# The Determinants of Aid in the Post-Cold War Era

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**Abstract**

This paper estimates the responsiveness of aid to recipient countries' economic and physical needs, civil/political rights, and government effectiveness. We look exclusively at the post-Cold War era and use fixed effects to control for the political, strategic, and other considerations of donors. We find that aid and per capita income have been negatively related, while aid has been positively related to infant mortality, rights, and government effectiveness.

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## I. Introduction

This paper estimates the extent to which aid, or official development assistance, is related to measures of recipient-countries' physical and economic needs, human rights, and government effectiveness. We examine the post-Cold War era, which thus far has not been the focus of substantial research, although there are fairly obvious reasons to believe that the differences in the geopolitics between the pre- and post-Cold War eras amount to a structural difference in terms of aid allocation.

There are many reasons why we should be interested in the determinants of aid levels. First, because aid is an important means by which donor countries and agencies try to alleviate poverty, we should care about whether aid is being directed towards those most in need of it. Similarly, we should also be interested in whether aid tends to go more towards where it might be most effective, as measured by the effectiveness of the recipient government in making use of the aid or in fostering economic growth.[1]

Early studies of aid allocation tend to apply some version of the McKinlay and Little (1979) dichotomy—recipient needs versus donor interests—to models of aid allocation. As laid out by Maizels and Nissanke (1984), in the recipient-needs model, "aid is given to compensate for the shortfalls in domestic resources," whereas in the donor-interests model, aid serves donors' "political/security, investment, and trade interests." Maizels and Nissanke found that multilateral aid tended to follow the

[1] See Boone (1996) and Kosack (2003) for discussions of the links between institutions and aid effectiveness. Also, in Burnside and Dollar (2000 and 2004) the impact of aid on growth depends on the quality of recipient-state institutions and policies; although Easterly *et al* (2004) and Rajan and Subramanian (2005) found little or no evidence of this.

recipient-needs model, while bilateral aid tended to follow the donor-interests model, although there were elements of each model in both types of aid.[2]

Subsequent research has added two other categories—human rights and recipient-country institutions—to the McKinlay and Little dichotomy, although not all papers deal with all four categories simultaneously.[3] For example, Wall (1995) found that countries with lower per capita incomes tended to receive higher levels of aid per capita, although aid was not related to infant mortality or to civil/political rights. On the other hand, Trumbull and Wall (1994) found that, when recipient-country fixed effects are included to control for donor interests, aid levels respond to changes in infant mortality and rights, but not to changes in per capita income.

Alesina and Dollar (2000) included a variety of variables, such as trade openness, colonial history, and friendliness at the UN, to capture the effects of donor interests. They concluded that, although aid is related to per capita income and democracy (but not to civil rights), it is as much directed by political and strategic considerations. A pair of recent studies focus on the institutions of the recipient countries: Alesina and Weder (2002) found that corrupt governments do not tend to receive less aid than clean governments, and Dollar and Levin (2004) found that, over time, aid has become directed more towards countries with sound institutions and policies, although there were differences across bilateral donors and multilateral agencies.

In a series of papers, Eric Neumayer provided a detailed analysis of the relationship between aid and human rights.[4] In Neumayer (2003a), UN agencies were found to respond to economic and possibly human-development needs, but not

[2] See also Dowling and Hiemenz (1985).
[3] Neumayer (2003b) provided an excellent survey of the literature.
[4] See also Neumayer (2003d).

necessarily to political freedom and corruption. There is some evidence in Neumayer (2003b) that high levels of rights or improvements in rights mean higher bilateral aid, but Neumayer concluded that the role of rights is limited and did not increase after the end of the Cold War. Finally, Neumayer (2003c) found that although respect for rights tends to play a role at the selection stage, there is significant inconsistency in the application of rights to the determination of the levels of bilateral aid.

This paper focuses on three of the four categories of aid determinants—recipient needs, human rights, and recipient-government effectiveness—while following Trumbull and Wall (1994) in using fixed effects to control for the fourth category, the strategic and political interests of donor countries. The advantage of this approach is that, because we do not have to choose strategic/political variables explicitly, we avoid the problems that can arise if there are excluded variables that determine both the level of aid and one or more of our other explanatory variables. This means that we do not run the risk of heterogeneity bias because of omitted time-invariant factors related to history, geography, culture, etc. If these factors, which are primarily the sort of factors that are used to measure donor interests, are not completely specified and they are correlated with aid and one or more of the included explanatory variables, then heterogeneity bias is the result. The relative shortness of our sample provides comfort that fixed effects provide a useful control for donor interests.

While our fixed-effects approach follows Trumbull and Wall (1994), there are two main differences between our analysis and theirs. The first and more obvious difference is that we are able to look at a more recent time period, so our results should be more relevant for understanding the present situation. Second, because we use a

quadratic rather than a log-linear functional form, we are able to provide a richer analysis of the functional relationship between aid and the variables of interest.

## II. Empirical Model and Data

Our dependent variable, $Aid_{it}$, is real net official development assistance from all sources for country *i* in year *t*. Data are taken from the World Bank and are denominated in constant 2000 $US. We estimate the following reduced-form regression, in which *i* denotes the recipient country and *t* denotes time:

$$\begin{aligned} Aid_{it} = {} & \alpha_0 + \alpha_i + \gamma_t + \beta_1 GDPpercapita_{it} + \beta_2 GDPpercapita_{it}^2 \\ & + \delta_1 InfantMortality_{it} + \delta_2 InfantMortality_{it}^2 \\ & + \lambda Civil/PoliticalRights \\ & + \omega GovernmentEffectiveness \\ & + \theta_1 Population_{it} + \theta_2 Population_{it}^2 + \varepsilon_{it}. \end{aligned}$$

The intercept includes a component, $\alpha_0$, that is common to all recipient countries, and a recipient-country fixed effect, $\alpha_i$, that is specific to each recipient country but fixed over the sample period. We also include a period effect, $\gamma_t$, that is common to all countries in the sample but varies over time. Our two recipient-needs variables are real GDP per capita and infant mortality, both of which are from the World Bank.[5] We think it is important to include both of these variables because each captures a different element of recipient need: Per capita income captures economic need while infant mortality represents physical need. While clearly correlated in the long run, economic and physical needs do not necessarily move in the same direction over shorter periods of time, and aid is clearly meant to respond to both.

[5] Per capita GDP is converted into $US using purchasing-power-parity exchange rates.

