of disasters per inhabitant, reconstruction aid only becomes significantly positive when countries are hit by more than one disaster per year. Measuring disasters relative to initial GDP suggests similar conclusions. While reconstruction aid *on average* provides positive growth input, it remains uncertain whether it is effective after major disasters. Similarly, reconstruction aid is not likely to (and logically should not) affect growth when no disaster has struck, i.e. when there is nothing to reconstruct.

Overall, though, the results suggest that the majority of disbursements of foreign aid in general are inconsequential for the growth of poor countries. The results nevertheless indicate different effects of different statistically separable types of foreign aid, since GMM estimates of the effects of reconstruction aid appear significant and positive. These findings provide new insights to be discussed in the final section.

5. Conclusions

The discussion of whether foreign aid is an effective tool with which to create development remains one of the most heated in the social sciences. A minority of economists continues to claim that aid is effective; another minority finds that aid is directly harmful, while most independent economists find no evidence of any growth effect. Different solutions to the inherent endogeneity problem have tended to reproduce the zero result, which underlines Mosley's micro-macro paradox: that projects financed by foreign aid are often successful but total aid disbursements seem to make no difference at the macro level. How to resolve this problem has generated an entire literature of its own, including a number of different theoretical perspectives.

Part of the discussion in recent years has revolved around which types of aid are likely to be effective, and by extension, how one could restructure and reallocate aid in order to get significant

results. Clemens et al. (2012) for example argue that budget and balance of payments support and aid for infrastructure and industrial development are likely to lead to measurably faster growth. Guillamont (2011), on the other hand, argues that aid ought to be given as a supplement to social expenditures.

This paper has followed the line of logic of this strand of the aid literature by first employing factor analysis to generate a statistically valid way of separating types of aid. Based on data on actual disbursements of foreign aid from AidData, reported in 24 purpose codes, this analysis suggests that aid can be separated in three distinct categories covering about 92 % of all disbursements and a residual category. These categories can be subsumed as aid for economic purposes, aid for social purposes, reconstruction aid, as well as a small residual category. Counting aid in these four categories and estimating growth regressions for a large set of 110 non-oil developing countries in the seven five-year periods between 1970 and 2005 suggests that different types of aid may have different effects.

When ignoring potential endogeneity problems, the findings suggest that inflows of reconstruction aid are significantly negatively associated with economic growth. However, reconstruction aid is obviously given as a response to actual or latent events that would also slow down growth. When estimating effects of four types of foreign aid with GMM, thereby ruling out endogeneity bias, reconstruction aid appears positively associated with growth while aid given for any other purpose remains insignificant. Further estimates suggest that this effect may be stronger in politically instable countries.

On the one hand, the positive estimate of reconstruction aid is positive news that some aid may have the intended consequences. On the other hand, reconstruction aid has in recent years only made up about 15 percent of total aid flows, suggesting that the majority of aid is entirely inconsequential. This particular result provides more insights into why countries such as Tanzania or Zambia, that have received comparatively large inflows of both economic and social aid, have nevertheless developed slowly since the early 1970s.

In other words, although reconstruction aid has become somewhat more prevalent in recent decades, implying that overall aid flows are less harmful than previously, most of the change of focus and intentions of foreign aid appears to have been negligible. The findings in this paper indicate that most aid, on average, simply remains without the intended consequences although being reallocated to other types and intentions. Separating aid into different identifiable types merely shows that the average contribution to long-run growth of aid with long-run development purposes has at best been zero.

References

Acharya, A., Fuzzo de Lima, A.T., Moore, M., 2006. Proliferation and fragmentation: transaction costs and the value of aid. Journal of Development Studies 42, 1-21.

Arellano, C., Bulíř, A., Lane, T., Lipschitz, L., 2009. The dynamic implications of foreign aid and its variability. Journal of Development Economics 88, 87-102.

Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies 58, 277-297.

Bjerg, C., Bjørnskov, C., Holm, A., 2011. Growth, debt burdens and alleviating effects of foreign aid in least developed countries. European Journal of Political Economy 27, 143-153.

Bjørnskov, C., 2010. Do elites benefit from democracy and foreign aid in developing countries? Journal of Development Economics 92, 115-124.

Bjørnskov, C., Schröder, P.J.H., 2010. Are debt repayment incentives undermined by foreign aid? Aarhus University, Department of Economics and Business, Working Paper 10-20.

