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Health Aid and Governance in Developing Countries

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Abstract

Despite anecdotal evidence that the quality of governance in recipient countries affects the allocation of international health aid, there is no quantitative evidence on the magnitude of this effect, or on which dimensions of governance influence donor decisions. We measure health aid flows over 2001-2005 for 87 aid recipients, matching aid data with measures of different dimensions of governance and a range of country-specific economic and health characteristics. Both corruption and political rights, but not civil rights, have a significant impact on aid. The sensitivity of aid to corruption might be explained by a perception that poor institutions make health aid inefficient. However, even when we allow for variations in the level of corruption, political rights still have a significant impact on aid allocation. This suggests that health aid is sometimes used as an incentive to reward political reforms, even though (as we find) such aid is not fungibile.

Key words: aid, governance, health

JEL classification: I19; O19

1. Introduction

It is now recognized that governance in the recipient country can play a key role in determining both the volume and efficiency of international aid to finance health expenditure (Walt *et al*., 1999; Jha *et al*., 2002; Labonte and Spiegel, 2003; Godal, 2005; Cohen, 2006; Bate, 2007). Making further aid conditional on improvements in recipient governance is recommended not only for general economic aid (Collier and Dollar, 2001), but also for health aid (Périn and Attaran, 2003). While empirical evidence on the impact of governance on aid effectiveness is mixed (Burnside and Dollar, 2000; Easterly, 2003; McGillivray, 2003), many donors now work on the assumption that bad governance leads to a low return on their aid dollars, and some have put policies in place that are designed to redirect aid towards recipients with good governance. The US Millennium Challenge Account is an example of such conditionality (Nowels, 2003).

This paper addresses three issues, the first of which is the extent to which governance has actually affected the distribution of health aid in the recent past. Despite the large amount of anecdotal evidence that governance has been important in determining the volume of health aid flows, there has been no attempt to quantify the size of the effect. Moreover, economic theory indicates that deterioration in governance is only sometimes a reason for a rational donor to reduce aid flows (Kemp and Long, 2007), and existing quantitative evidence on the impact of governance on total aid flows is mixed (Alesina and Weder, 2002; Aubut, 2004).

The second issue relates to the relative importance of different dimensions of governance in influencing the size of a country's aid receipts. There are now several indices measuring the quality of a recipient country's public sector institutions. For example, Kaufmann *et al*. (2007) provide three such indices, including a 'control of corruption' index measuring the extent to which public power is exercised for private gain or has been captured by elites and private interests, as well as two broader indicators of institutional quality. However, institutional quality is not the only dimension of governance. Kaufmann *et al*. also

report an index of political rights, 'voice and accountability', which measures the breadth of participation in selecting a government and freedom of expression and association. In addition, they report an index of civil rights, 'rule of law', measuring the quality and fairness of contract and law enforcement. These two indices are similar to (and correlated with) the political and civil rights indices published by Freedom House since 1973.[1] This paper makes use of these data sources to estimate the relative importance of different dimensions of governance in determining aid flows.

A donor has two possible motives for making aid conditional on institutional quality. Firstly, poor institutions (and possibly weak civil rights) make effective healthcare difficult and costly to deliver, so there is a utilitarian case for directing health aid to recipients with strong institutions. Secondly, as in the Millennium Challenge Account, the allocation of health aid can be used as an incentive for institutional reform, even if the reform does not directly improve the efficiency of healthcare expenditure. Either motive could explain an observed correlation between aid allocation and institutional quality. In contrast, political rights are less likely to have a direct impact on aid effectiveness, although they may have an indirect impact if they lead to better public sector institutions. Existing evidence suggests that the effects of democracy on economic efficiency are indirect (Doucouliagos and Ulubasoglu, 2006). Therefore, conditional on a certain level of institutional quality, a correlation between aid allocation and political rights is more likely to arise from the second motive.

The third issue to be addressed relates to the fungibility of health aid. If aid in general is fungible, then the fraction of aid that donors apportion to the health budget is of little material consequence, however it is determined. If an increase in health aid leads to a reduction in health expenditure by the recipient government (and a corresponding increase in expenditure in

[1] See the Freedom House *Freedom in the World Historical Rankings 1973-2006* at www.freedomhouse.org/uploads/fiw/FIWAllScores.xls.

other areas) then it makes more sense to model total aid expenditure, rather than health aid alone. Existing evidence on aid fungibility is mixed (Feyzioglu *et al*., 1998).

