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An Index of Donor Performance

By David Roodman

Abstract

The Commitment to Development Index of the Center for Global Development rates 21 rich countries on the "development-friendliness" of their policies. It is revised and updated annually. In the 2005 edition, the component on foreign assistance combines quantitative and qualitative measures of official aid, and of fiscal policies that support private charitable giving. The quantitative measure uses a net transfers concept, as distinct from the net flows concept in the net Official Development Assistance measure of the Development Assistance Committee. The qualitative factors are: a penalty for tying aid; a discounting system that favors aid to poorer, better-governed recipients; and a penalty for "project proliferation." The charitable giving measure is based on an estimate of the share of observed private giving to developing countries that is attributable to a) lower overall taxes or b) specific tax incentives for giving. Despite the adjustments, overall results are dominated by differences in quantity of official aid given. This is because while there is a seven-fold range in net concessional transfers/GDP among the scored countries, variation in overall aid quality across donors appears far lower, and private giving is generally small. Denmark, the Netherlands, Norway, and Sweden score highest while the largest donors in absolute terms, the United States and Japan, rank at or near the bottom. Standings by the 2005 methodology have been relatively stable since 1995.

An Index of Donor Performance

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Rich nations are often compared on how much they share their wealth with poorer countries. The Nordics and the Netherlands, it is noted, are the most generous with foreign assistance, while the United States gives among the least aid per unit of gross domestic product. Two major international consensus documents issued in 2002, the reports of the International Conference on Financing for Development, in Monterrey, Mexico, and the World Summit on Sustainable Development, in Johannesburg, call on donors to move toward giving at least 0.7 percent of their national income in aid, as few now do. (UN 2002a, p. 9; UN 2002b, p. 52)

The measure of aid implicitly or explicitly referenced in all these comparisons and benchmarks is "net overseas development assistance" (net ODA), which is a measure of aid quantity defined by the donor-funded Development Assistance Committee (DAC) in Paris. DAC counts total grants and concessional (low-interest) development loans given to developing countries, and subtracts principle repayments received on such loans (thus the "net").[2]

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[2] DAC considers a loan concessional if it has a grant element of at least 25 percent of the loan value, using a 10 percent discount rate.

Yet it is widely recognized that some dollars and euros of foreign aid do more good than others. While some aid has funded vaccinations whose effectiveness can be measured in pennies per life saved, other aid has handsomely paid donor-country consultants to write policy reports that collect dust on shelves, or merely helped recipients make interest payments on old aid loans. As a result, a simple quantity metric is hardly the last word on donor performance.

This paper describes an index of donor performance that takes the standard quantity measure as a starting point. It is motivated by the desire to incorporate determinants of aid impact other quantity into the Commitment to Development Index (CDI) (Roodman 2005; CGD and *FP* 2005). The aid index was introduced in 2003 has been revised annually.[3] At its heart, it is an attempt to quantify some aspects of aid quality. But it also departs from net ODA in its definition of aid quantity, and in factoring in tax policies that support private giving.

Because this aid measure is designed to draw entirely from available statistics, primarily the extensive DAC databases, many important aspects of aid quality are not reflected in the index—factors such as the realism of project designs and the effectiveness of structural adjustment conditionality. Moreover, most variation in aid quality may occur *within* donor's aid portfolios rather than across donors. As a result, while there is a sevenfold range in net aid transfers/GDP among the 21 rich countries scored here, the calculations in this paper reveal nothing like that sort of variation in aid quality across donors. Moreover, including private giving does not change this picture because it appears to be much smaller than official giving in most countries. Thus sheer quantity of official aid is still the dominant determinant of donors' scores on this index.

Still, the measure does highlight some interesting differences among donors, and does somewhat rearrange the usual standings. Japan is especially hurt by the netting out of its large amounts of interest received. Donors such as Australia and Italy are pulled low by the apparent tendency to spread their small aid budgets thinly, over many projects.

In the last three decades or so, researchers have taken three broad approaches to cross-country quantitative assessment of aid quality. Since at least the early 1970s, econometric studies have been done of the determinants of donors' aid allocations, factors such as recipient's poverty rate and level of oil exports (citations are below). Though often not evaluative in character, the approach offers a way to measure one aspect of aid quality, selectivity, by looking at the regres-

[3] Major changes since 2004 are: purging cancellation of old non-aid loans from gross aid; a new approach to penalizing "project proliferation"; some simplifications in the selectivity weighting; and refinements to the computation of tax policy–induced private giving.

sion coefficients on indicators of recipient need and development potential. How best to integrate such results with aid quantity into a single performance index is less obvious, however. Attempts to create a single index began with Mark McGillivray (1989, 1994), who essentially computed the weighted sum to each donor's aid disbursements to all recipients, basing weights on recipient GDP/capita as an indicator of need. The third approach is the newest and most sophisticated. Drawing on the literature on determinants of aid allocation, McGillivray, Leavy, and White (2002), formally model allocation, giving donors utility functions that depend on the commercial and geopolitical value of recipients, as well as developmental need and potential. They then compute optimal allocations and penalize donors to the extent they deviate from optima.

The donor performance measure described here is closest in spirit to McGillivray's original, but more ambitious than all previous approaches in scope of the information that it combines into single index. It factors quality of recipient governance as well as poverty into the selectivity scoring system, penalizes tying of aid, handles reverse flows (debt service) in a consistent way, penalizes project proliferation (overloading recipient governments with the administrative burden of many small aid projects), and rewards tax policies that encourage private charitable giving to developing countries.

This paper details the calculations and illustrates them with 2003 data, the latest available, and the basis for the 2005 index. The first six sections describe the computations involved in rating official aid programs: their final output is "quality-adjusted aid quantity" in dollars, or simply "quality-adjusted aid." They treat multilateral and bilateral donors in parallel, so that the World Bank's main concessional aid program, for instance, can be compared for selectivity to Denmark's aid program. The penultimate section describes how the quality-adjusted aid of multilaterals is allocated back to the bilaterals that fund them, in order to give national governments scores on official aid that reflect both their own aid programs and their contributions to multilaterals. The last section describes how the aid index factors in tax policies that favor private charitable giving.

1. The first step: gross aid transfers

The starting point for the calculation of quality-adjusted official aid is gross disbursements of ODA and Official Aid (OA), disaggregated by donor *and* recipient. In DAC terminology, OA is concessional aid meeting the ODA definition, except that while ODA goes to countries conven-

tionally thought of as developing, OA goes to "Part II" countries—most European states that emerged out of the Soviet bloc and richer non-DAC members such as Israel and Singapore. DAC excludes OA from its most frequently cited statistics, perhaps out of concern that assistance to such rich countries stretches the meaning of "aid." I include OA because some Part II countries, such as Ukraine, are poorer than many Part I countries.[4] And since the selectivity adjustment detailed below heavily discounts aid to the richest developing countries, there is less risk that counting OA will misrepresent aid flows. For simplicity of exposition, I refer henceforth to both ODA and OA as ODA.

DAC reports both commitments and disbursements of ODA, but its press releases normally focus on disbursement. Similarly, I use disbursements. Dudley and Montmarquette (1976) argue that commitments better indicate donor policies, on the idea that recipient absorptive capacity limits largely explain any shortfalls in disbursements. But commitment-disbursement divergences could reflect bottlenecks or unrealism on either side of the donor-recipient relationship. Large and persistent gaps between commitments and disbursements may reflect a tendency of certain donors to promise more than they can realistically deliver, or a failure to learn from history that certain recipients cannot absorb aid as fast as donors hope. On balance, it seems best to stick with disbursements and avoid the risk of rewarding donors for overpromising aid or systematically underestimating the capacity to absorb it.

The definition of gross disbursements used here differs in one respect from DAC's. In recent years, donors have formally cancelled billions of dollars in OOF loans to countries such as Pakistan, Cameroon, and the Democratic Republic of Congo (DRC). OOF or "Other Official Finance" loans are ones with too small a concessional element to qualify as ODA, or that are meant for military or other non-development purposes. OOF loan cancellations have run in the billions of dollars in recent years. The DRC, in fact, was the world's top ODA recipient in 2003, at just over $5 billion. It turns out that under a Paris Club agreement, donors cancelled $4.5 billion in outstanding OOF loans to the DRC.

When OOF loans are cancelled, they are, in effect, retroactively recognized by the DAC accounting system as ODA grants. This is a reasonable choice *if* the original purpose of the loan was for development and it was merely disqualified as ODA because it was not concessional

[4] See http://www.oecd.org/document/45/0,2340,en_2649_34447_2093101_1_1_1_1,00.html for lists of Part I and Part II countries.

enough. The DAC system books the transfer at the time it is officially recognized. It would be more accurate to recognize the gradual transfer that occurs year by year as the loans become uncollectible over time. The U.S. government does something like this, regularly assessing the likely collectability of its outstanding sovereign loans and taking on budget any drop in their apparent value.[5] DAC does not do this, perhaps in part because of the complexity, in part because accounting rules and appropriations processes within some of the donor agencies, which govern DAC, create strong disincentives for recognizing such losses.

Unfortunately, the resulting inaccuracies have been large and glaring in the last year or so. It has been obvious that the true, current financial value of debt cancellation for countries such as the DRC is far less than the face value. Even Pakistan, which received $1 billion in OOF debt relief in 2003, is a Highly Indebted Poor Country going by the numbers. Much of its cancelled debt may therefore have been uncollectible anyway, suggesting that the true value of the cancellation per se was far lower.[6]

The definition of gross disbursements used here therefore excludes forgiveness of non-ODA loans. The reasoning is that the net transfers that do occur are not primarily a credit to current policy. If a Carter Administration export credit to Zaire went bad in the early 1980s, and was finally written off in 2003, the transfer that occurred does not for the most part reflect 2003 development policy.

The starting point for purging OOF loan forgiveness is the formula for DAC's standard gross ODA:

Gross ODA = grants + ODA loans extended + offsetting entries for debt relief

The first two right-hand side terms are intuitive: gross ODA includes grants and concessional aid loans disbursed. The third term is rooted in the way that DAC accounts for cancellation of ODA loans (not the OOF ones just discussed). It does so with two offsetting transactions. The first is a "debt forgiveness grant," which is included under "grants" in the formula above. The second is an offsetting entry for debt relief, recorded with a negative sign, which represents

[5] The process occurs within the U.S. government's Interagency Country Risk Assessment System.
[6] Pakistan had an average ratio of present value of debt to exports of 189% during 2001–03 (World Bank 2005) and an average exchange-rate GDP/capita of $497 (World Bank 2004). The corresponding HIPC thresholds are 150% and $885. But Pakistan is not considered a HIPC because it is an IDA-IBRD blend country.

the immediate return of that grant in the form of amortization. This mechanism prevents double-counting of forgiven ODA loans, which were already fully counted as aid at disbursement. Canceling ODA loans therefore does not affect gross ODA. Note, however, that a grant for forgiveness of unpaid but uncapitalized interest does not get an offsetting entry and does add to gross ODA. This is because interest is viewed as a charge while amortization is viewed as a capital flow.

The above formula contains two other relevant subtleties. First, when donors cancel non-ODA loans, they report this is as a debt forgiveness grant without any offsetting entry for debt relief. Since the loan was not counted as ODA at disbursement there is no worry about double-counting, thus no need for an offsetting entry. This is how such cancellation increases ODA. Second, when donors and recipients *reschedule* debt, as under Paris Club agreements, capitalization of accrued but unpaid interest is treated as a new aid flow, and is included in "ODA loans extended." This is again because ODA is a capital flow concept, and capitalization of interest is a capital flow. The DAC subheading for this capitalized interest is "rescheduled debt."

Since the purpose here is to count only transactions that reflect current, actual transfers, I exclude debt forgiveness grants, offsetting entries for debt relief, and capitalized interest. I call the result "gross aid transfers" or simply "gross aid" to distinguish it from gross ODA. Thus:

Gross aid = (grants – debt forgiveness grants) + (ODA loans extended – rescheduled debt)

Table 1 shows the 10 recipients most affected by changing the definition this way for 2003. In all, forgiveness of non-ODA loans accounted for $8.6 billion of reported gross ODA in 2003 (and, by extension, net ODA, which was $70 billion). The figure could rise in the next few years, especially as Iraqi debt is cancelled, enough to substantially inflate total aid. But then, the "debt bubble," as DAC deputy director Richard Carey (2005) has called it, may pop, causing the world aid total to fall at a time when many donors are promising to raise it.

Table 1. Gross ODA and gross aid transfers, selected recipients, 2003 (million $)

Recipient	Gross ODA	Gross aid	Difference
Congo, Dem. Rep.	5,542	713	4,829
Cameroon	1,004	359	645
Pakistan	1,932	1,312	620
Indonesia	2,099	1,489	610
Poland	1,212	893	319
Zambia	818	567	251
Nicaragua	860	638	222
Serbia & Montenegro	1,317	1,097	220
Egypt	1,302	1,122	180
All Part I countries	82,808	74,168	8,640

Table 2 shows the implications from the donor perspective, with bilateral gross ODA and gross aid for 2003. Among bilaterals, the United States gave the most gross aid to non-DAC governments in 2003 and Japan came in second. Among multilaterals, the European Commission disbursed the most, followed by the World Bank's International Development Association (IDA). (Contributions to multilaterals are not counted here. They enter later.) Most of the calculations in the aid index are done for each donor-recipient pair. The figures in Table 2, which are donor-level totals, are *not* used in the calculations, but are summaries for illustration. The final row of the table is an exception: it shows the figures for one donor-recipient pair, the United States and Pakistan. I will continue the United States-Pakistan in order to illustrate the actual calculations at the level of the donor-recipient pair.

