

# Where Has All the Money Gone? Foreign Aid and the Quest for Growth\*

Santanu Chatterjee<sup>†</sup>  
*University of Georgia*

Paola Giuliano<sup>‡</sup>  
*University of California-Los Angeles*  
*IZA*

Ilker Kaya<sup>§</sup>  
*University of Georgia*

## Abstract

This paper examines fungibility as a possible explanation for the "missing link" between foreign aid and its effectiveness. The composition of aid plays a crucial role in determining the composition of government spending, thereby affecting any potential growth benefits. Embedding fungibility as an equilibrium outcome in an endogenous growth framework, we show that the substitution away from domestic government investment is higher than from government consumption. This leads to a crowding-out of domestic public investment spending and offsets any positive impact that aid might have on growth. The main predictions of the model are then tested using a panel dataset of 67 countries for 1972-2000. We find strong evidence of fungibility at the aggregate level: almost 70 percent of total aid is fungible in our sample. We also find that investment aid is more fungible than other categories of aid, crowding out about 90 percent of government investment. There is also no statistically significant relationship between foreign aid and private investment, whereas aid has a positive impact on household consumption. These results are significant, since more than two-thirds of all aid flows to the developing world are tied to some form of public investment.

**Keywords:** Foreign Aid, Aid Effectiveness, Economic Growth, Fungibility, Fiscal Policy.

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<sup>†</sup>Corresponding Author: Department of Economics, Terry College of Business, University of Georgia, Athens, GA 30602 USA. Phone: +1-706-542-3696. Email: schatt@terry.uga.edu

<sup>‡</sup>Anderson School of Management, Global Economics and Management Area, UCLA, 110 Westwood Plaza, C517 Entrepreneurs Hall, Los Angeles, CA 90095-1481. Email: paola.giuliano@anderson.ucla.edu, Phone: +1-310-206-6890.

<sup>§</sup>Department of Economics, Terry College of Business, University of Georgia, Athens, GA 30602. Email: ilker@uga.edu

# 1 Introduction

The apparent inability of foreign aid in affecting indicators of growth and development in the Third World has emerged as a challenging puzzle to both economists and policy-makers. A growing empirical literature since the mid-1990s has gradually changed the initial enthusiasm and optimism surrounding aid programs into concern and skepticism.<sup>1</sup> In this paper, we attempt to examine a potential transmission mechanism which might mitigate the effects of foreign aid on macroeconomic performance. Specifically, our focus is on the *composition* of foreign aid and its effects on the composition of government spending. In other words, we not only examine the extent to which total aid flows are fungible but, more importantly, whether certain categories of aid are more fungible than others. This channel is of critical importance, since according to the OECD, a large fraction of aid flows are allocated to public investment in recipient countries. Therefore, if aid allocated for investment crowds out domestic government investment spending, any potential growth benefits are likely to be offset.

The problem of fungibility arises when the marginal dollar of aid ends up financing the provision of a good that it was not intended to finance. In other words, aid relaxes a recipient government's budget constraint by substituting, rather than supplementing, domestic spending. This may lead to a reduction in domestic public spending or revenue generation in the recipient economy, thereby offsetting the positive impact of aid.<sup>2</sup> In this context, it is important not only to examine whether total aid is fungible or not, but also to identify which categories of government spending are being crowded out the most. As mentioned above, if aid targeted for infrastructure spending (say, building highways or airports) crowds out domestic public investment, then the aggregate growth effects of the aid flow might be small or non-existent. Anecdotal evidence suggests that fungibility is widely prevalent in

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<sup>1</sup>Notable among these is Boone (1996), who found that foreign aid has had no significant impact on the prominent indicators of development and quality of life. Easterly (1999) paints a much bleaker picture, reporting that an increase in foreign aid has actually led to a decline in growth rates in many recipient countries. The influential work of Burnside and Dollar (2000) argues that aid works only in economic environments that are characterized by "good" policy-making by recipient governments. Thus, their results call for greater selectivity from donors when designing aid programs. However, some recent papers, including Hansen and Tarp (2001), Dalgaard and Hansen (2001), and Easterly (2003) have argued that the Burnside-Dollar results are not robust to alternative definitions of aid, growth, and good policies.

<sup>2</sup>This phenomenon typically arises in circumstances where monitoring the actual disbursement of aid in recipient countries is prohibitively costly for the donor; see Clements et al. (2004)

the developing world. However, this phenomenon has not been studied systematically in an intertemporal context, thereby underscoring the need to derive a testable link between the composition of aid and that of government spending.<sup>3</sup> This link is of critical importance since the composition of government spending is known to have an important bearing on economic growth; see Devarajan et al. (1996). By embedding aid and the optimal allocation of government spending in a general equilibrium model and then testing the resulting hypotheses, we seek to provide a better understanding of the “missing link” between foreign aid and development.

This paper therefore contributes to the literature on aid effectiveness in two important directions:

(i) Starting with the "two-gap" model of Chenery and Strout, the theoretical literature on foreign aid has assigned an important role to aid allocated for investment as an engine of growth. Recently, a number of papers, starting with Chatterjee et al. (2003), and including Agenor and Aizenman (2007), Chatterjee and Turnovsky (2007), Dalgaard (2008), and Agenor et al. (2008) have developed models that explicitly tie the financing of productive public investment to foreign aid. These studies generally support tying aid to public investment in order to increase its effectiveness. However, this literature generally treats aid flows as non-fungible, i.e., the recipient government is assumed to spend aid resources according to the restrictions imposed by donors. We address this shortcoming by developing a simple stylized model to analyze the mechanism through which the allocation of aid determines the optimal composition of government spending between public investment and public consumption. Fungibility therefore emerges as an endogenous outcome in our paper, as the aid-recipient government chooses to respond optimally to the inflow of foreign aid. We derive a crucial link between the the composition of foreign aid and its consequences for the composition of government spending. Specifically, our theoretical results show that aid ear-marked for public investment is more fungible than that ear-marked for public consumption, thereby leading to a less-than proportionate adjustment of domestic spending

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<sup>3</sup>There is a small theoretical literature which focuses on the diversion of aid away from its intended activities in developing countries. For example, Svensson (2000) and Lahiri and Raimondos-Moller (2004) focus on rent-seeking activities by special interest groups or lobbies which divert aid from its designated uses. On the other hand, Adam and O'Connell (1999) examine the role of lobby groups in forcing the government to use aid money for tax cuts. While all these mechanisms fall under the general category of fungibility, none focus on the impact of aid on the composition of government spending.

in response to an increase in foreign aid. Such a fiscal response renders long-run growth to be independent of foreign aid, a result that is consistent with recent empirical findings. Moreover, we demonstrate that when aid is fungible, it should have no effect on private investment, but an unambiguously positive effect on private consumption, irrespective of its initial allocation.