We address these three issues with two pieces of statistical analysis. The first, which uses country-level cross-sectional data, is designed to identify factors that explain the allocation of health aid across developing countries over the first five years of the new millennium. We allow for the fact that a large proportion of the cross-country variation in aid can be explained by differences in economic or epidemiological need, or differences in the size of initial aid budgets. Conditional on these factors, we measure the extent to which different dimensions of governance impact on the volume of health aid receipts. The second piece of statistical analysis, which uses panel data, is designed to quantify the response of recipient governments to changes in the level of health aid over time. We will see that in general health aid exhibits little fungibility: on average, an increase in health aid does not lead to any change in the amount of domestic resources devoted to health expenditure. The volume of health aid is therefore important in its own right, independently of other parts of the aid budget, and the allocation of health aid has direct consequences for total health expenditure in individual countries.

2. Cross Country Variation in Health Aid and its Determinants

2.1 Data

Our main source of data, which reports annual health aid flows to individual developing countries, is the World Health Organisation National Health Accounts database (www.who.int/nha/en), which covers the period 1996-2005. We select data from the 87 countries in which health aid made up at least 1% of total annual health financing on average over the first half of this period (1996-2000), and for which reliable data on the correlates of aid are also available. The National Health Accounts record the value of annual *per capita* health aid flows to each country in US dollars; these are deflated using the international dollar

deflator in the World Bank *World Development Indicators*, with 2000 as the base year. Average flows to each country for 1996-2000 and 2001-2005 are then calculated; the 2001-2005 figures are recorded in Table 1. The table indicates considerable variation in *per capita* health aid among developing countries: the extreme cases are represented by Micronesia ($84.53) and India ($0.20). The dependent variable in our statistical analysis is the log of average *per capita* aid flows over 2001-2005. The log of average aid flows over 1996-2000 will be one of our explanatory variables, capturing the degree of persistence in health aid.[2]

The explanatory variables in our analysis measure reported characteristics of the recipient in the initial period, 1996-2000. These are characteristics that may have had an impact on donor decisions about health aid over the subsequent five years. There are two sets of explanatory variables, one capturing the degree of economic or epidemiological need in each recipient country, the other capturing different dimensions of governance. The "need" variables are as follows.

1. *Initial GDP per capita*. This is measured as the log of average annual GDP *per capita* over 1996-2000 in deflated international dollars, using National Health Accounts data on population and GDP, and the *World Development Indicators* deflator. If donors base health aid allocation decisions on recipient income, then aid should be decreasing in initial GDP *per capita*.
2. *The size of the initial total health budget, including domestic financing*. This is measured as the log of the average ratio of total health financing to GDP over 1996-2000, measured using National Health Accounts data. If donors compensate for

[2] Although our regression analysis reveals some degree of persistence in aid flows, it is clear that the annual health flow data are stationary. Application of the panel unit root test of Im *et al*. (2002) to the log of annual deflated aid flows produces a t-bar statistic of -2.63. In a sample of our dimensions, this indicates that the null of a unit root can be rejected at the 1% level, and that the data are indeed stationary. However, it is not possible to fit a model of aid allocation to annual panel data, because some of the correlates of aid are not reported on an annual basis.

unusually small levels of health spending in recipient countries by increasing the aid budget, then aid should be decreasing in initial total health spending.

3. *Initial infant mortality growth*. This variable is constructed using *World Development Indicators* five-yearly infant mortality data. Mortality rates for 1995 are 2000 are used to calculate the rate of growth of the ratio of infants dying in their first year to infants surviving. If donors are sensitive to the health status of recipient countries, then aid should be increasing in initial infant mortality growth.
4. *Initial growth in TB prevalence*. This variable is constructed as the average of annual growth rates over 1996-2000, the annual growth rates being constructed using the TB incidence and prevalence data in the World Health Organisation Core Health Indicators database (www.who.int/whosis/database/core/core_select.cfm). TB prevalence is an alternative indicator of the health status of recipient countries. Some donors may take into account other indicators of need, for example, other morbidity data. However, other indicators are not reported for a very wide range of countries. In any case, any additional health variables are likely to be highly correlated with the two measures we are using.

The governance variables are as follows.

1. *Initial institutional quality*. This is measured as the average value of the biennial 'control of corruption' scores for 1996, 1998 and 2000 reported in Kaufmann *et al*. (2007). A higher value indicates better quality public sector institutions, which may persuade donors to increase health aid. Other, broader measures of institutional quality are reported in Kaufmann *et al*. We do not report the regression equations incorporating these alternative measures, but do discuss them briefly in the results section below.
2. *Initial political rights*. We report two sets of results with two alternatives measures of political rights. The first is average value of the biennial 'voice and accountability' scores for 1996, 1998 and 2000 reported in Kaufmann *et al*. (2007). The second is the

average of annual values of the Freedom House political rights index for 1996-2000. In our dataset, the scores are scaled so that a higher value indicates a higher level of rights.

