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Do Donor Motives Matter?

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Abstract: The typical identification strategy in aid effectiveness studies assumes donor motives do not influence the impact of aid on growth. We call this homogeneity assumption into question, first constructing a model in which donor motives matter and then testing the assumption empirically.

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1. Introduction

Research on foreign aid identifies aid allocated both based on recipient need (RN) and donor interests (DI). Following Boone (1995), most aid effectiveness studies capitalize on this by using political instruments to identify the impact of aid on growth (Burnside and Dollar 2000; Rajan and Subramanian 2008).[1] However, interpreting estimation results as the general impact of aid on growth requires the strong homogeneity assumption that donor motives do not influence aid effectiveness. Only a handful of studies consider the impact of *donor* behavior on aid effectiveness in detail (Minoiu and Reddy 2007; Bearce and Tirone 2007; Headey 2008).

In this paper, we call this homogeneity assumption into question by developing an aid allocation model in which recipient government policy choices link donor motives to the impact of aid. We test the assumption by including an estimate of need-based aid in a cross-country time-series growth regression. The test rejects the homogeneity assumption, suggesting a more cautious interpretation of past research results.

2. Model

Official development assistance is allocated by a donor and passes through the recipient government. This means the objectives of both the donor and the recipient government – and how they interact – influence aid effectiveness. If the donor is motivated by recipient need, its allocation decision depends on how the recipient uses aid. This induces the recipient to select developmental policies. If the donor is motivated by self-interest, its allocation decision does not depend on how the recipient uses aid and the recipient does not select developmental policies.

Policy may be defined narrowly as the percentage of aid directed to investment or broadly as the overall quality of governance. In either case, aid has more impact on growth when the donor's motive is development.[2]

Aid allocation is a Stackelberg game in which the recipient government first picks policy quality ($p \in [0,1]$) and then the donor picks the level of aid (D).[3] The recipient government has an ideal policy (p^*) and views more aid as better. The recipient selects actual policy p to maximize its objective function:

$$U(p,D) = -(p^* - p)^2 + \sqrt{D} \tag{1}$$

The recipient will deviate from p^* if it receives sufficient extra aid as compensation. However, increasingly large amounts of aid are required for additional deviations from the ideal policy.

The donor selects its level of aid (D) to maximize its objective function which reflects both recipient need (RN) and donor self-interest (DI):

$$V(D,p) = -[\alpha(pD^{RN} - D)^2 + (1-\alpha)(D^{DI} - D)^2] \tag{2}$$

where $dD^{RN}/dRN > 0$, $dD^{DI}/dDI > 0$ and $\alpha \in [0,1]$. Based solely on donor interests, the donor's ideal level of aid is D^{DI}. Likewise, the ideal level of aid based on recipient need is D^{RN} – if the recipient directs all aid to development purposes ($p=1$). To the extent that aid is "wasted" ($p<1$),

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[1] Jensen and Paldam (2006) and Doucouliagos and Paldam (2009) survey this literature and test for robustness.

[2] We assume the donor can credibly threaten to withhold aid because it can redirect funds to other activities or because of reputation effects in a repeated game (no Samaritan's dilemma).

[3] The donor may or may not announce conditions prior to the recipient picking policy. Assuming full information (the recipient knows donor preferences), the distinction between explicit conditionality (formal conditionality as in Structural Adjustment Programs) and implicit conditionality (e.g., selectivity) is irrelevant here.

the donor's ideal level of need-based aid is correspondingly reduced to pD^{RN}. Finally, the donor may place more emphasis on need (high α) or on geopolitical interests (low α). The key feature of this model is that the donor only cares about how aid is used (policy) when the donor's objective is humanitarian. Geopolitically or commercially motivated aid is a bribe; how the recipient uses aid is irrelevant (Morgenthau 1962).

As Stackelberg follower, the donor's reaction function is

$$D(p) = \alpha p D^{RN} + (1-\alpha)D^{DI} \tag{3}$$

Substituting (3) into (1) gives the reduced form recipient objective function:

$$U(p) = -(p^{*} - p)^2 + \sqrt{\alpha p D^{RN} + (1-\alpha)D^{DI}} \tag{4}$$

After finding the FOC by setting the derivative of (4) with respect to *p* equal to zero, we can use the implicit function theorem to derive comparative statics for *p*:

$$dp/dD^{RN} > 0, dp/dD^{DI} < 0, dp/d\alpha > 0$$

Recipient policy will be better when the recipient is needier, worse when the recipient is more important to the donor, and better when the donor places more weight on need.

The final step in linking donor motives to aid effectiveness is to relate both donor aid and recipient policy to growth. In a neoclassical growth model with technological change,

$$Y = AF(K, L) \tag{5}$$

aid can influence output if it adds to capital stock (*K*) or improves efficiency (*A*). Both of these effects are conditioned on recipient government policy. Better policy indicates a greater share of aid is invested, e.g., $\Delta K=pD$. Likewise, a greater share of technical assistance aid will be used for its intended purpose in a good policy environment. Formally, we can model total factor productivity as $A=A(p,D)$ where $dA/dp>0$, $dA/dD>0$ and $d^2A/dDdp>0$. It follows that

$dA/dD^{RN} > dA/dD^{DI}$ and $dK/dD^{RN} > dK/dD^{DI}$. Taken together, these indicate that need-aid has a greater impact on growth than geopolitically based aid. In the linear growth equation

$$g = \gamma_1 D^{DI} + \gamma_2 D^{RN} + \gamma_3 p + \gamma_4 X \tag{6}$$

where X represents other variables that influence growth, this means that $\gamma_2 > \gamma_1$. Because it may be difficult to measure geopolitical interests consistently across donors and periods, we reformulate the equation (redefining coefficients appropriately) as:

$$g = \gamma_1 D + \gamma_2 D^{RN} + \gamma_3 p + \gamma_4 X \tag{7}$$

Assuming $D^{DI} \neq 0$, the greater development effectiveness of D^{RN} implies $\gamma_2 > 0$. Thus, in this model, the development effectiveness of aid depends on donor motives.