(ii) The simple stylized model we develop provides us with a rich set of hypotheses that can be taken to the data. This aspect highlights the second contribution of this paper: an empirical test of the theoretical literature that advocates tying aid to public investment. Using a panel of 67 countries over the 1972-2000 period, we first test whether total aid is fungible, by investigating how total government expenditures in recipient countries respond to changes in aggregate foreign aid. Our results indicate strong evidence of fungibility: a 10 percent increase in the aid-to-GDP ratio leads to an increase of only about 3 percent in total government spending (including aid) with respect to GDP. This implies that about 70 percent of foreign aid flows are fungible. We then test the link between the composition of aid and the composition of government spending by examining whether specific aid types are used for the targeted categories of public expenditures that they are assigned to. Disaggregating total aid and government spending into the investment, non-investment, and social infrastructure categories, we find that consistent with our theoretical predictions, investment aid is indeed the most fungible among all aid categories: almost 90 percent of all investment aid is fungible. The corresponding degree of fungibility for social infrastructure aid is about 78 percent. By contrast, we find no evidence of fungibility for the non-investment aid category. This suggests that aid tied to public investment might not have any real impact on macroeconomic performance. This is an important result, since more than two-thirds of all aid flows to developing countries are tied in some way to public investment projects. Finally, we test whether the composition of aid affects that of private spending. We find that while aid (and its composition) has no significant effect on private investment, it does have a strong positive impact on household consumption: a 10 percent increase in the aid-GDP ratio increases household consumption by 4-5 percent (as a fraction of GDP). More importantly, all three categories of aid have strong positive effects on household consumption. These results suggest that aid, though fungible, might be financing private consumption (rather than private or public investment), possibly through government transfers (for example, consumption subsidies and unemployment insurance). The issue of causality is addressed in

all our regressions, and foreign aid is instrumented by interacting aid flows with indicators of the recipient country's geographical and cultural proximity to donors. Taken together, our analysis sheds some new light on why aid is generally found to be ineffective in the developing world.

From an empirical standpoint, there have been a few attempts to examine the fungibility problem in aid-receiving countries. However, there is no consensus on the exact magnitude and importance of fungibility. Pack and Pack (1990, 1993) find that while foreign aid to Indonesia does not seem to be fungible, the opposite is true for the Dominican Republic, where they observe major shifts in public spending away from development expenditures into deficit reduction and debt service. Examining inter-governmental transfers in India, Swaroop et al. (2000) find evidence that foreign aid disbursements typically finance activities that are very different from the intentions of donors. Aggregate studies also differ in their conclusions about fungibility. For example, Feyzioglu et al. (1998), using annual data for 14 developing countries that span over 1971-90, find that foreign aid is not fungible and is also not associated with tax relief. On the other hand, a recent study by Gupta et al. (2003) finds that while concessional loans are not fungible and generate higher domestic resource mobilization, grants do indeed reduce revenue generation in recipient countries. None of these studies, however, examine the impact of the composition of aid on the composition of domestic government spending. Our results on the effects of aid on the composition of private spending is also related to some recent work in this area. The fact that aid has no impact on private investment is consistent with Harms and Lutz (2006), who find that, on average, aid has no effect on private foreign investment in recipient countries. On the other hand, studying a sample of Islamic countries that receive aid mainly from the OPEC, Werker et al. (2009) document that most aid flows are consumed. Our results tie in nicely with these papers, but yet distinguish themselves by focusing specifically on the consequences of the composition of foreign aid, which is often determined by donors.

The rest of the paper is organized as follows. Section 2 lays down the analytical framework and examines the consequences of fungibility. Section 3 contains the empirical analysis and section 4 concludes.

## **2 Aid and Fungibility: A Stylized Model**

We consider a representative agent who maximizes intertemporal utility from a private consumption good,  $C$ , and a public consumption good,  $G_C$ , over an infinite horizon

$$U = \int_0^{\infty} \frac{1}{\gamma} (CG_c^\theta)^\gamma e^{-\beta t} dt, \quad -\infty < \gamma < 1, \theta > 0, \gamma(1 + \theta) < 1 \quad (1)$$

$\theta$  denotes the relative weight of the public consumption good in the utility function. The agent produces output using her stock of private capital (an amalgam of physical and human capital),  $K$ , and the flow of services from a public investment good, such as infrastructure,  $G_I$ , through a neoclassical production function

$$Y = G_I^\eta K^{1-\eta}, \quad 0 < \eta < 1 \quad (2)$$

The accumulation of private wealth is subject to the following flow budget constraint

$$\dot{K} = Y - C - T \quad (3)$$

where  $T$  denotes lump-sum taxes (or transfers). The government provides the two public goods  $G_C$  and  $G_I$ , and finances their provision using domestic tax revenues and a flow of foreign aid,  $F$ . We will assume that the government maintains a balanced budget at all points of time:

$$G_c + G_I = F + T \quad (4)$$

In order to maintain an equilibrium of sustained growth, all variables must be tied linearly to the scale of the economy, given by the flow of output,  $Y$ . The provision of both public goods are co-financed, using a mix of domestic resources and foreign aid:<sup>4</sup>

$$G_I = G_I^d + \phi F = (g_I^d + \phi \varepsilon) Y \quad (5a)$$

$$G_c = G_c^d + (1 - \phi)F = [g_c^d + (1 - \phi)\varepsilon] Y \quad (5b)$$

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<sup>4</sup>Co-financing is an important ingredient of a majority of foreign aid programs. A recent example can be found in the European Union's Community Support Framework (CSF) and Agenda 2000 programs, which involved transfer (aid) programs for both its member countries as well as countries applying for membership to the Union. Most of these transfers were tied to infrastructure investment in the recipients and involved co-financing arrangements.

where  $G_I^d$  and  $G_c^d$  represent domestic government spending on the public investment and consumption goods, respectively, while  $g_I^d$  and  $g_c^d$  are the corresponding domestic expenditure ratios. The foreign aid-output ratio is given by  $\varepsilon$  and the parameter  $\phi$  ( $0 \leq \phi \leq 1$ ) denotes the *composition* of aid. In other words, a proportion  $\phi$  of the total foreign aid flow is ear-marked by the donor for the public investment good and  $(1 - \phi)$  is the corresponding allocation designated for the public consumption good. In that sense,  $\phi\varepsilon$  can be thought of as "investment aid", while  $(1 - \phi)\varepsilon$  can be thought of as "consumption" or "non-investment" aid. Note that the allocation parameter  $\phi$  is exogenous to the recipient economy, as it is assumed to be determined by the donor.<sup>5</sup>

Combining (3) and (4), we get the economy's aggregate resource constraint:

$$\dot{K} = Y - C - G_c - G_I + F \quad (6)$$

We will assume that the government responds to the foreign aid inflow optimally, by adjusting its own expenditure ratios. This type of behavior makes aid fungible. Our objective, therefore, is to characterize the nature and degree of fungibility of foreign aid. In other words, we are interested in the equilibrium allocation of government spending between public investment and public consumption in response to the aid inflow. Further, we will also examine the effect of the government's spending decisions and aid on private investment and household consumption.<sup>6</sup>

## 2.1 Resource Allocation

The representative agent maximizes (1) subject to (2) and (3), taking the expenditures on the two public goods, the foreign aid flow and its allocation, and the tax rate as given. The (balanced) growth rate ( $\psi$ ) and the consumption-capital ratio ( $\mu$ ) are then given by

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<sup>5</sup>We employ a linear endogenous growth structure, as in Barro (1990), to keep the analysis tractable and derive refutable hypotheses that can be easily taken to the data. For more complex models that are characterized by transitional dynamics, see Chatterjee et al. (2003) and Chatterjee and Turnovsky (2007).