3. *Initial civil rights*. This is measured as the average value of the biennial 'rule of law' scores for 1996, 1998 and 2000 reported in Kaufmann *et al*. (2007). One alternative measure is the Freedom House civil rights index. We do not report the regression equations incorporating this alternative measure, but do discuss them briefly in the results section below.

Table 2 provides some descriptive statistics for the variables in our model: means, standard deviations and bivariate correlations with the dependent variable. There is substantial variation in all of them. None of the individual bivariate correlations with aid *per capita* is that large, but all variables except initial *per capita* GDP and the initial health budget have the expected sign. One possible explanation for the positive unconditional correlation of these two variables with aid is that they are also correlated with quality of governance, which might have a positive impact on aid. Figure 1 illustrates a further descriptive characteristic relating to the degree of persistence in aid flows, that is, the unconditional correlation between initial aid *per capita* and its rate of growth between the two five-year periods. The negative correlation in the figure indicates that there has been some tendency for *per capita* aid flows to converge over time. It remains to be seen whether there are nevertheless differences in steady-state aid flows related to individual recipient characteristics.

2.2. Modelling the cross-country variation in health aid

Table 3 reports the result of least squares regression analysis designed to account for the variation in the health aid data in Table 1. Two versions of the regression equation are reported, with the two alternative measures of political rights: 'voice and accountability' and the Freedom House political rights index. The other regressors are the initial values of health aid *per capita*, GDP *per capita*, the total national health budget, infant mortality growth, TB

growth, 'rule of law' and 'control of corruption'. The Jarque-Bera and RESET tests reported in Table 2 indicate that the regression equations have normally distributed residuals and an appropriate functional form. The table reports heteroskedasticity robust t-ratios.

Further results concerning the robustness of our regression equations are included in Appendix 1. These show that there is no significant change in our results if the regression equations allow for systematic regional variation in health aid, or for differences in colonial affiliations. Another possible concern is that micro-states often tend to receive an unusually high level of aid *per capita*. However, Appendix 2 shows that there is no significant change in our results if the countries with populations of less than 150,000 (St Kitts; the Marshall Islands; Dominica; the Seychelles; Kiribati; Micronesia) are excluded from our sample.

2.2.1 Results regarding persistence

Table 2 indicates that there is a substantial degree of persistence in aid flows, with a significantly positive regression coefficient on initial log aid *per capita*. If there is a change in one of the other recipient characteristics, such as infant mortality, aid levels will adjust only slowly in response. The estimated coefficient on initial aid is close to 0.75, implying that on average only about 25% of the ultimate change in aid will be delivered in the first five years.

2.2.2 Indicators of need and health aid

Table 2 shows that health aid does vary systematically with the degree of deprivation in individual countries. There is a significant negative coefficient on initial log *per capita* GDP. The coefficient implies that a 1% reduction in *per capita* GDP can be expected to increase health aid by approximately a quarter of one percentage point over the next five years. In our sample, the standard deviation of initial log *per capita* GDP is 1.05, so a one standard deviation reduction in this variable can be expected to increase health aid by about 25 percentage points. There are also significant positive coefficients on initial infant mortality growth and initial TB growth. A percentage point increase in infant mortality growth can be expected to increase

health aid by approximately 1.8 percentage points over the next five years; the effect of a percentage point increase in TB growth is slightly less than half as large. These figures should be interpreted in the light of the standard deviation of these two variables, which are 14% and 22% respectively.

There is no significant coefficient on the size of the recipient's total initial health budget. Conditional on other recipient characteristics, donors do not attempt to fill the gap created by an unusually low level of domestic healthcare expenditure.

2.2.3 Governance and health aid

The results in Table 2 incorporate measures of three different dimensions of governance, as captured by 'voice and accountability' (or the Freedom House political rights index), 'rule of law' and 'control of corruption'. There are significant positive correlations across these three dimensions, as illustrated in Figures 2-3. However, the correlations are far from perfect: a substantial number of countries perform well in one dimension but not in another. Some relatively authoritarian countries have a low level of corruption, for example the mountain kingdom of Bhutan, and some democracies suffer high corruption levels, for example the Marshall Islands, blacklisted by G7 countries for persistent money-laundering. The correlations across the different dimensions of governance mean that the standard errors on the regression coefficients on these variables may be slightly inflated. However, the correlations are low enough for the variables to capture empirically distinct recipient characteristics.

The two regression equations show that both measures of political rights – 'voice and accountability' and the Freedom House index – are significant determinants of health aid. The correlation between the two alternative measures is quite high (r = 0.94), but they are drawn from separate and distinct sources, providing robust evidence that a poor political rights record will slow down the flow of health aid. A one standard deviation increase in 'voice and accountability' (s.d. = 0.82) should raise health aid by 26 percentage points over the next five

years; the corresponding estimate using the Freedom House political rights index (s.d. = 2.00) is 23 percentage points. By contrast, civil rights have no significant impact on aid flows: the 'rule of law' coefficient is statistically insignificant and close to zero. This result is unaltered if 'rule of law' is replaced by the Freedom House civil rights index.