3. Homogeneity Hypothesis Test

The homogeneity assumption in the literature is equivalent to requiring $\gamma_2 = 0$ in (7). To estimate (7), we construct a measure of need-based aid (D^{RN}) and aggregate across donors. Donors differ in their interests in a specific recipient (*DI*) and in the weight they place on *RN* versus *DI* across all recipients (α). To allow for this heterogeneity, we estimate donor-specific aid allocation equations of the form:

$$D_{ijt} = \beta_{1i} RN_{jt} + \beta_{2i} DI_{ijt} + \beta_{3i} \tilde{p}_{jt} + \beta_{4i} Z_{ijt} + \varepsilon_{ijt} \tag{8}$$

for aid from donor *i* to recipient *j* in year *t*. $\tilde{p}$ is observed policy quality; *Z* are other factors that might influence aid allocation.[4] Our estimate of need-based aid is $\hat{D}^{RN}_{ijt} = \hat{\beta}_{1i} RN_{jt}$; aggregating across donors gives $\hat{D}^{RN}_{jt} = \sum_i \hat{\beta}_{1i} RN_{jt}$. However, $\hat{D}^{RN}_{jt}$ is simply proportional to RN_{jt} since RN_{jt} does not vary across donors. This presents a collinearity problem if RN_{jt} also enters the growth equation separately (e.g., initial GDP, population). To avoid this, we allow donors to respond differently to need in their former colonies (a reasonable assumption given shared history, colonial guilt, and cultural affinity). The result is a need variable that also varies across donors:

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[4] If the policy impact of aid is narrow (e.g., *p* reflects the share of aid invested), then the impact of donor motives on aid effectiveness depends on aid not being completely fungible. If the policy impact of aid is broad (e.g., donor motives for giving aid influence macroeconomic

$$D_{ijt} = \beta_{1i} RN_{ijt} + \beta_{2i} DI_{ijt} + \beta_{3i} \tilde{p}_{jt} + \beta_{4i} Z_{ijt} + \varepsilon_{ijt} \tag{9}$$

and an aggregated need aid variable of the form $\hat{D}^{RN}_{jt} = \sum_i \hat{\beta}_{1i} RN_{ijt}$. To test the assumption that the impact of aid is homogeneous, we estimate:

$$g_{jt} = \gamma_1 D_{jt} + \gamma_2 \hat{D}^{RN}_{jt} + \gamma_3 \tilde{p}_{jt} + \gamma_4 X_{jt} + \upsilon_{jt} \tag{10}$$

and test H_0: $\gamma_2=0$ versus H_1: $\gamma_2 \neq 0$.

4. Data and Methods

To construct $\hat{D}^{RN}_{jt}$, our measure of need-based aid, we estimate (9) for the thirteen largest bilateral aid donors using annual data on aid flows to 117 countries for the period 1974-2001. The sample excludes observations with zero aid and high income OECD countries that receive aid plus Egypt and Israel. The dependent variable is log gross disbursements. The need variables are log population, log PPP per capita GDP, and their interactions with a dummy indicating if the recipient country is a former colony of that donor. We include additional control variables, as listed in Table 1. For data sources on these and other variables, see the on-

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policy), then including the appropriate policy measure is sufficient to account for heterogeneity. However, the observed measure of policy quality ($\tilde{p}$) may be insufficient.

line data appendix. Table 1 also summarizes the estimated coefficients on recipient need variables (employing OLS), all consistent with a need interpretation. We use these to construct a need-aid variable. For each donor-year, we multiply the ratio of predicted need-aid to predicted total aid by the actual aid amount, then sum across donors.[5]

[Table 1 about here]

The growth regression is a panel analysis using four year period averages. It covers 1974-2001 and 62 developing countries. The reduced country coverage is driven by data availability.[6] The dependent variable is the average four-year growth rate of per capita GDP. Estimation is with OLS; the specification is similar to Burnside and Dollar (2000) but includes country fixed effects. Fixed effects have numerous advantages, e.g., eliminating concerns that non-geopolitical aid is biased toward countries with better (but unobserved) long run growth prospects. In addition to aid to GDP ratios, the growth regression includes log of initial per capita GDP, number of assassinations, ethno-linguistic fractionalization interacted with assassinations, lagged M2 to GDP ratio (financial depth), Burnside-Dollar policy quality, and period dummies.

5. Results

Table 2 presents growth regression results. Control variables enter in a similar fashion across all three columns. Initial GDP enters with the expected negative sign; policy quality enters positively.[7] The estimated coefficients for assassinations, assassinations times ethno-linguistic fractionalization, and financial depth are all insignificant though with the expected sign or very small.

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[5] The first step insures that need-aid is never more than actual aid.

[6] The sample expands to 90 countries and 424 observations if we omit the ethno-linguistic fractionalization interaction term. Results are the same as reported below.

[Table 2 about here]

In Column 1, Aid/GDP reflects the combined effects of need-aid and donor self-interested aid. The estimated coefficient is negatively and marginally significant. Column 2 adds a separate need-aid variable to test the homogeneity hypothesis. Need-aid enters as significant with a positive coefficient indicating that the growth impact of need-aid is significantly different from the impact of aid when the donor has other objectives. Column 3 adds the aid/policy interaction at the core of Burnside and Dollar's analysis. An F-test of the joint significance of the need-aid variables rejects the homogeneity hypothesis at the 90% confidence level.