Boone, P., 1996. Politics and the effectiveness of foreign aid. European Economic Review 40, 289-329.

Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87, 11-143.

Brambor, T., Clark, W., Golder, M., 2006. Understanding interaction models: improving empirical analyses. Political Analysis 14, 63–82.

Burnside, C., Dollar, D., 2000. Aid, policies, and growth. American Economic Review 90, 847-868.

Calderisi, R., 2006. The Trouble with Africa: Why Foreign Aid isn't Working. Yale University Press, New Haven.

Chauvet, L., 2000. Socio-political instability and the allocation of international aid by donors. European Journal of Political Economy 19, 33-59.

Chauvet, L., Guillamont, P., 2001. Aid and performances: a reassessment. Journal of Development Studies 37, 66-92.

Chenery, H.B., Strout, A.M., 1966. Foreign assistance and economic development. American Economic Review 56, 679-733

Christensen, Z., Homer, D., Nielson, D.L., 2011. Dodging adverse selection: how donor type and governance condition aid's effects on school enrollment. World Development 39, 2044-2053.

Clemens, M.A., Radelet, S., Bhavnani, R.R., Bazzi, S. 2012. Counting chickens when they hatch: the short-term effect of aid on growth. The Economic Journal 122, 590-617.

Collier, P., Hoeffler, A., 2004. Aid, policy and growth in post-conflict societies. European Economic Review 48, 1125-45.

Collier, P., Hoeffler, A., 2007. Unintended consequences: does aid promote arms races? Oxford Bulletin of Economics and Statistics 69, 1-27.

Djankov, S., Montalvo, J.G., Reynal-Querol, M., 2008. The curse of aid. Journal of Economic Growth 13, 169-194.

Doces, J.A., 2011. Saving Sudan yet starving Uganda? A spatial analysis of foreign aid and economic growth. Paper presented at the APSA conference, Seattle, September 1-4.

Doucouliagos, H., Paldam, M., 2008. Aid effectiveness on growth: a meta study. European Journal of Political Economy 24, 1-24.

Doucouliagos, H., Paldam, M., 2010. Conditional aid effectiveness: a meta-study. Journal of International Development 22, 391-410.

Doucouliagos, H., Paldam, M., 2011. The ineffectiveness of development aid on growth: an update. European Journal of Political Economy 27, 399-404.

Dreher, A., Nunnenkamp, P., Thiele, R., 2008a. Does US aid buy UN General Assembly votes? A disaggregated analysis. Public Choice 136, 139–164.

Dreher, A., Nunnenkamp, P., Thiele, R., 2008b. Does aid for education educate children? Evidence from panel data. World Bank Economic Review 22, 291.

Dreher, A., Sturm, J-E., Vreeland, J.R., 2009. Development aid and international politics: does membership on the UN Security Council influence World Bank decisions? Journal of Development Economics 88, 1-18.

Easterly, W., 2002. The cartel of good intentions: the problem of bureaucracy in foreign aid. Journal of Policy Reform 5, 223-250.

Easterly, W., 2009. Can the West save Africa? Journal of Economic Literature 47, 373-344.

Easterly, W., Levine, R., Roodman, D., 2004. New data, new doubts: a comment on Burnside and Dollar's 'Aid, Policies, and Growth (2000)'. American Economic Review 94, 774-780.

EM-DAT, 2012. *EM-DAT: The International Disaster Database*. Center for the Epidemiology of Disasters, Catholic University of Louvain. Available at http://www.emdat.be/ (accessed January 2012).

Feyzioghlu, T., Swaroop, V., Zhu, M., 1998. A panel data analysis of the fungibility of foreign aid. World Bank Economic Review 12, 29-58.

Friedman, M., 1958. Foreign economic aid: means and objectives. Yale Review 47, 500-516.

Griffin, K.B., Enos, J.L., 1970. Foreign assistance, objectives and consequences. Economic Development and Cultural Change 18, 313-327.

Guillamont, P., 2011. Aid effectiveness for poverty reduction: macroeconomic overview and emerging issues. HAL working paper halshs-00554285, Université d'Auvergne.

Hansen, H., Tarp, F., 2000. Aid effectiveness disputed. Journal of International Development 12, 375–98.