Finally, 'control of corruption' is a significant determinant of health aid: aid is significantly lower in more corrupt countries. A one standard deviation improvement in the corruption measure (s.d. = 0.48) should raise health aid by approximately 21 percentage points over the next five years. However if 'control of corruption' is replaced by one of the broader measures of institutional quality from Kaufmann *et al*. then the resulting regression coefficient is statistically insignificant. It is corruption in particular rather than weak institutions in general that influences the flow of aid.

3. The Response of Domestic Health Spending to Health Aid

If health aid is fully fungible, then the results of the previous section are of limited interest. Domestic expenditure on health and other items will depend only on the total aid budget; changes in the proportion of the aid budget allocated to health can be exactly offset by changes in domestic financing, and therefore need have no impact on total health spending in the recipient country.

In order to explore the degree of health aid fungibility, we use the annual data in the National Health Accounts database to create a panel data set for 1996-2005 comprising the 109 countries in the database in which health aid over the sample period makes up at least 1% of total health spending. (This sample includes all 87 countries in Table 1.) The variables in this data set are as follows.

1. $(A/Y)_{i,t}$ The ratio of health aid to GDP in country i in year t.
2. $(D/Y)_{i,t}$ The ratio of domestic expenditure on health (excluding aid-funded expenditure) to GDP in country i in year t.

3. $Y_{i,t}$ *Per capita* GDP in country *i* in year *t*, measured in US dollars and deflated using the international dollar deflator in *World Development Indicators*.

Using these data, it is possible to explore some of the links between domestic health financing and health aid by fitting a model of the form

$$\log(D/Y)_{i,t} = \alpha_i + \beta_i \cdot \log(D/Y)_{i,t} + \phi_i \cdot \log(Y)_{i,t-1} + \theta_i \cdot \log(A/Y)_{i,t-1} + u_{i,t} \quad (1)$$

in which the residual $u_{i,t} \sim N(0, \sigma_i^2)$. The model parameters are estimated by least squares. Our modelling approach is similar to that of Nair-Reichert and Weinhold (2001), except that we do not assume the residual variance to be constant across countries (a restriction which can be rejected at the 1% level on our data). Of particular interest is the set of coefficients $\{\theta_i\}$. If on average $\theta_i < 0$ then an increase in health aid typically is typically followed by a reduction in domestic health financing, that is, there is some fungibility in health aid. On the other hand, if there is typically some complimentarily between aid-financed projects and domestically financed projects then it is possible that on average $\theta_i > 0$.

Having fitted equation (1) to the data, we test two hypotheses about $\{\theta_i\}$, in effect two types of Granger-causality test within a panel context. Firstly, we perform a test for the joint significance of the elements of $\{\theta_i\}$. This is a Wald test based on the difference between the residual sum on squares in equation (1) and the residual sum of squares in the equation

$$\log(D/Y)_{i,t} = \alpha_i^* + \beta_i^* \cdot \log(D/Y)_{i,t} + \phi_i^* \cdot \log(Y)_{i,t-1} + u_{i,t}^* \quad (2)$$

where $u_{i,t} \sim N(0, \sigma_i^{*2})$. The significance level of this difference is estimated using a bootstrap. We construct 1,000 samples of simulated values of $\log(D/Y)_{i,t}$ using the parameters of equation (2) and 1,000 alternative sets of errors drawn from a Normal distribution with variance σ_i^{*2}. Equations (1-2) are then fitted to each sample; the frequency with which the simulated difference in the residual sum of squares exceeds the actual difference indicates the

significance level of the actual difference. Secondly, we compute the mean value of the θ_i in equation (1) and then test whether this value is significantly different from zero, again using a bootstrap with equation (2) as the null.

Table 4 reports some of our results: the mean values of the α, β, ϕ and θ parameters in equation (1), their mean absolute value, the R^2 of the regression and the significance level of the two tests. There is some marginal evidence for the joint significance of the θ parameters (p = 0.08): health aid may have some impact on domestic health expenditure. However, the mean value of the θ parameters is only -0.003, and insignificantly different from zero; that is, domestic health expenditure in a particular country is just as likely to rise in response to extra health aid as it is to fall. The mean absolute value of the θ parameters is 0.15, so the elasticity (positive or negative) is typically quite small. The mean absolute values of the other parameters are all much larger than the corresponding simple means, indicating substantial cross-country heterogeneity in the evolution of domestic health spending.

