Of Donor Coordination, Free-Riding, Darlings, and Orphans: The dependence of bilateral aid commitments on other bilateral giving

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February 22, 2011

Very preliminary zero draft. Please do not quote or circulate.

Abstract

Using data from 1988 to 2007, we examine to what extent bilateral aid flows of an individual donor to a country depend on aid flows from all other bilateral and multilateral donors to that country. We thereby want to assess to what extent donor coordination, free-riding, selectivity, and common donor motivations drive bilateral aid allocation as these determinants would point to different dependence structures. Using approaches from spatial econometrics and controlling for endogeneity using an GMM framework, we find that other bilateral flows lead to a significant (but rather small) increase in aid flows from a particular donor. The effects are particularly pronounced for so-called donor 'orphans' who seem to be collectively shunned by bilateral aid donors. This suggests that donor coordination and free-riding are quantitatively less important than common donor interests and selectivity.

Introduction

Foreign aid continues to be the most important form of capital flow to a large number of poor countries, particularly in Africa; for many more, it remains a significant flow, although FDI and debt flows have increased substantially recently. Foreign aid is given by an increasing pool of donors, often allowing countries to choose from (or, as the case may be, be forced to deal with) hundreds of potential donors to fund their budgets, programs, and projects (World Bank, 1998); in fact, the number of donors has dramatically increased in past decades, with new entrants including several new regional development banks, new bilateral donors, global funds, large philanthropic foundations, and a myriad of NGOs of all sizes; as a result, there is increasingly less of a "cartel of good intentions" (Easterly 2002) a highly fragmented aid landscape which is increasingly difficult to negotiate for both donors as well as recipients (Harford, Hadjimichael, and Klein, 2010). This decentralized approach to aid has then led to two fears: that aid by one donor may crowd out aid by another and that some recipients are "darlings" that receive the bulk of aid whereas "orphans" are left out in the cold. The purpose of this paper is to examine whether bilateral aid patterns exhibit either of these concerns.

A second major trend in the past ten to fifteen years has been the increasing focus on aid effectiveness among bilateral and multilateral donors. Spurred by much-noted studies by Burnside and Dollar (2000) and Collier and Dollar (2001), the intention of most bilateral and multilateral aid agencies has increasingly been on focusing aid efforts selectively on those countries most deserving and best able to use it productively. While some find that this goal still remains largely elusive, at least as of 2006 (Aldasoro, Nunnenkamp, and Thiele, 2010), others have found that the direction of change has clearly been in the direction of selectivity (see World Bank, OECD-DAC). As a consequence, the phenomenon of donor 'darlings' and donor 'orphans' has emerged, who are, respectively, the winners and losers of this new selectivity (e.g. Rogersen and Steenson, 2009; Ansoms, Cassimon, and Marysee, 2007; Utz,

2009). It is not clear, however, whether the emergence of darlings and orphans reflects hard-nosed selectivity based on presumed aid effectiveness, or possibly more donor fads, an issue that we will also to try to address below.

Related to the two previous developments has been the call to better coordinate aid at the country level. The 2001 Paris Declaration on Aid Effectiveness and the 2006 Accra Plan of Action call on donors to better coordinate their aid, which, among other things, would mostly require that donors restrict their support to fewer countries, and fewer sectors within countries. For example, lead donors have been appointed for particular sectors in countries that should coordinate the aid, and the number of actors in each sector should be reduced (OECD-DAC Source). To the extent that such donor coordination actually works, one would expect to find crowding out, an issue we examine below.

All of these developments take place against the backdrop of two findings on aid allocation. First, that (bilateral) aid is (and has long been) granted not only for economic and altruistic motives, but that past colonial ties, strategic alliances, and trade relationships affect aid flows (e.g. Alesina and Dollar, 2001; Hoeffler and Outram, 2008).[1] Thus donors appear to derive particular benefits from giving aid to certain countries which cannot easily be replaced by aid flows from other donors. Second, there are substantial inter-temporal variations in aid flows. After a long decline in aid flows in the 1990s, they rose substantially in the 2000s, but large budget deficits in donor nations are sure to reduce aid flows substantially in coming years. How donors will coordinate these reductions with each other will be an interesting question.

Despite this substantial literature, there exists remarkably little analysis on how in actual fact aid allocation to particular countries is affected by aid flows from other donors. While there are a large set of studies examining bilateral aid allocation in general, only a study by

[11] See also Martinez-Zarzoso et al (2009) and Nowak-Lehmann et al. (2009) on the impact of bilateral aid on exports from the donor country, showing the relevance of aid to promote a trade relationship.

Mascarenhas and Sandler (2006) which examines to what extent the total aid flows of a donor and aid flows to regions by a donor depend on giving by other donors, is similar in spirit to what we are doing here. It finds that donors view giving by others largely as complementary which the authors interpret to mean that it follows common underlying motivations (which are not controlled for in the analysis). While the paper sets out a nice theoretical framework and provides an interesting analysis of direct bilateral flows and bilateral contributions to multilateral aid, there are some problems with the empirical analysis. First, it stops at the regional level; second, no other covariates from the aid allocation literature are considered so that it is impossible to distinguish between common underlying drivers and pure complementarity effects of giving; third, endogeneity is only cursorily tackled, and all is estimated using a static model. Our study differs by first looking at country allocations rather than overall or regional aid flows using a spatial econometric framework, by examining a later time period (1988-2007), by specifying a much more complete model of aid allocation using insights from the literature, by using GMM procedures to deal with endogeneity, by also estimating a dynamic model, and by providing a full set of robustness tests.

We find that there is a significant and rather robust (but relatively small) positive effect of giving by others on the giving by bilateral donors. A 1% increase in aid by another donor leads to about 0.03% increase in own aid. The effect is particularly strong prior to 1995, is more visible in aid to Sub-Saharan Africa and the Middle East, and is actually stronger for aid orphans rather than aid darlings.

The paper is organized as follows. The next section discusses a theoretical framework, section 3 presents the estimation strategy and the data, section 4 has the results, and section 5 concludes.

