

# Elusive Collaboration? The Determinants of Lead Donorship in International Development

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**Abstract:** Lead donorship is a condition of sustained outsourced responsibility by one foreign aid donor country for giving aid to a developing country. Prior research argues that lead donorship can either be a product of donors collaborating to carve out spheres of influence to maximize non-development foreign policy goals or else of donors buck-passing responsibility for addressing recipient needs. Which is it? This study seeks to answer this question using theory-driven expectations about when and where lead donorship should arise if donors cooperate or systematically fail to do so. It further develops novel measures of foreign aid's public goods characteristics and donors' marginal returns from giving aid that should help triangulate conditions under which we can expect lead donorship to arise due to cooperation or else its absence. Estimates from a flexible semi-parametric modeling strategy show that when and where lead donorship has the highest probability of occurring is consistent with systematic cooperation failure in the allocation of foreign aid. Various robustness checks are done and alternative explanations are also discussed. These findings provide insight into ongoing policy debates about donor cooperation and aid effectiveness and raise questions about what deeper strategic logics preclude donor cooperation.

*Keywords:* foreign aid, lead donorship, cooperation

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## Introduction

Why does lead donorship—a condition of sustained outsized responsibility by one bilateral foreign aid donor government for providing development assistance to a developing country—arise when and where it does? Does it emerge because of donor collaboration or is it a reflection of an uncooperative general equilibrium? Prior work suggests lead donorship portends good news about donor cooperation but bemoans its relative decline over the past few decades (Steinwand 2015). However, for good news about lead donorship to be good news about cooperation, we should expect to see a distinct pattern in when and where lead donorship arises. This study addresses this issue by modeling patterns in lead donorship as a function of novel measures of recipient need and donor-recipient ties to help triangulate different foreign policy goals of donors in aid recipients. Following the theoretical framework outlined by Steinwand (2015), two competing hypotheses (*collaboration* and *elusive collaboration*) for how donor-recipient ties and recipient need interact to predict patterns in lead donorship are pitted against each other. One hypothesis specifies what the distribution of lead donorship should look like if donors systematically cooperate in the allocation of bilateral aid while the other specifies what the distribution of lead donorship should look like if donors systematically fail to cooperate. In the main analysis, the *elusive collaboration* hypothesis finds support over the *collaboration* hypothesis, and further robustness checks support this conclusion. In short, the pattern of lead donorship is consistent with systematic cooperation failure in the allocation of foreign aid. This novel empirical finding is significant for both normative and theoretical reasons.

First, identifying whether lead donorship is a product of cooperation or cooperation failure is important because of its connection to aid fragmentation, which characterizes the extent to which a developing country receives aid from a diverse portfolio of donors. Past findings are mixed, but many propose that aid fragmentation may strain recipient bureaucratic capacity (Kanbur 2006; Knack and Rahman 2007), increase donor transaction costs (Anderson 2012), and reduce a donor’s ability to use aid conditionality to spur positive development and governance reforms in recipients (Hernandez 2017; Zeitz 2021). At the same time, others propose that lack of recipient choice (i.e., low fragmen-

tation or the presence of a lead donor) can have negative effects, and that under the right conditions, fragmentation actually has pro-development and growth impacts (Gehring et al. 2017; Gutting and Steinwand 2017). While a definitive statement on the effect of fragmentation remains elusive, most scholars agree that it matters for aid effectiveness. By extension so does lead donorship, because as Steinwand (2015) argues, why lead donorship emerges when and where it does may play a role in conditioning the impact of aid fragmentation on aid effectiveness.