For our rights variable, we use the sum of the civil liberties and political rights indices produced by Freedom House. For each category, the Freedom House index scores countries from 1 to 7, with 1 being the most free and 7 being the most restrictive. For the regression here, we have reversed the order, so that the level of rights increases with the index. Our measure of recipient-government effectiveness is from the World Bank's Governance Indicators (see Kaufmann *et al* 2006), which scores governments between −2.5 and 2.5 on the basis of the "competence of their bureaucracy and the quality of public service delivery." Finally, we include recipient-country population to capture differences in recipient-country size. The quadratic specification enables us to consider the extent of population bias, by which the per capita aid allocation falls with country size: a concave relationship between the level of aid and population is consistent with a population bias.

**Table 1 about here**

We have three years of data, 1995, 2000, and 2003. After eliminating observations for which data are incomplete and countries for which there are fewer than two useful observations, we are left with 135 recipient countries and 395 observations. The sample statistics for all variables are provided in Table 1 and the country averages of the variables are provided in the data appendix.

**Figure 1 about here**

The distribution of average aid to countries in our sample is illustrated by Figure 1. The mean country in our sample received $357 million per year in aid, although the median country, Yemen, received only $226 million, indicating that aid was skewed toward a few countries. Specifically, there were 13 countries that received more than $1 billion in aid per year, the top five of which were China, Poland, Congo, Indonesia, and Russia. At the other extreme, four countries in our sample—Singapore, the Bahamas, St. Kitts, and Kuwait—averaged less than $10 million in aid receipts per year.

**Figure 2 about here**

Figure 2 provides a different angle on the distribution of aid across countries by showing the shares of total aid received. The three countries receiving the most aid—China, Poland, and Congo—alone accounted for 13 percent of the total. These countries plus the 10 countries that received between $900 million and $1800 million per year accounted for a larger share of aid (40 percent) than did the 102 countries that received less than $450 million per year.

To get a clear picture of how aid is distributed, we need to control for the sizes of the recipient countries, so Figure 3 plots the within-country averages of our explanatory variables against per capita aid. These plots serve to illustrate the simple correlations between the dependent and independent variables as well as the distribution of the values of our independent variables.

**Figure 3 about here**

Note that the vast majority of our recipient countries had average per capita incomes around or below $10,000, although there were nine countries with average incomes above $15,000: Israel and Singapore were the richest of these countries, followed by Kuwait, Malta, Slovenia, Bahrain, Seychelles, the Bahamas, and the Czech Republic. There was a general tendency for relatively poor countries to receive more aid per capita, but some countries' receipts were well in excess of the sample average. For example, eight countries—Tonga, Cape Verde, Dominica, Vanuatu, Samoa, St. Vincent, St. Lucia, and Seychelles—saw average per capita aid that was more than two standard deviations above the mean. At the other extreme, six countries—Nigeria, China, Brazil, Kuwait, India, and Saudi Arabia—received less than $2 per capita.

From the second panel in Figure 3, it is clear that the eight countries listed above as having the highest per capita aid allocation also tended to have relatively low rates of infant mortality. Also note from this panel that there was a negative correlation between average per capita aid and infant mortality, and that the three countries with the highest average infant mortality rates—Sierra Leone, Niger, and Angola—received only about the average level of aid per capita.

As the third panel of Figure 3 shows, our civil/political rights variable was pretty evenly distributed across the countries in our sample, and there was a general positive correlation between per capita aid allocation and rights. In fact, of the eight countries listed above as receiving the most aid per person, only two—Tonga and Seychelles—had civil/political rights scores below 12. Glancing at the fourth panel, there was no apparent correlation between aid per capita and the effectiveness of recipient-country governments.

Also, the governments were clustered below the mediocre score of +1, with Singapore as the lone really effective government. Still, there is significant variation among countries, with many scoring worse than -1. Finally, consistent with the notion of population bias, the fifth panel illustrates the tendency for the smallest (largest) countries to receive the highest (lowest) levels of aid per capita.

**III. Empirical Results**

While the distributions and correlations discussed above are suggestive, they are, of course, inadequate for addressing whether aid is responsive to needs, rights, government effectiveness, and/or donor interests. Instead we need to control for all four categories of variables simultaneously, as in our regression equation above, to determine the influence of each category individually on aid.

We first estimate the model under the restriction that fixed effects, which we use to control for donor interests and other omitted factors, do not matter ($\alpha_i = 0 \; \forall i$), and then without these restrictions. So that we can control for recipient-specific heteroskedasticity, we estimate both models with Feasible Generalized Least Squares. Table 2 provides the regression results for both models, while Table 3 provides the Wald tests for the joint significance of those explanatory variables with quadratic specifications. For each estimation, we have produced a set of figures (Figures 4 and 5) to illustrate the shapes of the estimated relationships between aid and the five explanatory variables. Table 4 reports for the two models the effect on aid of one-standard-deviation increases in each of the five explanatory variables for the average country.

**Table 2 about here**

**Table 3 about here**

*A. Model without Fixed Effects*

In the estimation without fixed effects, the effects of all of our explanatory variables except for the civil/political rights variable are statistically different from zero. This is according to the *t*-statistics for the coefficients on the variables with linear specifications, and according to the Wald tests in Table 3 for the variables with quadratic specifications. Thus, according to this model, the level of aid is responsive to recipient needs (as measured by per capita income and by infant mortality), the effectiveness of recipient-country governments, and population, but not to civil/political rights.

**Figure 4 about here**

For the nature of these relationships, refer to Figure 4, which illustrates the U-shapes of the relationships between aid and both needs variables; i.e., from high levels of need (low income and high infant mortality) an increase in need brings an increase in aid. On the other hand, at low levels of need, an increase in need brings a decrease in aid. This rather peculiar result is not much of a concern when looking at per capita income, however, because there are very few countries with incomes on the upward sloping portion of the relationship. As reported in Table 4, a one-standard-deviation increase in per capita GDP (about $4,500) from the average (about $5,000) means a decrease in aid

of $90 million. The U-shape of the relationship for infant mortality is more troubling because the majority of countries have infant mortality levels that would place them on the downward-sloping portion of the relationship (see Figure 3). For example, for a country with the sample average rate of infant mortality (about 52), a one-standard-deviation increase in infant mortality (about 40) means a *decrease* in aid of $19 million.

**Table 4 about here**

The two other statistically significant explanatory variables are worth noting. First, in this model, aid is fairly responsive to government effectiveness: The difference between the least-effective government and the most-effective government is close to $550 million. Put another way, a one-standard-deviation increase from the average level of government effectiveness (-0.30) to the still-mediocre level of 0.37 means a $75 million increase in aid. And, finally, the hill shape of the relationship between aid and population confirms the oft-observed population bias, i.e., per capita aid falls with population. In fact, the bias is strong enough that for countries with populations above around 700 million (just India and China) an increase in population means a decrease in the level of aid, not just per capita aid.