Table 2. Gross ODA and gross aid transfers aid by donor, 2003

Donor	Gross ODA and OA	Gross aid trans-fers	% reduction from gross ODA to gross aid transfers
Australia	977	970	1
Austria	426	306	28
Belgium	1,525	773	49
Canada	1,787	1,633	9
Denmark	1,292	1,288	0
Finland	351	351	0
France	8,137	5,042	38
Germany	5,643	4,375	22
Greece	249	249	0
Ireland	353	353	0
Italy	1,319	721	45
Japan	10,636	9,807	8
Netherlands	3,252	2,996	8
New Zealand	130	130	0
Norway	1,517	1,517	0
Portugal	185	179	3
Spain	1,364	1,286	6
Sweden	1,885	1,720	9
Switzerland	1,016	986	3
United Kingdom	4,099	4,022	2
United States	16,996	15,527	9
AfDF	586	586	0
AsDF	1,138	1,138	0
CarDB	38	38	0
EBRD	99	99	0
EC	9,847	9,847	0
GEF	138	138	0
IDA	6,617	6,566	1
IDB Sp F	593	593	0
IFAD	265	265	0
Montreal Protocol	66	66	0
Nordic Dev.Fund	55	55	0
Other UN	495	495	0
IMF PRGF	1,187	1,187	0
UNDP	302	302	0
UNFPA	273	273	0
UNHCR	554	554	0
UNICEF	634	634	0
UNRWA	430	430	0
UNTA	518	518	0
WFP	356	356	0
U.S.-Pakistan	102	80	22

2. Subtracting debt service

The next step is to net debt service out of gross aid transfers, in the belief that net transfers are a better measure than gross of the cost to the donor's treasury and benefit to the recipient. This departs somewhat from the approach of the DAC, whose net ODA statistic is net of principal payments (on concessional loans), but not interest payments. The rationale for the DAC approach is the analogy with net foreign direct investment, a capital flow concept. Only return of capital is netted out of net FDI, not repatriation of earnings. Similarly, only amortization is netted out of net ODA, not interest, which can be seen as the donors' "earnings" on aid investment. So the formula for net ODA is simply:

Net ODA = Gross ODA – ODA loans received

I find the FDI analogy inapt. In the case of FDI, return of capital can be expected to reduce the host country's capital stock much more than repatriation of an equal amount of profits. When the government of Ghana sends a check to the government of Japan for $1 million, it hardly matters for either party whether it says "interest" or "principal" in the check's memo field, that is, whether the transaction enters the capital or current account. It seems unlikely that interest and principal payments have different effects on Japan's treasury or Ghana's capital stock and development.

Moreover, studies have found evidence of defensive lending on the part of bilateral and multilateral lenders, whereby new loans go to servicing old ones (Ratha 2001; Birdsall, Claessens, and Diwan 2002). To the extent that donors are lending to cover interest payments they receive on concessional loans, net ODA counts makes the circulation of money on paper look like an aid increase.

For these reasons, the CDI aid index treats debt service uniformly. "Net aid transfers" is defined as "gross aid transfers" less debt service actually received on ODA loans. (See Table 3.) However, the design principle followed here, that only actual transfers be counted, introduces another complexity. In DAC accounting, "interested received" includes interest on ODA loans that has been forgiven, not actually paid. Forgiving interest generates two opposite transactions: a debt forgiveness grant and a (forgiven) interest received transaction, which is included in total interest received. Since the definition of gross aid used here excludes the debt forgiveness grant, it must also exclude the return transaction for consistency; otherwise it will effectively penalize

forgiveness of interest. It should treat it neutrally, as a transaction that generates no transfers. Thus:

Net aid transfers = gross aid transfers – ODA loans received
– (interest received – interest forgiven)

Note that "ODA loans received" unlike, "interest received," only counts payments that result in actual transfers. Amortization payments made as the result of debt cancellation agreements are recorded separately, as offsetting entries for debt relief, described earlier. Surprisingly, it is impossible in general using DAC data to determine exactly how much a given aid recipient actually paid a given donor in interest in a given year. DAC Table 2a, the table with disbursements data by donor and recipient only reports total interest received, including forgiven interest. DAC Table 1, however, which contains donor-level aggregates, does make the distinction, and provides a good basis for estimating the shares at the donor-recipient level, via straightforward pro-rating. The portion of "interest received" for each donor-recipient pair that is actually forgiven is assumed to be the same for each of a donor's recipients as it is for all of them together.

Table 3 shows the donor-level amounts that are the basis for the pro-rating.[7] For most donors, the potential error is small because they a) receive no interest or almost none or b) almost all of the interest they report receiving is actually received rather than forgiven. In 2003, the donor for which the most error could occur is France, which formally received $627 million in interest and actually received $455 million. But even here, errors in the estimated allocation among aid recipients of the $172 million difference should be small relative to France's total bilateral net aid transfers of $3,094 million.

The final column of Table 3 shows net aid transfers by donor. Again, the calculations displayed do not in fact enter the aid index directly and are only illustrative summaries, except for the U.S.-Pakistan example at the bottom. Among bilaterals, this adjustment to gross aid particularly affects Japan, which received $6.7 billion in debt service on concessional loans, equal to a striking 68 percent of its gross aid transfers. Among bilaterals, France, Germany, Italy, and the United States are also major recipients of debt service for their size. Multilateral institutions are too, unsurprisingly. At the upper extreme, the IMF's concessional Poverty Reduction and Growth Facility received almost exactly as much as it disbursed.

[7] The figures shown here for the Asian and African Development Funds and the Caribbean Development Bank differ from those used in the 2005 CDI. Because of an error in the underlying DAC database, these institutions' interest received amounts had the wrong sign for 2003.

Table 3. Subtracting Debt Service, 2003

Donor	A. Gross aid transfers[1]	C. Amortization	D. DAC interest received	E. Estimated interest actually paid	F. Net aid transfers
Formula:					A – D – E
Australia	970	0	0	0	970
Austria	306	36	2	2	268
Belgium	773	29	3	3	741
Canada	1,633	337	2	2	1,295
Denmark	1,288	145	5	5	1,139
Finland	351	2	1	1	348
France	5,042	1,494	627	455	3,094
Germany	4,375	1,198	419	381	2,796
Greece	249	0	0	0	249
Iceland	14	0	0	0	14
Ireland	353	0	0	0	353
Italy	721	242	0	0	479
Japan	9,807	4,600	2,069	2,069	3,138
Luxembourg	155	0	0	0	155
Netherlands	2,996	154	0	0	2,842
New Zealand	130	0	0	0	130
Norway	1,517	7	0	0	1,510
Portugal	179	2	1	1	176
Spain	1,286	208	34	14	1,065
Sweden	1,720	0	0	0	1,720
Switzerland	986	5	0	0	981
United Kingdom	4,022	165	77	0	3,857
United States	15,527	1,001	474	454	14,071
AfDF	586	103	76	76	406
AsDF	1,138	312	175	175	651
CarDB	38	19	9	9	10
EBRD	99	0	0	0	99
EC	9,847	232	77	77	9,537
GEF	138	0	0	0	138
IDA	6,566	1,348	756	756	4,463
IDB Sp F	593	301	133	133	159
IFAD	265	109	39	39	117
Montreal Protocol	66	0	0	0	66
Nordic Dev. Fund	55	3	0	0	52
Other UN	495	0	0	0	495
IMF PRGF	1,187	1,178	0	0	9
UNDP	302	0	0	0	302
UNFPA	273	0	0	0	273
UNHCR	554	0	0	0	554
UNICEF	634	0	0	0	634
UNRWA	430	0	0	0	430
UNTA	518	0	0	0	518
WFP	356	0	0	0	356
U.S.-Pakistan	80	0	41	40	40

[1]From previous table.

3. Discounting tied aid

Most bilateral donors tie some of their aid, requiring recipients to spend it on goods and services from the donor's home country, which reduces recipient governments' freedom to shop for the best deals. Catrinus Jepma's literature survey (1991, p. 58) finds that tying raises the cost of aid projects a typical 15–30%. This suggests that tying reduces the *value* of aid by 13–23 percent.[8]

The DAC tying statistics split aid commitments into three categories: untied, tied, and partially untied. "Partially untied aid" comes with restrictions, but ones that are looser than those of "tied aid." To be precise, partially untied aid is subject to the restriction that it must be spent on goods and services from the donor nation *or* developing countries, or else to the restriction that it be spent on goods and services from developing countries only. In principle, the approach taken to penalizing tying is simple. Tied aid is discounted by 20% (a round number in the 13–23% range) and partially untied aid by 10%. No attempt is made to account for unreported, informal, de facto tying that may occur.

Implementation is more complex. The tying figures come primarily from the detailed commitment-level data in DAC's Creditor Reporting System (CRS) database, and are aggregated to the level of the donor-recipient pair. Since the data are for commitments, not disbursements, it is assumed that the same shares of disbursements and commitments are tied, untied, or partially untied. The discount applies to gross aid; returns flows are not discounted since they are assumed to have an opportunity cost equivalent to untied aid. The selectivity discount described in the next section exempts emergency aid, so the tying discount step also splits gross aid into emergency and non-emergency aid and discounts them separately for tying.[9,10]

Table 4 shows the results of this step, "net tying-discounted aid" by emergency status. Austria, Italy, and the United States suffer most in relative terms from the tying discount.[11]

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[8] Consider that a 15-percent cost increase lowers the purchasing power of aid by 1–1/1.15 = 13 percent. Similarly, a 30-percent cost increase cuts the value of aid 23 percent.

[9] For commitments that were missing tying status information, I used a number of backstops to estimate the tied fraction. If the donor was multilateral, I assumed the aid was untied. Otherwise, if at least part of the commitment was reported as technical cooperation, I took this as the tied share. Otherwise, I took the average tied share of all of a donor's commitments, excluding debt forgiveness, from DAC Table 7b, for the most recently available year. This is especially important for the United States, which has not reported tying data since 1996. The estimated tied shares in the index are those it reported for all aid in 1996: 71.6% tied and 0% partially untied.

[10] The tying figures reported here correct a small error in the computations used in the published 2005 CDI results.

[11] For simplicity, and in a change from 2004, aid to recipients missing tying information, such as to "Far East Asia unallocated," is assumed untied. Therefore the donor-level totals involve no extrapolations and are simple sums of the feasible estimates at the donor-recipient level.

Table 4. Penalizing tied aid, 2003

	Non-emergency					Emergency				
Donor	A. Gross transfers	B. Tied	C. Partially untied	D. Tying penalty (20%×B+ 10%×C)	E. Tying-discounted gross transfers (A – D)	F. Gross transfers	G. Tied	H. Partially untied	I. Tying penalty (20%×G+ 10%×H)	J. Tying-discounted gross transfers (F – I)
Arab Agencies	204	0	0	0	204	0	0	0	0	0
Arab Countries	5,174	0	0	0	5,174	0	0	0	0	0
Australia	831	295	0	59	772	139	56	0	11	128
Austria	250	155	0	31	219	56	43	0	9	47
Belgium	662	16	0	3	659	111	1	0	0	111
Canada	1,385	665	1	133	1,252	248	99	0	20	228
Czech Republic	84	0	0	0	84	0	0	0	0	0
Denmark	1,171	308	0	62	1,110	117	33	0	7	111
Finland	304	35	0	7	296	47	4	0	1	46
France	4,498	106	228	44	4,454	544	11	16	4	540
Germany	4,188	484	0	97	4,092	187	21	0	4	183
Greece	238	11	18	4	234	11	2	1	0	11
Iceland	14	0	0	0	14	0	0	0	0	0
Ireland	327	0	0	0	327	26	0	0	0	26
Italy	631	570	13	115	515	89	82	0	16	73
Japan	9,778	396	874	167	9,611	30	1	0	0	30
Korea	264	213	45	47	217	1	1	0	0	1
Lithuania	2	0	0	0	2	0	0	0	0	0
Luxembourg	139	5	0	1	138	14	0	0	0	14
Netherlands	2,689	157	416	73	2,616	307	12	30	5	301
New Zealand	113	18	4	4	109	17	3	0	1	17
Norway	1,167	4	0	1	1,166	350	0	0	0	350
Other Donors	153	0	0	0	153	0	0	0	0	0
Poland	41	0	0	0	41	0	0	0	0	0
Portugal	178	2	0	0	177	1	0	0	0	1
Slovak Republic	10	0	0	0	10	0	0	0	0	0
Spain	1,197	499	1	100	1,097	89	20	0	4	85
Sweden	1,329	86	31	20	1,309	391	5	20	3	388
Switzerland	821	9	0	2	819	166	2	0	0	165
Turkey	32	0	0	0	32	2	0	0	0	2
United Kingdom	3,453	0	0	0	3,453	569	0	0	0	569
United States	12,976	9,298	0	1,860	11,116	2,551	1,826	0	365	2,185
AfDF	586	0	0	0	586	0	0	0	0	0
AsDF	1,138	0	0	0	1,138	0	0	0	0	0
CarDB	38	0	0	0	38	0	0	0	0	0
EBRD	99	0	0	0	99	0	0	0	0	0
EC	9,123	0	0	0	9,123	723	0	0	0	723
GEF	138	0	0	0	138	0	0	0	0	0
IDA	6,566	0	0	0	6,566	0	0	0	0	0
IDB Sp F	593	0	0	0	593	0	0	0	0	0
IFAD	265	0	0	0	265	0	0	0	0	0
IMF PRGF	1,187	0	0	0	1,187	0	0	0	0	0
Montreal Protocol	66	0	0	0	66	0	0	0	0	0
Nordic Dev.Fund	55	0	0	0	55	0	0	0	0	0
Other UN	495	0	0	0	495	0	0	0	0	0
UNDP	302	0	0	0	302	0	0	0	0	0
UNFPA	273	0	0	0	273	0	0	0	0	0
UNHCR	554	0	0	0	554	0	0	0	0	0
UNICEF	634	0	0	0	634	0	0	0	0	0
UNRWA	430	0	0	0	430	0	0	0	0	0
UNTA		0	0	0	518	0	0	0	0	0
WFP		0	0	0	356	0	0	0	0	0
U.S.-Pakistan	72	51	0	10	62	8	6	0	1	7

4. Adjusting for selectivity

It has long been argued that which country aid goes to is an important determinant of its effectiveness (Easterly 2002, p. 35). Some countries need aid more than others. Some countries can use it better than others. There is little empirically grounded consensus, however, on what precisely donors should select for.

For anyone measuring selectivity, two main challenges arise: choosing a mathematical structure to distill numbers on recipient attributes and donor aid allocations into a metric; and choosing the attributes that donors are expected to select for, such as low income, good policies, or good governance. I will discuss my choices at the level of principle, then descend to the details of implementation.