1. Theoretical Framework

In this study we focus on the dependence of bilateral aid giving on giving by others. This does not cover the entire spectrum of aid flows, but focuses on one aspect. There are several reasons for this choice. First, bilateral aid continues to be the by far the most important aid flow to developing countries. While multilateral development banks (such as the World Bank and regional development banks) also transfer substantial amounts of resources, much of that is in the form of loans that are granted with near-market terms and conditions and thus do not qualify as aid. Further, country aid allocation using the soft loan windows of these institutions (which does qualify as aid), as well as donor aid contributions to these soft-loan windows (such as the World Bank's IDA allocation formula) are driven by allocation and contribution formulas that leave rather little room for donor discretion. In contrast, donors have a great deal of discretion over the amount and destination of their bilateral flows.[2, 3]

When examining the dependence of bilateral flows on other donor flows, it is important to discuss the differing motivations for bilateral aid and the implications this would have on the dependence of flows.

A first approach, also discussed by Mascarenhas and Sandler (2006), is to consider bilateral aid giving as a global public good. If it helps to promote the Millennium Development Goals or raises incomes in recipient countries, all donor countries benefit as they all committed themselves to promoting the MDGs and higher incomes in recipient countries will promote trade, reduce migration flows from these countries, and generate similar desirable effects. In such a setting, free-riding is clearly an issue. In fact, such free-riding would generate suboptimal total aid flows. This is well-recognized and there are several approaches to the problem: the multilateral organizations resort to contribution

[2] Non-governmental donors are generally too small to plausibly affect bilateral flows, although this might be changing currently as some of the large philanthropic funds are now drastically increasing their flows. Interestingly, NGO aid does not greatly differ in the allocation procedures and in fact appears to follow the aid allocation process of the donor country they are located in. See Dreher, Koch, Nunnenkamp, and Thiele (2008) for a discussion.

[3] We will, however, consider how multilateral flows to a country affect bilateral flows to the same country in our estimations.

formulas to address the problem[4], and the goal-setting of bilateral flows (aimed to reach 0.7% of GDP of donor countries as reaffirmed in the MDGs) is another (much less successful) attempt to circumvent the problem. Free-riding could not only affect total aid flows, but also affect aid flows to particular recipient countries. The more other donors give, the more one can free-ride on these contributions. One would thus expect that free-riding would cause crowding out, or a negative relation of other donor flows on one's own aid commitment.

Other considerations would limit such free-riding, however. First, there are donor-specific motivations that go beyond the provision of a global public good. Colonial ties, strategic and political interests, trade interests, and a donor's domestic political economy all may affect the priorities of aid allocation as far as the choice of recipient countries are concerned. To the extent that these motivations differ among donors, we would expect then little dependence of aid flows on each other. A clear example would be colonial history where each donor will have different priorities based on its own history. To the extent the motivations are similar across donors, however, and not well captured by our covariates below, we might actually find a positive relationship of each other's giving, or some crowding in.[5]

Such crowing-in could also occur as a result of the increasing selectivity focus of donors on countries with 'good policies' or those in high need. To the extent that these factors are not captured in our covariates, we would expect donors to converge in their selection strategy on the same set of countries. This would lead to both the phenomenon of "darlings" and "orphans" as well as to a crowding-in of bilateral donors. As selectivity has become an increasing focus of development cooperation in recent years, we would expect a

[4] This is for example how the soft loan window of the World Bank, IDA, raises its funds from bilateral donors.
[5] Of course, even if donor-specific interests predominate, donors might want to partly free ride on other country's flows which would counteract such crowding in. But one might argue that free-riding is much less likely if these motivations dominate. For example, guilt associated with colonial history can hardly be reduced by aid flows from other donors; furthering bilateral trade or strategic interests will likely be jeopardized rather than helped by other bilateral flows (e.g. Martinez-Zarzoso et al. 2009); and even altruistic, humanitarian, or ideological motives cannot depend on other donor flows, particularly if the 'warm glow' of giving is an important aspect of this motivation.

crowding-in to be particularly pronounced in more recent years, compared to earlier periods. While the need and effectiveness arguments might be important drivers for selectivity, selectivity might also be driven by a desire to associate one's aid flows with positive developments in poor countries. Countries with successful economic policies might attract more aid to associate that success with these aid flows. This could strengthen a crowding-in in 'donor darlings', and a collective flight from 'donor orphans' where difficult aid environments make aid that much harder to achieve.

Lastly, donor coordination, if taken seriously, should affect the dependence of bilateral flows on each other. This might generate different effects. To the extent that donor coordination operates as a cartel, as alleged by Easterly (2002), it could lead to crowding-in, i.e. a positive dependence of aid flows as donors decide which recipient countries are favoured by the cartel. But the increasing fragmentation of aid flows should reduce this effect over time. Moreover, recent effects at aid coordination, following from the Paris Declaration on Aid Effectiveness, would suggest that donors reduce the number of recipient countries and sectors, taking due note of other country's flows. Thus one should find a negative relation between the flows of an individual donor and those of all others. To the extent that a possible donor cartel has weakened and donor coordination has become an increasing focus of attention in the past ten years, we would therefore expect the relationship to become more negative over time.

Thus these theoretical considerations point to different plausible effects. While the public good argument and the donor coordination argument point to a crowding out, or a negative relation between donors' giving, the donor motivation and selectivity argument might generate a positive relationship. The importance of these effects might also vary over time so that it becomes largely an empirical question to inquire which effects dominate for different time periods and regions.

2. Estimation Strategy and Data

In this section, we describe our empirical methodology and our data.

3.1 Estimation Strategy

Our baseline specification estimates per-capita foreign aid from donor *d* to recipient *r* in year *t* as a function of donor characteristics $Donor_{d,t}$, recipient characteristics $Recipient_{r,t}$, donor-recipient variables $Pair_{d,r,t}$ and a time trend:

$$Aid_{d,r,t} = \beta_0 + \beta_1 Donor_{d,t} + \beta_2 Recipient_{r,t} + \beta_3 Pair_{d,r,t} + Trend_t + \varepsilon_{d,r,t} \qquad (1)$$

where $\varepsilon_{d,r,t}$ is the error term. Our control variables are drawn from the existing literature and are described below. We then modify this by including the aid from other donors to country *r* in year *t*, a variable known in the literature as the spatial lag. Specifically, we estimate:

$$Aid_{d,r,t} = \beta_0 + \rho \sum_{i \neq d} Aid_{i,r,t} + \beta_1 Donor_{d,t} + \beta_2 Recipient_{r,t} + \beta_3 Pair_{d,r,t} + Trend_t + \varepsilon_{d,r,t} \qquad (2)$$

where $\sum_{i \neq d} Aid_{i,r,t}$ is the total aid by other countries.[6] Clearly, if aid from *i* impacts country *d* and vice versa, the spatial lag is endogenous. To deal with this, we use GMM instrumental variables estimation. Following standard spatial econometric procedure, for our instruments we use $\sum_{i \neq d} Donor_{i,t}$ and $\sum_{i \neq d} Pair_{i,r,t}$ that is, the average of the other donor's characteristics and the average of their pair-wise characteristics with the recipient in question. The intuition behind these variables is that for a given donor *i*, donor and pair variables directly impact aid by *i* and are unaffected by aid from *d*. Therefore they are correlated with the endogenous variable but are themselves exogenous, making them suitable instruments.

