

Is Foreign Aid a Public Good?

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Abstract: Based on a panel of 24 development assistance committee (DAC) countries, across two decades, we present evidence that foreign aid (or its effects) are not perceived to be nonrivalrous by the citizens of donor countries. Using an empirical specification based on the median-voter model and the provision of Samuelsonian public goods, we find that aid is perceived to be a purely private good. Our findings suggest that private interests may be an important determinant of foreign aid flow decisions relative to humanitarian concerns. This would imply that foreign aid, as practiced and perceived, is inconsistent with conventional arguments offered for Pareto-optimal redistribution schemes (Hochman and Rodgers, 1969).

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1. Introduction

In December of 2005 Jan Egeland, UN Undersecretary-General for Humanitarian Affairs, commented: “It is beyond me why are we so stingy, really[.] Christmas time should remind many Western countries at least, [of] how rich we have become.” Then-US Secretary of State Colin Powel bristled at the comment: “[The US] has given more aid in the last four years than any other nation or combination of nations in the world.”¹

No doubt the fact that Egeland is from Norway made the remark particularly grating to US officials. While the US is the largest single foreign aid donor in absolute terms (over \$28 billion in 2009), “only four countries exceed the UN [aid] target of 0.7 percent of Gross National Income (GNI) and these four are Denmark, Norway and Sweden” (Gates and Hoeffler, 2004, p. 6). Nordic countries are the most generous donors of Official Development Assistance (ODA) in per-capita terms. Hence either characterization of the US – as stingy or generous – is apt depending on the perspective.

The Nordic countries are, of course, very small in terms of their populations; the US is relatively large. For Development Assistance Community (DAC) countries generally, **figure 1** plots populations versus ODA as a fraction of GNI. The top panel (A) includes all DAC countries and the fitted OLS regression line suggests large populations are associated with country’s that give a smaller portion of their total income as foreign aid. The US has more than twice the population of any other DAC country and is prominent in the upper-left corner of the scatter. However, removing the US (panel B) does not affect the general negative relationship between population and ODA/GNI.

In lieu of reasons to believe that higher population goes hand-in-hand with less

¹ See “U.N. Official Slams U.S. as ‘Stingy’ over Aid,” *Washington Post*, December 28th, 2004; “Irate over ‘Stingy’ Remark, U.S. Adds \$20 Million to Disaster Aid,” *New York Times*, December 29th, 2004.

inherent altruism, the relationship in **figure 1** may be made intelligible by the *publicness* of aid. Citizens of a donor country may demand foreign aid based on humanitarian concerns. Improvements in well-being in a developing nation would be difficult to exclude others from observing. (Indeed, it would be bizarre to try to exclude them!) Furthermore, from their perspective of donor country citizens, the effects of foreign aid may be largely nonrivalrous.² For example, when Kate's country gives a dollar of aid to feed a starving child, her enjoyment of knowing that the child is fed is not lessened by the fact that her fellow citizens are also enjoying the knowledge.³ If aid is a public good, then a citizenry's demand for it will not be, all else equal, a function of the number of citizens (Samuelson (1954, 1955)). The publicness of aid is a plausible explanation for the US-Nordic country per capita aid differential.

However, there are also good reasons to think that the effects of aid are actually rivalrous. If aid is given to specific countries and in specific forms at the behest of special interests within a donor country, then the effects of that aid may be largely private goods. Special interests may be associated with a specific sector of the donor economy (e.g., aid that is tied to purchases of agricultural output from the donor or targeted at a recipient that is already an importer of agricultural goods from the donor) or with non-government organizations that exist for the sake of administering aid flows.

Maizels and Nissanke (1984), Schraeder et al. (1998), and Alesina and Dollar (2000) are examples of papers that reject a purely-altruistic model of aid allocation.

However, even if there are significant ideological and strategic interests underlying aid

² These would be the *perceived* effects of aids on the recipients. Citizens of donor countries may be largely naive about the effectiveness of foreign aid, which is a controversial question. The recent literature on this question includes [...]. Also, the very *act* of giving may be what is consumed by a donor country's citizens.