*B. Model with Fixed Effects*

When we do not impose the restrictions that the fixed effects are all zero (i.e., the intercepts are the same for all recipients), we find that all five explanatory variables are statistically significant in explaining levels of aid. Further, a likelihood-ratio test easily rejects the null hypothesis that the fixed effects are all zero, meaning that this is the

statistically preferred model. Because there are no theory-based reasons to impose these restrictions, it is also the preferred model in terms of theory. The rejection of these restrictions on the fixed effects has important implications for our interpretation of the relationships between aid and the explanatory variables, and highlights the importance of controlling for donor interests.

**Figure 5 about here**

Comparing Figures 4 and 5, for which axes in corresponding figures have the same scale, it is clear that the estimated relationships between aid and each of the variables differ importantly between the two models. Even though per capita income, infant mortality, government effectiveness, and population are statistically significant in both, the actual responsive of aid differs between models.

The relationship between aid and per capita GDP has the same U-shape as in the previous model, with the upward sloping portion where there are very few recipient countries. In this model, however, aid is more responsive to per capita income: A one-standard-deviation increase in per capita GDP means a $135 million decrease in aid for the average country, which is 50 percent higher than with the previous model (see Table 4).

The relationship between aid and infant mortality differs a great deal between the two models. Recall that in the first model, the relationship was U-shaped and most countries' levels of infant mortality put them on the downward sloping portion of the curve. But in the preferred model, the relationship is hill-shaped and is upward-sloping

for all but a handful of countries. For the average country, a one-standard-deviation increase in infant mortality means a $27 million increase in aid. One might expect that the relationship between aid and infant mortality, if positive, would be convex rather than concave as we have found. One reason for the concavity is that, while higher levels of infant mortality indicate greater need, they might also indicate health-care systems that are less effective at making use of any money that they receive. If so, donors might then be allocating more of their limited aid budgets to countries with better health-care systems, where each dollar of aid might have a larger impact on well-being. At the extreme, for those countries with the very highest levels of infant mortality and least effective health-care systems, this concavity might make the relationship between aid and infant mortality a negative one.

An increase in the civil/political rights variable means an increase in aid according to the preferred model, in contrast with the no-fixed-effects model, for which it was statistically insignificant. A one-standard-deviation increase in civil/political rights means an increase in aid of $29 million. Recipient-government effectiveness matters in both models, although it matters somewhat less in the model with fixed effects. A one-standard-deviation increase in government effectiveness means a $54 million increase in aid, which is $21 million less than from the first model. Finally, because the estimated relationship between aid and population is concave, we find a population bias, which is somewhat larger than in the first model. Per capita aid falls more than twice as fast in this model, and the peak of the relationship is at a lower population level.

## IV. Conclusions

In this paper, we have estimated the responsiveness of total aid in the post-Cold War era to the needs, civil/political rights, and government effectiveness of recipient countries. To do so, we used the approach espoused in Trumbull and Wall (1994) to use fixed effects to control for donor interests. We have found that aid in this era generally responded negatively to per capita GDP and positively to infant mortality, rights, and government effectiveness. This is in contrast with much of the existing literature, which, while tending to find a positive link between aid and per capita income, has been decidedly more mixed in terms of the other variables.


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## Data Appendix. Country Averages

| Country | Real Aid per Capita ($) | Real Aid ($mils.) | Real GDP per Capita ($thous.) | Infant Mortality | Civil/ political Rights | Gov't Effective-ness | Popula-tion |
|---|---|---|---|---|---|---|---|
| Albania | 88.9 | 280.0 | 3.6 | 23.0 | 8.7 | -0.49 | 3.2 |
| Algeria | 8.3 | 247.9 | 5.4 | 38.3 | 4.7 | -0.69 | 30.1 |
| Angola | 33.8 | 410.6 | 1.9 | 154.0 | 4.3 | -1.33 | 12.3 |
| Argentina | 3.1 | 111.8 | 11.5 | 18.7 | 12.0 | 0.11 | 36.5 |
| Armenia | 72.3 | 228.7 | 2.6 | 35.7 | 8.0 | -0.52 | 3.2 |
| Azerbaijan | 22.7 | 182.9 | 2.6 | 77.3 | 4.7 | -0.96 | 8.0 |
| Bahamas, The | 17.9 | 5.2 | 15.8 | 17.0 | 13.5 | 0.96 | 0.3 |
| Bahrain | 71.9 | 46.0 | 16.2 | 13.0 | 4.3 | 0.66 | 0.7 |
| Bangladesh | 10.1 | 1297.0 | 1.5 | 58.3 | 8.7 | -0.59 | 129.7 |
| Belarus | 10.3 | 104.0 | 4.7 | 14.0 | 4.7 | -1.04 | 10.0 |
| Belize | 64.4 | 15.4 | 5.6 | 34.3 | 13.7 | -0.20 | 0.2 |
| Benin | 45.1 | 273.5 | 1.0 | 96.0 | 12.0 | -0.12 | 6.1 |
| Bolivia | 87.0 | 711.1 | 2.4 | 60.7 | 10.7 | -0.47 | 8.2 |
| Botswana | 33.4 | 52.3 | 7.2 | 68.7 | 12.0 | 0.73 | 1.6 |
| Brazil | 1.8 | 299.5 | 7.2 | 36.3 | 10.3 | -0.14 | 168.7 |
| Bulgaria | 34.4 | 275.4 | 6.4 | 13.3 | 12.0 | -0.22 | 8.1 |
| Burkina Faso | 39.5 | 431.8 | 1.0 | 108.0 | 7.7 | -0.49 | 11.1 |
| Burundi | 31.3 | 205.6 | 0.6 | 114.0 | 4.3 | -1.20 | 6.7 |
| Cambodia | 40.3 | 494.0 | 1.8 | 93.3 | 4.3 | -0.57 | 12.4 |
| Cameroon | 37.7 | 565.6 | 1.8 | 94.0 | 3.7 | -0.70 | 14.9 |
| Cape Verde | 279.6 | 119.1 | 4.7 | 31.0 | 13.3 | 0.04 | 0.4 |
| Central African Republic | 29.0 | 101.9 | 1.1 | 115.0 | 7.3 | -1.15 | 3.7 |
| Chad | 27.3 | 206.9 | 1.0 | 117.0 | 5.0 | -0.64 | 7.7 |
| Chile | 6.6 | 97.2 | 9.0 | 10.3 | 12.7 | 1.27 | 15.1 |
| China | 1.8 | 2252.6 | 3.8 | 33.0 | 2.7 | 0.19 | 1252.0 |
| Colombia | 8.7 | 376.8 | 6.4 | 20.7 | 8.0 | -0.18 | 41.8 |
| Comoros | 54.8 | 29.1 | 1.7 | 63.0 | 7.0 | -1.04 | 0.6 |
| Congo, Dem. Rep. | 34.7 | 1826.4 | 0.8 | 129.0 | 7.0 | -1.38 | 48.7 |
| Congo, Rep. | 24.5 | 78.5 | 1.0 | 81.0 | 3.3 | -1.79 | 3.4 |
| Costa Rica | 6.9 | 25.2 | 8.4 | 10.7 | 13.0 | 0.46 | 3.7 |
| Cote d'Ivoire | 43.8 | 635.7 | 1.5 | 114.0 | 5.0 | -0.65 | 15.5 |
| Croatia | 17.7 | 79.4 | 9.3 | 7.7 | 10.3 | 0.09 | 4.5 |
| Czech Republic | 27.5 | 282.4 | 15.5 | 5.0 | 13.0 | 0.72 | 10.3 |
| Djibouti | 136.1 | 86.3 | 2.1 | 103.3 | 6.0 | -1.00 | 0.7 |
| Dominica | 243.9 | 17.6 | 5.3 | 14.3 | 14.0 | -0.45 | 0.1 |
| Dominican Republic | 10.6 | 85.9 | 6.0 | 34.7 | 10.7 | -0.28 | 8.3 |
| Ecuador | 15.4 | 186.6 | 3.4 | 28.3 | 10.3 | -0.86 | 12.3 |
| Egypt, Arab Rep. | 23.6 | 1454.0 | 3.4 | 43.0 | 4.3 | -0.10 | 63.2 |
| El Salvador | 37.9 | 228.0 | 4.6 | 34.7 | 10.7 | -0.28 | 6.1 |
| Equatorial Guinea | 68.7 | 28.9 | 1.5 | 108.0 | 2.0 | -1.89 | 0.4 |
| Eritrea | 51.5 | 209.4 | 1.0 | 56.0 | 4.3 | -0.50 | 4.0 |
| Estonia | 49.9 | 69.0 | 9.6 | 10.3 | 12.7 | 0.84 | 1.4 |
| Ethiopia | 16.2 | 1024.4 | 0.7 | 117.0 | 6.3 | -0.63 | 63.1 |
| Fiji | 52.3 | 42.0 | 5.1 | 18.3 | 8.3 | -0.20 | 0.8 |
| Gabon | 75.2 | 84.0 | 6.3 | 60.0 | 7.0 | -0.79 | 1.2 |