6. Conclusion

Starting with a model of aid allocation, policy choice and growth, we illustrate how donor motives can influence the effectiveness of aid, undermining the homogeneity assumption implicit in the geopolitical instrumentation strategy used in many aid and growth regressions. We also test and reject this assumption empirically. This complicates interpretation of results in much of the aid effectiveness literature and poses a dilemma about how to deal with potential endogeneity.

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[7] This is an implicit dynamic panel specification. Judson and Owen (1999) demonstrate that the bias primarily affects the coefficient estimate on initial GDP rather than our variables of interest.

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Table 1
Aid Allocation

Donor	Population	Former Colony Population	GDP/capita	Former Colony GDP/capita	N
Canada	0.535**		-0.343**		2453
Denmark	0.258**		-0.954**		1852
France	0.245**	0.109**	-0.703**	0.404**	2523
Germany	0.804**		-0.319**		2694
Italy	0.395**		-0.469**		2290
Japan	0.616**		-0.508**		2669
Netherlands	0.740**	15.061	-0.613**	-7.525	2477
Norway	0.482**		-0.853**		2022
Spain	0.169**	0.0895	-0.508**	-0.825**	1215
Sweden	0.174**		-0.600**		1831
Switzerland	0.852**		-0.076		2339
UK	0.734**	0.441**	-0.573**	-0.645 **	2471
USA	0.407**	2.728	-0.304**	-2.893	2399

** p<.05

Estimation via OLS. Dependent variable: log gross disbursements. GDP per capita in PPP terms. Estimations include: number of deaths due to natural disasters, post-conflict dummy, Polity, Polity transition, Burnside-Dollar policy quality, UN vote alignment, UNSC "important year" membership dummy, oil reserves, former colony dummy, political alignment dummy, log exports to donor, log imports from donor, and year dummies.

Table 2
Growth Regressions

	(1)	(2)	(3)	
Initial GDP	-6.996**	-7.422**	-7.568**	
Assassinations	-0.351	-0.377	-0.363	
×Fractionalization	0.001	0.002	0.002	
Financial Depth	0.033	0.037	0.036	
BD Policy Index	0.001**	0.001**	0.001**	
Aid/GDP	-10.709*	-48.221**	-54.937**	
×Policy Index			-0.005	
Need Aid/GDP		59.534**	65.250**	†
×Policy Index			0.003	†
Number of observations	362	362	362	
Number of countries	62	62	62	

* p<0.10, ** p<0.05; robust standard errors
†Jointly significant at 90% confidence level (p=0.0531).

Includes country fixed effects and period dummies.

Appendix A: Proof of Comparative Statics Results

I. Derivation of the Donor's reaction function (Stackelberg follower):

$$V(D,p) = -\alpha(pD^{RN} - D)^2 - (1-\alpha)(D^{DI} - D)^2$$

FOC: $$\frac{dV}{dD}\Big|_p = 2\alpha(pD^{RN} - D) + 2(1-\alpha)(D^{DI} - D) = 0$$

$$\alpha(pD^{RN} - D) + (1-\alpha)(D^{DI} - D) = 0$$

$$D(p) = \alpha p D^{RN} + (1-\alpha)D^{DI}$$

In the proofs below, we replace D^{RN} with *RN* and D^{DI} with *DI* to simplify the derivations. Since the variables are defined so that $\frac{dD^{RN}}{dRN} > 0$ and $\frac{dD^{DI}}{dDI} > 0$, the signs in the proofs are unaffected. Finally, to keep the notation compact, we use *x*=*RN* and *y*=*DI* so that the donor reaction function can be written as $D(p) = \alpha px + (1-\alpha)y$.

II. Proof that recipient government picks higher policy quality when donor places more weight on need ($\frac{dp}{d\alpha} > 0$):

$$U(p) = -(p^* - p)^2 + (D(p))^{1/2} = -(p^* - p)^2 + (\alpha px + (1-\alpha)y)^{1/2}$$

FOC: $$\frac{dU}{dp} = 2(p^* - p) + \tfrac{1}{2}\alpha x(\alpha px + (1-\alpha)y)^{-1/2} = 0$$

$$\frac{d}{d\alpha}: \quad -2\frac{dp}{d\alpha} + \tfrac{1}{2}x(\alpha px + (1-\alpha)y)^{-1/2} - \tfrac{1}{4}\alpha x\left(px + \alpha\frac{dp}{d\alpha}x - y\right)(\alpha px + (1-\alpha)y)^{-3/2} = 0$$

$$-8\frac{dp}{d\alpha}+2x(\alpha px+(1-\alpha)y)^{-1/2}-\alpha x(px+\alpha\frac{dp}{d\alpha}x-y)(\alpha px+(1-\alpha)y)^{-3/2}=0$$

$$-[8+\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2}]\frac{dp}{d\alpha}=x(\alpha px+(1-\alpha)y)^{-1/2}[-2+\alpha(px-y)(\alpha px+(1-\alpha)y)^{-1}]$$

$$[8+\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2}]\frac{dp}{d\alpha}=x(\alpha px+(1-\alpha)y)^{-1/2}[2-\alpha(px-y)(\alpha px+(1-\alpha)y)^{-1}]$$

$$\frac{dp}{d\alpha}=\frac{x(\alpha px+(1-\alpha)y)^{-1/2}[2-\alpha(px-y)(\alpha px+(1-\alpha)y)^{-1}]}{8+\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2}}$$