<sup>6</sup>Another potential scenario could be that the government remains passive and does not alter its own expenditures rates. In this case, foreign aid is not fungible. This is a common assumption in the much of the aid-growth literature. In this case, it is straightforward to show that any aid allocated to public investment increases the equilibrium growth rate. This result is standard in the existing theoretical literature that advocates tying aid to public investment; see Chatterjee et al. (2003).

$$\psi = \frac{(g_I^d + \phi\varepsilon)^{\frac{\eta}{1-\eta}} - \beta}{1 - \gamma(1 + \theta)} \quad (7a)$$

$$\frac{C}{K} = \mu = \frac{\beta - [1 - \{1 - \gamma(1 + \theta)\}(1 - g_I^d - g_c^d)](g_I^d + \phi\varepsilon)^{\frac{\eta}{1-\eta}}}{1 - \gamma(1 + \theta)} \quad (7b)$$

It is evident from (7a) and (7b) that if the policy variables are exogenous to the model (i.e., the government is a passive actor), aid will have a positive effect on growth, as long as  $0 < \phi \leq 1$  (some aid is allocated by the donor to public investment). Given the high cost to donors of monitoring the implementation of aid programs and their allocation, it is entirely plausible that the recipient government treats the aid flow not as a supplemental source of financing public goods, but rather as a *substitute* for domestic revenues, and adjusts its own expenditure parameters in response to the aid shock. In that case, the domestic expenditure ratios  $g_I^d$  and  $g_c^d$  can no longer be treated exogenously in characterizing the macroeconomic equilibrium. This is the idea of fungibility.

The government's problem, therefore, is to maximize (1) subject to (2), (3), its own budget constraint (4) and the financing constraints (5a) and (5b). The government takes the private allocation decisions in (7) as given, and chooses the domestic expenditure rates,  $g_I^d$  and  $g_c^d$ , for the two public goods, respectively, based on the realization of the aid shock,  $\varepsilon$ .

The optimal rates of domestic expenditure on public investment and consumption,  $\hat{g}_I^d$  and  $\hat{g}_c^d$ , are given by

$$\hat{g}_I^d = \eta - \phi\varepsilon \quad (8a)$$

$$\hat{g}_c^d = \frac{1}{1 + \theta} \left[ \frac{\theta\{1 + \alpha - \eta\}}{1 - \gamma(1 + \theta)} - \{1 - \phi(1 + \theta)\}\varepsilon \right] \quad (8b)$$

where  $\alpha = \beta\eta^{\eta/\eta-1} - 1$ .

From (8a) we see that aid earmarked for public investment is indeed fungible. Domestic spending on the public investment good declines in proportion to the inflow of investment aid (as long as  $\phi > 0$ ), thereby indicating that aid allocated for public investment merely substitutes for corresponding government spending:

$$\frac{\partial \hat{g}_I^d}{\partial \varepsilon} = -\phi < 0$$

On the other hand, the change in domestic spending on the public consumption good in response to a foreign aid shock is less clear:

$$\frac{\partial \hat{g}_c^d}{\partial \varepsilon} = \phi - \frac{1}{1 + \theta}$$

The response of domestic spending on the public consumption good to an aid shock depends on the relationship between the marginal contribution of investment aid,  $\phi$ , and the relative importance of the public consumption good in utility,  $\theta$ . Consumption aid is fungible too, but only partially. To see this, consider the case when the entire aid is tied to the public consumption, i.e.,  $\phi = 0$ . In that case,

$$\frac{\partial \hat{g}_c^d}{\partial \varepsilon} = -\frac{1}{1 + \theta} < 0$$

The increase in foreign aid leads to a reduction in domestic spending on the public consumption good, but less than proportionately, i.e.,  $|\partial \hat{g}_c^d| < |\partial \varepsilon|$ . The partial fungibility of consumption (non-investment) aid is due to the fact that the public consumption good yields direct utility benefits to the representative agent as opposed to the public investment good, whose benefits are realized only indirectly (through higher output). This prevents a one-for-one decline in public consumption spending. On the other hand, if  $\phi = 1$ , (aid is earmarked only for the public investment good), the inflow of aid, being fully fungible, finances an increase in the spending on the public consumption good on the margin, but less than proportionately, as  $0 < \frac{\partial \hat{g}_c^d}{\partial \varepsilon} < 1$ . When aid is allocated to both public goods ( $0 < \phi < 1$ ), spending on the public consumption good rises only if  $\phi > 1/(1 + \theta)$ , i.e., if the allocation of aid to public investment increases the valuation of public consumption on the margin.

The obvious question that comes up at this juncture is how does an increase in foreign aid affect total government spending in an economy? To see this, we begin by defining total public expenditures (as a fraction of aggregate output), which include domestic spending on the two public goods, given by (8a) and (8b), as well as foreign aid:

$$\bar{g} = \hat{g}_I^d + \hat{g}_c^d + \varepsilon \tag{9}$$

Differentiating (9) with respect to the foreign aid parameter,  $\varepsilon$ , while taking into account (8a) and (8b), we get

$$\frac{\partial \bar{g}}{\partial \varepsilon} = \frac{\theta}{1 + \theta} < 1 \quad (9a)$$

The result in (9a) is a formal statement of fungibility. It states that when aid is fungible, total public expenditures (including foreign aid) rise less than proportionately. This indicates that foreign aid *substitutes* for domestic spending, rather than supplementing it. Note that when aid is not fungible, i.e.,  $g_I^d$  and  $g_c^d$  are constant, then  $\partial \bar{g} / \partial \varepsilon = 1$ , implying that if the government does not reallocate domestic expenditures in response to the aid flow, total expenditures should increase one-for-one with foreign aid.

Finally, to fully characterize the macroeconomic equilibrium, we need to substitute for  $\hat{g}_c^d$  and  $\hat{g}_I^d$  in (7a) and (7b):

$$\tilde{\psi} = \frac{\eta^{\frac{\eta}{1-\eta}} - \beta}{1 - \gamma(1 + \theta)} \quad (10a)$$

$$\tilde{\mu} = \frac{\beta - [1 - \{1 - \gamma(1 + \theta)\}(1 - \hat{g}_I^d - \hat{g}_c^d)](\hat{g}_I^d + \phi\varepsilon)^{\frac{\eta}{1-\eta}}}{1 - \gamma(1 + \theta)} \quad (10b)$$

From (10a), we see that when foreign aid is fungible, the equilibrium growth rate is *independent* of foreign aid and its allocation. Therefore, an aid shock, irrespective of whether it is targeted for public investment or consumption (or both) by the donor, will have no impact on private investment and long-run growth. This result is consistent with the voluminous empirical literature that finds aid has no effect on growth outcomes. On the contrary, given the government's allocation decisions in response to the aid flow, it can easily be shown that the consumption-capital ratio in (10b) increases, indicating that the decline in domestic spending on public goods is, in some way, rebated back to the private sector in the form of higher private consumption:

$$\frac{\partial \tilde{\mu}}{\partial \varepsilon} = \frac{\eta}{1 + \theta} > 0$$

This rebate could take the form of a lump-sum transfer or a cut in taxes, both of which would lower government revenues. Many empirical studies such as Pack and Pack (1993), Gupta et al. (2003), and Werker et al. (2009) document a similar result.