Overall, our results indicate that although health aid may be somewhat fungibile in some countries, an increase in aid is just as likely to promote an increase in domestic health expenditure as it is to promote a reduction. In most countries, the size of these effects is quite small, and one extra dollar of health aid is likely to correspond to more or less one extra dollar of total health expenditure. Therefore, the cross-country allocation of health aid – as opposed to aid in general – is likely to have a substantial impact on health outcomes.

4. Conclusion

A substantial proportion of the variation in health aid across countries can be explained by observable country characteristics. Understanding this variation is important, because health aid has low fungibility and its allocation therefore has a direct impact on total health expenditure in developing countries. Among the significant determinants of health aid are initial *per capita* GDP, initial infant mortality growth and initial growth in TB prevalence.

Consequently, part of the variation in health aid can be explained by variations in relative deprivation across countries.

Conditional on these factors, variations in governance also help to explain differences in aid flows. Part of the reason for an association between poor governance and declining aid flows may be that poor governance impairs the quality of donor-recipient negotiations and the efficiency of healthcare expenditure. This could explain the dependence of aid flows on the 'control of corruption' index. However, for a given level of corruption, variations in political rights also affect aid flows. This is more likely to arise from a desire by donors to use health aid to reward political reform, rather than basing aid allocations solely on a country's need for aid or its ability to spend aid efficiently.

Channelling health aid to countries with a good record of political reform may be an effective incentive to others to engage in similar reform. However, such a policy comes at a cost, at least in the short to medium term, since many of the countries with the worst health outcomes are also the least democratic, even if some of them are relatively incorrupt. The policy therefore has the potential to increase global inequalities in health outcomes.

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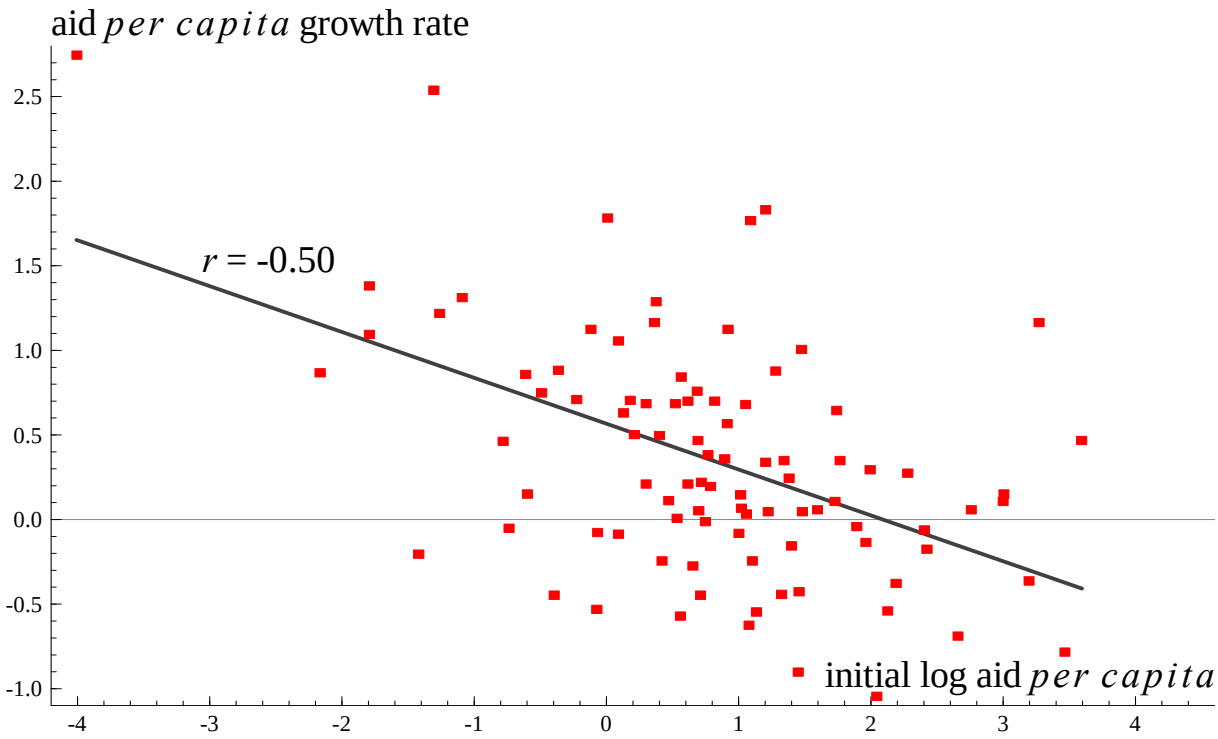