So $\frac{dp}{d\alpha}>0$ if $\alpha(px-y)(\alpha px+(1-\alpha)y)^{-1}<2 \quad\Rightarrow\quad \alpha px-\alpha y<2\alpha px+2(1-\alpha)y \quad\Rightarrow$

$$0<\alpha px+(2-\alpha)y$$

Since $\alpha\leq 1$, all the terms in the sum are non-negative and at least some are positive so the inequality must hold. *Q.E.D.*

III. Proof that recipient government picks higher policy quality when recipient need is greater ($\frac{dp}{dRN}>0$):

FOC: $\frac{dU}{dp}=2(p^*-p)+½\alpha x(\alpha px+(1-\alpha)y)^{-1/2}=0$

$\frac{d}{dx}$: $\quad -2\frac{dp}{dx}+½\alpha(\alpha px+(1-\alpha)y)^{-1/2}-¼\alpha x(\alpha x\frac{dp}{dx}+\alpha p)(\alpha px+(1-\alpha)y)^{-3/2}=0$

$$(-2-¼\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2})\frac{dp}{dx}=-½\alpha(\alpha px+(1-\alpha)y)^{-1/2}+¼\alpha^2px(\alpha px+(1-\alpha)y)^{-3/2}$$

$$\frac{dp}{dx}=\frac{-½\alpha(\alpha px+(1-\alpha)y)^{-1/2}+¼\alpha^2px(\alpha px+(1-\alpha)y)^{-3/2}}{-2-¼\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2}}$$

Multiply top and bottom by $4(\alpha px+(1-\alpha)y)^{3/2}$

$$\frac{dp}{dx}=\frac{-2\alpha(\alpha px+(1-\alpha)y)+\alpha^2 px}{-8(\alpha px+(1-\alpha)y)^{3/2}-\alpha^2x^2}=\frac{-2\alpha^2 px-2\alpha(1-\alpha)y+\alpha^2 px}{-8(\alpha px+(1-\alpha)y)^{3/2}-\alpha^2x^2}=\frac{\alpha^2 px+2\alpha(1-\alpha)y}{8(\alpha px+(1-\alpha)y)^{3/2}+\alpha^2x^2}$$

Since $\alpha\le 1$, $\dfrac{dp}{dx}>0$ and hence $\dfrac{dp}{dRN}>0$. *Q.E.D.*

IV. Proof that recipient government picks lower policy quality when the recipient is more important to the donor ($\dfrac{dp}{dDI}<0$):

FOC: $\dfrac{dU}{dp}=2(p^*-p)+½\alpha x(\alpha px+(1-\alpha)y)^{-1/2}=0$

$\dfrac{d}{dy}$: $\quad -2\dfrac{dp}{dy}-¼\alpha x(\alpha x\dfrac{dp}{dy}+(1-\alpha))(\alpha px+(1-\alpha)y)^{-3/2}=0$

$$(-2-¼\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2})\frac{dp}{dy}=¼\alpha(1-\alpha)x(\alpha px+(1-\alpha)y)^{-3/2}$$

$$\frac{dp}{dy}=\frac{¼\alpha(1-\alpha)x(\alpha px+(1-\alpha)y)^{-3/2}}{-2-¼\alpha^2x^2(\alpha px+(1-\alpha)y)^{-3/2}}$$

Multiply top and bottom by $-4(\alpha px+(1-\alpha)y)^{3/2}$

$$\frac{dp}{dy}=\frac{-\alpha(1-\alpha)x}{8(\alpha px+(1-\alpha)y)^{3/2}+\alpha^2x^2}$$

Since $\alpha\le 1$, $\dfrac{dp}{dy}<0$ and hence $\dfrac{dp}{dDI}<0$. *Q.E.D.*

Appendix B: Sources and descriptive statistics

Table A1: Descriptive Statistics for Allocation Regression Samples

	Variable	Mean	Std. Dev.	Min	Max
Canada (CAN) 2453 obs.	log aid	1.301082	2.086305	-4.60517	6.678455
	log population	16.02251	1.548047	12.41091	20.97667
	log GDP	7.858657	.8497038	6.178476	10.06949
	# killed	491.6494	7749.357	0	300000
	postwar	.0729719	.2601434	0	1
	polity	.1108846	6.990376	-10	10
	polity transition	.0008153	.0285481	0	1
	BD policy	.4476152	.4973496	0	1
	oil	2.535856	14.25086	0	262.79
	war	.0807175	.2724563	0	1
	political alignment	.2507134	.4335122	0	1
	UNSC	42.98492	161.6141	0	1221
	UN voting alignment	.6809555	.075955	.478022	1
	lagged log exports	2.529024	1.855633	0	7.882639
	lagged log imports	2.454358	2.095016	0	9.323768
	lagged log all exports	7.294345	1.888589	0	12.5088
	lagged log all imports	7.146961	2.002972	0	13.0876

	Variable	Mean	Std. Dev.	Min	Max
Denmark (DNK) 1852 obs.	log aid	.32215	2.234508	-4.60517	4.727919
	log population	16.29453	1.520804	12.75707	20.97667
	log GDP	7.760305	.8383322	6.178476	9.822355
	# killed	596.7754	8838.284	0	300000
	postwar	.0826134	.2753713	0	1
	polity	.0691145	6.935029	-10	10
	BD Policy	.4443844	.4970315	0	1
	oil	2.07285	8.909292	0	133.25
	war	.0863931	.2810195	0	1
	political alignment	.238121	.4260486	0	1
	UNSC	49.65173	174.1504	0	1221
	UN voting alignment	.7150559	.0630702	.4850746	1
	lagged log exports	2.276804	1.475879	0	6.838583
	lagged log imports	1.850429	1.718253	0	7.241251
	lagged log all exports	7.315553	1.962218	0	12.5088
	lagged log all imports	7.157854	2.090887	0	13.0876