This baseline specification is modified to explore the robustness of our findings. The specifics of these modifications are described below.

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[6] As described by Anselin (1988), one can alternatively "row standardize" the spatial lag, making it a weighted average of other countries' donations. Since there is no reason to expect that ODA from one country affects aid from *d* more than that from another, we could row standardize utilizing equal weights. However, since we have a constant number of donors across our sample, this would simply scale up the coefficient ρ by 22, the number of donors in our sample.

2.2 Data

Our data are a panel of 22 donors and 118 recipients that runs from 1988 to 2007. The list of donors and recipients are found in Table A1 of the Appendix.

Our dependent variable $Aid_{d,r,t}$ is the per-capita bilateral gross Official Development Assistance disbursements from country *d* to *r* in *t*, as reported in the OECD DAC database, using the official DAC definition of aid (i.e. flows that have a grant component of at least 25%). It is measured in millions of constant 2005 US dollars.[7] Figure 1 indicates how total aid flows have varied over time and across regions. As can be seen, the bulk of flows go to Africa followed by Asia. Over time, there was a substantial decline in the real value of bilateral aid flows during the 1990s, a trend which reversed itself during the 2000s. Figure 2 breaks down the average total donations by donor. Japan leads the way roughly 28% of ODA. This is followed by the US, Germany and France, who jointly make up another 42% of flows. Note that these are only the bilateral ODAs and do not include what donor countries provide to multilateral assistance programs.[8]

To control for the size of the donor country $Donor_{d,t}$ includes $GDP_{d,t}$, $GDP^2_{d,t}$, $Population_{d,t}$, and $Population^2_{d,t}$, which are the real value of per-capita donor GDP, its square, donor population, and its square. As with aid flows, GDP is measured in real 2005 millions of US dollars. Consistent with the existing literature which finds that larger, wealthier economies donate more, we generally anticipate positive coefficients for these variables.

For the recipient country, we similarly include per capita $GDP_{r,t}$, $GDP^2_{r,t}$, $Population_{r,t}$, and $Population^2_{r,t}$ to control for wealth and size. Following previous findings, we expect that more ODA goes to larger but poorer countries; in per-capita terms, we would expect, however, that smaller countries receive more aid/capita (e.g. Alesina and Dollar,

[7] We utilized the consumer price deflator from the Economic Report to the President (2009).
[8] In unreported results, we excluded the oil-rich Arab states (Saudi Arabia, Kuwait, Bahrain, Qatar, Oman, and United Arab Emirates) and/or Israel. This did not qualitatively affect the full sample results.

2001). In addition to recipient size, we include a several additional variables.[9] Three of these are intended to control for the nation's political situation. $Freedom_{r,t}$ is the sum of the political liberty and civil liberty scores from the Freedom House Index. $Politics_{r,t}$ is the difference between the democracy and autocracy scores from the Polity 4 Databank. Both $Freedom_{r,t}$ and $Politics_{r,t}$ are coded so that higher values mean less political freedom. $Conflict_{r,t}$ is a dummy variable equal to one if the nation experienced a conflict within its borders that resulted in at least 25 deaths during year *t*. Given that in nations with better institutions less ODA may be diverted due to corruption, increasing the benefit from aid, we expect negative coefficients on these variables. In addition, we control for $Openness_{r,t}$ measured as the sum of exports and imports divided by GDP. In order to control for the influence of multilateral aid flows to a recipient on its bilateral flows, we include $Multilateral_{r,t-1}$ which is the per-capita value of the multilateral aid received by recipient *r* in year *t-1*.[10]

Finally, we include several variables specific to a donor-recipient pair. $Distance_{d,r}$ is the great circle distance between the two capital cities (measured in kilometres). We expect this to be negatively correlated with aid as donors focus on proximate nations. In a similar vein, $Contiguity_{d,r}$ is a dummy variable equal to one if the two countries are geographically contiguous. $Language_{d,r}$ is a dummy variable equal to one if the two nations share the same official language, a trait we expect to be positively correlated with aid flows. Finally, $Colony_{d,r}$ is a dummy variable equal to one if the two countries were ever part of the same colonial empire. Since we expect donors to be particularly sensitive to the plight of nations with which they share a history, we anticipate a positive coefficient for this variable, as has been found in the literature (e.g. World Bank, 1998; Alesina and Dollar, 2001).

[9] When we omit these additional variables but include lagged ODA and recipient dummies, we find results for the spatial lag that are qualitatively comparable to the reported results, although the magnitude of the estimated coefficient is somewhat larger.

[10] We use the lagged value to deal with potential endogeneity. When using the contemporaneous value of multilateral aid instead, similar results were found.

Finally, except as noted, we include both donor and recipient dummy variables to control for donor or recipient specific, time-invariant characteristics in all regressions. Excepting the binary variables, all variables are measured in logs. Summary statistics are found in Table A2 of the Appendix.

3. Results

3.1 Baseline Results

Table 1 presents our baseline results. Column 1 presents our baseline results of (1) without recipient dummies (but including donor dummies). Column (2) repeats this including both donor and recipient dummies; the difference should capture a range of unmeasured recipient-specific effects that could affect aid allocations. The coefficients suggest that more aid comes from larger donors both in terms of GDP per capita and population. When not controlling for recipient-specific fixed effects, more ODA goes to recipients with lower GDP per capita and larger populations. However, after controlling for recipient specific, time-invariant effects, we see that more aid goes to countries with smaller populations and GDP per capita is insignificant.[11] In addition, more ODA goes to recipients with better institutions and those with greater multilateral aid flows; this effect becomes much smaller once recipient-specific effects are controlled for. Turning to the pair variables, we find that more aid occurs between donors and recipients that are proximate, share a common official language, and have a common colonial tie. The qualitative nature of these estimates mirror those found elsewhere in the literature (e..g Alesina and Dollar, 2001; Hoeffler and Outram, 2008).