Second, a question of major theoretical importance is understanding whether and how cooperation in the allocation of foreign aid is possible. Many studies that consider this issue take a spatial modeling approach, using the correlation in the giving of a donor with that of its peers to infer cooperation or cooperation failure (for example, Fuchs, Nunnenkamp, and Öhler 2015; Steinwand 2011, 2015). Such an approach has many advantages but may be sensitive to biases induced by endogeneity, circular causation, and heterogeneity in the spatial correlation of donor giving. The latter concern is especially significant given the diverse objectives donor governments pursue through their aid allocation. Using lead donorship to study this issue provides a fresh approach that side-steps the need to estimate the spatial correlation in donor giving to infer donor behavior. Instead, it offers a chance to consider the *general equilibrium* implications of donor behavior whereas a classical spatial modeling approach provides only a *partial* picture.

The paper proceeds as follows. First, the concept of lead donorship is introduced. Credit for the concept is owed to Steinwand (2015). Though important, lead donorship has received little engagement in subsequent research. This is unfortunate, because the concept has untapped potential for identifying whether systematic cooperation or cooperation failure exists in the aid allocation decisions of donor governments.

Next is a theoretical discussion of what patterns in lead donorship we should observe depending on whether donors cooperate or fail to do so in the allocation of foreign aid. This discussion addresses two buckets of goods donors seek from their aid allocation: *public* and *private*. When and where aid produces public goods for donor governments, classic theories of collective action (Olson 2012) imply that cooperation should reduce the likelihood of lead donorship. Meanwhile, cooperation failure

should increase the likelihood of lead donorship in proportion to the degree to which marginal returns from aid are concentrated in a single donor (Buchholz and Sandler 2016). The opposite is true when and where aid produces rival goods. Competition for rival benefits, like political influence or market access, should lead to crowding in, making it more difficult for the donor with the greatest marginal returns to maintain the top position. Cooperation implies, to the contrary, that donors agree to forego competition and thus cede the top position to the donor with the most to gain from its relationship with a developing country.

These two competing behavioral hypotheses—which I call *collaboration* and *elusive collaboration*, respectively—are pitted against each other in the remainder of the paper. The next sections discuss these hypotheses in more detail and empirical hurdles that need to be surmounted in order to test them. The main hurdle is how to capture when one kind of good (public or private) is most pronounced and whether marginal returns from the good are concentrated in a single donor or enjoyed by many. Two concepts are introduced: *donor interest* or *ties* with developing countries and *recipient need*. I argue that these two concepts permit triangulating when and where the public goods properties of aid will be more pronounced (high need) and when and where marginal returns are concentrated in a single donor (high concentration of dyadic donor-recipient ties).

The study then turns to measurement. First, lead donorship is operationalized and some possible limitations discussed. Next, donor-recipient ties and recipient need are considered. Most studies measure these concepts using vectors of multiple different variables. The approach taken here is to combine each into a unique measure. I rely on two sets of variables to construct an index of donor ties with recipients and an index of recipient need, respectively. The first is composed of measures of bilateral trade, colonial past, bilateral distance, and military alliances. The second is composed of recipient level measures of average income, population size, ongoing civil war, the impact of natural disasters, and strength of democracy. A method to combine these variables into their respective measures is introduced that creates a linear combination that is designed to maximally covary with its components.

Buttressing these measures are two assumptions. The first is that the degree of recipient need

is proportional to the extent to which addressing recipient problems with foreign aid addresses a public goods problem (e.g., promoting economic growth, limiting drivers of global migration, and supporting political stability). The second assumption is that the extent to which a donor has relatively stronger ties to a recipient is proportional to its marginal returns for giving aid to a recipient (e.g., close trade ties, geographic proximity, colonial legacy, and so on). These general buckets of donor considerations in giving aid to developing countries are well-studied. However, where need and ties were often pitted against each other in the empirical literature, more recent work shows that these drivers of aid giving are complementary (Bermeo 2017, 2018). For example, strength of donor ties with a recipient can mediate the benefits donors receive from promoting public goods in a recipient with foreign aid. Conversely, when recipient need is low, donor ties can determine the relative benefits donors receive from using aid for non-development purposes.