France (FRA)
2523 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	2.1319	2.006536	-4.60517	7.989377
log population	15.9837	1.562774	12.54516	20.97667
log GDP	7.939671	.9093496	6.178476	10.67489
# killed	466.8712	7626.934	0	300000
postwar	.0725327	.2594193	0	1
polity	-.1957987	7.082086	-10	10
polity transition	.0007927	.0281495	0	1
BD Policy	.43044	.4952359	0	1
former colony	.2160127	.4116046	0	1
oil	5.967847	27.16804	0	262.79
war	.078478	.2689756	0	1
political alignment	.2330559	.4228613	0	1
UNSC	42.49306	160.8641	0	1221
UN voting alignment	.6125272	.0821875	.423913	.875
lagged log exports	4.4751	1.789391	0	8.214294
lagged log imports	4.055673	1.998949	0	9.404278
lagged log all exports	7.397553	1.897197	0	12.5088
lagged log all imports	7.24885	2.051075	0	13.0876

Germany (DEU)
2694 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	2.676073	1.939981	-4.60517	8.617753
log population	15.91643	1.571445	12.30671	20.97667
log GDP	7.953451	.9126224	6.178476	10.70551
# killed	451.6451	7396.714	0	300000
postwar	.0727543	.2597809	0	1
polity	-.3151448	7.126762	-10	10
polity transition	.0007424	.0272418	0	1
BD policy	.452487	.4978298	0	1
oil	5.516594	26.20951	0	262.79
war	.0757238	.2646048	0	1
political alignment	.218634	.4133964	0	1
UNSC	40.55382	155.6421	0	1221
UN voting alignment	.6594722	.0928383	.4610389	1
lagged log exports	4.453479	2.07305	0	9.628689
lagged log imports	4.290346	2.148347	0	9.903658
lagged log all exports	7.325551	1.909906	0	12.5088
lagged log all imports	7.191548	2.051148	0	13.0876

Italy (ITA)
2290 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	.5252859	2.511064	-4.60517	7.622449
log population	16.15076	1.51179	12.57662	20.97667
log GDP	7.867534	.8702322	6.178476	10.66554
# killed	519.9624	8010.357	0	300000
postwar	.0799127	.2712172	0	1
polity	-.4768559	7.020138	-10	10
polity transition	.0008734	.0295463	0	1
BD policy	.4458515	.4971679	0	1
oil	4.21892	22.08949	0	262.697
war	.0873362	.2823888	0	1
political alignment	.1213974	.3266598	0	1
UNSC	43.56026	162.239	0	1221
UN voting alignment	.6727527	.0786102	.4925373	1
lagged log exports	4.01306	1.910042	0	8.38558
lagged log imports	3.880841	2.118994	0	8.993204
lagged log all exports	7.389985	1.833021	0	12.5088
lagged log all imports	7.22928	1.989617	0	13.0876

Japan (JPN)
2669 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	2.393954	2.551704	-4.60517	8.529519
log population	15.92585	1.578514	12.30671	20.97667
log GDP	7.966073	.9121624	6.178476	10.70551
# killed	456.7359	7431.178	0	300000
postwar	.0734357	.2608993	0	1
polity	-.3274635	7.126502	-10	10
polity transition	.0007493	.027369	0	1
BD policy	.454852	.4980508	0	1
oil	5.653871	26.4538	0	262.79
war	.0730611	.2602855	0	1
political alignment	.202323	.401807	0	1
UNSC	41.39116	157.9779	0	1221
UN voting alignment	.7165586	.0721542	.4873418	1
lagged log exports	4.291162	2.196871	0	10.5956
lagged log imports	3.785449	2.511866	0	11.03154
lagged log all exports	7.364601	1.885861	0	12.5088
lagged log all imports	7.235218	2.02208	0	13.0876

Netherlands (NLD)
2477 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	1.052159	2.063855	-4.60517	5.462263
log population	16.00522	1.539068	12.30671	20.97667
log GDP	7.85057	.8446514	6.178476	10.66794
# killed	486.3133	7711.796	0	300000
postwar	.0767057	.2661776	0	1
polity	-.0617683	7.034864	-10	10
polity transition	.0008074	.0284095	0	1
BD Policy	.4557933	.4981425	0	1
oil	2.837206	15.27937	0	262.79
war	.0799354	.2712479	0	1
former colony	.0117077	.1075886	0	1
political alignment	.2309245	.4215093	0	1
UNSC	41.22164	158.7624	0	1221
UN voting alignment	.6741653	.0762057	.4925373	1
lagged log exports	3.327133	1.636923	0	7.890792
lagged log imports	3.165934	2.107587	0	9.312725
lagged log all exports	7.241348	1.89993	0	12.5088
lagged log all imports	7.092501	2.025192	0	13.0876

Norway (NOR)
2022 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	.0876741	2.083411	-4.60517	5.732888
log population	16.25663	1.498137	12.79603	20.97667
log GDP	7.788535	.8359857	6.178476	10.25135
# killed	580.9322	8513.503	0	300000
postwar	.086548	.2812411	0	1
polity	.5351137	6.873747	-10	10
polity transition	.0009891	.0314425	0	1
BD policy	.4431256	.4968777	0	1
oil	2.981306	15.17086	0	262.79
war	.0905045	.2869741	0	1
political alignment	.2532146	.4349604	0	1
UNSC	47.4095	171.1679	0	1221
UN voting alignment	.7134267	.0672905	.4850746	1
lagged log exports	1.626101	1.409292	0	6.836946
lagged log imports	1.467134	1.63266	0	7.145362
lagged log all exports	7.350409	1.899115	0	12.5088
lagged log all imports	7.200393	2.038746	0	13.0876