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In column 3, we introduce the spatial lag to the specification of column 1 without recipient fixed effects. This results in two major changes. First, the estimated impact of

[11] At the sample mean, the net marginal effect of population is negative.

multilateral aid switches from positive to negative suggesting that the coefficient in column (1) was capturing both the impact of multilateral aid and that of the bilateral aid of others. Second, and of specific interest for our analysis, we find a significantly positive spatial lag. The estimated coefficient indicates that a 1% increase in ODA by country *i* would is associated with a .13% increase in ODA by country *d*.[12] Column 4 reintroduces the recipient effects. This results in insignificance of the recipient variables which are now all captured by the fixed effects. In particular, multilateral aid is now insignificant. Further, the point estimate on the spatial lag is cut by two-thirds, suggesting that a 1% increase in another nation's ODA would increase that of *d* by .049%.

Finally, column 5 introduces the lag of aid by donor *d* to recipient *r*.[13] As can be seen, this increases our R^2, which is not surprising given the persistence in donations. It is worth noting that we can reject the hypothesis that there is a unit root in aid.[14] Inclusion of this variable reduces the point estimate of the spatial lag further still implying that a 1% increase in the aid by another country only increases that in *i* by .036%. An alternative interpretation is that if all of the other 21 donors increased their donations by 1%, the country in question would raise their donations by just over .75%. Given the added explanatory power of the time lag of ODA, we utilize this preferred specification in the remainder of the paper.[15]

Taken as a whole, these estimates reject crowding-out. If anything, they suggest a slight crowding-in effect, although one that is economically small. This suggests that, overall, the selectivity, joint interest, or cartel issues are more relevant empirically than free-riding in

[12] Note that the spatial lag is the sum of logs, not the log of sums. A 1% increase in the donations of all other donors would result in an increase of aid from *d* of 21 times the estimated coefficient.
[13] Note that when we use lagged values, we are taking them to be exogenous. In practice, depending on the timing of ODA disbursements, donations by *d* in December of *t-1* may be reacting to what is dispersed by other nations in January of *t*. Unfortunately, the annual nature of our data do not allow us to investigate such issues. In unreported results, we used constructed values of lagged variables based off of column 2 of Table 1. This resulted in qualitatively similar results to those reported. These alternate specifications are available on request.
[14] The χ^2 value for this test was 1285.95.
[15] In any case, the results when excluding this variable were generally very comparable to those presented, although the point estimate on the spatial lag tended to be somewhat higher.

the provision of a global public good or true donor coordination following the Paris Declaration.

3.2 Robustness Checks

In Table 2, we approach two aspects of the time dimension of our data. In column 1, we replace the time trend with year dummies. In spatial econometrics, this often results in insignificant spatial lags. This is due to the fact that, when moving between the observations for, say donations from Germany and France to Ghana within a year, the spatial lag differs only by the difference in the individual aid levels. As a result, the spatial lag does not vary much across donors within a year. With this in mind, it is of little surprise that the estimated coefficient falls. Nevertheless, it remains significantly positive and again argues against crowding-out.

Columns 2 and 3 split our sample into two halves, one early and one late. One major reason to do this is that starting in the mid-1990s, there was a movement towards greater selectivity as well as greater coordination of aid (e.g. World Bank, 1998; Collier and Dollar, 2001); the former would suggest a rising positive dependence, the latter a rising negative dependence. In each, we find significantly positive spatial lags, although the late one has a somewhat smaller point estimate. This is consistent with the hypothesis that a donor cartel has weakened, and donor coordination has increased more than selectivity; but the changes are small and only suggest that crowing-out (or very high levels of donor coordination) continue to be absent.

Table 3 separates our data into five regions according to the World Bank classification system.[16] Across regions, the control variables are generally similar in terms of sign and significance to the preferred specifications results. Focussing on the spatial lag, excepting the Americas, we find a positive point estimate in each case. However, this is only significant for

[16] Details on which countries are in which category can be found in Table A1 of the appendix.

Africa and the Mideast. Thus, to the extent that crowding-in occurs, the data indicates that it tends to happen most often in those regions. Furthermore, in no region do we find evidence indicating crowding-out in bilateral aid. For Africa, however, note that we find a significantly negative effect on multilateral aid. This suggests that multilateral assistance to those nations may be replacing bilateral aid.

Table 4 modifies the preferred specification by including time lags of $\sum_{i \neq d} Aid_{i,r,t}$.[17] We do this to investigate whether there is evidence of crowding out over time. In particular, if ODA from the rest of the world were unexpectedly large in year *t-1*, one might be concerned that a given country would revise its ODA in year *t* downwards. Column 1 repeats the preferred specification for comparison. Column 2 adds $\sum_{i \neq d} Aid_{i,r,t-1}$ while column 3 also introduces $\sum_{i \neq d} Aid_{i,r,t-2}$.[18] As can be seen, the past values of ODA by other countries are significantly and negatively correlated with ODA in the current year. This does suggest some downward revision by country *d* in response to past increases by other nations. Nevertheless, the net effect from adding the coefficients on the spatial lag are essentially the same as that from the preferred specification and in each case we can firmly reject the null hypothesis that the net effect is less than or equal to zero.[19] Thus, even if there is some downward revision, the net effect continues to indicate that a 1% rise in the donations by another country increases the donations by the country in question by around .02%, indicating that there is no net crowding-out.

Finally, Table 5 attempts to examine whether there is a difference between nations that tend to receive higher ODA (darlings) and those that tend to receive smaller ODA (orphans).

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[17] As with $Aid_{d,r,t-1}$ we take these as exogenous in year *t*. In unreported results using constructed versions of these, similar results were found.
[18] In unreported results, we extended the time lags of the spatial lag back to *t-5*. These were not significant and did not overly effect the estimates of the reported time lags.
[19] The χ^2 for column 2 was 85.90 while that for column 3 was 3.45.