Figure 1. *Per Capita* Aid Growth According to Initial *Per Capita* Aid Levels

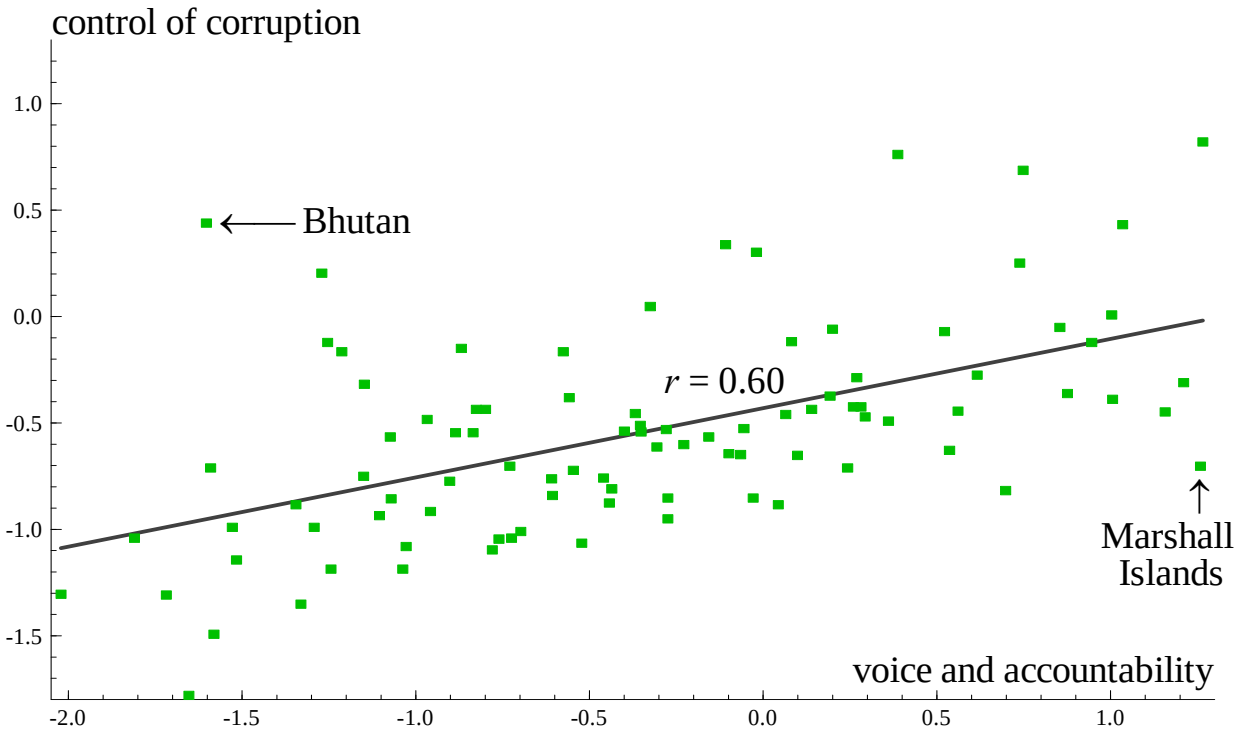

Figure 2. Control of Corruption Index According to Voice and Accountability

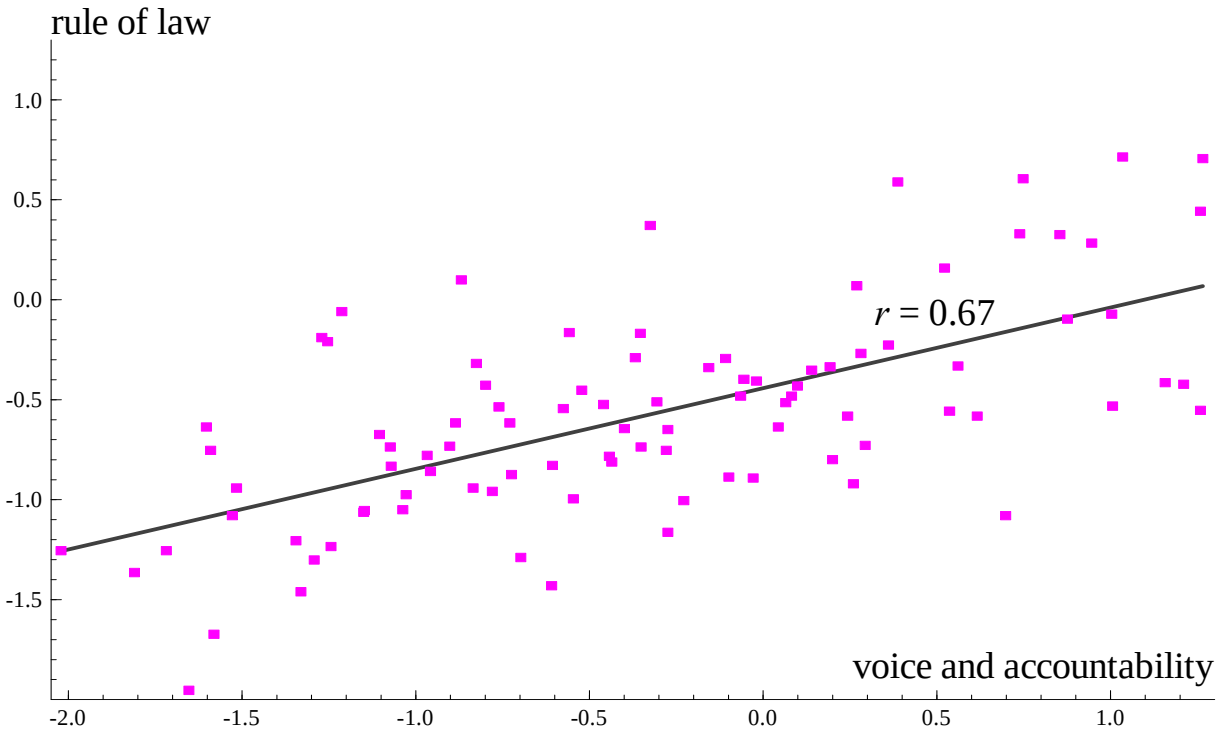

Figure 3. Rule of Law Index According to Voice and Accountability

Table 1. Average *Per Capita* Health Aid in International Dollars (2001-2005)

Albania	3.56	El Salvador	2.80	Lesotho	3.42	Romania	3.50
Armenia	5.65	Equatorial Guinea	6.21	Macedonia	2.41	St. Kitts & Nevis	16.92
Bangladesh	1.78	Eritrea	4.57	Madagascar	3.16	Samoa	12.89
Belize	8.32	Ethiopia	1.29	Malawi	8.65	Senegal	3.74
Benin	2.45	Fiji	7.74	Maldives	2.72	Seychelles	22.24
Bhutan	3.46	Gambia	4.39	Mali	2.74	Sierra Leone	2.13
Bolivia	4.70	Ghana	5.28	Marshall Islands	58.22	Solomon Islands	17.36
Bosnia-Herzegovina	2.12	Guatemala	2.51	Mauritania	2.41	Sudan	0.95
Burkina Faso	4.08	Guinea	1.72	Mauritius	2.67	Suriname	14.56
Cambodia	5.07	Guinea-Bissau	2.30	Micronesia	84.53	Swaziland	9.83
Cameroon	1.66	Guyana	4.23	Moldova	1.63	Tajikistan	1.24
Cape Verde Islands	11.97	Haiti	4.87	Mongolia	2.98	Tanzania	1.29