### 3 Empirical Analysis

We use an unbalanced panel dataset of 67 countries for the 1972-2000 period to test the main predictions from the theoretical model outlined in the previous section. Specifically, we test the following three hypotheses:

1. Aggregate aid flows are fungible.
2. There is a link between the composition of aid and that of government expenditure in aid-recipient countries, with aid allocated to public investment being more fungible than other categories of aid.
3. Aid has no effect on private investment, but does increase private consumption.

#### 3.1 Data

The dependent variables for our study are: annual total and sectoral government expenditures, private investment, and household final consumption expenditures.<sup>7</sup> The data on government spending are from the International Monetary Fund's Government Financial Statistics. Data on private investment is obtained from Pfeffermann et al. (1999), and that for household consumption expenditures are from the World Development Indicators (WDI).

The main explanatory variable in our analysis is foreign aid. Data on foreign aid is available from the Organisation for Economic Co-operation and Development's (OECD) International Development Statistics (IDS) online databases. These databases cover bilateral and multilateral donors' aid and other resource flows to developing countries and countries in transition. We use two different aid datasets, provided by the Creditor Reporting System (CRS) and Development Assistance Committee (DAC) databases.<sup>8</sup> The DAC report consists of aggregated data for Net Official Development Assistance (ODA), while the CRS report presents sectoral and geographical information on aid. Further, the data on total foreign aid from DAC show disbursements whereas data from CRS show commitments. To test whether the composition of aid matters for fungibility, we need data on the composition of aid and

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<sup>7</sup>Total expenditures do not include defense expenditures, which on average exceed 10 % of the total expenditure for the recipient countries. We exclude defense expenditures as it is unlikely for that type of expenditure to be affected by the social and economic indicators that are included in our empirical specification.

<sup>8</sup>See Appendix B for further details.

government spending, as the theoretical model makes predictions on how sector-specific expenditures respond to changes in sector-specific foreign aid.<sup>9</sup> Although the DAC report presents more data on disbursements, it does not provide as detailed a sectoral allocation of aid as the CRS report. These two databases may show some differences for some years and sectors due to their underlying information gathering systems and tools. However, using the CRS database has become more feasible recently because of its increased coverage, especially starting from 1990s.<sup>10</sup> To check for robustness, we use total aid data from both the CRS and DAC databases and find that the results are practically unchanged.

We classify domestic government expenditures and foreign aid into three categories: investment, non-investment and social infrastructure. Since there are no precise definitions for these categories in our databases, we use the following strategy: in the CRS (commitments) dataset, we define investment aid as the sum of economic infrastructure aid and aid to the production sector. Then we use the corresponding spending amounts listed under the Economic Affairs and Services Section in the IMF's Government Financial Statistics (GFS) to construct government investment expenditures for the recipient country. We create social-infrastructure aid by using aid to social infrastructure and services in the CRS data. General public services, education, health, social security, housing and recreational and cultural expenditures in the GFS data are then used to construct the corresponding domestic government expenditure on social infrastructure. The remaining components in both the aid and expenditure datasets are used to construct the non-investment categories. Total and sectoral aid and expenditures are expressed as a share of the aid-recipient's GDP.<sup>11</sup>

The control variables for the fungibility analysis include agricultural value-added, literacy rate, infant mortality rate, the dependency ratio (the fraction of population 65 years and above), exports plus imports as a percentage of GDP, real per-capita GDP, and the GDP

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<sup>9</sup>For this part of our analysis, we use the two distinct aid datasets obtained from the DAC and CRS database as described above. We compare the results obtained by using these two types of aid data to see if data source selection affects the results considerably. The tables are designed in a way that the reader can see and compare results with these aid data.

<sup>10</sup>We examined the correlation between the two series in our panel in each year starting from 1973 (which is the initial year of the CRS data). In our sample, the correlation between the two series increases over time. The correlation between the two measures is 0.6574 in 1973, 0.8057 in 1990 and 0.9289 in 2000. The overall correlation in our panel between the two series is 0.8355.

<sup>11</sup>We provide the complete aid (CRS) and expenditure classification charts from our data sources in Appendix A (Table A3 and Table A4).

per-capita growth rate. For the regressions involving private investment and household consumption, we use CPI inflation and interest rate spreads as additional controls. Agricultural value-added, the dependency ratio, the literacy rate, and GDP per-capita growth rates are obtained from the World Bank National Accounts Data and the OECD National Accounts. Data on infant mortality rates and real per-capita GDP are obtained from the U.S Census Bureau’s International databases (IDB) and the Penn World Table, respectively. Interest rate spreads and CPI inflation are obtained from the International Financial Statistics. The list of the recipient countries and the descriptive statistics for the variables of interest are presented in Tables A1 and A5 in Appendix A, respectively.

### 3.2 Empirical Specification and Results

We begin by examining the sensitivity of government spending and its composition (as defined above) to changes in total foreign aid and its composition in a panel of 67 countries, using annual data for the 1972-2000 period.<sup>12</sup>

*Is Foreign Aid Fungible?* The first step is to test for the fungibility of total aid flows. The following specification is estimated for this purpose:

$$GovExp_{it} = \alpha_0 + \alpha_1 Aid_{it} + \alpha_2 X_{it} + \epsilon_{it}$$

where  $GovExp_{it}$  represents total government expenditures as a share of GDP,  $Aid_{it}$  measures total aid as a fraction of GDP, and  $X_{it}$  is a set of controls, including variables that are considered standard determinants of government expenditure in the literature. Specifically, we include the recipient’s infant mortality rate and the dependency ratio as proxies for health-care and social security spending. The literacy rate and agricultural value-added are used to control for spending in the education and agriculture sectors. Finally, we include trade dependence (imports plus exports as a percentage of GDP) as international exposure could increase government expenditures (see Alesina and Wacziarg, 1998) and real per capita GDP (to control for the size of the government) as a proxy for income.<sup>13</sup> We use lagged values of

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<sup>12</sup>The list of aid-recipient countries used in our sample is provided in Appendix A (Table A1). No specific selection method was adopted for the countries included in our study. Rather, it was the availability of the data that determined the panel.

<sup>13</sup>Real GDP per capita of the recipient countries is included as an indicator of development levels which is

the above controls to minimize concerns about simultaneity. To address the potential for omitted country-level variables, we include country fixed effects. The time component that is common to all countries in a given period is addressed by including time effects. We also cluster the standard errors by country.

The effect of foreign aid on total government expenditures is presented in Table 1. The results confirm our theoretical predictions (see eq. 9a) and indicate that foreign aid is indeed fungible for both the DAC and CRS measures: from columns 1 and 2 in Table 1, we see that a 10% increase in the foreign aid to GDP ratio leads to an increase of about 3.5% in the ratio of total government spending to GDP when the DAC aid data is used, and about 2.9% when the CRS data is used. Both coefficients are statistically significant at the 1% level. Table 1 provides strong evidence of fungibility at the aggregate level: since total government expenditure already *includes* foreign aid spending, we see that on average (depending on which aid data is used), about 70% of total aid flows is fungible.