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|---|---|---|---|---|---|---|---|
| Gambia, The | 40.9 | 52.1 | 1.7 | 92.7 | 5.0 | -0.20 | 1.3 |
| Georgia | 42.2 | 201.5 | 2.0 | 41.0 | 7.7 | -0.62 | 4.8 |
| Ghana | 37.5 | 721.2 | 1.9 | 63.3 | 10.3 | -0.02 | 19.3 |
| Grenada | 129.6 | 13.1 | 6.9 | 21.7 | 13.0 | -0.07 | 0.1 |
| Guatemala | 21.7 | 241.6 | 3.8 | 41.0 | 8.0 | -0.60 | 11.2 |
| Guinea | 39.2 | 276.7 | 1.9 | 115.0 | 5.0 | -0.71 | 7.3 |
| Guinea-Bissau | 86.4 | 115.4 | 0.8 | 133.7 | 7.3 | -1.21 | 1.3 |
| Guyana | 124.5 | 94.2 | 3.9 | 56.0 | 12.0 | -0.23 | 0.8 |
| Haiti | 52.8 | 395.1 | 1.7 | 82.7 | 5.0 | -1.54 | 7.9 |
| Honduras | 66.9 | 419.3 | 2.5 | 34.0 | 10.0 | -0.71 | 6.4 |
| Hungary | 24.2 | 243.4 | 13.9 | 8.5 | 13.0 | 0.76 | 10.1 |
| India | 1.4 | 1421.4 | 2.4 | 68.3 | 10.0 | -0.09 | 1004.2 |
| Indonesia | 7.7 | 1573.4 | 3.1 | 37.3 | 7.0 | -0.23 | 204.6 |
| Iran, Islamic Rep. | 2.5 | 154.5 | 5.8 | 37.3 | 3.7 | -0.34 | 63.0 |
| Israel | 85.0 | 526.7 | 22.3 | 6.0 | 12.0 | 1.12 | 6.2 |
| Jamaica | 17.5 | 43.7 | 3.6 | 17.0 | 11.3 | -0.19 | 2.6 |
| Jordan | 157.5 | 768.3 | 4.0 | 25.7 | 7.3 | 0.30 | 4.8 |
| Kazakhstan | 11.3 | 171.3 | 4.8 | 61.0 | 5.0 | -0.70 | 15.3 |
| Kenya | 20.4 | 588.6 | 1.0 | 76.3 | 6.0 | -0.70 | 29.6 |
| Kuwait | 1.7 | 3.5 | 17.1 | 9.7 | 6.7 | 0.29 | 2.1 |
| Kyrgyz Republic | 49.3 | 236.9 | 1.5 | 60.7 | 6.0 | -0.61 | 4.9 |
| Lao PDR | 58.2 | 299.7 | 1.5 | 92.3 | 3.0 | -0.52 | 5.2 |
| Latvia | 37.4 | 89.1 | 7.9 | 13.0 | 12.7 | 0.35 | 2.4 |
| Lebanon | 48.3 | 206.2 | 4.3 | 28.3 | 5.0 | -0.25 | 4.3 |
| Lesotho | 45.7 | 78.3 | 2.1 | 74.7 | 9.0 | -0.05 | 1.7 |
| Lithuania | 61.2 | 215.0 | 8.9 | 10.0 | 13.0 | 0.37 | 3.5 |
| Macedonia, FYR | 91.8 | 186.0 | 5.8 | 15.0 | 9.3 | -0.33 | 2.0 |
| Madagascar | 25.2 | 386.3 | 0.8 | 85.7 | 10.0 | -0.46 | 15.2 |
| Malawi | 45.8 | 463.0 | 0.6 | 120.7 | 10.0 | -0.69 | 10.2 |
| Malaysia | 3.9 | 88.9 | 8.5 | 8.7 | 6.7 | 0.91 | 22.9 |
| Mali | 45.7 | 482.0 | 0.8 | 125.7 | 11.3 | -0.70 | 10.7 |
| Malta | 35.0 | 13.6 | 16.7 | 7.0 | 14.0 | 1.08 | 0.4 |
| Mauritania | 89.8 | 230.5 | 1.7 | 86.7 | 4.7 | 0.02 | 2.6 |
| Mauritius | 19.9 | 22.9 | 8.7 | 18.5 | 13.0 | 0.75 | 1.2 |
| Mexico | 2.8 | 257.8 | 8.2 | 26.5 | 10.0 | -0.01 | 96.7 |
| Moldova | 23.7 | 101.4 | 1.4 | 27.3 | 9.0 | -0.73 | 4.3 |
| Mongolia | 95.1 | 226.6 | 1.6 | 61.0 | 11.3 | -0.15 | 2.4 |
| Morocco | 17.1 | 483.6 | 3.5 | 42.7 | 6.3 | -0.01 | 28.4 |
| Mozambique | 58.2 | 1002.7 | 0.9 | 113.3 | 9.0 | -0.47 | 17.4 |
| Namibia | 91.9 | 166.3 | 5.8 | 51.0 | 11.0 | 0.37 | 1.9 |
| Nepal | 19.3 | 433.4 | 1.3 | 71.3 | 8.3 | -0.56 | 22.7 |
| Nicaragua | 138.2 | 685.9 | 3.1 | 35.0 | 9.3 | -0.65 | 5.0 |
| Niger | 29.7 | 312.4 | 0.8 | 163.0 | 8.0 | -0.90 | 10.5 |
| Nigeria | 1.9 | 238.3 | 0.9 | 106.7 | 6.0 | -1.11 | 124.9 |
| Oman | 21.7 | 50.5 | 12.5 | 12.3 | 4.7 | 0.86 | 2.4 |