³ While a donor country could, in principle, try to exclude some of its citizens from enjoying the effects of its aid flows, it seems more reasonable to also treat aid as non-excludable.

flows (as suggested by these papers) this does not imply that the effects of that aid are not public goods. For example, if a country gives aid to stabilize or pacify a potentially hostile nation, the effects are still nonrivalrous across the donor's citizens. As another example, even if agricultural special interests view the effects of aid as one type of good (i.e., a subsidy to their industry) other citizens may enjoy the effects as another type of good (i.e., the alleviation of poverty).

In this paper we estimate the relationship between ODA flows from DAC countries and their populations, median incomes and tax rates. Using a framework utilized by Holcombe and Sobel (1995) and based on the median voter theorem we find that aid flows are, from the perspective of donors, essentially 100 percent private goods. In our empirical analysis, even 95 percent lower bounds for the relevant coefficient estimates suggest that DAC aid flows are no more than 25 percent nonrivalrous.⁴ This conclusion is robust to controlling for a time trend, institutional quality, the extent of trade, and aggregate ODA flows.

We also present evidence that confirms the conventional wisdom that Nordic countries are inherently (i.e., due to variables outside of our analysis) more prone to giving aid. Specifically, being a Nordic country all else equal implies upwards of 50 percent more ODA. However, we do not find that aid has a higher degree of publicness from the Nordic perspective. Indeed, interacting population with a Nordic dummy in our regressions implies that the effects of aid are marginally *more* rivalrous.

The conclusion that ODA flows create, for donor's own citizens, purely private services belies the relevance of the seminal Hochman and Rodgers (1969) optimal redistribution hypothesis in the context of foreign aid. Hochman and Rodgers (1969, p.

⁴ We explain exactly what this means in this context below.

543) argue that “[g]iven interdependence among individual utility functions, it is possible that some redistribution will make everyone better off[.] If, for example, the utility of individuals with higher incomes depends upon and is positively related to the income of persons lower in the distributive scale[.]” If a donor’s citizens have utilities that are interdependent with those of a recipient’s citizens, then we would expect an improvement in the latter’s lot to be enjoyed nonrivalrously across the former. It is hard to reconcile utility interdependence with donor citizens receiving purely private benefits.

We will present theoretical motivation for our regressions in section 2. The data with which we will analyze the publicness of DAC ODA flows is described in section 3. Section 4 follows with the reporting of results and some concluding discussion is found in section 5.

2. Theory

Our empirical work will be founded on Deno and Mehay’s (1987) model of expressive voting based on Down’s (1957) median voter theorem. Holcombe and Sobel (1995) used this model to motivate an empirical framework to estimate the demand for legislative activities across US states as a function of the publicness of those activities. We similarly derive a framework to estimate donor ODA demands. These are the demands for aid flows by the citizens of donor countries as expressed through their political system. The political systems are presumed to be democratic, which is reasonable for DAC countries.

Assume that the decisive (median) individual (voter), i , in nation j has preferences over his consumption of foreign aid, A_{ij} , and other goods, X_{ij} , consumed:

$$(1) \quad U_{ij} = U(X_{ij}, A_{ij}).$$

A nation's foreign aid expenditures are A_j and aggregate (worldwide) foreign aid is,

$$(2) \quad A = \sum_{j=1}^J A_j .$$

The foreign aid consumed by the decisive individual is,

$$(3) \quad A_{ij} = \frac{A_j}{N_j^\gamma} .$$

where N_j is the number of citizens of nation j and $0 \leq \gamma \leq 1$.

If aid is a pure public good for country j then the aid services received by the decisive individual, A_{ij} , for a given amount of the nation's foreign aid, A_j , will be independent of the number of other citizens, N_j . This corresponds to $\gamma = 0$ and i 's aid consumption reduces to $A_{ij} = A_j$. Intuitively, if aid is entirely nonrivalrous across a donor's citizens then each citizen enjoys the total aid flow without hampering his or her fellow citizens' enjoyment. Alternatively, $\gamma = 1$ corresponds to a purely private good; $A_{ij} = (A_j/N_j)$ and i 's consumption of aid is the nation's per capita aid flows. In this case, the aid is entirely rivalrous and when one dollar of aid is being enjoyed by a given citizen it rules out any other citizen partaking in that enjoyment.