Based on the theoretical discussion, we should observe one of two patterns in lead donorship as a function of bilateral ties and recipient need. If donors cooperate, lead donorship should occur with the greatest frequency in recipients where we observe low need and ties concentrated with a single donor. Conversely, if donors fail to cooperate, lead donorship should occur with the greatest frequency in recipients where we observe high need and ties concentrated with a single donor.

These predictions imply an interactive hypothesis between need and ties, but one that is inconsistent with a simple two-way interaction in a linear model. Therefore, a semi-parametric approach is adopted. The data are aggregated to the recipient-year level with lead donorship modeled within a generalized additive model or GAM framework using a logit link function with year fixed effects and random recipient effects. A joint smoothing function is used to map the interaction of a measure of donor tie concentration and level of recipient need to the probability of lead donorship in a developing country.

The results show that lead donorship has the greatest probability of occurrence in developing countries that have high need and that have bilateral ties concentrated with one donor government. This finding is consistent with the *elusive collaboration* hypothesis, meaning that the pattern in lead donorship is consistent with the presence of uncooperative competition for top donor status where

private goods are predominant and buck-passing where public goods are predominant.

It is important to note that while this finding is consistent with the theoretical argument, other explanations cannot be ruled out. Several are discussed following the presentation of the main results, including the possibility that lead donorship is the product of coordination or that it is epiphenomenal to donor interests. Robustness checks are done as well that consider alternative measurement strategies, a lagged version of donor-recipient ties to account for possible endogeneity, and a more restrictive measure of lead donorship. Some exceptional cases of lead donorship are discussed as well. These are instances of lead donorship that arise when and where the theoretical argument contends it should be absent. Rather than suggest limitations with the theoretical argument, these cases appear to show that some cases are not adequately captured by the measure of donor-recipient ties. In short, these exceptions prove the rule, revealing instead that the measures developed in this study are somewhat blunt (an admitted limitation with any measurement approach that collapses many factors into one).

Ultimately, these findings matter for ongoing policy debates and raise important theoretical questions. From a policy perspective, the seeming failure to identify much collaborative behavior among donors (at least at a macro level) is frustrating in light of decades-long efforts to spur greater donor cooperation. From a theoretical perspective, systemic cooperation failure begs the question as to why uncooperative behavior is so endemic. Are there features of the strategic environment that donors and recipients inhabit that prevent cooperation? In addition, is aid effectiveness improved or worsened by virtue of when and where lead donorship emerges? These are important questions for future research to address.

### **Lead Donorship and Its Connection to Donor Cooperation**

Lead donorship characterizes a scenario where a single donor has a long-term relationship with an aid recipient and is responsible for the greatest share of foreign aid given (Steinwand 2015). The concept is closely connected to aid fragmentation, which is a measure of the extent to which a developing country receives aid from a diverse portfolio of donors. However, fragmentation is not strictly the

inverse of lead donorship. While low levels of fragmentation are an important condition for lead donorship to emerge, low fragmentation is just one dimension of lead donorship. Lead donorship is not just a reflection of a concentrated aid donor portfolio for a recipient, it is has a *temporal* dimension as well. As Steinwand (2015) notes, “lead donorship [is] a long-time stable exclusive relationship between one donor country and a recipient country, in which a donor continuously acts as biggest provider of foreign aid” (445). Based on this definition, while high fragmentation would mean the absence of a lead donor, low fragmentation is not sufficient to say a lead donor exists.

One of the main questions surrounding lead donorship is whether it is a product of donor collaboration in carving out spheres of influence, or else if it is a product of uncooperative buck-passing. The key factor contextualizing lead donorship is the public or rival nature of the goals donor governments use foreign aid to achieve. As Dreher, Lang, and Reinsberg (2024) note in a recent overview of the aid literature, industrialized countries use foreign aid as a multi-purpose foreign policy tool that can serve both as an instrument for promoting economic development and for providing donor governments with political influence, market access, and security. The former is often thought to have public goods properties, while the latter group of objectives is thought to have private goods properties.