Central African Rep.	4.59	Honduras	5.20	Mozambique	5.44	Togo	7.18
Chad	3.20	India	0.20	Namibia	20.82	Trinidad & Tobago	0.45
Comoros Islands	1.73	Indonesia	0.43	Nepal	2.10	Turkmenistan	4.62
Costa Rica	2.98	Jordan	10.93	Nicaragua	6.27	Uganda	2.55
Côte d'Ivoire	1.30	Kazakhstan	0.87	Niger	1.46	Uzbekistan	0.73
Djibouti	16.72	Kenya	3.19	Nigeria	1.20	Vanuatu	10.44
Dominica	6.14	Kiribati	23.44	Papua New Guinea	6.36	Vietnam	0.64
Dominican Republic	2.37	Kyrgyzstan	2.04	Paraguay	1.57	Yemen	3.34
Ecuador	0.99	Lao Republic	1.80	Peru	2.67	Zimbabwe	3.17
Egypt	0.55	Lebanon	9.47	Philippines	1.00		

Table 2. Descriptive Statistics

	mean	*s.d.*	*correlation with log aid per capita*
log aid *per capita*	1.244	1.054	
initial log GDP *per capita*	6.617	0.985	0.370
initial total health budget	-2.973	0.337	0.424
initial infant mortality growth	-0.122	0.128	0.131
initial TB growth	-0.473	0.216	0.226
initial voice & accountability	-0.327	0.797	0.528
initial FH political rights	3.883	1.982	0.463
initial rule of law	-0.585	0.504	0.276
initial control of corruption	-0.536	0.471	0.321