The decisive individual's budget constraint is,

$$(4) \quad Y_{ij} = P_{X_j} X_{ij} + T_{ij} P_{A_j} A_j ,$$

where Y_{ij} is the median income for nation j ; P_{A_j} and P_{X_j} are the prices of aid and other goods, respectively; T_{ij} is the median voter's tax share. Substituting in for A_j using (3) leads to,

$$(4)' \quad Y_{ij} = P_{X_j} X_{ij} + T_{ij} P_{A_j} A_j N_j^\gamma .$$

Optimization leads to the demand function,

$$(5) \quad A_{ij} = A_{ij}(P_{Xj}, T_{ij}, P_{Aj}, N_j, Y_{ij}),$$

and if we assume a constant elasticity of demand form the results in,

$$(6) \quad A_{ij} = D_{ij}(T_{ij}N_j^\gamma)^\alpha Y_{ij}^\beta,$$

where D_{ij} embodies tastes and preferences that are specific to the decisive individual in nation j .

Substituting for A_{ij} using (3) and some manipulation yields,

$$(7) \quad A_j = D_{ij}T_{ij}^\alpha N_j^{(1+\alpha)\gamma} Y_{ij}^\beta.$$

This expression is intuitive. A decisive individual's demand for his nation to give aid is increasing in the number of people unless aid is a purely public good ($\gamma = 0$). Taking logs and appending a random error term leads to our baseline empirical specification,

$$(8) \quad \ln(A_j) = d_{ij} + \alpha \ln(T_{ij}) + (1 + \alpha)\gamma \ln(N_j) + \beta \ln(Y_{ij}) + \varepsilon_j,$$

where $d_{ij} = \ln(D_{ij})$.

3. Data

We build our data panel for 24 Development Assistance Committee (DAC)⁵ countries using five annual cross-sections spaced across five-year increments beginning with 1985 and ending with 2005. All income measures are converted to 2005 constant US dollars using exchange rate data and a (constant 2005 US\$) consumer price index from OECD.

Official development assistance (ODA) flows, tax share and income thresholds, and median income data are from the Organization for Economic Co-operation (OECD).⁶

We use the same database to measure GDP for the construction of a trade openness

⁵ For a list of DAC countries see:

http://www.oecd.org/document/38/0,3746,en_2649_34603_1893350_1_1_1_1,00.html

⁶ <http://stats.oecd.org>

figure. (See below.) Population is from Angus Maddison dataset, 2008.⁷

As additional controls we employ a time trend, a Nordic dummy, a measure of trade openness, an aggregate ODA measure (summation of all annual ODA flows), and two indicators of institutional quality.

The trade openness measure is country's total trade activity as a percent of GDP (i.e., $(\text{imports}_j + \text{exports}_j)/\text{GDP}_j$). National trade data are from the *Correlates of War Trade Project Data Set, 2008* (COW).⁸ Trade may be an important determinant of aid flows. The openness of a country may correlate with both strategic and special interests.

We also control for institutional quality using democracy scores from the *Polity IV Project* and the economic freedom scores from the *Economic Freedom of the World: 2011 Annual Report* (EFW).⁹ Polity ranks countries on an eleven-point scale (0-10; 10 representing the best) based on each nation's ability to express leadership preference, its constraints on executive power, and its guarantee of civil liberties to the citizenry. The EFW scores are also an eleven-point scale (0-10) with a score of 10 representing the highest economic freedom among nations. There are various reasons to think that institutional quality correlates with aid flows. For example, the nature a country's democracy might determine to what extent special interests can influence political outcomes. Also, economic freedom may correlate (negatively) with the amount of special interest rent-seeking. More generally, institutional quality may capture unobserved heterogeneity that is correlated with aid flows.

⁷ <http://www.ggdc.net/maddison/>

⁸ Barbieri, Katherine, Omar Keshk, and Brian Pollins (2008). *Correlates of War Project Trade Data Set Codebook, Version 2.01*. Online: <http://correlatesofwar.org>.