When dealing with public goods, theories of collective action hold that if actors fail to cooperate, the actor with the greatest marginal returns from a public good will end up bearing the greatest share of the burden in supplying it (Buchholz and Sandler 2016; Olson 2012). By their very nature, public goods are nonrival and nonexcludable. That means one actor’s enjoyment of the good does not come at the expense of another’s, and no actor can be excluded from enjoying the good, even if they do not directly pay for it. This creates adverse incentives for all involved. Not only does each actor (regardless of its marginal returns) generally pay less for the public good than they would absent free-riding, but also the actors with lower marginal returns from the good will pay disproportionately less than the actor with the greatest marginal returns.

The welfare implications of free-riding are simple: all actors would be better off if they did not free-ride. As Steinwand (2015) notes, in the context of foreign aid, “coordination in the provision of aid with public goods properties helps to reduce free-riding and increases aid levels, with ultimately

positive results for development” (444-445). That means that cooperation actually increases aid giving by all donors and thus lowers the likelihood of lead donorship. In short, with respect to addressing public goods, aid effectiveness is improved by limiting lead donorship, but donor self-interest makes lead donorship more likely.

The converse holds for rival goods. Here, lack of cooperation manifests as a race to the top that makes it harder for the actor with the greatest marginal returns from rival goods to maximize those returns. The result is greater aid fragmentation and thus a lower likelihood of lead donorship. Like free-riding, competition is inefficient from a donor welfare perspective because it leads donors to crowd in resources that could otherwise be used to achieve other goals. It may also be bad from a recipient development perspective because by expanding recipient choice, rents shift away from the donor in favor of the recipient government. But, as Steinwand (2015) notes, if donors cooperate to limit competition, “[d]onor fragmentation decreases, lead donorship arises, but overall aid amounts fall” with the end result being less waste and overlap in aid projects and less opportunity for rent-seeking by recipient governments (445). In short, with respect to rival goods, aid effectiveness is improved with lead donorship, but donor self-interest limits the possibility of a lead donor emerging.

Buchholz and Sandler (2016) present a formal model of global public goods that may help to clarify the logic at work here and further show when and why the good in question will either increase or decrease the likelihood that a lead donor emerges if donors fail to collaborate. Buchholz and Sandler (2016) use a very simple game theoretic set-up that allows for a pair of actors in the provision of a public good to differ with respect to three things: their budget, their marginal returns from the public good (preferences), and their comparative advantage (or ability) in supplying the public good. Buchholz and Sandler (2016) find that if you take two actors involved in the supply of a public good who have similar budgets but asymmetric preferences or comparative advantages, the actor with the stronger preference or comparative advantage will shoulder most or all of the burden of supplying the good while the other actor free-rides. As Buchholz and Sandler (2016) further find, the influence of preference and comparative advantage can be enough such that an actor with a comparatively smaller budget will nonetheless bear the greatest responsibility for supplying the public good if they are more



motivated (stronger preference) or better equipped (comparative advantage) to do so. However, when actors are similar with respect to budget, preference, and comparative advantage, we should expect overall supply of the good to be lower, but no one actor to bear greater responsibility for supplying it. In short, there is nothing to compel one actor to take the lead thus making it possible for the other to sit on the sidelines.

While rival goods are not addressed by Buchholz and Sandler (2016), by reversing the sign of the impact that actor spending has on the other actor's ability to enjoy the good in question, solving for actors' best-responses shows that they now would be motivated to give more when the other does as well. Furthermore, where asymmetrical preferences or comparative advantages create space for a single actor to emerge as the chief supplier of a public good, these same factors will only enhance competition. This is because, with asymmetrical preferences, the actor with the weaker preference for the rival good faces strong incentives to keep up with the other actor. The mechanism driving this is that the actor with stronger preferences for a rival good will naturally spend more on that good to begin with. This forces the other actor to spend more on the rival good than otherwise in order to ensure they, too, get to enjoy some of the benefits they desire from the rival good. The result is crowding-in, with the actor that has the strongest preference for the rival good spending a little more than it would otherwise and the actor that has the weakest preference for the rival good spending a lot more than it would otherwise. In this way, competition narrows the gap in spending by actors for the rival good. The spending gap will similarly be slim or non-existent when actors are similar in terms of budget, preference, and comparative advantage because they will still need to compete to maximize their returns from the rival good.