*Does the Composition of Aid Matter?* The evidence presented in Table 1 supports the prediction that total aid is fungible, but it does not identify how and if the composition of aid matters for the composition of government spending. This is an important empirical question, since previous studies have shown that the composition of government spending is critical for macroeconomic performance. One of the main predictions of the theoretical model in section 2 is that aid designated for public investment is unambiguously fungible, while fungibility from non-investment aid is lower than that from investment aid (see equations 8a and 8b). To shed light on the link between the composition of aid and that of government spending, we split our sample into three categories of government expenditures and three corresponding categories of foreign aid. Our dependent variables are now the recipient government's investment expenditures, non-investment expenditures, and social infrastructure expenditures. The independent variables are the corresponding categories for foreign aid, while the control variables remain the same as in Table 1.

The effects of the composition of aid on the composition of government spending are reported in Table 2. The strategy we adopt for this part of our empirical analysis can likely to affect the size of the government, as Feyzioglu et al. (1998) have suggested, based on Wagner's Law. Wagner's law states that the development of an industrial economy will be accompanied by an increased share of public expenditure in GNP.

be described as follows. For example, the first column of Table 2 regresses government investment expenditure on investment and social infrastructure aid. This strategy is adopted for two reasons. First, we not only want to determine whether a particular category of government expenditure is influenced by the corresponding category of foreign aid, but also whether it is affected by other categories of aid as well. Second, since the three categories of aid sum up to total aid, only two of these categories are independent. We therefore can regress only two categories of foreign aid on any one category of government expenditure. Equation (8a) in section 2 predicts that an increase in investment aid will lead to an equal and proportionate decline in domestic government investment expenditure. The empirical results in Table 2 are very close to this theoretical prediction: a 10% increase in the ratio of investment aid to GDP is associated with approximately a 1% increase in total government investment expenditure relative to GDP (significant at the 5% level), indicating that about 90% of every dollar of investment aid is fungible (since government investment expenditure also includes spending from investment aid). In comparison, we see that social infrastructure aid is less fungible than investment aid, with a corresponding crowding out of about 78%. By contrast, there is no evidence of fungibility for non-investment aid. We also find no evidence of substitution between aid categories and expenditure categories (for example, social infrastructure aid has no significant effect on government investment expenditure).<sup>14</sup> Therefore, the empirical results reported in Table 2 confirm our theoretical predictions, i.e., the composition of aid does indeed effect the composition of government spending, and investment aid appears to be the most fungible category of aid.

### 3.3 Instrumental Variable Regressions

OLS estimations of the relationship between fungibility and foreign aid might be biased due to the potential endogeneity of foreign aid distributions (foreign aid can be sent where governments fail to provide public goods to their countries; these same countries could be characterized by corruption, weaker institutions and lower preferences for public goods). In this section, we test the robustness of our earlier results by employing instrumental variable

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<sup>14</sup>This regression strategy leads to six possible pairs of aid categories. For the purposes of clarity and space, we report results for only three such pairs in Table 2. The results for the other three pairs are available upon request. However, the pattern of results reported in Table 2 remain virtually unaffected for the three other pairs.

regressions.

Following Tavares (2003), we use a combination of geographical and cultural ties between major donors and recipient countries as instruments for aid, which in turn are interacted with aid outflows from donors. These interaction terms serve as instrumental variables, determining foreign aid inflows to each recipient country. The procedure we adopt can be described as follows. For each country in our sample, we construct an instrument for aid which captures the exogenous component of the aid sample. We use the inverse of bilateral distance and a contiguity dummy (the presence of a common land border) for geographical proximity, and common language and religion as measures of cultural affinity. For each country in our sample, we sum the product of aid outflows from 22 donor countries (listed in Table A2 of Appendix A) after multiplying each of them by the bilateral exogenous measures described above.<sup>15</sup> We consider the interaction of the aid variable and instruments for two main reasons: first, since we use country fixed effects in our regressions and the instruments are time-invariant, we are not able to observe their individual effects on foreign aid distributions. Second, the instruments under consideration exist only between donors and recipients on bilateral basis. Since we use total aid from all donors in our empirical study, this method allows us to link bilateral comparisons to total aid.

In the first stage of the instrumental variable regression, we regress aid inflows for each developing country on the four exogenous instruments above. The predicted value of the dependent variable in that regression is then used in the second stage regression to examine the link between aid and government spending. The results of our first stage regressions are presented in Table 3. All the exogenous variables have the expected signs (an increase in distance reduces the amount of aid received whereas common borders, religion and official language increase the amount of aid). Three of the instruments (distance, language, and religion) are statistically significant for the total foreign aid variable from the DAC data and two of them (distance and religion) are statistically significant for the total foreign aid variable from the CRS data. Our specification passes the Anderson (1984) canonical correlations

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<sup>15</sup>The instrumental variable for aid is constructed in the following manner:

$$Instrumental\ Variable(Aid * Inst)_{i,t} = \sum_{j=1}^{22} Aid_{i,j,t} * Instrument_{i,j}$$

where  $i$  : recipient country,  $j$  : donor country,  $t$  : year.

likelihood-ratio test for identification and instrumental variable relevance, the Cragg-Donald F-statistic for weak identification and the Hansen J-statistic for over-identification tests for all instruments. As for the second stage regression, Table 4 presents the impact of total aid on total government expenditures when aid is instrumented. Our earlier results still remain valid (the coefficients are now slightly lower than the ones in Table 2), even after instrumenting foreign aid: a 10% increase in the total aid to GDP ratio is associated with approximately a 3.3% increase in government spending relative to GDP for the DAC variable, and a 2.1% increase for the CRS variable.

### 3.4 Foreign Aid and Private Spending

Though we find that total aid is fungible, the results above do not suggest a cross subsidization of government spending: investment aid reduces domestic government investment, but does not finance any other category of government spending. The question, then, is that what type of spending does the fungible aid finance? This is no doubt a complex question, and one that is not obvious from the data. However, our theoretical results do point to one potential channel: private spending. Equations (10a) and (10b) indicate that when aid is fungible, it should have no effect on private investment (and consequently, growth), but would finance an increase in private consumption. In this section, we test this simple prediction.

Table 5 presents a summary of our results relating foreign aid and its composition to private investment and household consumption. Columns (1)-(5) indicate that foreign aid or its composition has no significant effect on private investment expenditures.<sup>16</sup> Columns (6)-(10) report the effects of aid and its composition on household consumption expenditures. The findings are broadly consistent with theory: a 10% increase in the aid to GDP ratio increases the household consumption-GDP ratio by approximately 4.9% for the DAC aid variable, and 3.9% for the CRS aid variable (both significant at the 1% level). Moreover, the composition of aid matters too: a 10% increase in the investment aid-GDP ratio increases household consumption by 3% (significant at the 5% level). Social infrastructure aid and

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<sup>16</sup>We have also tested for the effect of aid and its composition on GDP growth, using a specification that is quite standard in the empirical aid-growth literature. Consistent with existing results, we find no statistically significant relationship between the two. These results are not reported, but are available upon request.

non-investment aid increase household consumption by amounts larger than investment aid. These results suggest that aid, by releasing domestic public spending resources, might end up financing private consumption on the margin. The transmission mechanism could be through government transfer programs such as unemployment benefits or subsidies. The fact that aid has no effect on private investment expenditures is consistent with our results regarding the crowding out of domestic public investment. By reducing domestic public investment, aid offsets any positive externalities for private investment (through higher productivity of private capital), which consequently might explain why economic growth remains unaffected.