Spain (ESP)
1215 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	.0206641	2.513487	-4.60517	6.298159
log population	16.35992	1.470293	12.72165	20.97667
log GDP	7.949864	.8855973	6.178476	9.991495
# killed	351.7926	4321.416	0	139939
postwar	.090535	.2870648	0	1
polity	2.023045	6.402311	-10	10
polity transition	.0016461	.0405553	0	1
BD Policy	.3893004	.4877924	0	1
oil	3.603482	15.25888	0	260.05
war	.0806584	.272422	0	1
former colony	.1053498	.30713	0	1
political alignment	.2707819	.4445466	0	1
UNSC	57.02222	197.3644	0	1221
UN voting alignment	.7311244	.0751449	.4925373	.9180328
lagged log exports	3.542905	1.806017	0	7.689646
lagged log imports	3.752781	1.969969	0	8.410741
lagged log all exports	7.853031	1.834393	0	12.5088
lagged log all imports	7.654443	2.012284	0	13.0876

Sweden (SWE)
1831 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	.6199201	2.103035	-4.60517	5.423848
log population	16.29789	1.515847	13.0857	20.97667
log GDP	7.862197	.8475577	6.178476	10.51645
# killed	616.284	8927.352	0	300000
postwar	.0895685	.2856406	0	1
polity	1.170945	6.796716	-10	10
polity transition	.0010923	.0330409	0	1
BD policy	.4691425	.4991832	0	1
oil	3.313266	13.62592	0	168.848
war	.0944839	.2925806	0	1
political alignment	.2878209	.4528709	0	1
UNSC	49.3905	177.6024	0	1221
UN voting alignment	.7485343	.0649892	.4925373	1
lagged log exports	2.791438	1.85543	0	7.563263
lagged log imports	2.069448	1.898665	0	7.467085
lagged log all exports	7.51789	1.954487	0	12.5088
lagged log all imports	7.355812	2.081532	0	13.0876

Switzerland (CHE)	Variable	Mean	Std. Dev.	Min	Max
2339 obs.	log aid	-.0615079	2.032892	-4.60517	3.908617
	log population	16.18486	1.483478	12.54516	20.97667
	log GDP	7.806329	.8310452	6.178476	10.06631
	# killed	523.4566	7941.931	0	300000
	postwar	.084224	.2777829	0	1
	polity	-.0119709	6.952105	-10	10
	polity transition	.0008551	.0292353	0	1
	BD policy	.4476272	.4973559	0	1
	oil	2.849272	12.09847	0	133.25
	war	.0876443	.2828374	0	1
	political alignment	.0085507	.0920933	0	1
	UNSC	43.02309	162.3324	0	1221
	lagged log exports	2.738114	1.774675	0	7.180854
	lagged log imports	2.08266	1.690047	0	7.946908
	lagged log all exports	7.335273	1.859602	0	12.5088
	lagged log all imports	7.171286	2.012648	0	13.0876

United Kingdom (GBR)	Variable	Mean	Std. Dev.	Min	Max
2471 obs.	log aid	.8514467	2.260599	-4.60517	5.849872
	log population	16.00948	1.546396	12.30671	20.97667
	log GDP	7.879746	.8659996	6.178476	10.70551
	# killed	489.8936	7722.021	0	300000
	postwar	.0772966	.2671156	0	1
	polity	.0408741	7.07756	-10	10
	polity transition	.0008094	.028444	0	1
	BD Policy	.4548766	.4980605	0	1
	oil	2.294615	10.72941	0	133.25
	war	.0772966	.2671156	0	1
	former colony	.2776204	.4479157	0	1
	political alignment	.2270336	.4189993	0	1
	UNSC	42.54917	161.1211	0	1221
	UN voting alignment	.5860477	.0929543	.3993506	1
	lagged log exports	4.029561	1.780711	0	8.117226
	lagged log imports	3.771724	2.034189	0	9.26052
	lagged log all exports	7.3059	1.886482	0	12.5088
	lagged log all imports	7.147374	2.002624	0	13.0876

United States (USA)
2399 obs.

Variable	Mean	Std. Dev.	Min	Max
log aid	3.046075	1.753187	-4.60517	8.959183
log population	16.01915	1.535003	12.47972	20.97667
log GDP	7.853908	.8469107	6.178476	10.02417
# killed	483.0842	7793.561	0	300000
postwar	.0766986	.2661681	0	1
polity	-.0050021	7.052287	-10	10
polity transition	.0008337	.0288675	0	1
BD policy	.4476865	.4973594	0	1
oil	1.972584	10.73022	0	262.73
war	.0779491	.2681474	0	1
former colony	.0116715	.1074249	0	1
political alignment	.2313464	.4217812	0	1
UNSC	42.06461	160.5664	0	1221
UN voting alignment	.3615605	.1172837	.1689189	.7363636
lagged log exports	4.814886	2.196771	0	11.59683
lagged log imports	4.758642	2.553019	0	11.82148
lagged log all exports	7.248561	1.872991	0	12.5088
lagged log all imports	7.088391	1.983854	0	13.0876