Principles

The oldest approach to measuring selectivity—even if not always thought of as such—is the use of cross-country regressions to explain donors' aid allocations as a function of recipient characteristics indicating geopolitical importance (e.g, oil exports or military expenditure), commercial value (trade with donors), and development need and potential (income, governance) (Kaplan 1975; Dudley and Montmarquette 1976; McKinley and Little 1979; Mosley 1981, 1985; Maizels and Nissanke 1984; Frey and Schneider 1986; Gang and Lehman 1990; Schraeder, Hook, and Taylor 1998; Trumbull and Wall 1994; Alesina and Dollar 1998; Burnside and Dollar 2000; Collier and Dollar 2002; Birdsall, Claessens, and Diwan 2002). In general, bilateral donors appear to have been less sensitive to recipient need and potential than to geostrategic and commercial interests. More limited evidence suggests that multilaterals have acted oppositely. Almost all the studies that check find a widespread bias in favor of small countries, in the sense that the elasticity of aid receipts with respect to population is statistically less than 1.

The cross-country regression approach to measuring selectivity is conceptually consistent, but it does invite methodological challenges that it might be better to avoid with a simpler approach. This is because it embodies an attempt to *model* donor decision-making and *predict* the effects on allocations of marginal changes in recipient characteristics, all else equal. With modeling comes the risk of misspecification. If a donor's aid allocations fail to relate to the chosen variables via the chosen functional form, the results may not be meaningful. For example, if a donor specializes in one region, such as France in francophone Africa, its aid allocations will

be highly nonlinear with respect to most indicators of recipient appropriateness, and a linear regression may produce strange results. Similarly if a donor specializes in the poorest nations. Results may also be sensitive to the choice of regressors. The United States gives large amounts of aid to countries such as Russia and Pakistan that appear too poorly governed to make good use of aid for development but have obvious geopolitical value. As a result, regressions that control for geopolitical value may yield a different coefficient on governance for the United States from regressions that do not. This then raises the question of whether evaluations of selectivity should abstract from donors' responsiveness to non-development concerns. Controlling for non-development concerns gives a better picture of the effects of a hypothetical marginal change in an indicator of recipient development potential. Not controlling for it gives a better picture of the general importance of development potential in allocation. It is a question, in other words, of what is meant by "selectivity."

The work of David Dollar and Victoria Levin (2004), used in the World Bank's *Global Monitoring Report* (2005), stands in the regression tradition and faces some of these questions. The authors estimate the elasticity of a donor's aid disbursements with respect to recipient's income and governance. They do not control for commercial or geopolitical interests. They posit a log-linear (elasticity-type) relationship between aid disbursements and recipient population, GDP/capita, and "institutions/policies" as indicated by the World Bank's Country Policy and Institutional Assessment (CPIA). They do not control for donor interest variables. They do, however, abstract from small-country bias by controlling for population, even though Collier and Dollar (2002) find that global aid could reduce poverty twice as fast if most of it were reallocated to India.

The Dollar and Levin specification has a problem that is relatively specific to it, yet illustrates the general risk that comes with modeling. In the elasticity framework, the only recipients that receive no aid are those with an extreme value on one of the determinants—e.g., infinite GDP/capita or zero CPIA score. Since there are no such countries, an elasticity-based model predicts that every recipient receives aid from every donor. Rising income or falling governance cause *percentage* reductions in aid, but never bring it to zero. Yet 1,523 out of the 4,914 the potential donor-recipient pairs in the DAC database show zero disbursements for 2002 by my

count.[12] The conflict between theory and reality appears when Dollar and Levin attempt, as it were, to take the logarithms of these zeroes in order to perform their log-linear regressions. To avoid infinities, they replace zeroes with a small number, $10,000 (actually, 0.01, since the figures are in millions of dollars). But in natural logs, 0.01 becomes –4.6. For comparison, the largest gross flow in 2002, $1.3 billion from Japan to China, has a log of 7.2. If Dollar and Levin were to replace zeroes with $100 (with a log of –9.2) or $1 (–13.8) they might reach quite different results. An alternative specification that directly confronts the possibility that the distribution of aid disbursements is truncated, such as tobit specification, may be more appropriate. Below, I compare my results to theirs.

The second major approach to evaluating selectivity was initiated by McGillivray (1989, 1992). It is more radically empirical, eschewing any attempt to model allocation procedures or estimate marginal effects, and lends itself more naturally to creating an index that reflects quantity and selectivity. His index is, essentially, the weighted sum of a donor's aid disbursements to all recipients, where the weights are mathematically related to a recipient characteristic such as GDP/capita. If the weights lie between 0 and 1, they can be thought of as discounts that penalize or reward selection for desired characteristics. The ratio of the weighted sum to the unweighted sum measures overall selectivity.[13]

Rao (1994, 1997) points out that donors can maximize their scores on McGillivray's index by concentrating all their aid in the single poorest country. He argues that the source of this perverse result is the failure of McGillivray's index to consider recipients' *post-aid* GDP/capita. On the assumption that aid leads directly to GDP gains, if all aid went to the poorest country, that country's GDP/capita would rise rapidly and make it a less deserving recipient. He revised McGillivray's index to factor in both pre- and post-aid GDP. This introduced a notion of diminishing returns to aid: not diminishing returns to the effectiveness of aid in raising GDP/capita, but diminishing returns to the value of doing so.

The third approach to assessing selectivity is the newest and most sophisticated. Drawing on the cross-country literature on determinants of aid allocation, McGillivray, Leavy, and White

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[12] This excludes recipients lacking GDP, population, or (1999) CPIA data, and excludes three atypical donors: Arab Agencies, the Montreal Protocol fund, and the Caribbean Development Bank.

[13] McGillivray's original (1989) index summed aid/recipient population rather than total aid to each recipient. White (1992) questioned the implicit notion of donors "allocating" aid/recipient population: shifting $1 million in aid from small, poor Mali to large, poor India would reduce a donor's score in McGillivray's system because the aid would be lower *per capita* in India. In reply, McGillivray (1992) proposed using absolute aid rather than aid/capita, within the same basic framework.

(2002), formally model aid allocation. They endow donors with utility functions that depend on their allocation of aid among recipients that are characterized by various commercial and geopolitical interest factors and levels of development need and potential. The authors incorporate diminishing returns to aid; compute optimal allocations; and penalize donors to the extent they deviate from their optima. The approach has several disadvantages from the point of view of the CDI. It is conceptually complex. It is vulnerable to challenges analogous to those that apply to the first approach, regarding proper specification. It rewards donors for pursuing geopolitical and commercial interests (though this could be easily changed, to focus purely on recipient need, as appropriate for the CDI). And it penalizes donors for aid allocations that are rather different from the ideal ones even if they do not generate much lower utility. For example, if a donor at the optimal allocation shifts aid between two identical recipients, the marginal utility cost is zero, but the marginal decline in the donor's score would be non-zero.

The approach I take is closest to McGillivray's original. For the purposes of the CDI, it has the advantages of conceptual simplicity; it combines quantity and quality (selectivity) in a natural way that minimizes questions about proper modeling specification. Since it does not model with smooth functional forms, it does not inherently penalize specialization in a certain region or income bracket. It can be combined with other discount factors, such as for tying and project proliferation. It lends itself to a distinction between subflows of aid (emergency and non-emergency). And it can handle net transfers even when they are negative, where some of the common functional forms cannot. (Reverse flows, like zero flows, would bedevil the elasticity approach of Dollar and Levin, for example.)

Here is a simple example of how the chosen system works. The selectivity formula introduced here, it will emerge, assigns Mozambique a weight of 0.8 for non-emergency aid and Cyprus a 0.2. A donor whose aid program consisted of giving $1 million to each of these countries would have selectivity-weighted aid of $1 million (0.8 × $1 million = $0.8 million for Mozambique plus 0.2 × $1 million = $0.2 million for Cyprus). The donor's "selectivity" is then the ratio of its selectivity-weighted aid to its unweighted aid—in this case 0.5. This is also the average selectivity weight of the donor's recipients, where the average is weighted by how much aid the donor gives to each recipient.

One potentially counterintuitive result of this approach is that a donor that is constitutionally confined to a clientele with low selectivity weights comes off poorly even if it is in some

sense selective within that pool. The best example is the European Bank for Reconstruction and Development (EBRD), which lends to the (relatively rich) nations of the former Eastern bloc. But for purposes of comparing bilateral donors to each other, this is actually as it should be. As will be described below, the "quality-adjusted aid quantities" of multilaterals are ultimately allocated back as credits to the bilaterals. If Germany is to be more rewarded for giving aid to Malawi than Poland, it should also be more rewarded for doing the same indirectly—giving more to the African Development Fund than the EBRD.

Having settled the question of mathematical form for measuring selectivity, there remains the question of what donors are supposed to select for. I use two indicators. The first is GDP/capita, converted to dollars on the basis of exchange rates. In 2003 and 2004, I used purchasing power parity–GDP/capita. I switched because the exchange rate version is available for more countries. The change does little harm because GDP/capita is used here in logs, and the two variants are highly correlated in logs. The second indicator is the composite governance variable of Daniel Kaufman and Aart Kraay (Kaufmann, Kraay, and Mastruzzi 2003), which is the most comprehensive governance indicator available. The KK composite is an average of indicators on up to six dimensions, available data permitting: democracy, political instability, rule of law, bureaucratic regulation, government effectiveness, and corruption. The six variables are themselves synthesized from several hundred primary variables from 24 datasets. GDP/capita and the KK composite have several strengths for measuring selectivity. They have wide coverage. They are updated regularly and made freely available. And they reflect consensus views that a) the richer a country is, the less it needs aid; and b) that institutional quality is a key determinant of development and, most likely, aid effectiveness. Craig Burnside and David Dollar, in their 2004 reprise on their influential finding that "aid works in a good policy environment," switch from economic policy variables to the KK composite to measure "policies/institutions."

In 2004, in factoring governance into the weighting, the formula distinguished between program and project aid, on the idea that the greater recipient ownership allowed by program aid can be expected to be healthy in the best-governed countries, the icon being Chile, and counterproductive in the worst-governed, epitomized by the Democratic Republic of Congo. That distinction has been abandoned this year to make way for the new approach to project proliferation discussed in the next section.

Before descending to the particulars of the selectivity discounting, it is worth reiterating that two concepts are defined here relating to selectivity. The first, selectivity-weighted aid, is a measure of aid allocations that blends quantity and quality, and is of primary interest for grading performance. It possesses the desirable properties of linearity. If a country doubles its aid to every recipient, its selectivity-adjusted aid score will double. If it runs two parallel aid programs, the selectivity-adjusted aid total of the combination is the sum of the those for the individual programs.

The second concept is the weighted-average selectivity score of a donor's recipients—the donor's "selectivity." This measure, it should be noted, behaves strangely when applied to donors with net transfers much smaller than gross transfers. Consider this example. Donor X is a development bank. It disburses nothing to Recipient Y, which has selectivity weight 0.6, but *receives* $1 million from Y in debt service, which is treated as negative aid. It disburses the $1 million to Recipient Z, which has weight 0.8. Donor X's selectivity-weighted aid is thus:

$$0.6 \times (-\$1 \text{ million}) + 0.8 \times (\$1 \text{ million}) = \$0.2 \text{ million}.$$

Its score is small but positive because it has transferred funds from a less appropriate to a more appropriate aid "recipient"—perhaps an odd result, but meaningful. Now, what is the "selectivity" of Donor X?

$$\text{selectivity-weighted net transfers} / \text{total net transfers} = \$0.2 \text{ million} / 0 = \infty.$$

The donor has done some good for the developing world on net, according to the measure, with zero net disbursal of funds. It is infinitely efficient.

This extreme example illustrates a counterintuitive result for donors whose net transfers are much smaller than gross transfers (because of debt service). In these cases, the donor's reported "selectivity" can lie outside the range of most of its recipients' selectivity weights. For example, the IDB's Fund for Special Operations disbursed $593 million in 2003. It received $434 million in debt service, for a net aid of only $159 million. Yet it generally transferred funds from countries deemed less appropriate for aid to those deemed more appropriate and so achieves a selectivity score of 0.82 in 2003, it will emerge, which is higher than the selectivity weight of any of its recipients. Mathematically, the 0.82 is a weighted average of selectivity factors between 0 and 1, where some of those weights (net transfers) are negative.

One can avoid such results by measuring selectivity of gross disbursements only, which I call "gross selectivity." In the abstract example above, Donor X has gross selectivity of $0.2 mil-

lion/$1 million = 0.2. This result seems more meaningful than infinity, but comes at the expense of ignoring the debt service received from Recipient Y.

The sometimes-strange behavior of the version that includes reflows, "net selectivity," does not mean it is inherently flawed. Rather, it points up another subtlety in the question of what is meant by selectivity. The picture conjured by the word "selectivity" is of a donor that only sends funds outward. In fact, donors not only distribute their own money but redistribute that of recipients. What does selectivity mean in such a context? Is a donor that bestows all its net transfers on Malawi almost perfectly selective? Or is it falling far short of the ideal by failing to transfer billions of dollars from Kuwait to Malawi?

The 2005 CDI deals with this problem with a compromise between principle and simplicity. To avoid infinities, it segregates (tying-discounted) disbursements from reflows. It then applies the gross selectivity factor to disbursements, yielding selectivity-weighted disbursements, and applies the same factor to reflows, implicitly assuming that the distribution of a donor's disbursements and reflows across recipients are same. It would be more accurate to separately compute the "selectivity" of the donor's reflows, but would also be more complicated.

Implementation

The flow to which selectivity weights are applied is the output of the previous steps in the construction of the aid performance measure, namely "net tying-discounted aid" and debt service reflows. However, emergency aid is exempted from the selectivity discounting, since it is often effective even in the poorest-governed countries.