## 4 Conclusions

In this paper, we have examined fungibility as a possible explanation for the "missing link" between foreign aid and economic growth. Fungibility arises out of an aid-recipient government's reallocation of domestic resources in response to foreign aid. We show how the composition of aid, often determined by donors, plays a crucial role in determining the composition of government expenditures and, as a consequence, its impact on macroeconomic performance.

We introduce fungibility as an equilibrium outcome in an endogenous growth framework, and highlight the mechanism through which an injection of foreign aid might affect domestic resource allocation, with respect to both public and private expenditures. We show that when aid is fungible, the substitution away from domestic government investment is higher than from government consumption. This leads to a reduction in domestic productive public spending on part of the recipient government and completely offsets any positive impact that aid might have on growth. Our theoretical framework generates some interesting hypotheses which we then confront with data. The empirical findings are consistent with our theoretical predictions: we find strong evidence of fungibility at the aggregate level, with almost 70 percent of total aid being fungible in our sample. When aid and government spending are disaggregated into different categories, we find that investment aid is the most fungible type of aid. Finally, we confirm that in the presence of fungibility, there is no statistically significant relationship between foreign aid and private investment, but aid does have a strong positive impact on household consumption. We address the issue of causality in all

our regressions, and our results remain robust to the instrumentation of foreign aid.

Our results provide useful insights for the design and implementation of foreign aid programs. Recently, much of the theoretical literature on foreign aid has advocated tying aid to public investment, in order to realize large growth and investment effects. In fact, more than two-thirds of all aid flows to the developing world are "tied" to public investment (e.g. infrastructure projects). Our findings, therefore, serve as a caution to donors imposing specific tying restrictions on recipients. On the other hand, the fact that non-investment and social infrastructure aid are less fungible also provides insights on how the disbursement of foreign aid can be designed more effectively.

This paper is not ambitious enough to explain away the "missing link" between foreign aid and growth. However, we have attempted to explain a piece of this complicated puzzle. We therefore end with a caveat which might be useful for future research: the problem of fungibility is also a political economy issue and is probably intricately linked with factors such as rent-seeking, corruption, the institutional environment of recipients and their strategic relationships with donors. We believe that our results will provide insights into how the above factors can be integrated into a more comprehensive analysis of foreign aid and its impact on macroeconomic performance.

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**Table 1**  
**The Effect of Foreign Aid on Government Spending**

Variable	Dependent Variable	
	Total Government Expenditure (% of GDP)	
Aid DAC (% of GDP)	0.347 (6.02)***	
Aid CRS(% of GDP)		0.288 (5.28)***
Real GDP per capita	-0.0000 (0.18)	-0.0001 (0.40)
Infant mortality rate, lag (-1)	-0.103 (2.16)**	-0.095 (2.01)**
Agricultural value added (% of GDP), lag (-1)	-0.227 (2.91)***	-0.252 (3.31)***
Literacy rate, lag (-1)	-0.213 (1.24)	-0.235 (1.36)
Import plus export (% of GDP), lag (-1)	-0.037 (1.57)	-0.038 (1.61)
Dependency ratio (65+), lag (-1)	-0.883 (0.96)	-0.726 (0.73)
Constant	52.878 (4.10)***	53.684 (3.93)***
Observations	620	620
Adj. R-squared	0.90	0.90
Country Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Cluster (by country)	Yes	Yes

t statistics in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 2**  
**The Composition of Aid and the Composition of Government Spending**

Variable	Dependent Variable		
	Investment expenditure (% of GDP)	Non investment expenditure (% of GDP)	Social infrastructure expenditure (% of GDP)
Investment aid (% of GDP)	0.100 (2.27)**		
Non investment aid (% of GDP)		0.158 (1.57)	0.121 (1.00)
Social infrastructure aid (% of GDP)	0.030 (0.45)	0.064 (0.70)	0.221 (2.73)***
Real GDP per capita	0.0003 (1.58)	0.00002 (0.08)	-0.0003 (0.81)
Infant mortality rate, lag (-1)	-0.015 (0.66)	-0.104 (4.00)***	-0.011 (0.44)
Agricultural value added, lag (-1) (% of GDP)	-0.043 (1.60)	-0.080 (1.31)	-0.086 (1.17)
Literacy rate, lag (-1)	-0.052 (0.64)	0.028 (0.40)	-0.181 (1.58)
Import plus export (% of GDP), lag (-1)	0.019 (1.95)*	-0.008 (0.61)	-0.043 (2.45)**
Dependency ratio 65, lag (-1)	-0.329 (0.53)	-0.736 (1.08)	-0.315 (0.54)
Constant	9.172 (1.43)	17.907 (2.09)**	29.799 (4.00)***
Observations	591	571	609
Adj. R-squared	0.82	0.72	0.93
Country Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Cluster (by country)	Yes	Yes	Yes

t statistics in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 3**  
**First Stage Instrumental Variables Regressions**

Variable	Dependent Variable	
	Aid DAC (% of GDP)	Aid CRS (% of GDP)
Aid/Distance	1865.634 (2.38)**	2714.921 (1.78)*
Aid*Border	10.2954 (1.05)	10.9746 (0.85)
Aid*Language	0.8379 (3.77)***	0.0333 (0.07)
Aid*Religion	0.8468 (4.86)***	0.8032 (1.75)*
Real GDP per capita	-0.00038 (-1.72)*	-0.00043 (-1.40)
Infant mortality rate, lag (-1)	0.0326 (0.65)	-0.0381 (-1.62)
Agricultural value added, lag (-1) (% of GDP)	-0.0871 (-2.48)**	0.0595 (1.53)
Literacy rate, lag (-1)	-0.0212 (-0.32)	-0.0542 (-0.67)
Total trade, lag (-1) (% of GDP)	0.0096 (1.52)	0.0114 (1.37)
Dependency ratio 65, lag (-1)	0.7265 (1.35)	0.8573 (1.76)*
Observations	613	596

t statistics in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 4**  
**Instrumental Variables Regressions for the Effect of Aid on Government Spending**

Variable	Dependent Variable	
	Total Expenditure (% of GDP)	Total Expenditure (% of GDP)
Aid DAC (% of GDP)	0.329 (4.72)***	
Aid CRS (% of GDP)		0.212 (2.47)**
Real GDP per capita	-0.000 (0.23)	-0.000 (0.58)
Infant mortality rate, lag (-1)	-0.104 (2.23)**	-0.106 (2.35)**
Agricultural value added, lag (-1) (% of GDP)	-0.226 (2.94)***	-0.242 (3.20)***
Literacy rate, lag (-1)	-0.216 (1.28)	-0.232 (1.43)
Total trade, lag (-1)	-0.037 (1.61)	-0.030 (1.24)
Dependency ratio 65, lag (-1)	-0.863 (0.98)	-1.083 (1.12)
Observations	613	596
Country Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Cluster (by country)	Yes	Yes
Anderson canonical correlations test (p value)	0.0000	0.0000
Cragg-Donald F statistic	313.628	108.054
Hansen J statistic (p value)	0.8303	0.1377

z statistics in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 5**  
**The Effect of Foreign Aid (and its Composition) on Private Investment and Household Consumption**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Invest.	Invest.	Invest.	Invest.	Invest.	Consump.	Consump.	Consump.	Consump.	Consump.
Aid DAC (% GDP)	0.080 (0.121)					0.489 (0.119)***				
AID CRS (% GDP)		0.023 (0.080)					0.387 (0.098)***			
Investment aid (% GDP)			0.002 (0.096)	0.010 (0.118)				0.289 (0.113)**	0.283 (0.134)**	
Non Investment aid (% GDP)				-0.001 (0.113)	-0.018 (0.132)				0.569 (0.111)***	0.493 (0.094)***
Social infrastructure aid (% GDP)			0.097 (0.244)		0.113 (0.301)			0.717 (0.391)*		0.517 (0.379)
Observation	590	591	560	560	556	1494	1424	1273	1321	1291
R-squared	0.85	0.84	0.85	0.85	0.85	0.84	0.83	0.84	0.84	0.84