⁹ Center for Systemic Peace (www.systemicpeace.org) and Gwartney, Lawson, and Hall (2011) (www.freetheworld.com), respectively.

4. Results

Our regression results based on (8) are contained in **table 2**. Column 1 reports OLS results from the baseline model with only (log) median tax rates, population, and median income as regressors. The point estimate for the recovered parameter of interest, γ , is 1.017. This implies that ODA flows are purely private goods. The parameter is estimated precisely: the 95 percent confidence interval is (0.773, 1.285). The lower bound implies that *at most 25 percent of services from ODA (to donors) are public*. The other coefficient estimates are of the expected signs (i.e., negative for tax rates; positive for income). While the partial correlation with median tax rates is of marginal (12.5 percent) significance, the effect of median income is significant at the one percent level. The R^2 is quite high (0.872) suggesting that even the baseline model accounts for a large majority of the variation in ODA flows.

Column 2 reports results that acknowledge that the preferences for aid flows by decisive voters (D_{ij}) may well differ across countries. Specifically, we introduce a dummy variable for Nordic countries based on the conventional wisdom that these countries are, for one reason or another, more inherently prone to international giving. The results support the conventional wisdom: being a Nordic country is associated with about a 63 percent larger flow of ODA – a result which is statistically significant at the one percent level. Furthermore, allowing for Nordic generosity does not affect the γ point estimate in a meaningful way (1.017). The 95 percent confidence interval is (0.781, 1.253) so the lower bound implies that at most 22 percent of services from ODA are public.

A time trend is incorporated (along with the previously included regressors) to

produce the results found in column 3 of **table 2**. This does not change any of the other results in a meaningful way. (In particular, γ is significant at the one percent level; the point estimate is 0.993. The lower bound of the 95 percent confidence interval is 0.757 implying that at most 24 percent of ODA services are public.)

Institutional quality may represent important omitted variables in our analysis. Institutions may correlate with decisive voters' (unobserved) tastes for giving aid. Also, given the underlying theory of our analysis, institutions may represent and/or proxy for the effectiveness of the political process in expressing decisive voter preferences. Omitting institutional quality could then bias our estimate of γ if institutions are an important determinant of income levels. To address this concern, column 4 reports results produced from adding the Polity IV democracy score ($DEMOC_j$) and the Economic Freedom of the World score (EFW_j). The former does not enter significantly into the regression while economic freedom is only marginally (12 percent level) significant. Point estimates for both coefficients are negative. Importantly, controlling for institutional quality does not change the results of interest. By the point estimate ($\gamma = 1.014$) we conclude that ODA is perceived as a purely private good (for donors). Even the 95 percent confidence interval lower bound (0.754) implies that only 25 percent of the services produced by ODA flows are public. Again, being a Nordic country in-and-of-itself is associated with nearly a 50 percent higher ODA flow.

Another potentially important determinant of a country's ODA is its extent of trade. Countries relying to a greater extent on trade may have special interests that successfully lobby for indirect subsidies via aid flows. More generously, it is also possible that a greater extent of trade leads to greater sensitivity to the plights of trading

partners. We include exports plus imports as a fraction of GDP ($OPENNESS_j$) to produce the results reported in column 5 of **table 2**. The estimated coefficient on $OPENNESS_j$ has the expected (positive) sign but is only marginally significant at best. Remarkably, the services of ODA are again estimated to be purely private with even the 95 percent confidence interval lower bound (0.809) suggesting at most 19 percent publicness.

While we are interested in whether a donor's aid flows are perceived to be public goods across that donor's citizens, aid may also be a public good *across donors* (Mosely, 1985). Aid may finance global public goods (GPGs) such as a secure or clean environment (Feroni and Moody (2002); Kaul et al. (2003)). The World Bank (2001) estimates that, by 2000, 8 percent of aid was financing GPGs. Mascarenhas and Sandler (2006) estimate donor demand functions taking the possibility for GPGs into account explicitly. They find no evidence of cooperative behavior. However, they also find that donor aid flows are viewed as complements (and therefore not purely public) and that this partially offsets the lack of cooperative behavior in practice. Amand (2004) argues that ODA allocated towards such GPGs crowds out aid for more conventional development projects to the tune of three to 25 percent of total aid.¹²