We can apply the above general logic to many scenarios, including to foreign aid allocation and lead donorship. Simply treat the actors in this framework as aid donors and the public or rival goods they seek to promote as either development or non-development goals that donors have for giving aid to a particular recipient. In the case where donors seek to address recipient need (a goal with public goods properties), there will be incentives to free-ride. Free-riding, furthermore, creates space for a lead donor to emerge, particularly when a single donor disproportionately benefits from promoting

development and/or has a comparative advantage in doing so. Conversely, when no donor draws comparatively greater benefits or has a comparative advantage in promoting development and/or when donors seek to maximize non-development foreign policy objectives (goals with rival goods properties), a lead donor is unlikely to emerge. This is either because no donor is comparatively more motivated/able to supply public goods to sufficiently crowd-out other donors, or because competition forces donors to crowd-in aid to maximize their non-development foreign policy interests regardless of which donor has the strongest preference for or comparative advantage in promoting said foreign policy interests.

It may be helpful to consider a hypothetical example with two donors (A and B) and three aid recipients (X, Y, and Z) where donors seek to promote public goods by giving foreign aid. Say A draws greater returns from giving aid to X, B draws greater returns from giving aid to Y, and both draw similar returns from giving aid to Z. The logic of public goods laid out by Buchholz and Sandler (2016) is consistent with an equilibrium where A will specialize in giving aid to X, B will specialize in giving aid to Y, and both will bear similar responsibility for giving aid to Z. That is, A will be a lead donor in X, B will be a lead donor in Y, but there will be no lead donor in Z.

Alternatively, suppose A and B seek to promote rival foreign policy objectives in X, Y, and Z with their foreign aid. Assuming A still draws greater returns from giving aid to X, B draws greater returns from giving aid to Y, and both draw similar returns from giving aid to Z, we will observe a different equilibrium emerge than with public goods. Because of competition, even though B derives fewer benefits from rival goods in X than does A, B will be compelled to give more aid to X than it would otherwise, narrowing the gap between its giving and A's. The reverse problem will happen in recipient Y. Meanwhile, both donors will give equal amounts of aid to recipient Z. The end result is that no lead donor is able to emerge across any of the recipient countries.

Steinwand's (2015) argument builds on the above logic and extends it to consider what cooperation among donors would imply—that is, if donors could stay their incentives to either free-ride or compete. If cooperation failure implies lead donorship will arise when and where addressing public goods is salient and when and where a single donor has the greatest motivation and ability to do

so, successful cooperation implies that lead donorship will arise when and where the pursuit of rival goods is salient and when and where a single donor has the greatest motivation and ability to realize these rival goods.

The logic of lead donorship and its connection to cooperation is clear enough once explained, but empirical identification of why lead donorship emerges is quite the challenge. Steinwand (2015), who was the first to consider the concept of lead donorship, takes a novel and creative approach. First, to delineate aid given primarily for public or private goods, Steinwand (2015) disaggregates foreign aid by two main delivery channels: government-to-government and bypass aid.

Dietrich (2013) is among the first to note the possibility of different motives associated with these alternative forms of aid delivery. Dietrich (2013) argues that while donor governments certainly are driven by non-development foreign policy goals, they also care about responding to recipient country development need. She hypothesizes that donors should therefore be sensitive to recipient governance quality, calibrating their form of aid delivery to optimize the chances that aid reaches the populations in a recipient country it is meant to help. Specifically, she argues that donor countries will use the so-called “bypass” channel in inverse proportion to the quality of governance in a recipient.