Hansen, H., Tarp, F., 2001. Aid and growth regressions. Journal of Development Economics 64, 547-570.

Heckelman, J., Knack, S., 2008. Foreign aid and market-liberalizing reform. Economica 75, 524-548.

Heston, A., Summers, R., Aten, B., 2011. Penn World Tables Version 7. Center for International Comparisons, University of Pennsylvania.

Hodler, R., Dreher, A., in press. Development (paradigm) failures. Journal of Development Economics forthcoming.

Hodler, R., Knight, D.S., 2012. Ethnic fractionalization and aid effectiveness. Journal of African Economies 21, 65-93.

Hollyer, J.R., Rosendorff, B.P., Vreeland, J.R., 2011. Democracy and transparency. Journal of Politics 73 , 1191-1205.

Kegley, C.W. Jr., Hook, S.W., 2991. US foreign aid and UN voting: did Reagan's linkage strategy buy defense or defiance? International Studies Quarterly 35, 295-312.

Kilby, C., Dreher, A., 2010. The impact of aid on growth revisited: do donor motives matter? Economics Letters 107, 338-340.

Kimura, H., Mori, Y., Sawada, Y., 2012. Aid proliferation and economic growth: a cross-country analysis. World Development 40, 1-10.

Knack, S., 2001. Aid dependence and the quality of governance: cross-country empirical tests. Southern Economic Journal 68, 310-329.

Knack, S., 2004. Does foreign aid promote democracy? International Studies Quarterly 48, 251-266.

Kourtellos, A., Tan, C.M., Zhang, X., 2007. Is the relationship between aid and economic growth nonlinear? Journal of Macroeconomics 29, 515-540.

Kuziemko, I., Werker, E.D., 2006. How much is a seat on the Security Council worth? Foreign aid and bribery at the United Nations. Journal of Political Economy 114, 905-930.

Licht, A.A., 2010. Coming into money: the impact of foreign aid on leader survival. Journal of Conflict Resolution 54, 58-87.

Marshall, M.G., Marshall, D.R., 2010. Coup d'Etat Events, 1946-2008. Codebook and data. Available at http://www.systemicpeace.org/inscr/inscr.htm (accessed May 2010).

Michaelowa, K., Weber, A., 2007. Aid effectiveness in the education sector: a dynamic panel analysis. In: Lahiri, S. (Ed.), Theory and Practice of Foreign Aid. Elsevier, Amsterdam, pp. 357-385.

Minoiu, C., Reddy, S., 2010. Development aid and economic growth: a positive long-run relation. Quarterly Review of Economics and Finance 50, 27-39.

Mishra, P., Newhouse, D.L., 2009. Does health aid matter? Journal of Health Economics 28, 855-872.

Morgenthau, H., 1962. A political theory of foreign aid. American Political Science Review 56, 301-309.

Mosley, P., Hudson, J., Horrell, S., 1987. Aid, the public sector and the market in less developed countries. The Economic Journal 97, 616-641.

Moss, T., Pettersson, G., van de Walle, N., 2007. An aid-institutions paradox? A review essay on aid dependency and state building in Sub-Saharan Africa. In: Easterly, W. (Ed.), Reinventing Foreign Aid. MIT Press, Cambridge, MA.

Munck, G.L., Verkuilen, J., 2002. Conceptualizing and measuring democracy: evaluating alternative ideas. Comparative Political Studies 35, 5-34.

Nielsen, R.A., Findley, M.G., Davis, Z.S., Candland, T., Nielson, D.L., 2011. Foreign aid shocks as a cause of violent armed conflict. American Journal of Political Science 55, 219-232.

Nielson, D.L., Powers, R.M., Tierney, M.J., Findley, M.G., Hawkins, D.G., Hicks, R.L., Parks, B.C., Roberts, J.T., Wilson, S.E., 2011. AidData: tracking development finance. Presented at the PLAID Data Vetting Workshop, Washington DC; available at http://www.aiddata.org/research/releases (accessed May 2011).

Nowak-Lehmann, F., Dreher, A., Herzer, D., Klasen, S., Martínez-Zarzoso, I., 2012. Does foreign aid really raise per capita income? A time series perspective. Canadian Journal of Economics 45, 288-313.

Ovaska, T., 2003. The failure of foreign aid. Cato Journal 23, 175-188.