Robust standard errors in parenthesis. Each regression controls for year and country fixed effects. The private investment regression controls for lagged private investment, openness to trade, per capita gdp growth, inflation and interest rate spread (the difference between the lending rate and the deposit rate) The consumption regression controls for per capita gdp growth, trade and inflation. All control variables are taken from the WDI dataset.

## Appendix A

**Table A1. List of Recipient Countries Included in Our Panel Data**

Argentina, Bahrain, Barbados, Belarus, Belize, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Chile, Colombia, Congo - Rep., Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Dominican Republic, Egypt, El Salvador, Estonia, Ethiopia, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Jamaica, Kazakhstan, Kuwait, Latvia, Lesotho, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Nepal, Nicaragua, Niger, Pakistan, Panama, Paraguay, Peru, Romania, Russia, Rwanda, Senegal, Singapore, Slovenia, Sri Lanka, Syria, Tajikistan, Thailand, Togo, Trinidad & Tobago, Tunisia, Turkey, Uruguay, Venezuela.

**Table A2. List of Donor countries included in the IV regression**

Australia, Austria, Belgium, Canada, Denmark, Finland, Japan, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

**Table A3. CRS/Aid Activities (these activities include all commitments)**

<b>DAC name</b>	<b>Definition</b>
XII.TOTAL	
I.SOCIAL INFRASTRUCTURE & SERVICES	I.Total
I.1 Education, Total	Includes general teaching and instruction at all levels; as well as construction specifically to improve or adapt educational establishments. Training in a particular field, such as agriculture, is reported against the sector concerned.
I.1.a) Education, Level Unspecified	Includes education sector policy and research, as well as buildings and teacher training when level of education unspecified.
I.1.b) Basic Education	Includes primary, basic life skills for youth and adults and early childhood education.
I.1.c) Secondary Education	Includes vocational training.
I.1.d) Post-Secondary Education	Includes higher education and advanced technical and managerial training.
I.2 Health, Total	Covers assistance to hospitals, clinics, other medical and dental services, public health administration and medical insurance programmes.
I.2.a) Health, General	Includes health policy, medical education and research, laboratories, hospitals and specialised clinics, ambulances, dental services, mental health, rehabilitation, non-infectious disease control, drug and substance abuse control (excluding narcotics traf
I.2.b) Basic Health	Basic health care provision, training of basic health personnel and development of basic health infrastructure; nutrition, infectious disease control, public health campaigns.
I.3 Population Programmes	Covers all activities in the field of reproductive health, family planning and research into population problems.
I.4 Water Supply & Sanitation	Covers assistance given for water supply and use, sanitation and water resources development (including rivers).
I.5 Government & Civil Society	Includes assistance to strengthen the administrative apparatus and government planning, and activities promoting good governance and strengthening civil society.
I.5.a) Government and civil society - general	
I.5.b) Conflict, Peace and Security	
I.6 Other Social Infrastructure & Services	Covers assistance to employment, housing, other social services and cultural development. Includes also research when sector cannot be identified.
II.ECONOMIC INFRASTRUCTURE	II.Total
II.1Transport & Storage	Covers road, rail, water and air transport and storage, whether or not related to transportation.
II.2Communications	Includes all communications (post and telecommunications, radio, television, print media).

II.3 Energy	Covers both the production and distribution of energy. Assistance towards the peaceful use of nuclear energy is reportable as ODA. This includes the construction and decommissioning of nuclear power reactors for civilian power supply, the development or
II.4 Banking & Financial Services	Covers assistance to finance and banking in both formal and informal sectors.
II.5 Business & Other Services	Includes business development and activities aimed at improving the business climate; privatisation.
III.PRODUCTION SECTORS	III.Total
III.1 Agriculture - Forestry - Fishing, Total	Including agricultural sector policy, agricultural development and inputs, crops and livestock production, agricultural credit, co-operatives and research.
III.1.a) Agriculture	Including agricultural sector policy, agricultural development and inputs, crops and livestock production, agricultural credit, co-operatives and research.
III.1.b) Forestry	Includes forestry policy, planning and programmes, fuelwood and charcoal projects, forestry education, research and development.
III.1.c) Fishing	Includes fisheries policy, planning and programmes as well as fisheries research and education.
III.2 Industry - Mining - Construction, Total	Covers assistance to manufacturing industries of all kinds, technological research and development, extractive industries, and construction when sector cannot be identified.
III.2.a) Industry	Industrial policy, small business and craft development; all types of manufacturing, including agro-processing, chemicals and fertilisers, gas liquefaction and petroleum refining, fuel wood production, textiles and leather.
III.2.b) Mining	Includes mining and minerals policy and programmes, geology, and extraction of metals, minerals and fuels.
III.2.c) Construction	Construction sector policy and planning; excluding construction activities within specific sectors (e.g., hospital or school construction).
III.3 Trade Policy and Regulations	Covers trade and export promotion; hotels and other tourist facilities.
III.4 Tourism	Tourism policy and administrative management.
IV. MULTISECTOR	IV.Total
IV.1 General Environment Protection	Covers activities concerned with conservation, protection or amelioration of the physical environment without sector allocation.
IV.2 Women In Development	Covers activities concerned with advancement of women in development without sector allocation.
IV.3 Other Multisector	Covers urban and rural development projects and other multisector activities
V.TOTAL SECTOR ALLOCABLE (I+II+III+IV)	Sum of amounts on lines 100, 200, 300 and 400.
VI. COMMODITY AID / GENERAL PROG. ASS.	This main heading includes contributions for general development purposes without sector allocation, with or without restrictions on the

	specific use of the funds (and irrespective of any control by the donor of the use of counterpart funds). Funds suppl
VI.1 General Budget Support	Non-sector allocable programme assistance whose provision is explicitly linked to agreed policy packages, in particular those implementing recommendations made by the World Bank and the IMF.
VI.2 Developmental Food Aid/Food Security Assistance	Supplies and transport of food, cash for food, and intermediate products (fertilisers, seeds etc.) provided as part of a food aid programme.
VI.3 Other Commodity Assistance	Includes import, budget and balance-of-payments support.
VII. ACTION RELATING TO DEBT	This main heading groups all actions relating to debt (forgiveness, swaps, buy-backs, rescheduling, refinancing).
VIII. EMERGENCY ASSISTANCE AND RECONSTRUCTION	This main heading groups emergency and distress relief in cash or in kind, emergency food aid, humanitarian aid including aid to refugees, and assistance for disaster preparedness.
VIII.1 Emergency Food Aid	Food aid for population groups affected by emergency situations.
VIII.2 Other Emergency and Distress Relief	All emergency, distress relief and humanitarian aid except food aid.
VIII.3 Reconstruction relief	
IX. ADMINISTRATIVE COSTS OF DONORS	Administrative costs as defined in paragraphs 1.26 to 1.30.
X. SUPPORT TO NGO'S	This main heading refers to official funds paid over to national and international non-governmental organisations for use at the latter's discretion. Official funds made available to NGO's for use on behalf of the official sector, in connection with purp
XI. UNALLOCATED/UNSPECIFIED	Amounts should be reported under this heading only for forms of aid which cannot be assigned to another part of the table, and also, in the case of project or sector assistance, to record contributions for which sectoral destination remains to be specific