These quantities are multiplied by two discount factors. The first is linearly related to a country's KK governance score. The linear relationship is such that in the benchmark year of 2001, the data year for the first edition of the CDI, the governance weight ranges exactly between 0 (for the worst-governed country, the DRC) and 1 (for Chile). The second factor is a linear function of a country's log GDP/capita. In 2001, the United Arab Emirates (GDP/capita of $28,751) gets a 0 and the DRC (GDP/capita of $97), defines the upper end for the GDP/capita weights. This upper end is not 1.0, as one might expect, but 1.84, a number chosen so that the highest *combined* selectivity weight (the product of the governance and income factors) *is* 1.0 in the benchmark year of 2001. (It happens to be for Mongolia.) Table 5 summarizes the weight

computations. Kaufmann and Kraay have computed their governance variables for even years since 1996, so the CDI scoring for 2003 aid uses 2002 KK scores.

This system implies several valuations, which are meant to be minimally arbitrary but should be made explicit. First, non-emergency program aid to the highest-weighted recipient in 2001, Mongolia, is precisely as meritorious as emergency aid to any country any year, since the latter is not discounted. All other aid is valued less. Second, because of the multiplicative weighting structure, non-emergency aid to the richest country is valueless no matter how well-governed the country: by virtue of being the richest its income weight is zero. Similarly, non-emergency aid to the worst-governed country is also treated as valueless regardless of how poor the country is. Governance quality and income level are each seen as conditioning the other's relevance for aid effectiveness.

Table 6 summarizes the calculations by donor, which, recall, actually take place at the donor-recipient level.

Table 5. Computation of selectivity weights, 2003

Recipient	A. Exchange rate GDP/capita, 2003 ($)	B. Kaufmann-Kraay composite governance score, 2002	C. Governance selectivity multiplier	D. Log exchange rate GDP/capita	E. GDP selectivity multiplier	F. Combined selectivity multiplier (C × E)
Bhutan	301	0.16	0.69	5.71	1.47	1.01
Mongolia	439	0.21	0.70	6.08	1.35	0.95
Madagascar	322	–0.07	0.62	5.77	1.45	0.90
Sao Tome and Principe	305	–0.11	0.61	5.72	1.47	0.89
Malawi	148	–0.42	0.51	5.00	1.70	0.87
Mauritania	388	–0.08	0.61	5.96	1.39	0.85
Ghana	374	–0.16	0.59	5.92	1.40	0.83
Mozambique	230	–0.40	0.52	5.44	1.56	0.80
Burkina Faso	316	–0.31	0.54	5.76	1.46	0.79
Kiribati	593	–0.15	0.59	6.38	1.25	0.75
Mali	372	–0.35	0.53	5.92	1.40	0.75
India	571	–0.19	0.58	6.35	1.27	0.74
Senegal	614	–0.16	0.59	6.42	1.24	0.73
Benin	497	–0.26	0.56	6.21	1.31	0.73
Gambia, The	257	–0.53	0.48	5.55	1.52	0.73
Lesotho	612	–0.21	0.58	6.42	1.24	0.72
Tanzania	279	–0.54	0.47	5.63	1.50	0.71
Ethiopia	95	–0.84	0.38	4.56	1.84	0.70
Samoa	1,813	0.42	0.77	7.50	0.89	0.69
Nepal	220	–0.66	0.44	5.39	1.57	0.69
Eritrea	168	–0.73	0.41	5.13	1.66	0.69
Moldova	441	–0.43	0.51	6.09	1.35	0.68
Niger	247	–0.64	0.44	5.51	1.54	0.68
Sri Lanka	937	–0.12	0.60	6.84	1.11	0.67
Cambodia	328	–0.59	0.46	5.79	1.44	0.66
Maldives	2,111	0.44	0.78	7.65	0.84	0.65
Vietnam	479	–0.48	0.49	6.17	1.32	0.65
Zambia	398	–0.57	0.46	5.99	1.38	0.64
Uganda	243	–0.74	0.41	5.49	1.54	0.64
Philippines	952	–0.22	0.57	6.86	1.10	0.63
Guinea-Bissau	173	–0.84	0.38	5.16	1.65	0.63

Recipient	A. Exchange rate GDP/capita, 2003 ($)	B. Kaufmann-Kraay composite governance score, 2002	C. Governance selectivity multiplier	D. Log exchange rate GDP/capita	E. GDP selectivity multiplier	F. Combined selectivity multiplier (C × E)
Guyana	975	–0.25	0.56	6.88	1.09	0.62
Nicaragua	780	–0.35	0.53	6.66	1.16	0.62
Chile	4,622	1.28	1.04	8.44	0.59	0.61
Cape Verde	2,016	0.22	0.71	7.61	0.86	0.61
Morocco	1,404	–0.05	0.63	7.25	0.97	0.61
Uruguay	3,312	0.70	0.86	8.11	0.70	0.60
Namibia	2,338	0.32	0.74	7.76	0.81	0.60
Togo	324	–0.72	0.42	5.78	1.45	0.60
Thailand	2,225	0.25	0.72	7.71	0.83	0.59
Bolivia	934	–0.38	0.52	6.84	1.11	0.58
Jordan	1,806	–0.01	0.64	7.50	0.89	0.57
China	1,092	–0.34	0.54	7.00	1.06	0.57
Armenia	933	–0.40	0.52	6.84	1.11	0.57
Dominica	3,661	0.65	0.84	8.21	0.67	0.56
Bulgaria	2,622	0.26	0.72	7.87	0.77	0.56
Marshall Islands	1,878	–0.02	0.64	7.54	0.88	0.56
Egypt, Arab Rep.	1,103	–0.37	0.53	7.01	1.05	0.56
Comoros	510	–0.69	0.43	6.24	1.30	0.56
Bangladesh	375	–0.78	0.40	5.93	1.40	0.56
St. Vincent & Grenadines	3,176	0.42	0.77	8.06	0.71	0.55
Tunisia	2,461	0.11	0.67	7.81	0.79	0.54
Vanuatu	1,419	–0.27	0.56	7.26	0.97	0.54
Papua New Guinea	642	–0.64	0.44	6.46	1.23	0.54
Kyrgyz Republic	347	–0.85	0.38	5.85	1.43	0.54
Botswana	4,517	0.77	0.88	8.42	0.60	0.53
Costa Rica	4,492	0.81	0.89	8.41	0.60	0.53
Solomon Islands	505	–0.75	0.41	6.22	1.31	0.53
Kenya	429	–0.81	0.39	6.06	1.36	0.53
Mauritius	4,312	0.70	0.86	8.37	0.61	0.52
Latvia	4,163	0.64	0.84	8.33	0.62	0.52
Suriname	2,195	–0.03	0.63	7.69	0.83	0.52
Dominican Republic	1,824	–0.17	0.59	7.51	0.89	0.52
Honduras	1,047	–0.49	0.49	6.95	1.07	0.52
Rwanda	204	–1.02	0.33	5.32	1.60	0.52
South Africa	3,597	0.39	0.76	8.19	0.67	0.51
Pakistan	441	–0.84	0.38	6.09	1.35	0.51
Belize	3,243	0.22	0.71	8.08	0.70	0.50
Brazil	2,703	0.02	0.65	7.90	0.76	0.49
Romania	2,699	0.01	0.64	7.90	0.76	0.49
Fiji	2,591	–0.03	0.63	7.86	0.78	0.49
Ukraine	1,030	–0.59	0.46	6.94	1.07	0.49
Sierra Leone	138	–1.16	0.28	4.93	1.72	0.49
Lithuania	5,027	0.69	0.85	8.52	0.56	0.48
El Salvador	2,226	–0.18	0.58	7.71	0.83	0.48
Malaysia	4,460	0.45	0.78	8.40	0.60	0.47
Jamaica	2,901	–0.03	0.63	7.97	0.74	0.47
Peru	2,246	–0.22	0.57	7.72	0.82	0.47
Micronesia, Fed. Sts.	2,229	–0.23	0.57	7.71	0.83	0.47
Swaziland	1,593	–0.43	0.51	7.37	0.93	0.47
Estonia	6,204	0.94	0.93	8.73	0.50	0.46
Poland	5,437	0.69	0.85	8.60	0.54	0.46
St. Lucia	4,274	0.37	0.75	8.36	0.62	0.46
Guinea	402	–0.99	0.34	6.00	1.38	0.46
Lao PDR	345	–1.03	0.32	5.84	1.43	0.46
Grenada	4,918	0.50	0.80	8.50	0.57	0.45
Tonga	1,507	–0.54	0.47	7.32	0.95	0.45
Syrian Arab Republic	1,223	–0.66	0.44	7.11	1.02	0.45
Yemen, Rep.	558	–0.94	0.35	6.32	1.27	0.45
Chad	286	–1.09	0.30	5.66	1.49	0.45
Tajikistan	189	–1.17	0.28	5.24	1.62	0.45
Slovak Republic	5,890	0.63	0.83	8.68	0.51	0.43

Recipient	A. Exchange rate GDP/capita, 2003 ($)	B. Kaufmann-Kraay composite governance score, 2002	C. Governance selectivity multiplier	D. Log exchange rate GDP/capita	E. GDP selectivity multiplier	F. Combined selectivity multiplier (C × E)
Guatemala	1,776	–0.53	0.48	7.48	0.90	0.43
Albania	1,735	–0.52	0.48	7.46	0.91	0.43
Indonesia	886	–0.84	0.38	6.79	1.12	0.43
Panama	4,357	0.16	0.69	8.38	0.61	0.42
Cameroon	787	–0.91	0.36	6.67	1.16	0.42
Central African Republic	326	–1.13	0.29	5.79	1.45	0.42
Djibouti	1,367	–0.71	0.42	7.22	0.98	0.41
Macedonia, FYR	2,314	–0.48	0.49	7.75	0.81	0.40
Hungary	8,232	0.96	0.94	9.02	0.40	0.38
Turkey	3,494	–0.26	0.56	8.16	0.68	0.38
Kazakhstan	1,966	–0.67	0.43	7.58	0.87	0.38
Colombia	1,863	–0.66	0.44	7.53	0.88	0.38
Azerbaijan	909	–0.96	0.34	6.81	1.12	0.38
Georgia	836	–1.00	0.33	6.73	1.14	0.38
Barbados	9,486	1.24	1.02	9.16	0.36	0.37
Ecuador	2,058	–0.66	0.44	7.63	0.85	0.37
Bosnia and Herzegovina	1,745	–0.73	0.41	7.46	0.90	0.37
Nigeria	409	–1.20	0.27	6.01	1.37	0.37
Uzbekistan	383	–1.22	0.26	5.95	1.39	0.37
Burundi	110	–1.40	0.21	4.70	1.80	0.37
Czech Republic	8,331	0.81	0.89	9.03	0.40	0.36
Oman	7,485	0.60	0.83	8.92	0.43	0.36
Croatia	6,292	0.29	0.73	8.75	0.49	0.36
Iran, Islamic Rep.	2,040	–0.73	0.42	7.62	0.85	0.36
Paraguay	962	–1.01	0.33	6.87	1.10	0.36
Malta	9,834	1.16	1.00	9.19	0.35	0.35
Mexico	6,036	0.13	0.68	8.71	0.50	0.34
Gabon	4,245	–0.28	0.55	8.35	0.62	0.34
Russian Federation	2,995	–0.55	0.47	8.00	0.73	0.34
Cote d'Ivoire	826	–1.10	0.30	6.72	1.15	0.34
Algeria	2,081	–0.81	0.39	7.64	0.85	0.33
Argentina	3,356	–0.58	0.46	8.12	0.69	0.32
Belarus	1,695	–0.98	0.34	7.44	0.91	0.31
Haiti	353	–1.40	0.21	5.87	1.42	0.29
Liberia	133	–1.53	0.17	4.89	1.74	0.29
Seychelles	8,948	0.34	0.75	9.10	0.38	0.28
Lebanon	5,097	–0.44	0.51	8.54	0.56	0.28
Congo, Rep.	1,188	–1.19	0.27	7.08	1.03	0.28
Zimbabwe	666	–1.34	0.23	6.50	1.22	0.28
Sudan	467	–1.40	0.21	6.15	1.33	0.28
St. Kitts and Nevis	9,545	0.35	0.75	9.16	0.36	0.27
Trinidad and Tobago	9,237	0.34	0.74	9.13	0.37	0.27
Saudi Arabia	7,693	–0.05	0.62	8.95	0.43	0.27
Antigua and Barbuda	11,149	0.68	0.85	9.32	0.31	0.26
Venezuela, RB	3,440	–0.88	0.37	8.14	0.69	0.25
Slovenia	13,074	0.99	0.94	9.48	0.25	0.24
Turkmenistan	1,258	–1.30	0.24	7.14	1.01	0.24
Korea, Rep.	12,595	0.67	0.85	9.44	0.27	0.23
Bahrain	11,705	0.53	0.80	9.37	0.29	0.23
Angola	1,226	–1.36	0.22	7.11	1.02	0.22
Libya	3,563	–1.05	0.31	8.18	0.67	0.21
Cyprus	14,773	0.88	0.91	9.60	0.22	0.20
Bahamas, The	17,682	1.28	1.04	9.78	0.16	0.16
Macao, China	15,452	0.53	0.80	9.65	0.20	0.16
Equatorial Guinea	5,661	–1.17	0.28	8.64	0.52	0.15
Congo, Dem. Rep.	99	–1.82	0.08	4.59	1.83	0.15
Israel	17,197	0.56	0.81	9.75	0.17	0.13
Kuwait	16,750	0.36	0.75	9.73	0.17	0.13
Hong Kong, China	23,349	1.16	1.00	10.06	0.07	0.07
Qatar	22,016	0.48	0.79	10.00	0.09	0.07
United Arab Emirates	29,011	0.74	0.87	10.28	0.00	0.00