Paldam, M., Jensen, P.S., 2006. Can the new aid-growth models be replicated? Public Choice 127, 147-175.

Papanek, G.F., 1972. The effect of aid and other resource transfers on savings and growth in less developed countries. The Economic Journal 82, 934-950

Papanek, G.F., 1973. Aid, foreign private investment, savings, and growth in less developed countries. Journal of Political Economy 81, 120-30.

Rajan, R.G., Subramanian, A., 2008. Aid and growth: what does the cross-country evidence really show? Review of Economics and Statistics 90, 643-665.

Rajan, R.G., Subramanian, A., 2011. Aid, Dutch Disease, and manufacturing growth. Journal of Development Economics 94, 106-118.

Remmer, K., 2004. Does foreign aid promote the expansion of government? American Journal of Political Science 48, 77-92.

Roodman, D.M., 2007. The anarchy of numbers: aid, development, and cross-country empirics. World Bank Economic Review 21, 255-277.

Roodman, D.M., 2008. Through the looking glass, and what OLS found there: on growth, foreign aid, and reverse causality. Center for Global Development Working Paper 137.

Roodman, D.M., 2009. How to do Xtabond2: an introduction to difference and system GMM in Stata. Stata Journal 9, 86-136.

Rosenstein-Rodan, P.N., 1957. Notes on the Theory of the 'Big Push'. Center for International Studies, MIT.

Rostow, W.W., 1960. The Stages of Economic Growth: A Non-Communist Manifesto. Cambridge University Press, Cambridge, UK.

Savun, B., Tirone, D.C., 2011. Foreign aid, democratization, and civil conflict: how does democracy aid affect civil conflict? American Journal of Political Science 55, 233-246.

Selaya, P., Thiele, R., 2012. The impact of aid on bureaucratic quality: does the mode of delivery matter? Journal of International Development 24, 379-386.

Svensson, J., 1999. Aid, growth and democracy. Economics and Politics 11, 275–297.

Swaroop, V., Devarajan, S., 2000. The implications of foreign aid fungibility for development assistance, in: The World Bank: Structure and Policies. Cambridge University Press, New York and Melbourne, 196-209.

Tornell, A., Lane, P.R., 1999. The voracity effect. American Economic Review 89, 22-46.

Torvik, R., 2001. Learning by doing and the Dutch Disease. European Economic Review 45, 285-306.

Voeten, E., Merdzanovic, A., 2010. United Nations General Assembly Voting Data. Available at: http://hdl.handle.net/1902.1/12379 (accessed June 2010).

Vreeland, J.R., 2008. The effect of political regime on civil war: unpacking anocracy. Journal of Conflict Resolution 52, 401-425.

Werker, E.D., Ahmed, F.Z., Cohen, C., 2009. How is foreign Aid spent? Evidence from a natural experiment. American Economic Journal: Macroeconomics 1, 225–244.

Wright, J., Winters, M., 2010. The politics of effective foreign aid. Annual Review of Political Science 13, 61-80.

TABLE 1

Aid in purpose codes

Purpose code	Mean	Standard deviation	Zero observations
Agriculture, forestry and fishery	.586	.952	29
Banking and financial services	.051	.098	182
Business and other services	.027	.084	378
Communications	.080	.168	136
Development aid, food security assistance	.168	.416	155
Disaster prevention and preparedness	.001	.001	706
Education	.276	.608	29
Emergency response	.110	.421	100
Energy generation and supply	.254	.399	101
General budget support	.489	1.103	205
General environmental protection	.024	.059	331
Government and civil society	.196	.493	81
Health	.146	.262	95
Industry, mining and construction	.212	.441	72
Other	.570	1.032	30
Other commodity assistance	.136	.383	235
Other social infrastructure and services	.083	.188	116
Population policies	.041	.120	282
Reconstruction relief	.039	.151	450
Support to NGOs and government organizations	.004	0.16	408
Trade and tourism	.031	.083	217
Transport and storage	.594	.878	31
Water supply and sanitation	.209	.301	64
Women	.001	0.13	679

Note: all aid variables have 756 observations.