To categorize countries, we took the estimates from Table 1, column 1 and calculated residuals. Countries where the mean residual was positive were then classified as darlings while those with negative mean residuals were classified as orphans.[20] Table A1 of the appendix indicates which nations fell into which categories. Column 1 uses only the orphan countries. As can be seen, the results are largely similar to the preferred specification's pooled results. Column 2 uses only the darlings. We find a significant impact of the spatial lag only for the orphans, where the estimated coefficient is comparable to that in the pooled regressions. Thus, once again, we find no evidence of crowding out, even among those countries that tend to receive smaller ODAs that the data would predict. Conversely, it seems more that specifically among orphans, the selectivity has some bite, leading donors to collectively abandon them.

In addition to these reported robustness checks, we investigated other splits of the data such as using only the top five donor countries, only European donors, only non-OECD recipients, only recipients with on less greater than the sample mean total ODA per capita, and only recipients with on average greater than the sample mean ODA per capita. In all but the last of these alternative sub-samples, we found significantly positive spatial lags with coefficients of around .03. In the last of these using only above average recipients, comparable to the darlings result in Table 5, we found and insignificant spatial lag. In no case did we find a significantly negative spatial lag, again arguing against evidence of crowding out. These additional robustness checks are available on request.

4. Conclusion

[20] In unreported results, we classified darlings as those in the top quartile of mean residuals and orphans as those in the lowest quartile. Qualitatively similar results were found. A second check on our approach utilized column 2 of Table 1 (i.e. also using recipient fixed effects) to construct residuals. A third utilized only the recipient's GDP per capita and population when predicting aid whereas a fourth simply took those with above and below average ODA per capita to define the darlings and orphans. In each case, we found qualitatively similar results.

The goal of this paper has been to investigate whether there is evidence of crowding-out or crowding-in in bilateral ODA flows. There are several arguments that point to both effects and their respective strength is an empirical question. Using panel data from 22 donors to 118 recipients over a twenty year period, we find no evidence of crowding-out, that is that increased donations by other countries to a given recipient tends to lower donations by a given donor to that recipient. Instead, we find evidence for crowding in, with a 1% increase in the ODA by another country being associated with approximately a .03% increase in ODA by the country in question. While this result is of minor economic significance, it suggests that selectivity and/or donor cartels based on joint interests are more important factors in aid allocation than donor coordination or free-riding. The falling positive association over time suggests a declining role of cartels and a rising role of aid coordination. For aid orphans, the dependence of aid flows is particularly strong, making their problem particularly severe.

It should be noted that even though we find no evidence of crowding out, this does not imply that aid levels are optimal either from the perspective of the globe or from that of the donor countries as a whole. While we find little evidence of free-riding at the country level, it may still play a role as far as total aid flows are concerned. Thus current efforts and mechanisms to reduce free-riding (such as the step plan of the EU to increase aid flows) remain relevant.

These are rather preliminary results and there is a range of ways one can extent the analysis. For example, it is useful to more carefully model the interaction between multilateral and bi-lateral giving more carefully, including the role of leads and lags in that respect. Similarly, one might want to include giving by other entities (including non-DAC countries, global funds, large foundations and NGOs) which plays an increasing role in the last 10 years. Lastly, one might want to investigate whether indeed the response of bilateral donors to giving by other bilateral depends on who those other bi-laterals are.