Table A2: Allocation Regressions by Donor
For donors with former colonies

	ESP	FRA	GBR	NLD	USA
log population	0.169*	0.245***	0.734***	0.740***	0.407***
	(2.15)	(8.80)	(18.15)	(20.03)	(12.18)
× colony dummy	-0.0895	-0.109*	-0.441***	15.06	-2.728
	(-0.44)	(-2.09)	(-9.30)	(0.71)	(-0.81)
log GDP	-0.508***	-0.703***	-0.573***	-0.613***	-0.304***
	(-3.68)	(-14.35)	(-7.88)	(-9.79)	(-5.13)
× colony dummy	-0.825*	0.404***	-0.645***	-7.525	-2.893
	(-2.14)	(4.01)	(-6.96)	(-0.98)	(-0.48)
# killed	-0.00000453	-0.00000176	0.00000410	-0.00000255	-0.00000415
	(-0.33)	(-0.57)	(0.96)	(-0.63)	(-1.16)
× colony dummy	-0.000555	-0.0000757	0.00000506	-0.000553	0.0000347
	(-0.52)	(-0.28)	(0.47)	(-0.95)	(0.21)
postwar	0.831***	-0.227*	0.143	0.543***	0.373***
	(3.80)	(-2.25)	(1.07)	(4.39)	(3.36)
× colony dummy	-1.199	-0.258	0.0289	-0.664	-0.629
	(-1.41)	(-0.94)	(0.11)	(-0.88)	(-1.03)
polity	0.0201	0.0335***	0.0599***	0.0501***	0.00752
	(1.76)	(7.46)	(9.36)	(9.09)	(1.53)
× colony dummy	0.0399	-0.00587	-0.0323**	0.0350	0.0516
	(0.79)	(-0.48)	(-3.04)	(0.31)	(0.57)
polity transition	-0.862	1.840	1.059	0.0816	1.207
	(-0.60)	(1.57)	(1.00)	(0.07)	(1.26)
× colony dummy		2.641			
		(1.58)			
BD policy	0.118	0.0398	-0.0620	0.159*	0.440***
	(0.87)	(0.73)	(-0.81)	(2.39)	(7.50)
× colony dummy	1.069*	-0.348*	0.0519	-1.972	-0.442
	(2.56)	(-2.50)	(0.35)	(-1.11)	(-0.41)
colony dummy	9.833***	-0.157	14.17***	-226.1	73.51
	(3.31)	(-0.13)	(11.81)	(-0.65)	(1.26)
oil	-0.0268***	-0.00614***	-0.0174***	-0.00722***	-0.0140***
	(-6.41)	(-6.20)	(-5.61)	(-3.33)	(-5.11)
war	-0.0678	-0.244**	-0.0125	0.397***	0.0920
	(-0.30)	(-2.69)	(-0.10)	(3.32)	(0.85)
political alignment	0.376**	0.0143	0.0224	0.155*	-0.0956
	(2.80)	(0.25)	(0.29)	(2.01)	(-1.41)
UNSC	0.0000522	0.000101	0.0000708	0.000167	-0.0000240
	(0.17)	(0.67)	(0.36)	(0.83)	(-0.13)
UN voting alignment	-6.705***	-0.526	2.671***	1.499*	-0.550
	(-6.71)	(-1.05)	(4.39)	(2.40)	(-1.30)
lagged log exports	1.015***	0.888***	0.0577	0.0381	0.482***
	(13.40)	(27.50)	(1.16)	(0.86)	(14.66)
lagged log imports	0.0474	0.0789**	0.217***	0.0737*	-0.0105
	(0.67)	(2.65)	(6.09)	(2.33)	(-0.39)
lagged log all exports	-0.250	-0.289***	-0.0947	0.138*	0.121*
	(-1.94)	(-5.97)	(-1.47)	(2.25)	(2.10)
lagged log all imports	-0.0861	-0.0876	-0.0258	-0.358***	-0.395***
	(-0.67)	(-1.83)	(-0.44)	(-6.15)	(-6.71)
N	1215	2523	2471	2477	2399