Table 6. Discounting for selectivity, 2003

Donor	Tying-discount gross transfers: A. Non-emergency[1]	Tying-discount gross transfers: B. Emergency[1]	C. Reflows[1]	D. Gross selectivity	Tying- and selectivity-discounted gross transfers (A × D + B)	Selectivity-discounted reflows (C × D)
Arab Agencies	204	0	158	0.62	126	97
Arab Countries	5,174	0	306	0.42	2,155	127
Australia	772	128	0	0.55	549	0
Austria	219	47	38	0.49	154	18
Belgium	659	111	31	0.50	441	16
Canada	1,252	228	339	0.57	942	193
Czech Republic	84	0	0	0.48	41	0
Denmark	1,110	111	150	0.64	823	96
Finland	296	46	2	0.58	218	1
France	4,454	540	1,948	0.45	2,550	879
Germany	4,092	183	1,579	0.53	2,365	842
Greece	234	11	0	0.44	114	0
Iceland	14	0	0	0.75	10	0
Ireland	327	26	0	0.63	233	0
Italy	515	73	242	0.52	339	125
Japan	9,611	30	6,669	0.57	5,489	3,788
Korea	217	1	36	0.55	121	20
Lithuania	2	0	0	0.37	1	0
Luxembourg	138	14	0	0.59	96	0
Netherlands	2,616	301	154	0.58	1,814	89
New Zealand	109	17	0	0.55	76	0
Norway	1,166	350	7	0.57	1,010	4
Other Donors	153	0	0	0.48	74	0
Poland	41	0	0	0.43	18	0
Portugal	177	1	3	0.57	102	2
Slovak Republic	10	0	0	0.44	5	0
Spain	1,097	85	221	0.51	645	113
Sweden	1,309	388	0	0.58	1,150	0
Switzerland	819	165	5	0.56	626	3
Turkey	32	2	0	0.50	18	0
United Kingdom	3,453	569	165	0.62	2,723	103
United States	11,116	2,185	1,455	0.51	7,801	735
AfDF	586	0	180	0.71	415	127
AsDF	1,138	0	487	0.60	688	295
CarDB	38	0	28	0.50	19	14
EBRD	99	0	0	0.44	43	0
EC	9,123	723	309	0.50	5,325	156
GEF	138	0	0	0.51	70	0
IDA	6,566	0	2,103	0.63	4,106	1,315
IDB Sp F	593	0	434	0.53	316	231
IFAD	265	0	148	0.59	158	88
IMF PRGF	1,187	0	1,178	0.55	657	652
Mont. Protocol	66	0	0	0.58	38	0
Nordic Dev.Fund	55	0	3	0.71	39	2
Other UN	495	0	0	0.47	235	0
UNDP	302	0	0	0.56	170	0
UNFPA	273	0	0	0.56	153	0
UNHCR	554	0	0	0.48	266	0
UNICEF	634	0	0	0.54	340	0
UNRWA	430	0	0	0.46	198	0
UNTA	518	0	0	0.52	270	0
WFP	356	0	0	0.50	179	0
U.S.-Pakistan	62	7	41	0.51	39	21

[1]From previous tables.

5. Penalizing proliferation

Project proliferation, donor fragmentation, and lack of coordination have long been cited as major problems for aid effectiveness. Donors often act at cross-purposes—one donor's trains won't run on another's tracks, literally or metaphorically. Or donors overload recipient ministries with mission visitations and project reporting requirements (Acharya, de Lima, and Moore 2003).

Though such transaction costs of aid are widely thought to be substantial, they have mostly defied direct measurement. For example, Brown et al. (2000) set out to measure aid transaction costs in Vietnam but ended up obtaining only anecdotal information. A pair of recent papers has made fresh contributions to analyzing the extent of proliferation and indirectly measuring its costs. Arnab Acharya, Ana Fuzzo de Lima, and Mick Moore (2003) develop indexes of donors' tendency to *proliferate* (disperse) aid among recipients, and of the tendency of recipients' aid to be *fragmented* among many donors. Stephen Knack and Aminur Rahman (2004) measured fragmentation similarly, and find it to be predictive of lower recipient bureaucratic quality. They theorize that donors out-compete recipient governments for the scarce resource of skilled nationals.

The inputs to the indexes of proliferation and fragmentation in these papers are data on aid disbursements by donor and recipient, from DAC Table 2a. Given that dataset, the indexes are logical first steps toward measuring proliferation. But this style of analysis also has disadvantages since it looks at allocation of aid across countries rather than allocation across projects within countries. A donor that gives aid to only one country but does so through tiny projects would score perfectly on Acharya, de Lima, and Moore proliferation index since it would not be proliferating at all across recipients, while a donor that provided large, equal-sized blocks of pure budgetary support to several dozen nations would be a major "proliferator."

The 2004 CDI handled project issues in two ways. First, for project aid (as distinct from program aid, which is theoretically more hands-off), the range of governance selectivity weights described in the previous section was contracted from 0–1 to 0.25–0.75. So in poorly governed countries, project aid was treated as better than program aid, with a governance weight that was higher, closer to 0.5, on the idea that more monitoring and intervention is productive in such countries. In well-governed countries the opposite held. Second, the 2004 CDI also imposed a penalty based on the percentage of aid commitment monies committed in amounts less than $100,000.

On reflection, this combination seems problematic. In one part of the 2004 design, small may be good or bad (assuming projects are smaller than programs). In another, it is always bad. And there are two notions—project *size* and the distinction between projects and programs—of unclear relationship. Does a $10 million road-building "project" help development much more or less than a $10 million "program" of support to the transportation sector? The 2005 CDI replaces both those features with a single calculation derived from a theoretical framework that preserves their core ideas. The idea of the new adjustment is to weight each dollar of aid based on the size of the "aid activity," whether project or program, of which it is part. The weights depend on the sizes of other projects in the country and the country's governance.

Calculating "size weights" in a theoretically sound way turns out to be more complicated than calculating selectivity weights. One reason is that the sizes of aid activities, whether projects or program or budget support, range over many orders of magnitude, from $10,000 or smaller to $100 million or bigger. A linear map from this range to a limited range needed for weights, such as [0, 1], would have to consign all projects smaller than $5 million to near-0 weights. A map from *log* project size would work little better, for while it would compress the high end, bringing $10 million and $100 million aid activities closer together, it would explode the low end, generating large weight differences between $1,000 and $10,000 projects. A second complication is that if there is such a thing as too small, there is also such a thing as too big, which is why programs in poor-governance countries were penalized relative to projects last year. As Radelet (2004) argues, large blocks of program support are less appropriate for countries where governance is poor. In such countries, the oft-criticized transaction costs associated with aid activities—meetings with donors, quarterly reports, etc.—also have the benefit of improving measurability of results and holding recipients accountable for outcomes. This makes size fundamentally different from governance and poverty, for which monotonic weighting functions are reasonable: to a first approximation, the poorer or better governed the country, the more appropriate it seems for aid. In contrast, there is in, in some theoretical sense, an *optimal* project size. It should depend on several factors, including how big the receiving country is, how much aid it is receiving, and the quality of its governance.

For these reasons, the new size weighting function in the CDI tends toward zero at both the low and high ends, with a peak in between. More precisely, it is lognormal. This is the most natural functional form for this situation because it has strictly positive support (and project size

is never negative), takes strictly positive values (so that size weights are never negative), and is inherently compatible with the tendency of aid activity sizes to range over many orders of magnitude, being a normal function of log project size.

As it happens, aid activities themselves tend to be lognormally distributed by size. Thus the mathematical framework is one where a weighted sum of an approximately lognormal distribution of aid activities is taken using weights from a separate lognormal function. Figure 1 illustrates. The heavy line shows the distribution of aid activities by size in a hypothetical country. The most common size is at the peak of this curve. Because of the lognormal scale, however, the *average size*, which is lifted by a few very large projects, is far to the right of the peak. The dashed line shows one possible weighting curve. The curve peaks at an "optimal" size somewhat above the average project size, suggesting that the average aid dollar is going into aid activities that are too small, and is relatively wide, which implies some uncertainty about what the true optimal size is, and how much deviation from this optimum matters.

Implementing this approach forces choices about the height, location, and width of each recipient's size weighting curve. In a near-vacuum of empirical evidence about the costs of proliferation, three principles hinted at above shaped the choices. First, the *actual* distribution of aid activities by size was taken as a starting point. Even though this is probably far from optimal in most countries, there is some evidence (Roodman forthcoming) that donors limit proliferation in ways that increase effectiveness, by reducing aid activity numbers in countries with low GDP (and presumably low administrative capacity) and high aid flows (which heavily tax that capacity). Thus using the actual distribution of aid activities does incorporate some information about what the optimum is. Second is a bias toward larger projects. There is more consensus that the proliferation of small projects in countries such as Tanzania and Mozambique is inefficient than that $100,000,000 million loans from Japan and the Asian Development Bank to China are too big, even though one might legitimately question the appropriateness of such *carte blanche* disbursements to a relatively unaccountable, corrupt government. Thus the parameters chosen here lead to formulas that tend to penalize projects on the small side more than those on the large side. Third is a bias toward agnosticism given the poor understanding of these issues, toward preventing the differences among bilaterals' scores from being too great, expressed as a relatively wide weighting curve.

The choices can be stated precisely, as follows. The data source is the CRS database, for

which the unit of observation is the "aid activity," which the CRS reporting guidelines describe as follows:

> An aid activity can take many forms. It could be a project or a programme, a cash transfer or delivery of goods, a training course or a research project, a debt relief operation or a contribution to an NGO. (DAC 2002)

All aid activities in the CRS database are included, except for those coded as being donor administrative costs or debt forgiveness.

Since there are three degrees of freedom in the lognormal family of curves, which can be thought of as height, width, and mode, three constraints must be imposed. The first constraint is that the weighting function must reach a peak value of 1.0, so that only projects of "optimal" size go undiscounted. That fixes the height. To describe how the mode is determined, let μ_1 and σ_1 be the mean and standard deviation of a recipient's log aid activity size. These are the standard parameters of the lognormal distribution. Let *KK* be the country's Kaufmann-Kraay governance score (on which 0 is average). Then the peak (mode) of the weighting function is decreed to occur at size $2^{KK} e^{\mu_1+\sigma_1^2}$. For comparison, if the aid activities are perfectly lognormally distributed, *their* modal size is $e^{\mu_1-\sigma_1^2}$, their median at e^{μ_1}, and their average size at $e^{\mu_1+\sigma_1^2/2}$ (Aitchison and Brown 1963, p. 8). Thus for a country of average governance (*KK* = 0), the "optimal aid activity size" is $e^{\mu+\sigma_1^2}$, which is another step above the average—just as far above the average as the average is above the median, in order of magnitude terms. This choice is meant to be minimally arbitrary. Meanwhile, as a hypothetical country's KK score climbs from 0 to about standard deviation above the mean, to 1.0, the "optimal" project size exactly doubles.[14] This choice is meant to be minimally arbitrary. Finally, the width of the weighting curve, as measured by its standard deviation in log space, is set to twice that of the distribution of projects, that is, to $2\sigma_1$. A relatively broad weighting curve is meant to reflect uncertainty about the true optimal size.

To simplify the calculations somewhat, the weighting is not done project by project. Rather, the mean and standard deviation of log aid activity size of each donor-recipient pair is computed. The donor's projects are then treated as if they are perfectly lognormally distributed, thus fully characterized by these two numbers, and size-weighted aid is calculated using a general formula for the integral of the product of two lognormal curves. (See Appendix for details.)

[14] Scores on each of the 6 Kaufmann-Kraay components are standardized to have mean 0 and standard deviation 1. The composite has mean zero and standard deviation 0.93 (in 2002).

As elsewhere, there are practical complications. Bilateral donors that do not report full CRS commitments data, including Belgium, Spain, and Ireland, are assigned, recipient by recipient, the average weight for donors that do. But the multilaterals that do not provide CRS data are assigned an average size weight of 1.0 for all recipients. Figure 2 shows that most of the multilaterals that do report get size weights near 1. Given this pattern, a figure near 1 is clearly appropriate for the only major multilateral not reporting, the IMF, which disburses in large blocks. Both emergency and non-emergency aid are subject to the discount. For consistency, debt service is discounted too, but by the size weight that corresponds to the full distribution of a recipient's projects from all donors. This implicitly assumes that the opportunity cost of debt service is a set of aid activities of a size that is not necessarily typical for the donor in that country, but is typical of all donors. Note that this choice can penalize a donor that disburses aid to a country through small projects and then received comparable amounts of money in debt service. If the debt service is discounted much less than the disbursements for size, a donor's size-adjusted aid can turn negative.

The approach does penalize very large projects, especially in poorly governed countries, but because the parameter choices create a bias toward large projects and a degree of agnosticism, few large projects are actually discounted much. As a result, there is a strong positive correlation between a donor's average project size across all recipients and its average size weight in the CDI. (See Figure 2.) In sum, the approach has a well-defined and somewhat sophisticate theoretical foundation, but in practice, because of the conservative parameter choices, the upshot is essentially a straightforward discount based on each donor's average (log) project size.

Summary calculations at the donor level are in Table 7. As before, the actual calculations take place at the donor-recipient level. At that level, two size weights figure: one for the donor's own portfolio of projects in the recipient country, the other for all donors' projects in each recipient country, which is used for discounting debt service. Multilaterals such as the African and Asian Development Funds and the IDA clearly come out ahead, as they commit aid in much larger blocks than other donors in the countries they assist. Among bilaterals, Denmark stands out.

Since this is the last adjustment for quality, the final column of Table 7 is labeled "net quality-adjusted aid." This is a dollar value that embodies both quantity and quality factors. Since this is first calculated the donor-recipient level, the next step to is the process for aggregating up to the donor level.