TABLE 2A

Principle components analysis – types of aid

Purpose code	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Agriculture, forestry and fishery	**.61**	**.34**	-.07	.02	**-.35**
Banking and financial services	.15	.20	-.03	-.07	.00
Business and other services	-.05	**.53**	-.10	.07	.22
Communications	**.58**	.12	-.03	.20	.06
Development aid, food security assistance	**.70**	.02	.14	-.02	.11
Disaster prevention and preparedness	.00	.01	.08	-.01	.00
Education	**.34**	**.43**	-.08	**.42**	-.09
Emergency response	.06	.16	**.64**	.00	.04
Energy generation and supply	**.45**	.14	-.01	-.08	-.01
General budget support	.20	**.51**	-.04	-.08	.14
General environmental protection	-.05	**.48**	-.08	.06	**.32**
Government and civil society	.00	**.43**	**.40**	.25	.00
Health	**.32**	**.65**	.16	.12	.13
Industry, mining and construction	**.52**	.09	-.04	.06	-.02
Other	.26	**.66**	.11	-.09	-.01
Other commodity assistance	**.70**	-.01	.04	-.04	.12
Other social infrastructure and services	.11	**.69**	.05	.02	-.22
Population policies	.00	**.38**	.20	.05	**.31**
Reconstruction relief	.07	.12	**.59**	.00	-.04
Support to NGOs and government organizations	.09	**.31**	.10	**.55**	.05
Trade and tourism	.21	.10	.01	.04	.03
Transport and storage	**.64**	.27	.02	.03	-.17
Water supply and sanitation	**.50**	**.31**	-.07	-.06	.05
Women	.09	.08	-.04	-.06	-.03
Eigenvalue	4.846	1.859	1.013	.571	.526
Proportion explained	.582	.223	.122	.069	.063

Note: components are rotated with Oblimin.

TABLE 2B

Separating types of aid, factor weight

Purpose code	Factor 1	Factor 2	Factor 3	Residual	Early-impact	Residual
Agriculture, forestry and fishery	.64	.36			1	
Banking and financial services				1	1	
Business and other services		1			1	
Communications	1				1	
Development aid, food security assistance	1					1
Disaster prevention and preparedness				1		1
Education	.44	.56				1
Emergency response			1			1
Energy generation and supply	1				1	
General budget support		1			1	
General environmental protection		1				1
Government and civil society		.52	.48			1
Health	.33	.67				1
Industry, mining and construction	1				1	
Other		1				1
Other commodity assistance	1					1
Other social infrastructure and services		1				1
Population policies		.55		.45		1
Reconstruction relief			1			1
Support to NGOs and government organizations				1		1
Trade and tourism				1		1
Transport and storage	1				1	
Water supply and sanitation	.62	.38				1
Women				1		1

Note: the purpose codes in italics are collapsed in a residual category since they load unto none of the factors extracted. The two right-hand columns report the way purpose codes are aggregated according to the typology in Clemens et al. (2012).

TABLE 3

The distribution of aid, three typologies

	Growth		GDP		Disasters		Sub-Saharan Africa	
	High	Low	High	Low	High	Low	Yes	No
Total aid	4.851	3.806	6.058	2.599	5.281	3.377	6.219	2.903
	p<.034		p<.000		p<.014		p<.000	
Clemens et al.								
Early impact	2.558	2.027	1.429	3.155	2.586	1.998	3.214	1.597
	p<.054		p<.002		p<.271		p<.000	
Residual	2.126	1.946	1.169	2.903	2.587	1.486	3.005	1.306
	p<.343		p<.000		p<.004		p<.000	
This paper								
Economic aid	2.313	1.929	1.254	2.988	2.384	1.857	3.074	1.402
	p<.194		p<.000		p<.467		p<.000	
Social aid	1.661	2.056	1.145	2.572	2.349	1.368	2.659	1.254
	p<.145		p<.002		p<.005		p<.000	
Reconstruction aid	.219	.267	.107	.379	.363	.124	.369	.148
	p<.308		p<.001		p<.000		p<.000	
Residual aid	.108	.104	.093	.199	.133	.079	.115	.099
	p<.810		p<.146		p<.011		p<.142	

Note: 'High' indicates the average within the half-sample with growth rates, GDP per capita and disasters per million inhabitants above the sample median; 'Low' indicates the average in the other half.