| Pakistan | 6.4 | 868.9 | 1.9 | 81.7 | 6.0 | -0.50 | 136.3 |
| Panama | 10.6 | 29.5 | 6.0 | 20.3 | 12.3 | -0.21 | 2.8 |
| Papua New Guinea | 60.2 | 295.6 | 2.5 | 70.3 | 10.3 | -0.66 | 5.1 |
| Paraguay | 18.8 | 93.7 | 4.7 | 26.3 | 9.3 | -1.04 | 5.2 |
| Peru | 16.6 | 426.2 | 4.8 | 34.7 | 9.3 | -0.32 | 25.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Philippines | 10.2 | 752.6 | 3.9 | 31.0 | 10.7 | 0.04 | 75.5 |
| Poland | 57.4 | 2212.6 | 9.9 | 9.3 | 13.0 | 0.52 | 38.5 |
| Romania | 19.9 | 441.8 | 6.5 | 19.3 | 11.0 | -0.46 | 22.3 |
| Russian Federation | 10.3 | 1500.2 | 7.3 | 17.3 | 7.0 | -0.47 | 145.7 |
| Rwanda | 71.0 | 465.9 | 1.1 | 120.0 | 3.7 | -0.67 | 7.3 |
| Samoa | 206.6 | 35.2 | 4.8 | 21.3 | 12.0 | 0.13 | 0.2 |
| Saudi Arabia | 1.1 | 23.5 | 12.7 | 24.3 | 2.0 | -0.04 | 20.5 |
| Senegal | 57.7 | 523.7 | 1.5 | 80.7 | 9.0 | -0.09 | 9.4 |
| Seychelles | 172.2 | 13.7 | 15.9 | 13.3 | 10.0 | -0.59 | 0.1 |
| Sierra Leone | 46.2 | 229.1 | 0.6 | 168.0 | 6.3 | -1.01 | 5.0 |
| Singapore | 2.7 | 9.6 | 21.5 | 3.5 | 6.0 | 2.47 | 3.8 |
| Slovak Republic | 23.0 | 123.6 | 11.1 | 8.7 | 12.3 | 0.37 | 5.4 |
| Slovenia | 30.2 | 60.1 | 16.3 | 5.0 | 13.3 | 0.79 | 2.0 |
| Solomon Islands | 143.1 | 59.1 | 2.0 | 21.7 | 10.3 | -1.15 | 0.4 |
| South Africa | 11.6 | 500.1 | 9.6 | 49.3 | 13.0 | 0.48 | 43.0 |
| Sri Lanka | 27.6 | 504.6 | 3.3 | 16.7 | 8.7 | -0.25 | 18.3 |
| St. Kitts and Nevis | 96.2 | 4.1 | 10.4 | 23.0 | 13.0 | -0.06 | 0.0 |
| St. Lucia | 172.6 | 25.8 | 5.5 | 17.0 | 13.0 | 0.21 | 0.2 |
| St. Vincent & the Grenadines | 192.0 | 21.3 | 5.3 | 20.7 | 13.0 | -0.09 | 0.1 |
| Sudan | 11.3 | 358.5 | 1.7 | 65.7 | 2.0 | -1.39 | 31.0 |
| Swaziland | 35.3 | 34.0 | 4.4 | 93.7 | 4.7 | -0.50 | 1.0 |
| Syrian Arab Republic | 15.3 | 233.3 | 3.3 | 20.3 | 2.0 | -0.64 | 15.9 |
| Tajikistan | 17.9 | 110.6 | 0.9 | 81.7 | 3.7 | -1.32 | 6.1 |
| Tanzania | 35.5 | 1183.9 | 0.5 | 103.7 | 7.7 | -0.63 | 33.1 |
| Thailand | 13.5 | 805.0 | 6.4 | 27.0 | 10.0 | 0.33 | 59.7 |
| Togo | 26.0 | 107.0 | 1.6 | 80.3 | 5.3 | -1.10 | 4.4 |
| Tonga | 292.9 | 29.0 | 6.2 | 17.3 | 8.0 | -0.42 | 0.1 |
| Tunisia | 20.5 | 197.7 | 6.0 | 23.3 | 5.0 | 0.78 | 9.5 |
| Turkey | 4.2 | 274.8 | 6.3 | 40.3 | 7.3 | -0.04 | 66.6 |
| Turkmenistan | 6.4 | 29.2 | 4.1 | 76.0 | 2.0 | -1.39 | 4.6 |
| Uganda | 38.6 | 877.5 | 1.2 | 86.0 | 6.3 | -0.31 | 22.9 |
| Ukraine | 8.0 | 397.8 | 4.5 | 17.3 | 8.3 | -0.70 | 49.8 |
| Uruguay | 10.9 | 35.6 | 8.3 | 15.7 | 13.3 | 0.61 | 3.3 |
| Uzbekistan | 6.2 | 153.5 | 1.5 | 59.3 | 2.7 | -0.96 | 24.3 |
| Vanuatu | 224.2 | 41.9 | 3.0 | 36.3 | 12.0 | -0.38 | 0.2 |
| Venezuela, RB | 2.8 | 67.3 | 5.5 | 20.0 | 9.0 | -0.87 | 24.0 |
| Vietnam | 18.1 | 1420.6 | 2.0 | 24.7 | 2.7 | -0.23 | 77.6 |
| Yemen, Rep. | 13.1 | 226.0 | 0.8 | 85.0 | 5.3 | -0.70 | 17.3 |
| Zambia | 126.7 | 1177.6 | 0.8 | 102.0 | 8.0 | -0.80 | 9.7 |
| Zimbabwe | 30.3 | 355.9 | 2.6 | 66.5 | 5.5 | -0.69 | 12.1 |