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Figure 1: Aid by Region

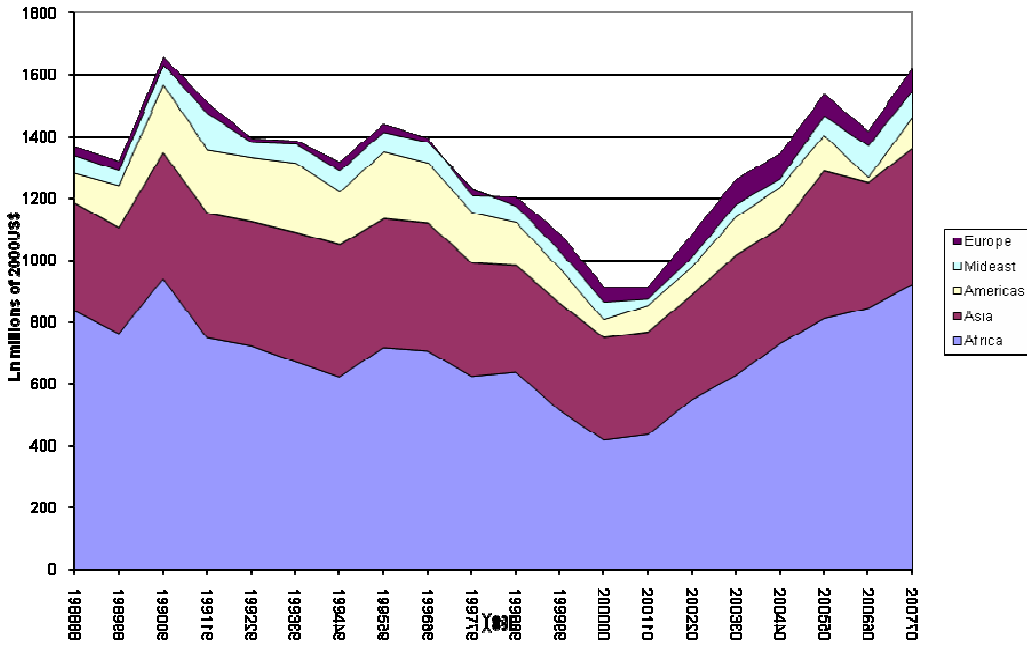

Figure 2: Aid by Donor

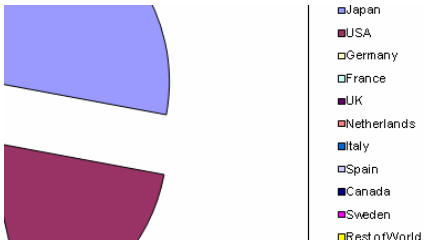

Table 1: Baseline Results

	(1)	(2)	(3)	(4)	(5)
$\sum_{i \neq d} Aid_{i,r,t}$			0.128***	0.049***	0.036***
			(0.005)	(0.010)	(0.007)
Donor Variables					
$GDP_{d,t}$	6.645***	6.555***	7.236***	6.927***	0.797
	(1.120)	(1.003)	(1.284)	(1.008)	(0.671)
$GDP^2_{d,t}$	0.414***	0.416***	0.427***	0.421***	-0.024
	(0.098)	(0.089)	(0.114)	(0.090)	(0.059)
$Population_{d,t}$	-6.285	-6.610	-7.075	-8.531	-1.717
	(6.837)	(6.308)	(7.931)	(6.339)	(3.682)
$Population^2_{d,t}$	0.447**	0.476**	0.534**	0.541***	0.111
	(0.201)	(0.187)	(0.234)	(0.190)	(0.103)
Recipient Variables					
$GDP_{r,t}$	-0.434***	-0.378	0.511***	-0.024	-0.116
	(0.069)	(0.335)	(0.091)	(0.438)	(0.227)
$GDP^2_{r,t}$	-0.011***	-0.027	0.013***	-0.001	0.001
	(0.004)	(0.019)	(0.005)	(0.027)	(0.018)
$Population_{r,t}$	2.188***	-12.183***	-4.342***	-0.384	5.399
	(0.196)	(1.410)	(0.349)	(4.824)	(5.444)
$Population^2_{r,t}$	-0.039***	0.353***	0.085***	0.011	-0.141
	(0.006)	(0.042)	(0.009)	(0.125)	(0.145)
$Freedom_{r,t}$	-0.076***	-0.003	0.128***	0.003	-0.018*
	(0.010)	(0.014)	(0.014)	(0.014)	(0.009)
$Politics_{r,t}$	0.026***	0.014**	0.011*	0.002	-0.007
	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)
$Conflict_{r,t}$	-0.003	-0.053	-0.341***	-0.001	0.045
	(0.037)	(0.044)	(0.045)	(0.046)	(0.052)
$Openness_{r,t}$	0.322***	0.070	-0.533***	0.000	0.001
	(0.028)	(0.068)	(0.048)	(0.071)	(0.061)
$Multilateral_{r,t-1}$	0.529***	0.199***	-1.073***	0.001	-0.145
	(0.016)	(0.022)	(0.064)	(0.050)	(0.095)
Pair Variables					
$Distance_{d,r}$	-0.634***	-1.832***	-1.490***	-1.920***	-0.556***
	(0.030)	(0.038)	(0.049)	(0.059)	(0.090)
$Contiguity_{d,r}$	1.025*	-0.131	0.190	-0.140	0.063
	(0.538)	(0.493)	(0.513)	(0.569)	(0.230)
$Language_{d,r}$	1.562***	1.882***	1.896***	1.974***	0.537***
	(0.044)	(0.042)	(0.058)	(0.066)	(0.033)
$Colony_{d,r}$	1.963***	1.677***	1.997***	1.759***	0.469***
	(0.067)	(0.062)	(0.095)	(0.068)	(0.040)
$Aid_{d,r,t-1}$					0.750***
					(0.005)
$Trend_t$	-0.083***	-0.038***	-0.083***	-0.080***	-0.060**
	(0.007)	(0.010)	(0.009)	(0.021)	(0.027)
Constant	161.610***	209.846***	189.227***	171.936***	71.642**

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	(57.719)	(54.417)	(66.346)	(54.427)	(32.549)
Recipient Dummies?	No	Yes	No	Yes	Yes
Observations	34587	34587	34587	34587	33936
R-squared	0.598	0.677	0.428	0.663	0.854

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications include donor dummies.

Table 2: Time

	(1)	(2)	(3)
	Year Dummies	1995 and earlier	1996 and later
?	0.023***	0.034*	0.021***
	(0.002)	(0.020)	(0.008)
Donor Variables			
$GDP_{d,t}$	0.480	4.271	1.697
	(27.632)	(3.477)	(1.069)
$GDP^2_{d,t}$	0.047	0.134	0.017
	(2.656)	(0.308)	(0.094)
$Population_{d,t}$	-3.770	111.308	-18.392***
	(260.876)	(77.612)	(6.184)
$Population^2_{d,t}$	0.209	-3.308***	0.660***
	(23.537)	(1.134)	(0.184)
Recipient Variables			
$GDP_{r,t}$	-0.397**	1.650	-0.134
	(0.192)	(44.639)	(0.645)
$GDP^2_{r,t}$	-0.009	0.087	0.000
	(0.010)	(1.930)	(0.061)
$Population_{r,t}$	1.037	9.741	2.908
	(1.117)	(14.093)	(20.590)
$Population^2_{r,t}$	-0.042	-0.227	-0.069
	(0.035)	(3.943)	(0.687)
$Freedom_{r,t}$	-0.015	0.034	-0.024
	(0.009)	(0.545)	(0.018)
$Politics_{r,t}$	0.001	0.020	-0.003
	(0.005)	(0.047)	(0.027)
$Conflict_{r,t}$	0.022	0.040	-0.013
	(0.031)	(0.607)	(0.049)
$Openness_{r,t}$	-0.013	0.152	-0.034
	(0.045)	(6.654)	(0.088)
$Multilateral_{r,t-1}$	-0.116***	-0.159	-0.036
	(0.019)	(1.022)	(0.070)
Pair Variables			
$Distance_{d,r}$	-0.523***	-0.580	-0.536***
	(0.026)	(3.934)	(0.065)
$Contiguity_{d,r}$	0.055	-1.056	0.580**
	(0.226)	(26.298)	(0.259)
$Language_{d,r}$	0.510***	0.606	0.486***
	(0.030)	(1.303)	(0.098)
$Colony_{d,r}$	0.438***	0.408	0.464***
	(0.037)	(4.520)	(0.080)
$Aid_{d,r,t-1}$	0.750***	0.752***	0.748***
	(0.018)	(0.014)	(0.007)
$Trend_t$		-0.135	-0.054
		(1.084)	(0.036)
Constant	-19.137	-726.136***	221.803***
	(34.343)	(160.340)	(55.589)

Observations	33936	10815	23121
R-squared	0.859	0.868	0.856

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications include donor and recipient dummies.