TABLE4

Growth effects, total aid versus typologies, fixed effects

	Total aid		Clemens et al.		3+1 types	
	1	2	3	4	5	6
Disasters	.022	-.013	.024	-.014	.031	-.007
	(.028)	(.029)	(.028)	(.029)	(.028)	(.029)
Openness	.062***	.041***	.063***	.041***	.060***	.040***
	(.009)	(.009)	(.009)	(.009)	(.009)	(.009)
Log initial GDP per capita	-5.997***	-6.212***	-6.257***	-6.516***	-6.482***	-6.542***
	(.573)	(.561)	(.598)	(.587)	(.611)	(.602)
Investment rate		.135***		.137***		.132***
		(.023)		(.023)		(.023)
Government expenditures		-.094**		-.094**		-.089*
		(.047)		(.047)		(.047)
Life expectancy		.194***		.193		.193***
		(.050)		(.050)		(.050)
Democracy (Cheibub)		-1.139**		-1.099**		-1.129**
		(.501)		(.501)		(.500)
Coups		-.482***		-.452**		-.462***
		(.177)		(.177)		(.177)
Total aid disbursement	-.151***	-.147***				
	(.049)	(.048)				
Early impact aid (Clemens)			-.046	-.034		
			(.086)	(.082)		
Residual aid (Clemens)			-.293***	-.299***		
			(.107)	(.101)		
Economic aid					-.091	-.139
					(.093)	(.088)
Social aid					-.208**	-.168*
					(.092)	(.092)
Reconstruction aid					-.959***	-.753**
					(.323)	(.302)
Residual aid					2.141	2.047*
					(1.301)	(1.238)
Aid concentration, typology					2.364	1.649
					(1.619)	(1.619)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Period fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	754	730	753	730	753	730
Countries	110	110	110	110	110	110
R squared within	.216	.315	.219	.318	.232	.324
F statistic	17.45	18.51	16.10	17.59	13.55	15.17
Hausmann test	113.02***	105.26***	166.57***	128.61***	133.83***	115.63***

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10].

TABLE 5

Growth effects, total aid versus typologies, GMM

	Total aid		Clemens et al.		3+1 types	
	1	2	3	4	5	6
Disasters	-.019	.030	-.029	.007	-.022	.018
	(.031)	(.024)	(.032)	(.024)	(.028)	(.022)
Openness	.054***	.025**	.048***	.025**	.041***	.021*
	(.020)	(.013)	(.018)	(.012)	(.015)	(.011)
Lagged growth	.050	.036	.045	.040	.047	.039
	(.068)	(.064)	(.068)	(.061)	(.075)	(.057)
Log initial GDP per capita	-.406	-2.244***	-.191	-2.245***	.173	-1.967***
	(.578)	(.512)	(.525)	(.511)	(.603)	(.537)
Investment rate		.064*		.065*		.071**
		(.035)		(.036)		(.036)
Government expenditures		-.049		-.041		-.056**
		(.031)		(.029)		(.028)
Life expectancy		.186***		.169***		.186***
		(.071)		(.059)		(.059)
Democracy (Cheibub)		-.054		.479		.412
		(.593)		(.698)		(.681)
Coups		-.607***		-.631***		-.588**
		(.224)		(.246)		(.232)
Total aid disbursement	.025	-.000				
	(.065)	(.063)				
Early impact aid (Clemens)			-.092	-.149		
			(.117)	(.106)		
Residual aid (Clemens)			.170	.166		
			(.144)	(.126)		
Economic aid					.031	-.086
					(.137)	(.109)
Social aid					.019	.092
					(.115)	(.112)
Reconstruction aid					1.059*	1.133**
					(.629)	(.462)
Residual aid					-1.157	-1.359
					(1.447)	(1.345)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Period fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	620	620	621	620	620	620
Countries	109	109	109	109	109	109
Wald Chi sq.	57.26	113.91	51.80	140.35	76.89	153.36
1st order corr.	-3.04***	-3.07***	-3.05***	-3.16***	-3.11***	-3.27***
2nd order corr.	-.18	-.12	-.16	-.13	-.06	.03
Hansen test, p<	.923	1.000	.997	1.000	1.000	1.000

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10].