While this type of publicness is different than that in which we are particularly interested here, we attempt to control for its effect on ODA flows by including aggregate ODA as a regressors. The results of doing so are reported in column 6 of **table 2**. The coefficient on (log) aggregate ODA is not significant though the point estimate has the

¹² Lei et al. (2006) explore "weakest-link" international public goods where the enjoyment (or realization) of the good is dependent on the smallest contributor. An example of this would be a war-on-terror where global security is only realized if the smallest of countries refuse safe haven to terrorists and contribute to the cause. Lei et al. ask whether in-kind or income aid to smallest contributors is most effective, concluding that the former is only advisable when the discrepancy between the weakest-link(s) and the other contributors is large. Their evidence for this does not come from cross-country data; rather, from experiments using individual subjects on a university campus.

expected (negative) sign. The inclusion of aggregate ODA does not alter the conclusion that a donor's ODA generates services that, for its own citizens, are purely private goods. The point estimate for γ is 1.090 and even the lower bound of its 95 percent confidence interval indicates that ODA services are only 21 percent public.

Table 3 explores whether two extensions to the model change the results in a meaningful way: (1) the inclusion of period fixed effects in the estimation; (2) the assumption of an interaction between population and the Nordic dummy. While our institutional quality variables likely control for a good deal of unobserved cross-sectional heterogeneity, they are slowly-evolving variables. In **table 2** we include results that control for a linear time trend, but the 20 year period from 1985 to 2005 may very well be characterized by unobserved, *nonlinear* time heterogeneity. Period fixed effects introduce a control for such heterogeneity.

We also introduce a population-Nordic dummy interaction. Our results from **table 2** suggest that aid is not perceived to be non-rivalrous. The results also suggest that being a Nordic country is inherently associated with giving more aid. One explanation for the latter finding, however, is that Nordic citizens *do* perceive the effects of aid as public goods. Therefore we modify our empirical specification as follows:

$$(8) \quad \ln(A_j) = d_{ij} + \alpha \ln(T_{ij}) + (1 + \alpha)\gamma \ln(N_j) + (1 + \alpha)\lambda(\ln(N_j) * \text{NORDIC}) + \beta \ln(Y_{ij}) + \varepsilon_j$$

The modified model allows for a Nordic-specific perception of the publicness of aid. Specifically, an estimate of $(\gamma + \lambda)$ provides us with an indicator of that Nordic-specific perception.

The first column of **table 3** is simply the column 2 regression from **table 2** but now including period fixed effects. Nothing essentially changes. The point estimate for γ

is 0.969 and the lower bound of its 95 percent confidence interval is just under 74 percent. Column 2 then includes the population-Nordic dummy interaction. Perhaps surprisingly, the λ estimate is statistically significant (at the one percent level) and *positive*. It is very small (point estimate equal to 0.036) but, if anything, it implies that Nordic citizens perceive aid to be *more* of a private good. Finally, column 3 includes both the population-Nordic dummy interaction and the Nordic dummy itself separately. Neither the estimate of λ nor the coefficient on the Nordic dummy itself are statistically significant. Furthermore, the λ estimate is still positive.

5. Concluding Discussion

We question the publicness of foreign aid based on the Samuelsonian definition of a public good. That is, if the benefit from aid is non-rivalrous and non-excludable in consumption, then all else equal, a citizenry's demand for it will not be a function of the population. A cursory look at the data seems to support the hypothesis that aid is a public good (see **figure 1**). Our findings suggest otherwise.

In each of our baseline models (1-6 in **table 2**) the findings suggest that aid is 100 percent private in consumption. Further, robustness checks strengthen our results – the lower-bound of our 95 percent confidence interval on the parameter of interest suggests that, *at most*, aid is 25 percent public; robustness checks tighten this measure to suggest that *at most* aid is 20 percent public. All point estimates for our parameter of interest are significant at the 1 percent level or greater. Controlling for period fixed effects or a Nordic-specific perception of aid's publicness (**table 3**) does not change the results in any meaningful way.