Table 3: Regions

	(1)	(2)	(3)	(4)	(5)
	Africa	Asia	Americas	Mideast	Europe
ρ	0.034***	0.009	-0.005	0.044***	0.009
	(0.008)	(0.008)	(0.014)	(0.015)	(0.006)
Donor Variables					
$GDP_{d,t}$	0.559	0.821	2.187	0.829	9.503***
	(0.986)	(1.374)	(1.468)	(2.475)	(3.219)
$GDP^2_{d,t}$	-0.066	0.007	0.156	0.074	0.827***
	(0.088)	(0.122)	(0.130)	(0.217)	(0.281)
$Population_{d,t}$	-1.073	-11.541	7.304	-14.734	-37.157*
	(5.325)	(7.891)	(8.169)	(13.699)	(21.758)
$Population^2_{d,t}$	0.105	0.470**	-0.080	0.545	1.143*
	(0.149)	(0.234)	(0.239)	(0.396)	(0.678)
Recipient Variables					
$GDP_{r,t}$	0.497	-0.269	0.758	2.122	-1.470
	(0.585)	(1.100)	(0.778)	(1.487)	(1.864)
$GDP^2_{r,t}$	0.018	-0.007	0.070	0.281**	-0.069
	(0.032)	(0.052)	(0.060)	(0.143)	(0.127)
$Population_{r,t}$	8.372**	-1.460	-10.371	8.108	-13.943
	(3.816)	(3.903)	(7.581)	(5.689)	(19.012)
$Population^2_{r,t}$	-0.264**	0.024	0.369	-0.308	0.362
	(0.120)	(0.116)	(0.275)	(0.189)	(0.650)
$Freedom_{r,t}$	-0.002	-0.043**	0.017	0.026	-0.028
	(0.016)	(0.021)	(0.029)	(0.042)	(0.092)
$Politics_{r,t}$	0.003	-0.011	0.018	0.012	-0.005
	(0.007)	(0.008)	(0.015)	(0.015)	(0.026)
$Conflict_{r,t}$	-0.052	0.095	-0.058	0.111	0.147
	(0.043)	(0.059)	(0.087)	(0.143)	(0.207)
$Openness_{r,t}$	0.046	0.022	-0.060	-0.651*	-0.193
	(0.059)	(0.125)	(0.121)	(0.395)	(0.296)
$Multilateral_{r,t-1}$	-0.126***	-0.064	0.005	-0.014	-0.125
	(0.044)	(0.073)	(0.031)	(0.026)	(0.147)
Pair Variables					
$Distance_{d,r}$	-0.613***	-0.555***	-0.522***	-0.926***	-0.901***
	(0.051)	(0.095)	(0.118)	(0.257)	(0.201)
$Contiguity_{d,r}$			0.020		-0.540
			(0.206)		(0.493)
$Language_{d,r}$	0.560***	0.077	0.695***	0.374**	
	(0.043)	(0.078)	(0.106)	(0.169)	
$Colony_{d,r}$	0.603***	0.394***	0.205*	0.054	-0.829
	(0.057)	(0.100)	(0.107)	(0.302)	(0.513)
$Aid_{d,r,t-1}$	0.734***	0.758***	0.700***	0.764***	0.530***
	(0.008)	(0.015)	(0.014)	(0.019)	(0.025)
$Trend_t$	-0.042***	-0.029	-0.061**	0.012	0.059
	(0.012)	(0.021)	(0.025)	(0.038)	(0.037)
Constant	20.031	133.745*	112.470	40.840	322.194
	(50.692)	(79.975)	(111.755)	(134.616)	(204.467)

Observations	16191	5460	7140	2667	2478
R-squared	0.850	0.892	0.873	0.873	0. 785

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications include donor and recipient dummies.

Table 4: Time Lags

	(1)	(2)	(3)
	0.036***	0.074***	0.046***
	(0.007)	(0.007)	(0.014)
		-0.052***	-0.030***
		(0.004)	(0.008)
			-0.007***
			(0.001)
Donor Variables			
$GDP_{d,t}$	0.797	0.451	0.302
	(0.671)	(0.682)	(0.666)
$GDP^2_{d,t}$	-0.024	-0.032	-0.044
	(0.059)	(0.060)	(0.059)
$Population_{d,t}$	-1.717	0.745	0.483
	(3.682)	(3.718)	(3.589)
$Population^2_{d,t}$	0.111	0.032	0.039
	(0.103)	(0.104)	(0.101)
Recipient Variables			
$GDP_{r,t}$	-0.116	0.245	0.032
	(0.227)	(0.199)	(0.232)
$GDP^2_{r,t}$	0.001	0.014	-0.000
	(0.018)	(0.011)	(0.013)
$Population_{r,t}$	5.399	2.398**	-0.363
	(5.444)	(1.173)	(1.694)
$Population^2_{r,t}$	-0.141	-0.073**	0.008
	(0.145)	(0.036)	(0.053)
$Freedom_{r,t}$	-0.018*	0.006	0.003
	(0.009)	(0.010)	(0.010)
$Politics_{r,t}$	-0.007	-0.002	0.002
	(0.008)	(0.005)	(0.005)
$Conflict_{r,t}$	0.045	0.003	-0.005
	(0.052)	(0.031)	(0.031)
$Openness_{r,t}$	0.001	-0.019	0.001
	(0.061)	(0.046)	(0.046)
$Multilateral_{r,t-1}$	-0.145	-0.018	0.013
	(0.095)	(0.016)	(0.017)
Pair Variables			
$Distance_{d,r}$	-0.556***	-0.507***	-0.499***
	(0.090)	(0.026)	(0.025)
$Contiguity_{d,r}$	0.063	0.047	0.031
	(0.230)	(0.249)	(0.234)
$Language_{d,r}$	0.537***	0.487***	0.470***
	(0.033)	(0.031)	(0.030)
$Colony_{d,r}$	0.469***	0.422***	0.414***
	(0.040)	(0.040)	(0.038)
$Aid_{d,r,t-1}$	0.750***	0.761***	0.757***
	(0.005)	(0.005)	(0.006)
$Trend_t$	-0.060**	-0.027***	-0.020***

	(0.027)	(0.005)	(0.007)
Constant	71.642**	21.016	32.660
	(32.549)	(33.027)	(33.003)
Observations	33936	33936	33285
R-squared	0.854	0.849	0.859

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications include donor and recipient dummies.