**Table A4. Government Financial Statistics (IMF)**

**Government Finance**

<b>Revenue Classification</b>	<b>Source</b>
80. OVERALL DEFICIT/SURPLUS	IMF, GDF
81. TOTAL REVENUE & GRANTS	IMF, GDF.
81A. TAXES ON INCOME, PROFITS, & CAPITAL GAINS	IMF, GDF.
81B. SOCIAL SECURITY CONTRIBUTIONS	IMF, GDF.
81C. TAXES ON PAYROLL OR WORK FORCE	IMF, GDF.
81D. TAXES ON PROPERTY	IMF, GDF.
81E. DOMESTIC TAXES ON GOODS & SERVICES	IMF, GDF.
81F. TAXES ON INTL TRADE & TRANSACTIONS	IMF, GDF.
81G. OTHER TAXES	IMF, GDF.
81Y. TOTAL REVENUE	IMF, GDF.
81YA. TAX REVENUE	IMF, GDF.
81YB. NONTAX REVENUE	IMF, GDF.
81YC. CAPITAL REVENUE	IMF, GDF.
81YD. CURRENT REVENUE	IMF, GDF.
81Z. GRANTS	IMF, GDF.
<b>Expenditure Classification</b>	
82. TOTAL EXPENDITURE	IMF, GDF.
82A. GENERAL PUBLIC SERVICES	IMF, GDF.
82AC. PUBLIC ORDER & SAFETY (B3)	IMF, GDF.
82B. DEFENSE (B2)	IMF, GDF.
82C. EDUCATION (B4)	IMF, GDF.
82D. HEALTH (B5)	IMF, GDF.
82E. SOCIAL SECURITY & WELFARE (B6)	IMF, GDF.
82F. HOUSING & COMMUNITY AMENITIES (B7)	IMF, GDF.
82G. RECREATIONAL, CULTURAL, & RELIG AFFAIRS (B8)	IMF, GDF.
82H. ECONOMIC AFFAIRS & SERVICES (B9 TO B13)	IMF, GDF.
82HB. AGRI, FORESTRY, FISHING, & HUNTING (B10)	IMF, GDF.

82HC. MINING & MINERAL RESOURCES, MANUF, & CONSTRUCTION (B11)	IMF, GDF.
82HD. FUEL & ENERGY (B9)	IMF, GDF.
82HI. TRANSPORTATION & COMMUNICATION (B12)	IMF, GDF.
82HL. OTH ECONOMIC AFFAIRS & SERVICES (B13)	IMF, GDF.
82K. OTH EXPENDITURES (B14)	IMF, GDF.
82N. CURR EXPENDITURE ON GOODS & SERVICES (C1)	IMF, GDF.
82NA. WAGES & SALARIES; EMPLOYER CONTRIBUTIONS (C1.1 + C1.2)	IMF, GDF.
82NP. OTH PURCHASES OF GOODS & SERVICES (C1.3)	IMF, GDF.
82NX. EMPLOYER CONTRIBUTIONS (C1.2)	IMF, GDF.
82PA. INTEREST PAYMENTS (C2)	IMF, GDF.
82PJ. SUBSIDIES & OTH CURR TRANSFERS (C3)	IMF, GDF.
82PK. SUBSIDIES (C3.1)	IMF, GDF.
82PM. TRANSFERS TO OTH LEVELS OF NATL GOVT (C3.2)	IMF, GDF.
82PP. TRANSFERS ABROAD (C3.5)	IMF, GDF.
82PT. TRANSFERS TO NONPROFIT INSTS & HHLDS (C3.3 4 + C3.4)	IMF, GDF.
82R. CURRENT EXPENDITURE (C.III)	IMF, GDF.
82V. CAPITAL EXPENDITURE (C.IV)	IMF, GDF.
82VA. ACQUISITION OF FIXED ASSETS (C4)	IMF, GDF.
82Z. EXPEND & LENDING MINUS REPAYMENTS (C.I; OR C.II + C.V)	

**Table A5. Summary Statistics**

<b>Variable (% of GDP)</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Observations</b>
Total expenditure (excluding defense)	22.96231	9.929409	.0275524	56.08927	N = 1019
Investment expenditure	5.684408	4.034981	.0033656	25.72717	N = 1048
Non-investment expenditure	3.887969	3.568834	1.43e-06	23.37628	N = 988
Social infrastructure expenditure	13.81117	7.381383	.021869	55.66596	N = 1058
Aid DAC	4.963536	6.418934	-.5458025	48.14704	N = 1727
Aid CRS	3.922629	5.361861	4.30e-06	41.02941	N = 1618
Investment aid (CRS)	1.729454	2.525373	2.12e-06	22.93244	N = 1525
Non-investment aid (CRS)	1.481203	2.522273	9.31e-10	22.22922	N = 1566
Social infrastructure aid (CRS)	.9368216	1.608255	0	17.5981	N = 1484

## APPENDIX B

All data on ODA are collected by the OECD/DAC Secretariat from its 23 members, then checked and aggregated by the OECD/DAC Secretariat. The DAC Secretariat collects two sets of data:

(i) Development Assistance Committee (DAC) Database: The DAC statistics provide comprehensive data on the volume, origin and types of aid and resource flows to over 180 aid-recipient countries. The data cover official development assistance (ODA), other official flows (OOF) and private funding (foreign direct investment, bank and non-bank flows) from members of the DAC, multilateral organizations and other donors. See [www.oecd.org/dac/stats/dac/guide](http://www.oecd.org/dac/stats/dac/guide) for further details.

(ii) Creditor Reporting System (CRS) Database: The objective of the CRS Aid Activity database is to provide a set of readily available basic data that enables analysis on where aid goes, what purposes it serves and what policies it aims to implement, on a comparable basis for all DAC members. The Aid Activity data are used to analyze the sectoral and geographical breakdown of aid for selected years and donors or groups of donors. But the database also permits to consider specific policy issues (e.g. tying status of aid) and monitor donors' compliance with various international recommendations in the field of development co-operation. See [www.oecd.org/dac/stats/crs/guide](http://www.oecd.org/dac/stats/crs/guide) for further details.

The Net Official Development Assistance (ODA) data comprises grants or loans to developing countries and territories on the OECD/DAC list of aid recipients that are undertaken by the official sector with promotion of economic development and welfare as the main objective and at concessional financial terms. This definition is from Millennium Development Goals Indicators webpage.