Figure 1. Illustration of aid activity size weighting

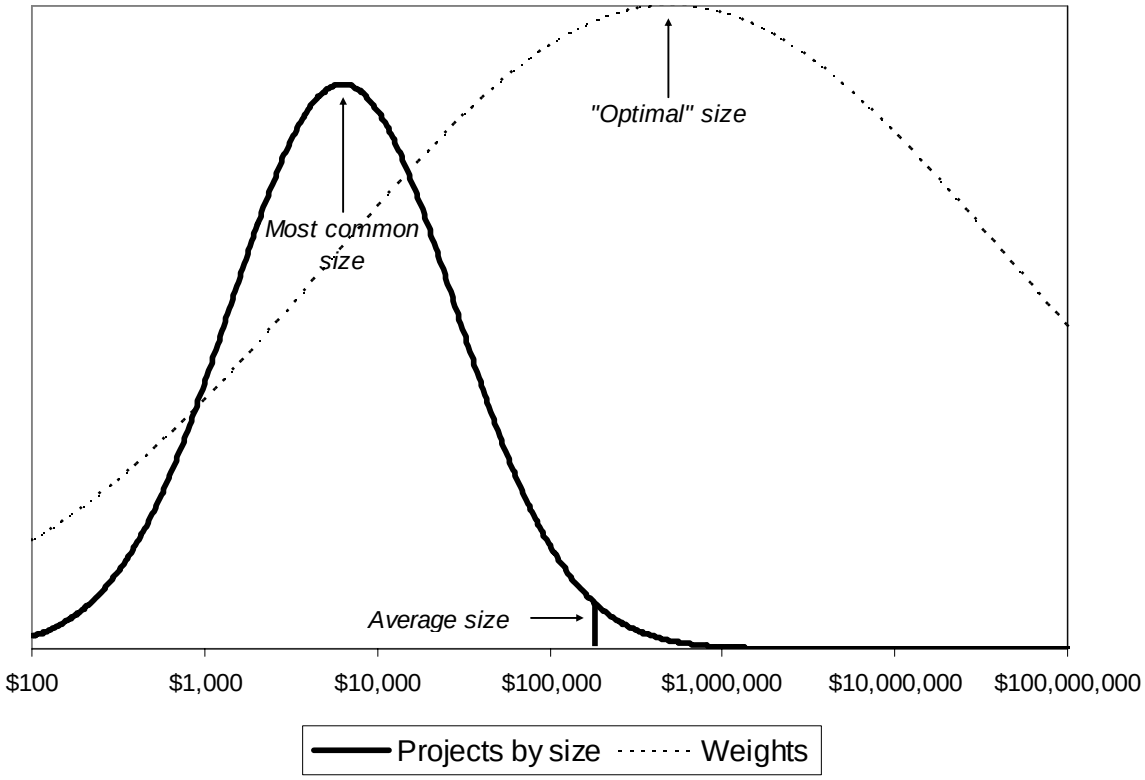

Figure 2. Average size weight in CDI versus average log aid activity commitment, 2003

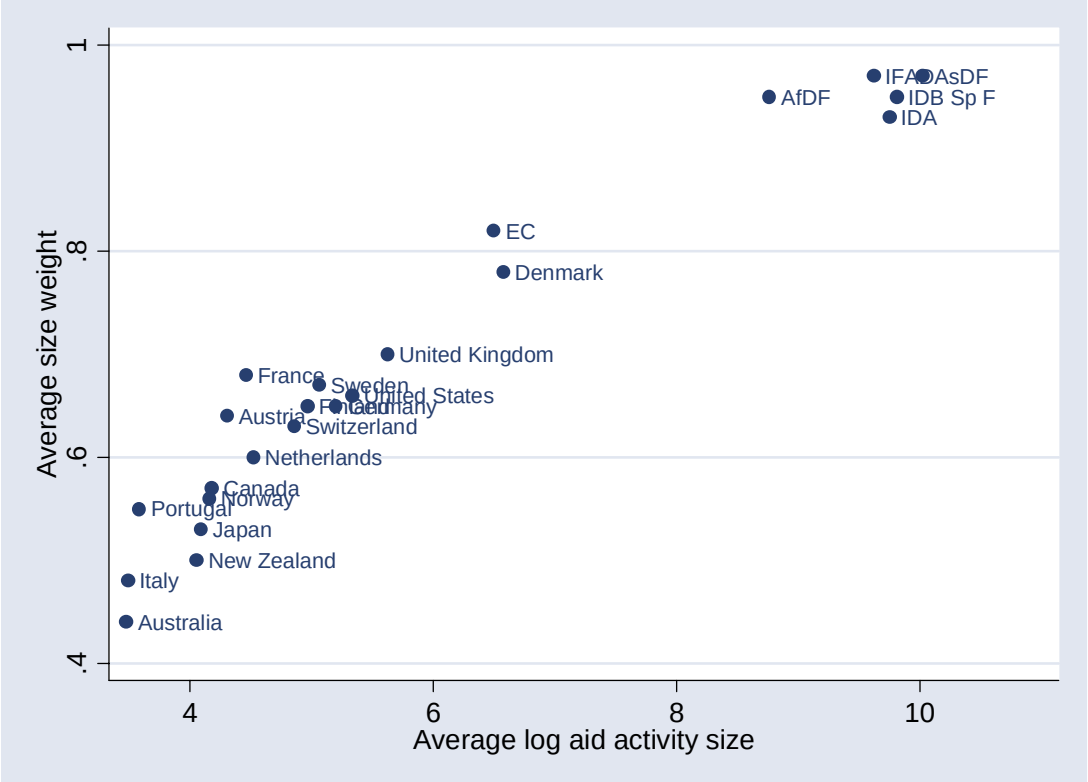

Table 7. Discounting for proliferation, 2003

Donor	A. Tying- and selectivity-discounted gross aid[1]	B. Selectivity-discounted reflows[1]	C. Size weight	D. Recipient average size weight	E. Gross quality-adjusted aid (A × C)	F. Quality-adjusted repayments (B × D)	Net quality-adjusted aid (E + F)
Arab Agencies	126	97	0.76	0.76	96	74	22
Arab Countries	2,155	127	0.71	0.71	1,520	90	1,430
Australia	549	0	0.44	0.61	241	0	241
Austria	154	18	0.64	0.70	99	13	86
Belgium	441	16	0.75	0.75	330	12	318
Canada	942	193	0.57	0.73	533	140	393
Czech Republic	41	0	0.72	0.72	29	0	29
Denmark	823	96	0.78	0.74	640	71	569
Finland	218	1	0.65	0.73	141	1	140
France	2,550	879	0.68	0.70	1,732	616	1,116
Germany	2,365	842	0.65	0.69	1,539	577	962
Greece	114	0	0.71	0.71	81	0	81
Iceland	10	0	0.77	0.77	8	0	8
Ireland	233	0	0.77	0.77	180	0	180
Italy	339	125	0.48	0.71	164	88	75
Japan	5,489	3,788	0.53	0.65	2,921	2,466	455
Korea	121	20	0.69	0.69	84	14	70
Lithuania	1	0	0.69	0.69	1	0	1
Luxembourg	96	0	0.73	0.73	70	0	70
Netherlands	1,814	89	0.60	0.73	1,089	65	1,024
New Zealand	76	0	0.50	0.64	38	0	38
Norway	1,010	4	0.56	0.75	561	3	558
Other Donors	74	0	0.70	0.70	52	0	52
Poland	18	0	0.67	0.67	12	0	12
Portugal	102	2	0.55	0.76	56	1	55
Slovak Republic	5	0	0.72	0.72	3	0	3
Spain	645	113	0.71	0.71	455	80	375
Sweden	1,150	0	0.67	0.75	768	0	768
Switzerland	626	3	0.63	0.73	395	2	393
Turkey	18	0	0.70	0.70	13	0	13
United Kingdom	2,723	103	0.70	0.75	1,912	77	1,835
United States	7,801	735	0.66	0.69	5,134	508	4,626
AfDF	415	127	0.95	0.77	392	98	295
AsDF	688	295	0.97	0.74	664	217	447
CarDB	19	14	0.60	0.60	11	8	3
EBRD	43	0	0.69	0.69	30	0	30
EC	5,325	156	0.82	0.69	4,343	108	4,235
GEF	70	0	0.66	0.66	46	0	46
IDA	4,106	1,315	0.93	0.74	3,834	973	2,862
IDB Sp F	316	231	0.95	0.77	299	178	121
IFAD	158	88	0.97	0.73	153	64	89
IMF PRGF	657	652	0.77	0.77	506	502	4
Mont. Protocol	38	0	0.57	0.57	22	0	22
Nordic Dev.Fund	39	2	0.75	0.75	30	2	28
Other UN	235	0	0.71	0.71	167	0	167
UNDP	170	0	0.75	0.75	128	0	128
UNFPA	153	0	0.75	0.75	114	0	114
UNHCR	266	0	0.76	0.76	201	0	201
UNICEF	340	0	0.75	0.75	255	0	255
UNRWA	198	0	0.65	0.65	129	0	129
UNTA	270	0	0.73	0.73	197	0	197
WFP	126	97	0.76	0.76	96	74	22
U.S.-Pakistan							

[1]From previous tables.

6. Aggregation to the donor level

In principle, this aggregation is matter of simple sums over recipients. But data problems intrude. Not all aid in the DAC database is fully disaggregated by recipient country, partly because administrative costs at headquarters are hard to allocate, partly because aid can support projects or programs intended to benefit an entire region or continent. The United States, for example, gave $2.435 billion in gross transfers in 2003 to "Least developed countries unspecified," $130 million to "Americas Unspecified," and a separate $37 million to "North and Central America Unallocated." In addition, it is impossible to assign selectivity weights to some recipients for lack of values for GDP/capita or the KK composite. These aid flows cannot be discounted for selectivity without further assumptions. Similarly, some recipients, including recipient groups like those just mentioned, have no commitments listed in the CRS database for some donors, so that no size weight can be directly computed.

Leaving out aid that cannot be directly discounted for selectivity or size would understate donors' contributions. So such aid is incorporated as follows. For each sub-continental region, as defined in the DAC database, such aid is discounted by the donor's average selectivity and size weights for aid that *can* be directly discounted. Once this discounting is done, all selectivity-discounted aid to each region is summed. This procedure repeats at the level of the continent, then the Part, then the aid recipient universe.[15]

7. Allocating multilateral quality-adjusted aid to bilaterals

Since the motivation for this exercise is to compare national governments, it is important to give bilaterals credit for their contributions to multilateral institutions. This final step in computing the index of official aid performance is done in a way that is the mirror image of the standard DAC approach.[16] In the DAC approach, each bilateral's contribution to each multilateral is imputed forward to recipient countries based on the multilateral's allocation across recipients in the same year. So if Japan gives $50 million to the Asian Development Fund in some year, and 10% of the AsDF's net ODA goes to Indonesia that year, then 10% × $50 million = $5 million is imputed as Japan-Indonesia aid. In the CDI, the process runs the other way, because it is necessary

[15] The DAC database divides Part II counties not into continents but into two major groups—former eastern bloc nations, and relatively rich non-DAC members. For the present calculations, these two groups are treated as "continents."

[16] Previous editions of this paper erroneously asserted that the two methodologies are the same.

to transmit back the information about the multilaterals' aid quality contained in their quality-adjusted aid totals. So in the aid index, bilaterals receive credit for the aid programs of multilaterals in proportion to the bilaterals' contributions to those multilaterals during the same year. For example, since France accounted for 8.60% of net contributions to the IDA during 2003, it receives credit for 8.60% of the IDA's quality-adjusted aid of $2.862 billion, or $246 million.[17] (See Table 8.)

The penultimate column of Table 8 is the final measure of official aid performance: quality-adjusted aid as a share of donor GDP. GDP figures are converted to dollars using market exchange rates, and are from World Bank (2004).[18]

Despite the quality adjustments, what most distinguishes donors from each other in this index is still the sheer quantity of aid they disburse, especially when measured as true net transfers. Denmark, the Netherlands, Norway, and Sweden are large donors by DAC's net ODA measure, and they score highest on this one too, with at least 0.29% of GDP for 2003. The two largest donors by DAC's standard net ODA measure, Japan and the United States score lowest on this index, Japan at 0.04%, the United States at 0.05%. One reason for Japan's low score is that its true net transfers are much lower than its net ODA; at $5.763 billion, they put Japan behind Germany and the United Kingdom and essentially tie it with France.

The final column of Table 8 offers a quantitative measure of aid quality: the ratio of quality-adjusted aid to net aid transfers. U.S. aid quality is low despite large projects, because of high tying and low selectivity for poverty and good governance. Japanese aid quality also registers low, in part because the tying penalty, computed as a fraction of gross aid, looms large relative to its much-smaller net aid. The leaders are the Sweden (43%), Switzerland (44%), Denmark (46%), Ireland (47%), and the United Kingdom (49%).[19]

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[17] A few small multilaterals, such as the Central American Bank for Economic Integration received contributions in 2003 but did not themselves report to DAC on their own aid allocations (examples include). This made it impossible to compute their quality-adjusted aid and allocate it back to bilaterals. To prevent contributions to these unscored multilaterals from being dropped, a simple extrapolation was performed based on each bilateral's ratio of quality-adjusted allocated back from scored multilaterals to contributions the donor made to those multilaterals.

[18] The results reported here differ slightly from those used in the 2005 CDI because of the errors noted in footnotes 7 and 10.

[19] Last year, Belgium, Greece, Ireland, and Spain were erroneously penalized because they did not report commitments data to the CRS. DAC substituted disbursements data from CRS Table 5 but did not clearly document doing so. The disbursements data tend to be much finer-grained and so created the appearance of high proliferation, reducing these countries' scores substantially.

Although the final scores are expressed as percentages of GDP, they should not be compared to other variables so expressed, such as net ODA/GDP, only to each other. The selectivity adjustment, for example, could have super-weighted aid to the most appropriate recipients rather than discounting it to less appropriate ones. This equally meaningful choice would make little difference for the relative results, but would raise scores across the board.

I back-calculate this index of official aid performance to explore time-series as well as cross-sectional variation in scores. What sets the starting point of the time frame is the availability of the Kaufmann-Kraay governance variable. It is available for even years in 1996–2003. For odd years, I use the previous year's score, except that 1995 calculations use the 1996 KK scores. This allows calculation of the index for 1995–2003. Total quality-adjusted aid/GDP of bilaterals was fairly stable over this period. The simple average is 0.19% in 1995 and 0.16% in 2003, and the correlation of 1995 and 2003 scores is 0.93.[20] (See Figure 3.)

Aid quality (quality-adjusted aid/net aid transfers) is more volatile, and appears be falling. It averages 46% in 1995 and 40% in 2003.[21] The underlying reason appears to be slow declines in selectivity for governance and increasing proliferation. This seems to contradict the finding of Dollar and Levin (2004) of increasing selectivity since 1985.

[20] These figures exclude Greece, which did not report to DAC for 1995, and may have given essentially no aid.
[21] Figures exclude Greece.