Table 5: Darlings and Orphans

	(1)	(2)
	Orphans Only	Darlings Only
?	0.041***	-0.007
	(0.014)	(0.009)
Donor Variables		
$GDP_{d,t}$	1.620	0.420
	(1.094)	(0.831)
$GDP^2_{d,t}$	0.065	-0.028
	(0.098)	(0.072)
$Population_{d,t}$	-10.208*	4.389
	(5.879)	(4.805)
$Population^2_{d,t}$	0.416**	-0.082
	(0.172)	(0.135)
Recipient Variables		
$GDP_{r,t}$	-0.340	-0.850**
	(0.310)	(0.344)
$GDP^2_{r,t}$	-0.014	-0.043**
	(0.017)	(0.019)
$Population_{r,t}$	7.302*	-4.357**
	(3.969)	(2.128)
$Population^2_{r,t}$	-0.212*	0.125**
	(0.127)	(0.058)
$Freedom_{r,t}$	-0.011	-0.013
	(0.015)	(0.013)
$Politics_{r,t}$	-0.000	0.008
	(0.006)	(0.008)
$Conflict_{r,t}$	-0.049	0.057
	(0.051)	(0.040)
$Openness_{r,t}$	0.032	0.223***
	(0.080)	(0.079)
$Multilateral_{r,t-1}$	-0.116***	0.043
	(0.043)	(0.052)
Pair Variables		
$Distance_{d,r}$	-0.604***	-0.457***
	(0.046)	(0.039)
$Contiguity_{d,r}$	-0.488**	0.717
	(0.244)	(0.516)
$Language_{d,r}$	0.709***	0.348***
	(0.054)	(0.045)
$Colony_{d,r}$	0.448***	0.398***
	(0.066)	(0.051)
$Aid_{d,r,t-1}$	0.715***	0.768***
	(0.008)	(0.008)
$Trend_t$	-0.053***	-0.019
	(0.013)	(0.013)
Constant	99.927*	26.778

	(55.336)	(42.653)
Observations	16149	17787
R-squared	0.835	0.872

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications include donor and recipient dummies.

Appendix

Table A1: List of Countries in the Sample

Donor Countries			
Australia	France	Netherlands	Switzerland
Austria	Germany	New Zealand	United Kingdom
Belgium	Greece	Norway	USA
Canada	Ireland	Portugal	
Denmark	Italy	Spain	
Finland	Japan	Sweden	
Recipient Countries			
Algeria [a]	Côte d'Ivoire [a]	Kuwait [c]	**Peru** [d]
Albania [e]	**Croatia** [e]	**Laos** [b]	**Philippines** [b]
Angola [a]	Djibouti [a]	**Lebanon** [c]	Qatar [c]
Argentina [d]	Dominican Republic [d]	Lesotho [a]	**Rwanda** [a]
Armenia [e]	**Egypt** [a]	Liberia [a]	Saudi Arabia [c]
Azerbaijan [e]	**El Salvador** [d]	Libya [a]	Senegal [a]
Bahrain [c]	**Eritrea** [a]	Madagascar [a]	**Sierra Leone** [a]
Bangladesh [b]	**Ethiopia** [a]	Malawi [a]	**South Africa** [a]
Belarus [e]	**Fiji** [b]	**Malaysia** [b]	**Sri Lanka** [b]
Benin [a]	Gabon [a]	Mali [a]	**Sudan** [a]
Bhutan [b]	Gambia [a]	**Mauritania** [a]	**Swaziland** [a]
Bolivia [d]	**Georgia** [e]	Mauritius [a]	Syria [a]
Botswana [a]	Ghana [a]	Mexico [d]	**Tanzania** [a]
Brazil [d]	**Guatemala** [d]	Moldova [e]	**Thailand** [b]
Burkina Faso [a]	Guinea [a]	**Mongolia** [b]	Togo [a]
Burundi [a]	**Guinea-Bissau** [a]	Morocco [a]	Trinidad and Tobago [d]
Cambodia [b]	Guyana [a]	**Mozambique** [a]	**Tunisia** [a]
Cameroon [a]	Haiti [d]	Myanmar [a]	Turkey [e]
Central African Rep. [a]	**Honduras** [d]	**Namibia** [a]	**Uganda** [a]
Chad [a]	India [b]	**Nepal** [b]	United Arab Emirates [c]
Chile [d]	**Indonesia** [b]	**Nicaragua** [d]	**Uruguay** [d]
China [b]	Iran [c]	Niger [a]	Venezuela [d]
Colombia [d]	**Israel** [c]	Nigeria [a]	**Vietnam** [b]
Comoros [a]	**Jamaica** [d]	Oman [c]	Yemen [c]
Congo, Dem. Rep. [a]	**Jordan** [c]	Pakistan [c]	**Zambia** [a]
Congo, Rep. [a]	Kazakhstan [e]	Panama [d]	
Costa Rica [d]	**Kenya** [a]	**Paraguay** [d]	

[a] Africa, [b] Asia, [c] Mideast, [d] Americas, [e] Europe. **Boldface** recipients are darlings, non-bold recipients are orphans.

Table A2: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
[illegible]	38577	-1.420337	4.051457	-6.968033	9.250069
$GDP_{d,t}$	38577	-6.472016	1.214143	-8.992874	-4.524399
$GDP^2_{d,t}$	38577	43.3611	16.31987	20.47019	80.87179
$Population_{d,t}$	38577	16.69646	1.223539	15.02447	19.52358
$Population^2_{d,t}$	38577	280.2689	41.69704	225.7347	381.1703
$GDP_{r,t}$	38577	-7.683194	2.406324	-13.85938	-1.467863
$GDP^2_{r,t}$	38577	64.82173	35.93501	2.154621	192.0824
$Population_{r,t}$	38577	15.68813	1.919009	11.13965	20.99407
$Population^2_{r,t}$	38577	249.7998	59.92893	124.0918	440.7511
$Freedom_{r,t}$	38577	8.218487	3.397718	2	14
$Politics_{r,t}$	38577	.9726804	6.662391	-10	10
$Conflict_{r,t}$	38577	.1550604	.3619662	0	1
$Distance_{d,r}$	38577	8.834431	.5776767	5.600936	9.84973
$Contiguity_{d,r}$	38577	.0013264	.0363965	0	1
$Language_{d,r}$	38577	.1390326	.3459844	0	1
$Colony_{d,r}$	38577	.0429102	.2026569	0	1
$Openness_{r,t}$	38577	4.20463	.5940247	-1.175052	5.636078
$Multilateral_{r,t-1}$	38577	-11.90666	1.508448	-17.74102	-8.447645