TABLE 6

Conditional aid effects, GMM

	Total aid			3+1 types		
Interacting variable:	Coups	Disasters	Concentration	Coups	Disasters	Concentration
Total aid disbursement	.022	.069	.188			
	(.064)	(.071)	(.258)			
Economic aid				.073	.127	-.556
				(.173)	(.124)	(.785)
Social aid				.038	-.039	1.006
				(.132)	(.120)	(.722)
Reconstruction aid				-.957	1.890***	-7.667
				(.847)	(.624)	(6.332)
Residual aid				-.051	-2.092	.3689
				(1.422)	(1.510)	(5.261)
Coups	-.778***			-.562***		
	(.246)			(.201)		
Disasters		-.031			-.014	
		(.029)			(.022)	
Aid concentration, typology			2.231			1.689
			(2.336)			(2.667)
Total aid interaction	.002	.069	-.381			
	(.039)	(.071)	(.485)			
Economic aid interaction				.025	-.007	.823
				(.070)	(.007)	(1.157)
Social aid interaction				-.218	.005	-1.905
				(.179)	(.011)	(1.282)
Reconstruction aid				2.318**	-.196*	20.587
interaction				(.933)	(.101)	(15.663)
Residual aid interaction				-.379	.130	-2.587
				(1.389)	(.096)	(13.193)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Period fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	620	620	620	620	620	620
Countries	109	109	109	109	109	109
Wald Chi sq.	80.21	52.41	62.51	97.66	104.28	87.85
1st order corr.	-3.18***	-3.04***	-3.05***	-3.56***	-3.26***	-3.32***
2nd order corr.	.10	-.27	-.15	.34	-.05	.16
Hansen test, p<	1.000	.999	1.000	1.000	1.000	1.000

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10].

TABLE 7

Descriptive statistics

Variable	Mean	Standard deviation	Observations
Economic aid	2.121	2.591	756
Social aid	1.859	2.541	756
Reconstruction aid	.243	.635	756
Residual aid (3+1 types)	.106	.152	756
Total aid (AidData)	4.329	4.847	756
Early impact aid (Clemens)	2.292	2.775	756
Residual aid (Clemens)	2.036	2.581	756
Aid concentration, all purpose codes	.199	.155	756
Aid concentration, 3+1 types	.515	.124	756
Net official development assistance (WDI)	9.097	10.602	680
Government expenditures, % of GDP	13.888	10.629	756
Growth rate	1.323	4.493	754
Initial GDP per capita	3,184	3,113	756
Investment rate, % of GDP	23.698	12.106	756
Life expectancy	58.188	10.125	746
Openness (trade volume, % of GDP)	72.891	38.669	756
Democracy (Cheibub)	.379	.485	736
Disasters (per million)	3.497	7.661	756
Arable land, % of total	11.571	12.148	748
Coups	.412	.891	755
Voting with the US	.184	.095	713
Voting with Russia	.617	.169	713