Table 3. Determinants of Log *Per Capita* Health Aid

	coefficient	*t- ratio*	*p-value*	*coefficient*	*t- ratio*	*p-value*
intercept	2.860	4.560	0.000	3.207	5.250	0.000
initial log aid *per capita*	0.771	8.880	0.000	0.783	8.970	0.000
initial log GDP *per capita*	-0.240	-3.760	0.000	-0.225	-3.410	0.001
initial total health budget	-0.018	-0.123	0.902	0.015	0.099	0.921
initial infant mortality growth	1.819	4.070	0.000	1.878	3.940	0.000
initial TB growth	0.731	2.530	0.013	0.694	2.260	0.026
initial voice & accountability	0.318	3.460	0.001			
initial FH political rights				0.115	3.790	0.000
initial rule of law	-0.115	-0.577	0.565	-0.096	-0.472	0.638
initial control of corruption	0.416	2.160	0.034	0.452	2.210	0.030
R^2		0.805			0.806	
σ		0.489			0.489	
Schwartz Bayesian Criterion		-1.081			-1.082	
Jarque-Bera test p-value		0.434			0.216	
RESET test p-value		0.529			0.526	

Table 4. Panel Regression Results

$$\log(D/Y)_{i,t} = \alpha_i + \beta_i \cdot \log(D/Y)_{i,t} + \phi_i \cdot \log(Y)_{i,t\text{-}1} + \theta_i \cdot \log(A/Y)_{i,t\text{-}1} + u_{i,t}$$

	mean value of the coefficients	*mean absolute value of the coefficients*
α_i	-2.289	4.319
β_i	0.255	0.471
ϕ_i	0.017	0.502
θ_i	-0.003	0.148
R^2	0.58	
joint significance of $\{\theta_i\}$	p = 0.08	
significance of mean θ_i	p = 0.45	

Appendix 1

The following table reproduces the regression equations in Table 3 of the text, with the addition of dummy variables to capture different regions (Africa and the Americas versus Eurasia) and different colonial affiliations (ex British and French colonies versus others). The addition of these variables causes no significant change in any of coefficients on the regressors appearing in Table 3.

Table A1. Determinants of Log *Per Capita* Health Aid

	coeff.	*t-ratio*	*p-value*	*coeff.*	*t ratio*	*p-value*
intercept	2.429	4.160	0.000	2.893	5.240	0.000
initial log aid *per capita*	0.758	8.890	0.000	0.765	8.660	0.000
initial log GDP *per capita*	-0.159	-2.330	0.022	-0.132	-1.840	0.069
initial total health budget	0.014	0.093	0.926	0.058	0.382	0.703
initial infant mortality growth	1.415	2.830	0.006	1.503	2.870	0.005
initial TB growth	0.845	3.090	0.003	0.850	2.970	0.004
initial voice & accountability	0.407	4.450	0.000			
initial political rights				0.154	4.490	0.000
initial rule of law	-0.234	-1.020	0.310	-0.218	-0.906	0.368
initial control of corruption	0.397	2.210	0.030	0.457	2.440	0.017
Africa country dummy	0.139	1.230	0.223	0.105	0.909	0.366
Americas country dummy	-0.417	-2.860	0.005	-0.459	-2.850	0.006
British colony dummy	0.008	0.050	0.960	0.009	0.053	0.958
French colony dummy	-0.096	-0.916	0.363	0.003	0.021	0.984
R^2		0.829			0.827	
σ		0.470			0.473	
Schwartz Bayesian Criterion		-1.003			-0.991	
Jarque-Bera test p-value		0.248			0.682	
RESET test p-value		0.215			0.269	

Appendix 2

The following table reproduces the regression equations in Table 3 of the text, but excluding countries with a population of less than 150,000 from the sample. These exclusions cause no significant change in any of coefficients on the regressors appearing in Table 3.

Table A2. Determinants of Log *Per Capita* Health Aid

	coeff.	*t-ratio*	*p-value*	*coeff.*	*t ratio*	*p-value*
intercept	2.763	3.770	0.000	3.006	4.070	0.000
initial log aid *per capita*	0.729	8.470	0.000	0.734	8.460	0.000
initial log GDP *per capita*	-0.271	-4.000	0.000	-0.256	-3.690	0.000
initial total health budget	-0.159	-0.914	0.364	-0.147	-0.830	0.409
initial infant mortality growth	1.691	4.030	0.000	1.738	3.950	0.000
initial TB growth	0.944	3.340	0.001	0.924	3.200	0.002
initial voice & accountability	0.265	2.860	0.006			
initial political rights				0.098	3.260	0.002
initial rule of law	-0.015	-0.076	0.939	-0.007	-0.037	0.971
initial control of corruption	0.395	2.160	0.034	0.431	2.260	0.027
R^2		0.467			0.766	
σ		0.763			0.464	
Schwartz Bayesian Criterion		-1.153			-1.166	
Jarque-Bera test p-value		0.448			0.274	
RESET test p-value		0.521			0.460	