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**Figure 1. Distribution of Average Aid**

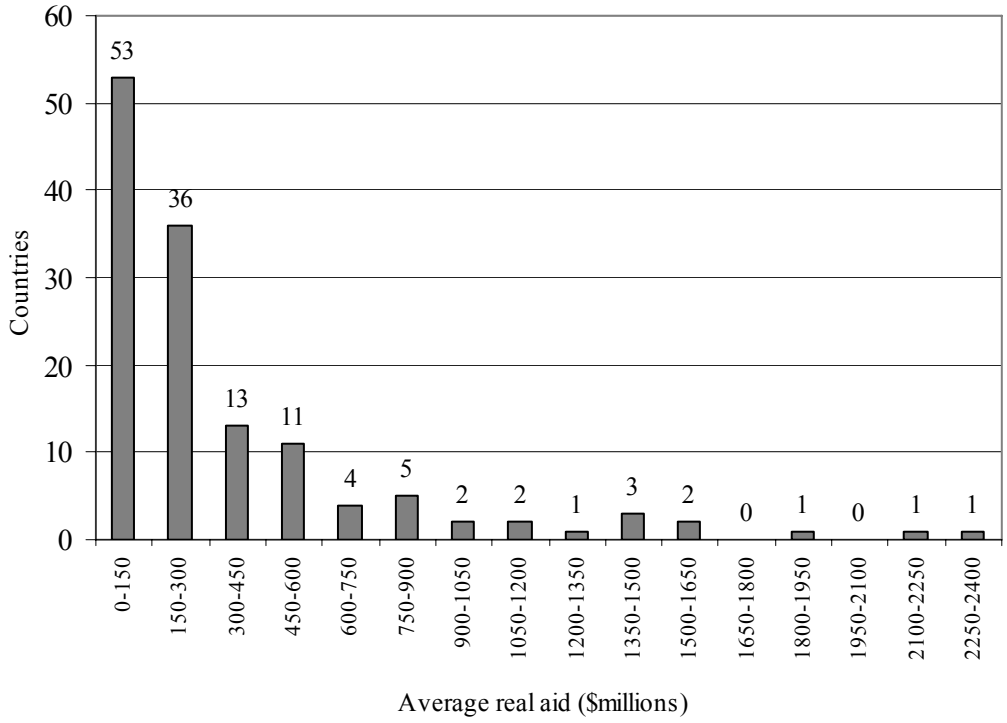
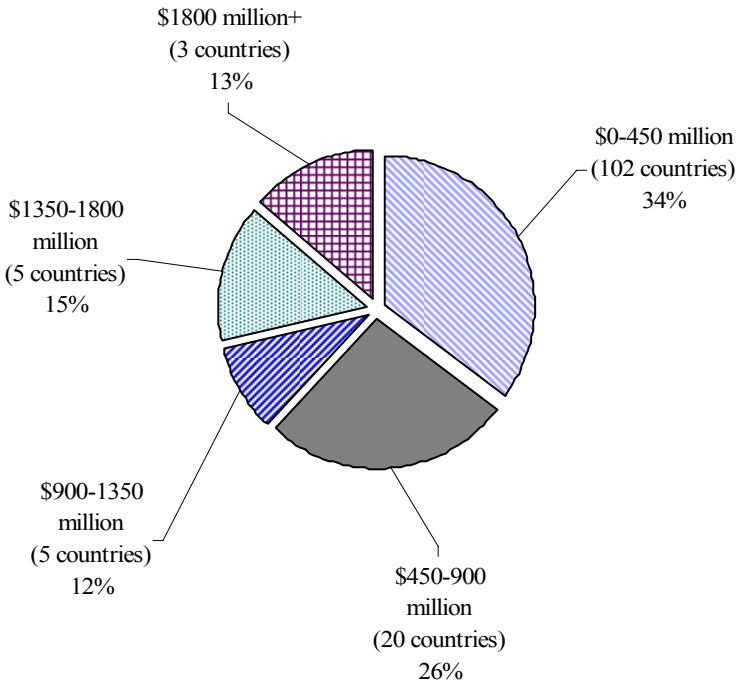
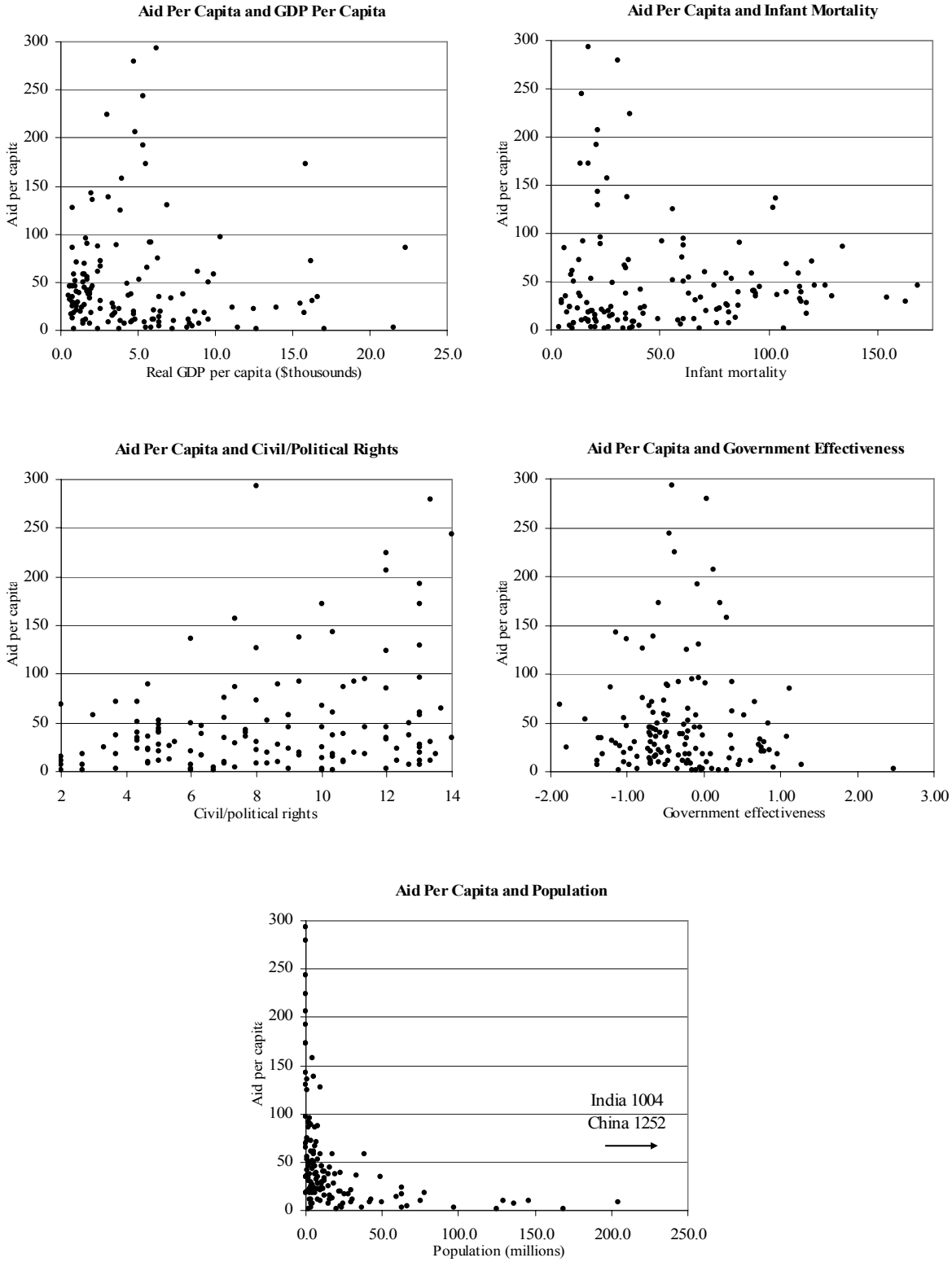