FIGURE 1

Shares of aid in types, 1975-2005

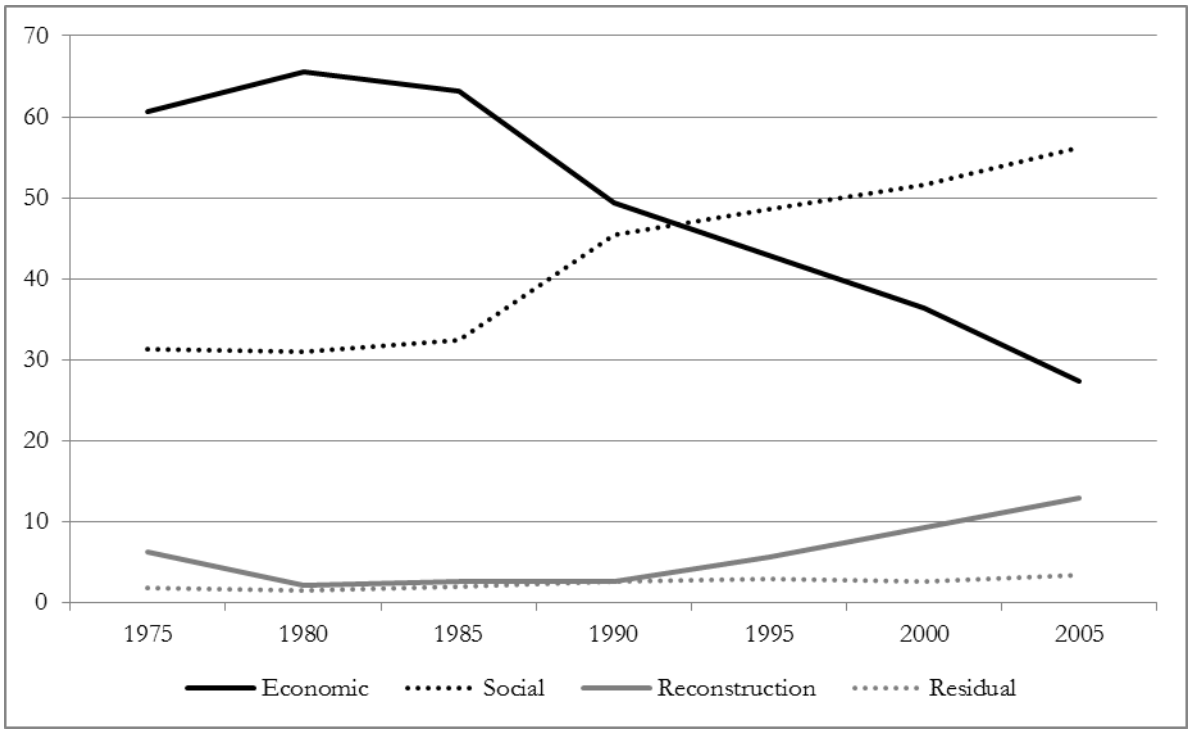
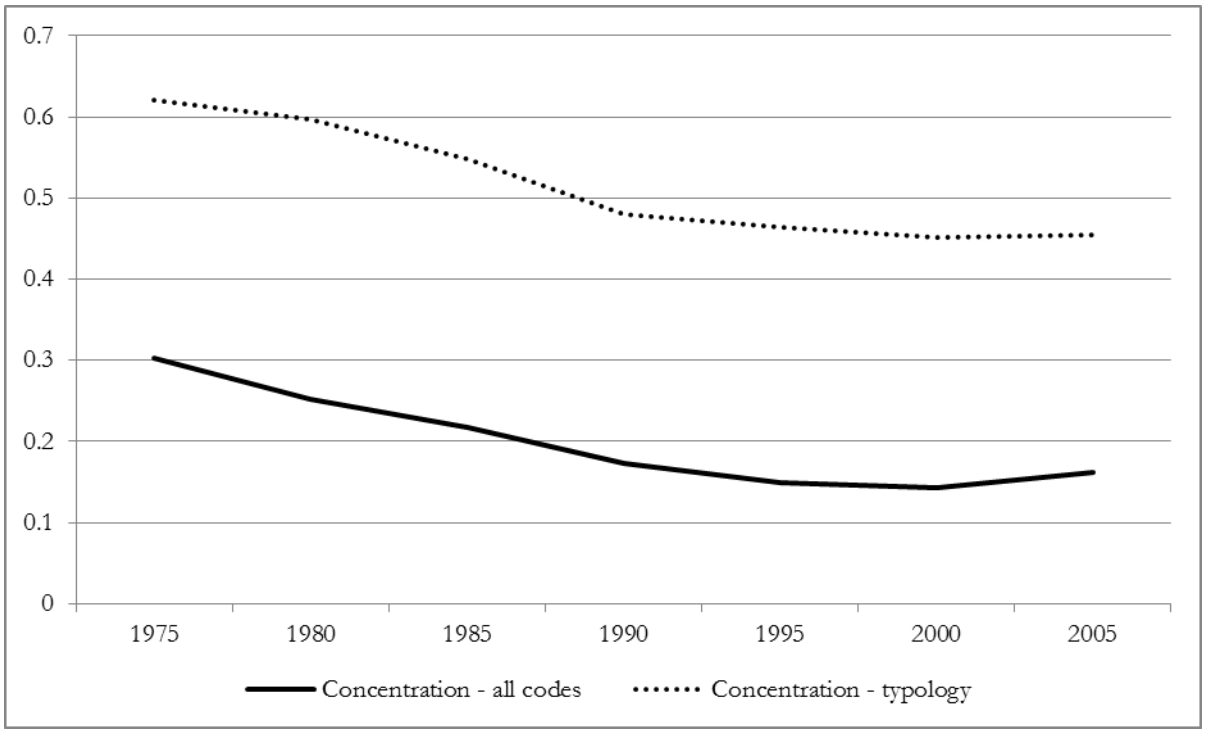


FIGURE 2

Concentration of aid – raw data and types



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