Table 8. Allocating multilateral quality-adjusted aid to bilaterals, 2003

Country	Gross aid	Net aid			Quality-adjusted aid			GDP	**Ad-justed aid/GDP**	Adjusted/ Net aid
		Bilat-eral	Multi-lateral	Total	Bi-lateral	Multi-lateral	Total			
	(million $)	----- (million $) -----			----- (million $) -----			(million $)	----- (%) -----	
Australia	1,221	970	251	1,221	241	147	388	522,378	**0.07**	32
Austria	665	268	360	628	85	166	251	253,126	**0.10**	40
Belgium	1,292	741	519	1,261	318	218	536	301,896	**0.18**	42
Canada	2,316	1,295	683	1,978	394	361	755	856,523	**0.09**	38
Denmark	2,091	1,139	803	1,941	569	322	892	211,888	**0.42**	46
Finland	642	348	292	640	140	133	273	161,876	**0.17**	43
France	7,678	3,094	2,636	5,730	1,115	1,276	2,391	1,757,613	**0.14**	42
Germany	7,895	2,796	3,520	6,316	958	1,679	2,637	2,403,160	**0.11**	42
Greece	443	249	194	443	81	84	165	172,203	**0.10**	37
Ireland	505	353	152	505	180	57	237	153,719	**0.15**	47
Italy	2,572	478	1,852	2,330	75	738	814	1,468,314	**0.06**	35
Japan	12,432	3,138	2,624	5,763	455	1,452	1,907	4,300,858	**0.04**	33
Netherlands	4,126	2,842	1,130	3,972	1,027	479	1,506	511,502	**0.29**	38
New Zealand	166	130	37	166	38	15	53	79,572	**0.07**	32
Norway	2,099	1,510	582	2,092	558	224	782	220,854	**0.35**	37
Portugal	367	176	188	364	55	86	141	147,899	**0.10**	39
Spain	2,096	1,065	810	1,875	375	364	739	838,652	**0.09**	39
Sweden	2,362	1,720	643	2,362	769	242	1,011	301,606	**0.34**	43
Switzerland	1,352	981	366	1,347	390	201	591	320,118	**0.18**	44
United Kingdom	7,069	3,857	3,047	6,904	1,835	1,562	3,397	1,794,878	**0.19**	49
United States	17,257	14,071	1,730	15,802	4,626	445	5,071	10,948,547	**0.05**	32

Figure 3. Total quality-adjusted aid/GDP by bilateral donor, 1995–2003

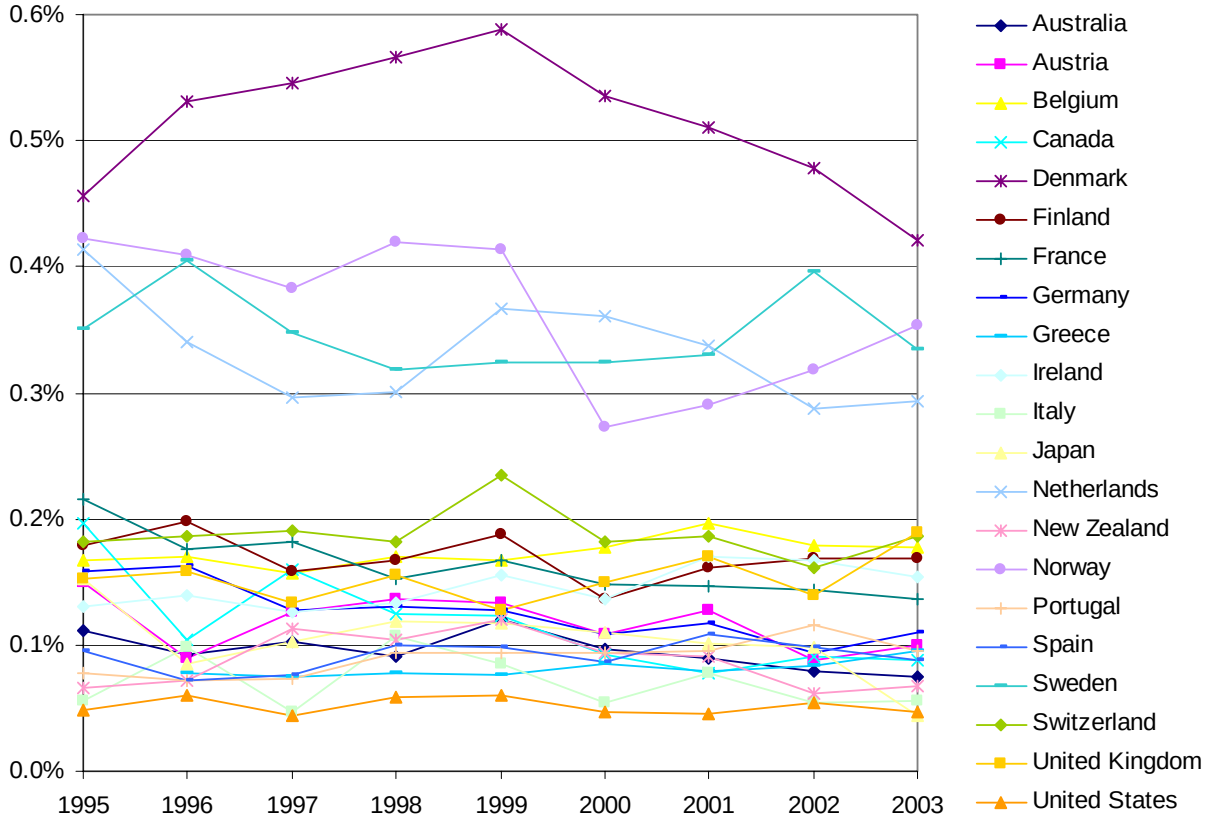
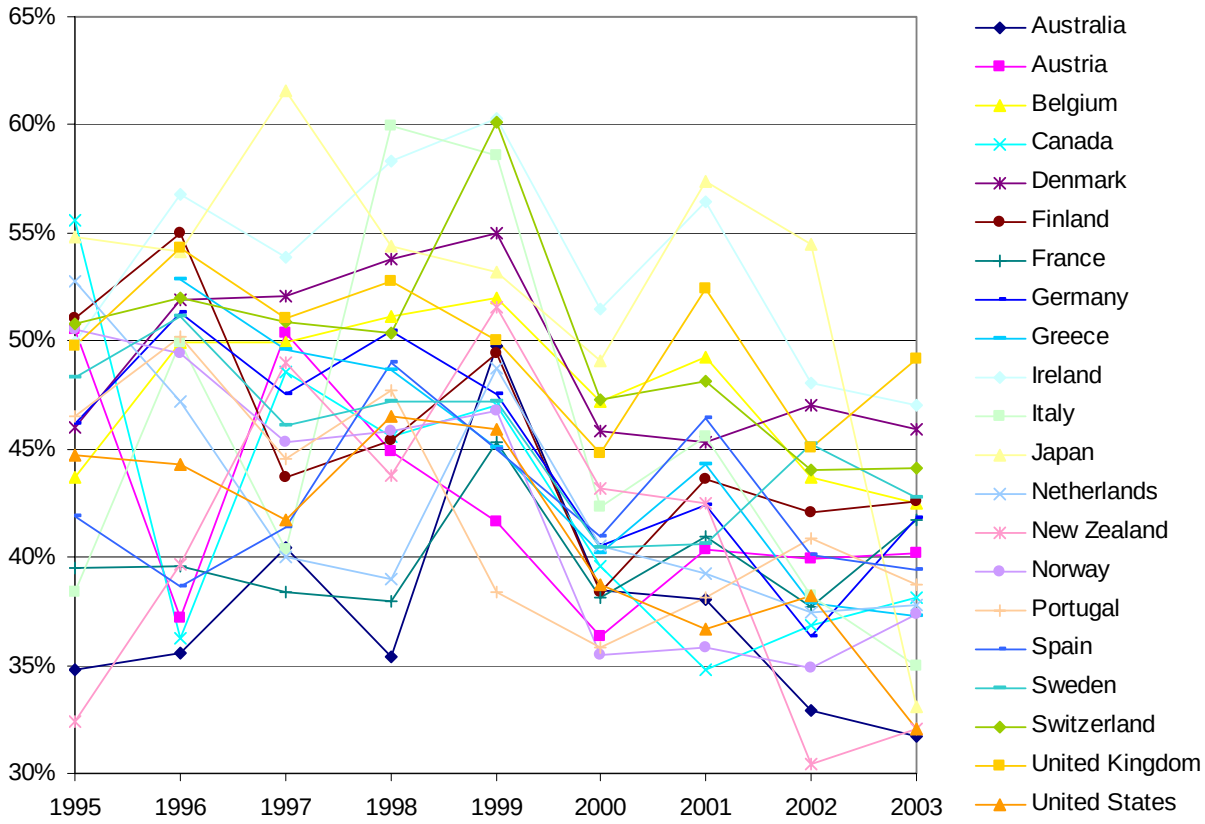


Figure 4. Total quality-adjusted aid/net aid by bilateral donor, 1995–2002



8. Rewarding tax policies that support private giving[22]

The focus thus far as been on foreign aid in the sense of public expenditure. However, private citizens also give aid to developing countries, usually via non-governmental organizations. Private giving is of course not public policy per se, but it is influenced by public policy—fiscal policy in particular. Thus the approach taken here is to estimate the proportional increase in giving caused by each country's tax policies, compare that to actual giving, then work backwards to estimate how much giving would have occurred in the absence of the policies and how much is a credit to their presence. Two aspects of fiscal policy are considered. First are targeted income tax incentives that lower the "price" of giving. Second is the total tax revenue/GDP ratio: lower taxes leave citizens and corporations with more after-tax income to give to charity.

The approach taken here will seem simplistic to some and too sophisticated to others. To make the calculations practical, we make several simplifying assumptions. Each country's tax

[22] Scott Standley contributed to this section.

policies are complex and idiosyncratic. No two households are in exactly the same financial position, and so the tax codes present different incentives to different households. And of course different people respond to the same incentives differently. On the other hand, the sophistication of the calculations, such as it is, should not be read to imply that we see our estimates as beyond improvement. The version presented here contains important refinements since last year's, based on new data in Roodman and Standley (2005).

All but three index countries—Austria, Finland, and Sweden—offer income tax incentives for charitable giving. Australia, Belgium, Denmark, Germany, Greece, Ireland, Japan, Netherlands, Norway, Switzerland, the United Kingdom, and the United States allow partial or full deduction of charitable donations from taxable income. Canada, France, Italy, New Zealand, Portugal, and Spain offer partial credits—through the tax code, they reimburse a percentage of the donation regardless of the donor's marginal tax bracket.[23] These incentives lower the price of giving in the sense that a dollar of forgone after-tax income buys more than a dollar of charity. Charitable donations can fund the operations of non-profit groups working in developing countries, such as Oxfam and CARE, or they can go to foundations that fund such projects.

We translate the presence of a tax incentive into an estimate of the increase in charitable giving in third steps. First, we express the tax measure as a price effect. For credits, this step is straightforward. Canada's 29% tax credit, for example, reduces the price of giving by 29%. For deductions, we used a crude but available proxy for the marginal income tax rate faced by the households with above-average incomes that appear to generate most charity. This proxy is the typical marginal income tax rate for workers at 167% of the income level of the average production worker, from the OECD Tax Database.[24] For example, this tax rate is 31.4% for the United States in 2003, so deductibility of charitable giving in the United States is treated as reducing the price by 31.4%. The second step is to factor in whether the deduction or credit is capped. In countries where high-income, high-giving people account for most charity in the aggregate, caps can severely limit the incentive effect in practice. Precisely how much, however, is hard to know, especially because there is little information about the distribution of giving by income group outside the United States. Given the uncertainty, we factor caps in coarsely, by taking the simple

[23] This year countries offering credits are not treated as if they offer deductions instead.
[24] Last year, the average rather than marginal tax rate was used. We favor the marginal rate now because it is the marginal incentive that matters, and because it is more representative of tax rates on the high income people that give most of the money.

average of the below- and above-threshold price incentives. For most countries with caps, the above-threshold price incentive is 0—there is no tax incentive to exceed the cap—so the price effect is halved. The one exception is Greece, which offers full deductibility up to €2950 each year, then imposes a 10% tax above that limit. Since the Greece's representative marginal income tax is 25.2%, the above-threshold price incentive is the difference between this and the special tax rate, i.e., 15.2%. So the simple average of the below- and above-threshold rates for Greece is 20.2%. (See Table 9.)

Finally, having estimated the price effect, we couple it with an estimate of the price elasticity of giving. Research puts it at around 0.5 in the United States (Andreoni 2001). Thus, if a representative individual in the United States faces a price effect of 31.4%, full deductibility of charitable contributions multiplies giving by a factor of $(1 - 0.314)^{-0.5} = 1.208$, for a 20.8% increase.

The procedure is similar for the effect of lower total taxes. When the overall tax ratio is lower individuals have more money to give to charity. Thus, while high marginal tax rates *increase* the incentive to give when we look at the price effects of tax deductions, they *decrease* the incentive to give when we look at income effects. Among the 21 scored countries, the tax revenue/GDP ratio in 2000, the last year with data available for the *first* edition of the CDI, ranged from 27.1% in Japan to 53.8% in Sweden (OECD 2004). To reward countries for lower tax ratios, we need a baseline against which to define lowness. We choose Sweden's 2000 tax ratio, the highest. We combine this with an estimate of the income of elasticity of giving of 1.1 (Andreoni 2001). The United States, to continue the example, is treated as having reduced its total tax burden in 2002, the last year with data available for the current index edition, from Sweden's 2000 ratio of 53.8% to the actual 26.4%. (Sweden's 2000 ratio is used every year for a consistent benchmark.) This hypothetically raises the privately claimed share of GDP from 46.2% to 73.6%, an increase of 59.3%.[25] As a result, the lower U.S. tax burden is estimated to multiply charity by

$$\left(\frac{1-0.264}{1-0.538}\right)^{1.1} = 1.669, \text{ for a 66.9\% increase.}$$

[25] Some share of the revenue funds transfer payments, which increase recipients' disposable income and should therefore increase charitable giving. However, the majority of transfer recipients probably account for only a small share of charitable giving, which appears to be

The two multipliers are then combined, inverted, and applied against observed giving in order to estimate giving in the absence of these favorable policies. Observed giving is "grants by NGOs" from DAC Table 1; it counts contributions by foundations and individuals, which do ordinarily go through NGOs, but excludes official aid that is channeled through NGOs. Unlike in 2004, grants by NGOs to Part 2 countries are also counted. The result is a set of estimates for the dollar increase in private giving to developing countries caused by fiscal policy. In the U.S. case, the multipliers combine to 1.208 × 1.669 = 2.015. Observed giving of $10.58 billion in 2003 happens to be 2.015 times $5.25 billion, so U.S. policy is credited for the difference, $5.33 billion. (See Table 10.)