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
Estimation via OLS

Table A2: Allocation Regressions by Donor
For donors with no former colonies

	CAN	CHE	DEU	DNK	ITA	JPN	NOR	SWE
log population	0.534***	0.852***	0.804***	0.258***	0.395***	0.616***	0.482***	0.174**
	(13.64)	(18.47)	(28.22)	(4.36)	(7.75)	(17.53)	(10.00)	(3.01)
log GDP	-0.343***	-0.0764	-0.319***	-0.954***	-0.469***	-0.508***	-0.853***	-0.600***
	(-5.11)	(-1.02)	(-6.68)	(-10.50)	(-5.50)	(-8.34)	(-10.53)	(-6.13)
# killed	0.000000260	0.00000199	-0.00000587	0.00000601	0.00000128	-0.00000457	0.00000115	0.00000309
	(0.07)	(0.48)	(-1.84)	(1.18)	(0.25)	(-1.09)	(0.25)	(0.61)
postwar	-0.247*	0.195	-0.200*	-0.122	0.377*	-0.647***	0.577***	0.590***
	(-2.01)	(1.63)	(-2.13)	(-0.71)	(2.36)	(-5.26)	(4.00)	(3.58)
polity	-0.0111*	0.0132*	0.0279***	0.0172*	0.00335	0.0218***	0.0501***	0.0219**
	(-2.02)	(2.35)	(6.83)	(2.12)	(0.44)	(4.11)	(7.05)	(2.69)
polity transition	2.032	0.641	1.856*		3.344*	-2.302*	-1.400	1.577
	(1.89)	(0.57)	(2.16)		(2.38)	(-2.05)	(-1.13)	(1.16)
BD policy	-0.124	-0.221**	0.130**	0.146	0.173*	0.0117	0.163*	0.133
	(-1.90)	(-3.19)	(2.63)	(1.49)	(1.97)	(0.18)	(1.96)	(1.37)
oil	-0.0178***	-0.0281***	-0.00871***	-0.0278***	-0.0161***	-0.00955***	-0.00909**	-0.00946**
	(-7.82)	(-9.78)	(-8.71)	(-5.00)	(-7.89)	(-7.28)	(-3.28)	(-2.62)
war	-0.130	0.361**	-0.519***	-0.339*	0.633***	-1.064***	0.885***	0.549***
	(-1.10)	(3.03)	(-5.60)	(-2.05)	(4.12)	(-8.54)	(6.25)	(3.38)
political alignment	0.0227	-0.899*	0.124*	-0.0234	0.0132	0.0261	0.206*	0.495***
	(0.31)	(-2.46)	(2.10)	(-0.22)	(0.10)	(0.32)	(2.24)	(4.88)
UNSC	0.000205	0.0000393	0.000132	-0.000482	0.000507	-0.000234	0.000310	0.000210
	(1.04)	(0.19)	(0.85)	(-1.80)	(1.92)	(-1.16)	(1.31)	(0.80)
UN voting alignment	4.044***		1.250**	1.312	-0.888	0.429	1.572*	-0.812
	(6.31)		(2.60)	(1.39)	(-1.04)	(0.63)	(2.03)	(-0.89)
lagged log exports	0.705***	-0.0257	0.304***	0.915***	0.664***	0.495***	0.266***	0.664***
	(16.99)	(-0.47)	(8.59)	(12.89)	(11.79)	(14.02)	(5.16)	(11.20)
lagged log imports	-0.0458	-0.0202	0.0917***	0.000739	0.0212	0.135***	0.0284	-0.0363
	(-1.51)	(-0.51)	(3.48)	(0.01)	(0.44)	(5.16)	(0.67)	(-0.76)
lagged log all exports	-0.387***	0.453***	-0.204***	-0.352***	-0.432***	-0.0273	-0.173*	-0.264**
	(-6.70)	(6.62)	(-4.28)	(-4.13)	(-4.87)	(-0.44)	(-2.38)	(-3.13)
lagged log all imports	0.107	-0.715***	-0.138**	-0.0573	0.0465	-0.0896	-0.115	-0.167*
	(1.93)	(-11.91)	(-3.16)	(-0.75)	(0.58)	(-1.57)	(-1.68)	(-2.07)
N	2453	2339	2694	1852	2290	2669	2022	1831

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
Estimation via OLS

Table A3: Descriptive Statistics for Growth Regression Sample
(362 observations; 62 countries)

Variable	Mean	Std. Dev.	Min	Max
GDP growth	1.092133	3.415615	-12.96011	17.05426
Initial GDP	6.800601	1.06149	4.657915	8.987198
Assassinations	.4854972	1.25047	0	11.5
× Fractionalization	17.60704	58.09222	0	736
Financial Depth	28.04208	16.32562	6.085686	120.8928
BD Policy Index	-128.1457	682.4691	-8750.868	5.870643
Aid/GDP	.0380722	.0421961	.000000153	.3310182
× Policy Index	-7.398583	69.71358	-1214.182	.3758931
Need Aid/GDP	.0224103	.0257368	.000000153	.2100129
× Policy Index	-4.099119	38.22349	-681.758	.1447021

Table A4: Variable Definitions and Sources

Allocation Equations

Variable	Definition	Source
log aid	Log of total official gross bilateral disbursements in millions of 2006 dollars	OECD DAC (2006)
log population	Log of population	World Bank (2008)
log GDP	Log of GDP per capita in PPP terms	World Bank (2008)
# killed	Number of people killed by natural disasters	EM-DAT (2007)
postwar	0/1 indicator for 5 year period following "war"	Gleditsch *et al.* (2002)
polity	-10 to 10 autocracy to democracy polity2 index	Marshall and Jaggers (2008)
polity transition	0/1 indicator for polity2=-88 (transition)	Polity IV Project (2005)
BD policy	Burnside-Dollar policy quality index	Burnside and Dollar (2000)
oil	Proven oil reserves, billion barrels	British Petroleum (2007)
war	0/1 indicator of war with at least 1000 conflict deaths	Gleditsch *et al.* (2002)
former colony	0/1 former colony indicator (recipient/donor pairing)	Correlates of War (2003)
political alignment	0/1 indicator of executive political alignment between donor and recipient (LL, RR, etc.)	Beck et al. (2001)
UNSC	0/1 indicator of UNSC membership in important year	Kuziemko and Werker (2006)
UN voting alignment	UN voting alignment between donor and recipient	Voeten and Merdzanovic (2008)
lagged log exports	log of exports from donor to recipient, lagged 1 year	IMF (2006A, 2006B)
lagged log imports	log of imports from donor to recipient, lagged 1 year	IMF (2006A, 2006B)
lagged log all exports	log of exports from world to recipient, lagged 1 year	IMF (2006A, 2006B)
lagged log all imports	log of imports from world to recipient, lagged 1 year	IMF (2006A, 2006B)

Growth Equations

Variable	Definition	Source
GDP growth	Growth rate of GDP per capita	World Bank (2008)
Initial GDP	GDP per capita in PPP terms at start of 4 year period	World Bank (2008)
Assassinations	Number of assassinations	Banks (2002)
Fractionalization	Ethno-linguistic fractionalization	Easterly and Levine (1997)
Financial Depth	M2 / GDP lagged one 4 year period	World Bank (2008)
BD Policy Index	Burnside-Dollar policy quality index	Burnside and Dollar (2000)
Aid/GDP	Total official gross bilateral disbursements / GDP	OECD DAC (2006), World Bank (2008)
Need Aid/GDP	Estimated need-based aid / GDP	Authors' calculations

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