The provision of public goods, based largely on the Samuelsonian definition, is often listed among a government's primary roles. Our findings bring to question the legitimacy of government position in providing aid with the public interest in mind. This analysis presents evidence that private interests are a larger (and significant) determinant of foreign aid flow decisions.

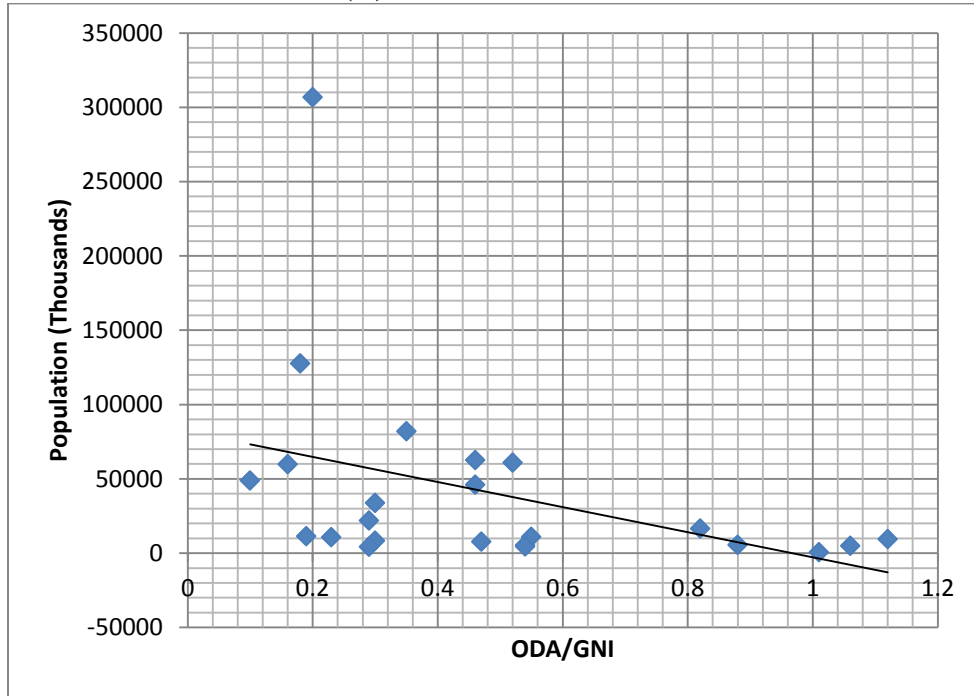
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FIGURE 1. DAC COUNTRY POPULATIONS VERSUS ODA AS A FRACTION OF GNI