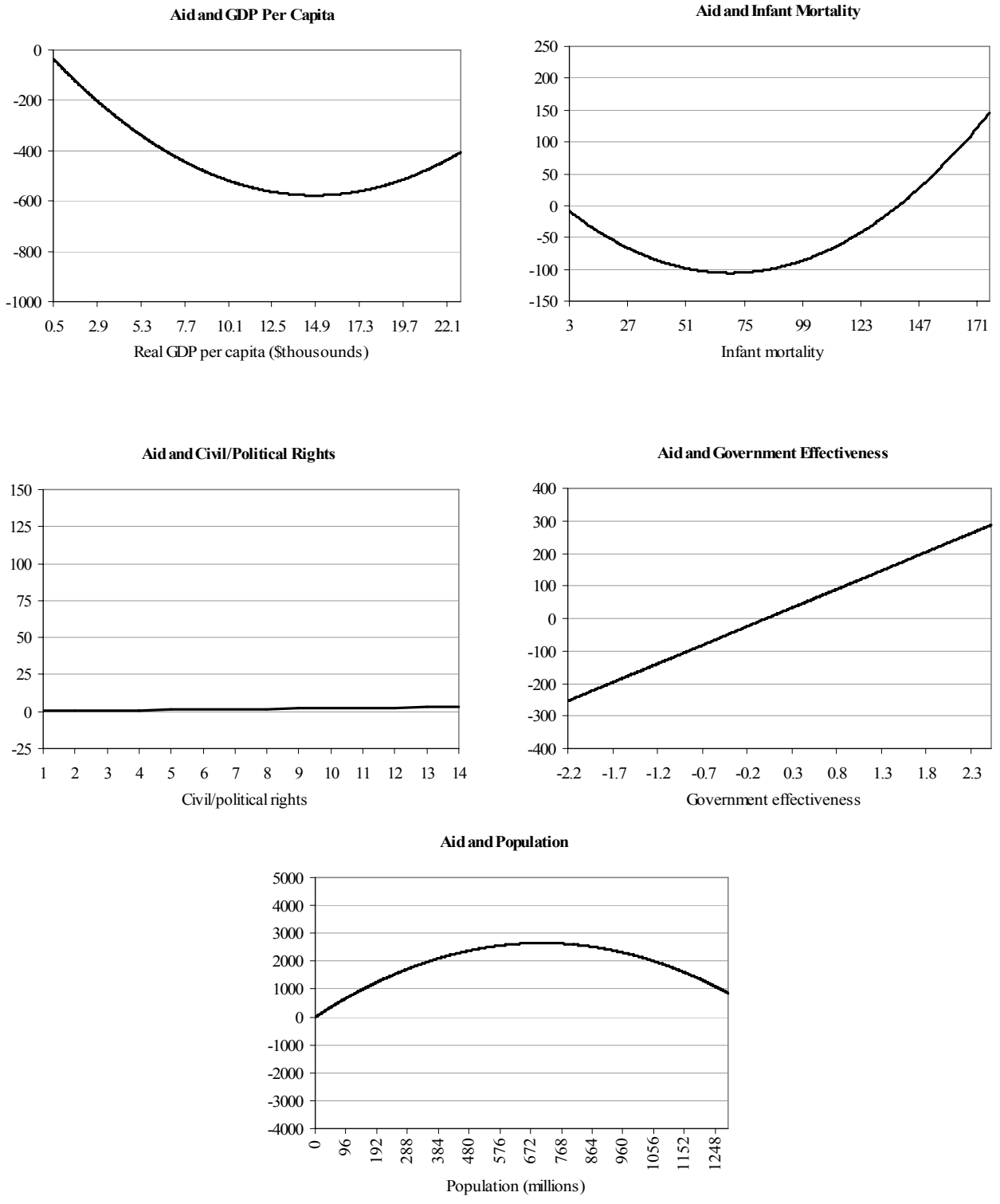

**Figure 2. Shares of World Aid**



## Figure 3. Aid Per Capita and the Explanatory Variables
(Country Averages)



## Figure 4. Relationships Without Fixed Effects



## Figure 5. Relationships With Fixed Effects

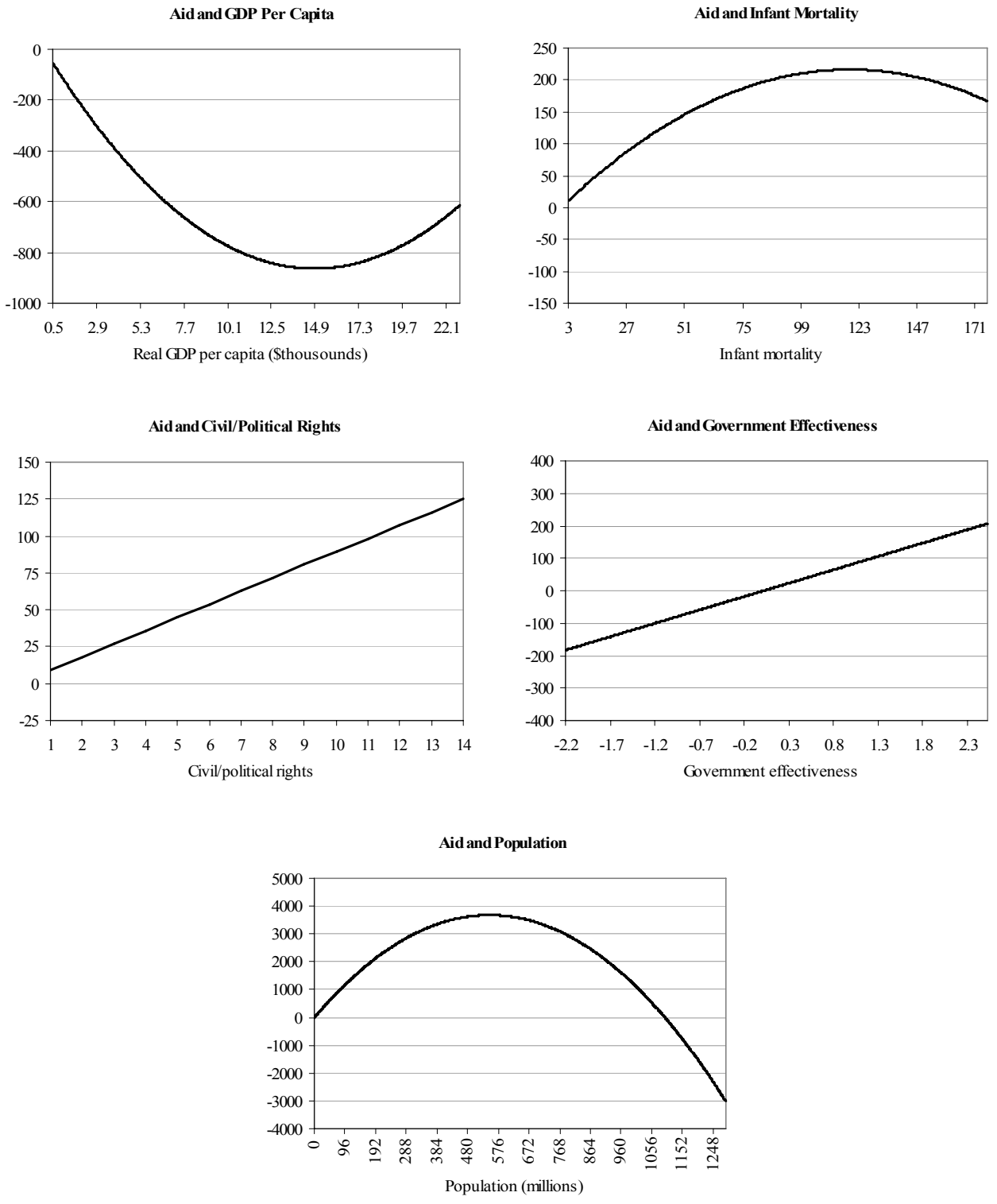


**Table 1. Sample Statistics**

| | Mean | Standard Deviation |
|---|---|---|
| Real aid ($millions) | 356.93 | 439.26 |
| Real GDP per capita ($thousands) | 4.96 | 4.54 |
| Infant mortality | 52.33 | 39.56 |
| Civil/political rights | 8.29 | 3.39 |
| Government effectiveness | -0.30 | 0.67 |
| Population (millions) | 36.25 | 139.51 |

**Table 2. Regression Results: Dependent Variable = Level of Real Aid**

| | No Fixed Effects | | | With Fixed Effects | | |
|---|---|---|---|---|---|---|
| | Coeff. | Std. Err. | *t*-statistic | Coeff. | Std. Err. | *t*-statistic |
| Common intercept | 564.693* | 48.850 | 11.56 | 400.684* | 126.088 | 3.18 |
| Recipient fixed effects | no | | | yes | | |
| 2000 dummy | -56.913* | 12.688 | -4.49 | -82.195* | 6.984 | -11.77 |
| 2003 dummy | -18.343 | 12.985 | -1.41 | -11.714 | 10.667 | -1.10 |
| Real GDP per capita | -78.178* | 5.955 | -13.13 | -116.490* | 8.848 | -13.17 |
| Real GDP per capita squared | 2.646* | 0.268 | 9.86 | 3.927* | 0.387 | 10.14 |
| Infant mortality | -3.053* | 0.693 | -4.41 | 3.632* | 1.291 | 2.81 |
| Infant mortality squared | 0.022* | 0.004 | 5.75 | -0.015* | 0.008 | -1.95 |