To incorporate the results on charitable giving attributed to policy into the main quality-adjusted aid measure, it is necessary to discount the results for quality in parallel fashion. As noted above, quality-adjusted aid cannot be directly compared or added to simple aid totals. Moreover, private giving too can go to countries that are more or less appropriate for aid, and can contribute to the problems of project proliferation. As a rough adjustment in the absence of information on the quality of private aid, the CDI discounts policy-induced private giving by the simple average of the quality discounts for the bilaterals' own aid programs, relative to net aid transfers, which is 65% for 2003.

Incorporating private giving turns out to have small effects on the scores. In the case of the United States, a country often pointed to as a stingy public donor and a generous source of private charity, the result is $1.873 billion in quality-adjusted charitable giving attributed to tax policy. Added to the country's $5.161 billion in official quality-adjusted aid, this raises the final U.S. score on the aid index from 0.05% to 0.06% of GDP, leaving the country ahead of only Italy and Japan. (See Table 11.)

Table 9. Computation of price incentive of tax policy, 2003

Country	A. Tax deduction?	B. Marginal income tax rate, 2003[1] (%)	C. Tax credit (%)	D. Deduction or credit capped?	Price incentive[2] (%)
Australia	Yes	48.5	0.0	No	48.5
Austria	No	31.7	0.0	No	0.0
Belgium	Yes	45.1	0.0	No	45.1
Canada	No	39.4	29.0	No	29.0
Denmark	Yes	54.3	0.0	Yes	27.2
Finland	No	44.5	0.0	No	0.0
France	No	25.4	60.0	No	60.0
Germany	Yes	50.1	0.0	No	50.1
Greece	Yes	25.2	0.0	No	20.2
Ireland	Yes	42.0	0.0	No	42.0
Italy	No	46.6	19.0	No	19.0
Japan	Yes	20.4	0.0	No	20.4
Netherlands	Yes	52.0	0.0	No	52.0
New Zealand	No	39.0	33.3	Yes	16.7
Norway	Yes	41.5	0.0	Yes	20.7
Portugal	No	24.0	25.0	No	25.0
Spain	No	26.2	25.0	No	25.0
Sweden	No	51.2	0.0	No	0.0
Switzerland	Yes	22.9	0.0	No	22.9
United Kingdom	Yes	22.0	0.0	No	22.0
United States	Yes	31.4	0.0	No	31.4

[1]Marginal income tax rate for single individual at 167% income level of the average production worker. [2]Formula is: Column B or C as appropriate, divided by 2 if there is a cap. Uniquely, Greece gives full deductibility up to a certain amount (2950 euros) and imposes a low tax (10%) on contributions above the threshold. The tax incentive is therefore computed as the average of the below- and above-threshold incentives.

Table 10. Calculation of policy-induced charitable giving

Country	A. Marginal price effect (%)[1]	B. Increase in giving with incentive (%)	C. Tax revenue/GDP, 2002 (%)	D. Giving increase because of smaller gov't (%)	E. Combined increase	F. Grants by NGOs[2]	G. Giving in absence of favorable tax policies	Giving attributed to tax policies
	---------- (%) ----------					---------- (million $) ----------		
Formula:		(1–A)^price elasticity–1[3]		((1–C)/(1–53.8%))^ income elasticity–1[4]	(1+B)× (1+D)–1		E/(1+F)	G–F
Australia	48.5	39.3	31.5	54.2	114.9	337	157	180
Austria	0.0	0.0	44.0	23.6	23.6	83	67	16
Belgium	45.1	35.0	46.4	17.8	58.9	165	104	61
Canada	29.0	18.7	33.9	48.3	76.0	565	321	244
Denmark	27.2	17.2	48.9	11.7	30.9	18	14	4
Finland	0.0	0.0	45.9	19.0	19.0	13	11	2
France	60.0	58.1	44.0	23.6	95.4	280	143	137
Germany	50.1	41.6	36.0	43.1	102.6	1,107	546	561
Greece	20.2	11.9	35.9	43.4	60.5	7	4	3
Ireland	42.0	31.3	28.4	61.9	112.6	283	133	150
Italy	19.0	11.1	42.6	27.0	41.1	27	19	8
Japan	20.4	12.1	25.8	68.4	88.7	335	178	157
Netherlands	52.0	44.3	39.2	35.3	95.2	300	154	146
N. Zealand	16.7	9.5	34.9	45.8	59.7	18	11	7
Norway	20.7	12.3	43.5	24.8	40.2	451	322	129
Portugal	25.0	15.5	33.9	48.3	71.2	3	2	1
Spain	25.0	15.5	35.6	44.1	66.4	132	79	53
Sweden	0.0	0.0	50.2	8.6	8.6	23	21	2
Switzerland	22.9	13.9	30.3	57.2	79.0	291	163	128
U.K.	22.0	13.2	35.8	43.6	62.6	393	242	151
U.S.	31.4	20.8	26.4	66.9	101.5	10,580	5,249	5,331

[1]From previous table. [2]Data for latest available year. [3]Price elasticity of giving taken to be –0.5. [4]Income elasticity of giving taken to be 1.1.

Table 11. Incorporating private giving attributable to public policy, 2003

Country	A. Quality-adjusted official aid[1]	B. Charitable giving credited to policy[1]	C. Quality-adjusted charitable giving credited to policy (B × (1–65%))	**Adjusted (aid+charitable giving)/GDP** ((A + C)/GDP, %)
Australia	388	180	63	**0.09**
Austria	252	16	6	**0.10**
Belgium	540	61	22	**0.19**
Canada	759	244	86	**0.10**
Denmark	899	4	1	**0.42**
Finland	273	2	1	**0.17**
France	2,409	137	48	**0.14**
Germany	2,671	561	197	**0.12**
Greece	165	3	1	**0.10**
Ireland	237	150	53	**0.19**
Italy	817	8	3	**0.06**
Japan	2,050	157	55	**0.05**
Netherlands	1,496	146	51	**0.30**
New Zealand	53	7	2	**0.07**
Norway	789	129	45	**0.38**
Portugal	145	1	0	**0.10**
Spain	743	53	19	**0.09**
Sweden	1,026	2	1	**0.34**
Switzerland	603	128	45	**0.21**
United Kingdom	3,422	151	53	**0.19**
United States	5,161	5,331	1,873	**0.06**

[1]From previous tables.

Appendix. Size weighting formula

This appendix derives the formula used to compute size-weighted aid for each donor-recipient pair. It first derives a general formula for the integral of the product of two lognormal curves. In the application here, one curve represents the distribution of aid activities by size and the other the weights applied to them based on size. This appendix then shows how the parameters of the size weighting curve are mathematically determined.

Suppose we have two lognormal curves of the form:

$$h_1(x) = \frac{N_1}{\sqrt{2\pi}\sigma_1 x} e^{-\frac{1}{2}\left(\frac{\ln x - \mu_1}{\sigma_1}\right)^2}$$

$$h_2(x) = \frac{N_2}{\sqrt{2\pi}\sigma_2 x} e^{-\frac{1}{2}\left(\frac{\ln x - \mu_2}{\sigma_2}\right)^2}$$

If $u = \ln x$, then $x = e^u$, $du = dx/x$, and the total integral of the product of the two curves is

$$\int_0^\infty \frac{N_1}{\sqrt{2\pi}\sigma_1 x} e^{-\frac{1}{2}\left(\frac{\ln x - \mu_1}{\sigma_1}\right)^2} \frac{N_2}{\sqrt{2\pi}\sigma_2 x} e^{-\frac{1}{2}\left(\frac{\ln x - \mu_2}{\sigma_2}\right)^2} dx$$

$$= \frac{N_1 N_2}{2\pi\sigma_1\sigma_2} \int_{-\infty}^\infty \frac{1}{e^u} e^{-\frac{1}{2}\left(\frac{u-\mu_1}{\sigma_1}\right)^2 - \frac{1}{2}\left(\frac{u-\mu_2}{\sigma_2}\right)^2} du$$

$$= \frac{N_1 N_2}{2\pi\sigma_1\sigma_2} \int_{-\infty}^\infty \frac{1}{e^u} e^{-\frac{1}{2}\left(u^2\left(\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}\right) - 2u\left(\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}\right) + \frac{\mu_1^2}{\sigma_1^2}+\frac{\mu_2^2}{\sigma_2^2}\right)} du$$

$$= \frac{N_1 N_2}{2\pi\sigma_1\sigma_2} \int_{-\infty}^\infty e^{-\frac{1}{2}\left(u^2\left(\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}\right) - 2u\left(\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1\right) + \frac{\mu_1^2}{\sigma_1^2}+\frac{\mu_2^2}{\sigma_2^2}\right)} du.$$

This arranges the exponent as a quadratic expression in u. Completing the square in that expression gives

$$\frac{N_1 N_2}{2\pi\sigma_1\sigma_2}\int_{-\infty}^{\infty} e^{-\frac{1}{2}\left(\left(u\sqrt{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}-\frac{\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1}{\sqrt{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}}\right)^2-\frac{\left(\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1\right)^2}{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}+\frac{\mu_1^2}{\sigma_1^2}+\frac{\mu_2^2}{\sigma_2^2}\right)}du$$

$$=\frac{N_1 N_2}{2\pi\sigma_1\sigma_2}e^{-\frac{1}{2}\left(-\frac{\left(\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1\right)^2}{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}+\frac{\mu_1^2}{\sigma_1^2}+\frac{\mu_2^2}{\sigma_2^2}\right)}\int_{-\infty}^{\infty} e^{-\frac{1}{2}\left(u\sqrt{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}-\frac{\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1}{\sqrt{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}}\right)^2}du.$$

The integral has been transformed into that of a normal curve, and evaluates to

$$\frac{\sqrt{2\pi}}{\sqrt{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}}.$$

The whole expression is therefore

$$\frac{N_1 N_2}{2\pi\sigma_1\sigma_2}\frac{\sqrt{2\pi}}{\sqrt{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}}e^{-\frac{1}{2}\left(-\frac{\left(\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1\right)^2}{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}+\frac{\mu_1^2}{\sigma_1^2}+\frac{\mu_2^2}{\sigma_2^2}\right)}$$

$$=\frac{N_1 N_2}{\sqrt{2\pi}\sqrt{\sigma_1^2+\sigma_2^2}}e^{-\frac{1}{2}\left(\frac{\mu_1^2}{\sigma_1^2}+\frac{\mu_2^2}{\sigma_2^2}-\frac{\left(\frac{\mu_1}{\sigma_1^2}+\frac{\mu_2}{\sigma_2^2}-1\right)^2}{\frac{1}{\sigma_1^2}+\frac{1}{\sigma_2^2}}\right)}.$$

Letting $\eta_1 = \mu_1/\sigma_1$, $\eta_2 = \mu_2/\sigma_2$, and $\hat{\sigma} = \sqrt{\sigma_1^2+\sigma_2^2}$, this can be rewritten as

$$\int_0^{\infty} h_1(x)h_2(x)dx = \frac{N_1 N_2}{\sqrt{2\pi}\hat{\sigma}}e^{-\frac{1}{2}\left(\eta_1^2+\eta_2^2-\frac{\sigma_1^2\sigma_2^2}{\hat{\sigma}^2}\left(\frac{\eta_1}{\sigma_1}+\frac{\eta_2}{\sigma_2}-1\right)^2\right)}. \qquad (1)$$

In the present case h_1 is the distribution of aid activities by size, so N_1, the number of aid activities is known, and μ_1 and σ_1 can be estimated from the data. To fix the three parameters of h_2, the size weighting function, we impose three constraints. First, we require that the peak value of the weighting function is 1. In general, the mode of h_2 is $e^{\mu_2-\sigma_2^2}$ (Aitchison and Brown 1963), at which it takes the value

$$h_2\left(e^{\mu_2-\sigma_2^2}\right)=\frac{N_2}{\sqrt{2\pi}\sigma_2 e^{\mu_2-\sigma_2^2}}e^{-\frac{1}{2\sigma_2^2}\left(\mu_2-\sigma^2-\mu_2\right)^2}=\frac{N_2}{\sqrt{2\pi}\sigma_2 e^{\mu_2-\frac{\sigma_2^2}{2}}}.$$

This is 1 when

$$N_2=\sqrt{2\pi}\sigma_2 e^{\mu_2-\frac{\sigma_2^2}{2}}.$$

As discussed in the main text, we next require that h_2 peaks at $2^{KK}e^{\mu_1+\sigma_1^2/2}$, where *KK* is the recipient's Kaufmann-Kraay governance score. And we require that h_2 is twice as wide as h_1, that is, $\sigma_2=2\sigma_1$. Since the mode of h_2 occurs at $e^{\mu_2-\sigma_2^2}$, we have $2^{KK}e^{\mu_1+\sigma_1^2/2}=e^{\mu_2-\sigma_2^2}$. Ergo

$$\mu_2=\ln\left(2^{KK}e^{\mu_1+\sigma_1^2/2}\right)+\sigma_2^2=\mu_1+\sigma_1^2/2+KK\ln 2+4\sigma_1^2=\mu_1+9\sigma_1^2/2+KK\ln 2.$$

Having expressed N_2, μ_2, and σ_2 as functions of N_1, μ_1, σ_1, and *KK*, we can then apply (1) to estimate total size-weighted aid for a given project distribution.

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