(A) INCLUDING THE US



(B) EXCLUDING THE US

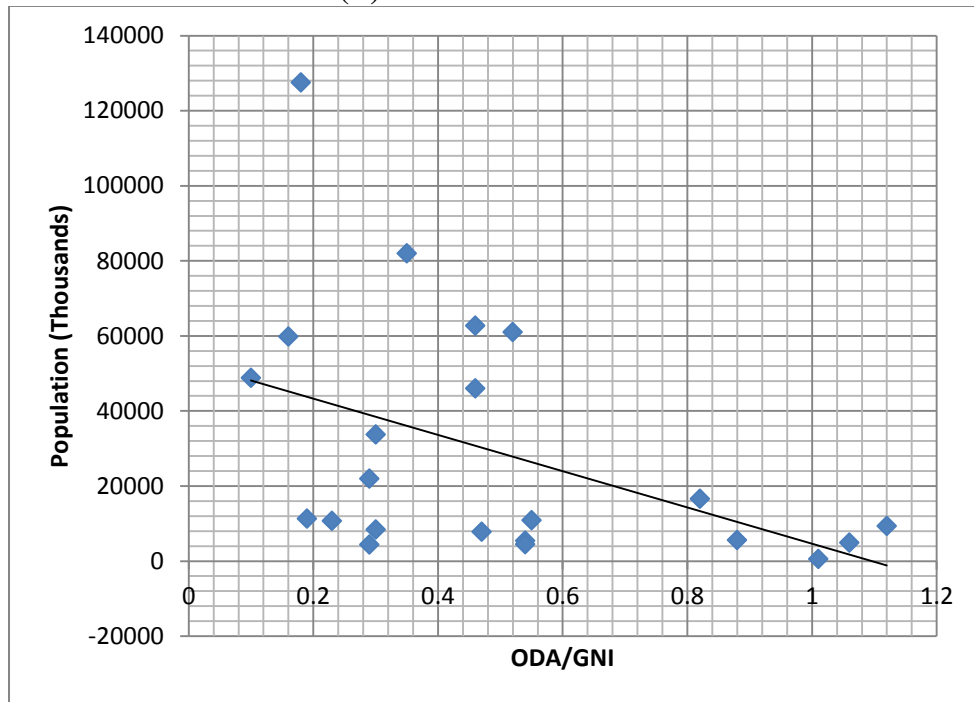


Table 1. Summary Statistics

Variables	Statistics		
	<i>Mean</i>	<i>Standard Deviation</i>	<i>Observations</i>
Income (thous. 2005 \$US)	19.698	7.739	61
Tax (rate)	23.371	12.2	52
Aid (bil. 2005 \$US)	3.930	5.730	66
Population (thous.)	3,788.726	58,153.601	69
Agg. Aid (bil. 2005 \$US)	86.900	26.200	69
Democracy	9.682	1.338	66
EFW	7.199	0.762	69
Trade openness	1.043	2.897	69
Log(income)	9.809	0.412	61
Log(aid)	21.1	1.629	66
Log(aggregate aid)	25.141	0.312	69

Table 2. Estimates of the DAC Aid Equations

Independent variable	Model					
	(1)	(2)	(3)	(4)	(5)	(6)
Tax share	-0.144 (0.092)	-0.092 (0.088)	-0.076 (0.090)	-0.092 (0.091)	-0.092 (0.089)	-0.079 (0.093)
Income	1.593*** (0.186)	1.492*** (0.178)	1.636*** (0.241)	1.794*** (0.294)	1.535*** (0.335)	1.548*** (0.338)
γ	1.017*** (0.134)	1.017*** (0.118)	0.993*** (0.118)	1.014*** (0.130)	1.107*** (0.149)	1.090*** (0.149)
95% Lower bound (γ)	0.749	0.781	0.757	0.754	0.809	0.792
Nordic	-	0.627*** (0.231)	0.565** (0.241)	0.451 (0.278)	0.623** (0.295)	0.615** (0.297)
Time	-	-	-0.102 (0.115)	-0.027 (0.124)	-0.047 (0.122)	0.964 (1.668)
Democracy	-	-	-	-0.051 (0.176)	-0.040 (0.173)	-0.039 (0.174)
EFW	-	-	-	-0.242 (0.152)	-0.187 (0.154)	-0.156 (0.164)
Trade openness	-	-	-	-	0.438 (0.284)	0.449 (0.286)
Aggregate aid	-	-	-	-	-	-2.743 (4.514)
R^2	0.872	0.890	0.892	0.897	0.903	0.904
Observations	50	50	50	49	49	49

Notes: Standard errors are in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Constants (not reported) are included in all regressions. The parameter, γ , is recovered from the estimated coefficients on the tax share and (log) population.

Table 3. Aid equation robustness checks: fixed effects and Nordic interaction term

Independent variable	Model		
	(1)	(2)	(3)
Tax share	-0.055 (0.092)	-0.056 (0.092)	-0.058 (0.094)
Income	1.699*** (0.247)	1.699*** (0.246)	1.701*** (0.250)
γ	0.969*** (0.115)	0.970*** (0.115)	0.972*** (0.117)
95% Lower bound (γ)	0.739	0.740	0.738
Nordic	0.523** (0.243)		-2.958 (14.709)
λ	-	0.036** (0.017)	0.238 (1.010)
R^2	0.895	0.896	0.896
Observations	50	50	50

Notes: Standard errors are in parentheses. *, **, and *** denotes significance at the 10, 5, and 1 percent levels, respectively. Constants (not reported) are included in all regressions. All regressions include period fixed effects. The parameter, γ , is recovered from the estimated coefficients on the tax share and (log) population. Likewise the parameter, λ , is recovered from the estimated coefficients on the tax share and the interaction of (log) population and the Nordic dummy.