| Civil/political rights | 0.212 | 1.841 | 0.12 | 8.940* | 2.486 | 3.60 |
| Government effectiveness | 114.432* | 13.934 | 8.21 | 82.453* | 12.856 | 6.41 |
| Population (millions) | 7.497* | 0.394 | 19.01 | 13.419* | 2.815 | 4.77 |
| Population squared | -0.005* | 0.000 | -10.78 | -0.012* | 0.002 | -6.95 |
| Log likelihood | -2563.56 | | | -2264.07 | | |
| Number of observations | 395 | | | 395 | | |
| Number of recipient countries | 135 | | | 135 | | |
| Estimated coefficients | 11 | | | 145 | | |

Estimated using Feasible Generalized Least Squares, allowing for recipient-specific heteroskedasticity. An "*" indicates statistical significance at the 10 percent level.

**Table 3. Wald Tests of Joint Significance**

| | No Fixed Effects | | With Fixed Effects | |
|---|---|---|---|---|
| | $\chi^2$ | Prob. > $\chi^2$ | $\chi^2$ | Prob. > $\chi^2$ |
| Real GDP per capita | 202.53 | 0.000 | 174.00 | 0.000 |
| Infant mortality | 46.40 | 0.000 | 8.37 | 0.015 |
| Population | 388.91 | 0.000 | 49.34 | 0.000 |

**Table 4. Responsiveness of Aid to Explanatory Variables**

| | No Fixed Effects | With Fixed Effects |
|---|---|---|
| Real GDP per capita | -90 | -135 |
| Infant mortality | -19 | 27 |
| Civil/political rights | 1 | 29 |
| Gov't effectiveness | 75 | 54 |
| Population | 1013 | 1734 |

Change in aid ($millions) for the average country from a one-standard-deviation increase in the explanatory variable.