Bypass aid encompasses resources that are given to nongovernmental actors such as NGOs operating in recipients rather than through direct cooperation with the state bureaucracy. In poorly governed developing countries, donors may fear that aid will be lost to rent-seeking elites. This mistrust in turn leads them to target more aid through the bypass channel relative to the government-to-government channel. Dietrich (2013) finds strong support for her claims, and later studies have found similar patterns when examining different aid sectors (Bermeo 2017, 2018) and alternative measures of limited state capacity such as civil conflict (Everett and Tirone 2021). Of course, later work by Dietrich (2016) puts important scope conditions on this practice, finding that the political economies of donors—whether they are oriented toward market-efficiency or a strong state—condition the use of the bypass channel as well.

After separating aid by delivery channel, Steinwand (2015) further applies spatial autoregressive

models and proposes alternative hypotheses for the direction of the spatial correlation in donor giving on the basis of delivery channel and the presence of donor collaboration. Specifically, if donors cooperate in the provision of public goods, donor reactivity to other-donor aid should be null when examining the bypass aid channel. However, if donors do not collude, then they should give less aid in inverse proportion to the giving of others due to free-riding.

Conversely, if donors collude in private goods aid, donors should have a negative reaction to other-donor giving through the government-to-government channel. The idea is that donors agree to a delineation of spheres of influence. By foregoing competition for rival goods where they reap only minimal returns, donors are free to target aid in developing countries where they reap higher marginal returns. But, if donors do not cooperate, they should crowd in resources in the government channel and thus give more aid in proportion to the giving of other donors.

Steinwand's findings only partially support these expectations. Most notably, the fine-grained distinction between bypass and government-to-government aid—that one is oriented toward public goods and the other private—does not hold up in the empirical analysis. In fact, Steinwand (2015) finds evidence of competition in bypass aid, contrary to the claim that the bypass channel closely corresponds to public goods.

However, Steinwand (2015) does claim to recover evidence that lead donorship is linked to donor collaboration. He finds that with lead donorship, a donor decreases its level of giving in proportion to the giving of others. Conversely, donors increase their level of giving in proportion to others in the absence of a lead donor. Importantly, at least from Steinwand's perspective, this finding comes from examining the government-to-government aid channel.

The conclusion drawn from this analysis is that competition is the driving strategic concern in foreign aid allocation, but that lead donorship suggests donors have successfully engaged in some amount of cooperation. But Steinwand (2015) adds to this the observation that lead donorship has been on a secular decline over the past few decades, and he thus calls for greater efforts to promote lead donorship to reduce competitive waste.

Without calling into question the soundness of Steinwand's empirical strategy, some caution in

interpreting his results is warranted. In particular, the observation that with lead donorship the spatial correlation in donor giving is negative does not necessarily support the argument that lead donorship arises out of donor cooperation. Steinwand notes that bypass aid is surprisingly tied to competition for rival goods. Is it not possible that government-to-government aid is partially linked to public goods? How do we know that the pattern Steinwand labels cooperation is not actually suggestive of free-riding?

The limitation of Steinwand's approach is that it relies heavily on aid delivery channels to help contextualize donor motives and spatial correlations in donor giving, which can be subject to heterogeneity, endogeneity, and circular causation. If aid giving in general (regardless of delivery method) reflects a mix of both public and private goods, it is impossible to diagnose the meaning of spatial correlations in donor giving by the presence or absence of lead donorship. It may be that with lead donorship we observe a negative correlation between individual and other-donor giving due to collaboration. It also may be that when and where lead donorship arises, it does because of free-riding. The observation of a negative spatial correlation in donor giving in the presence of a lead donor is consistent with both explanations, and lead donorship itself is likely a descriptive product of the spatial correlation in donor giving.

In this study, an alternative empirical strategy is proposed. Rather than use variation in lead donorship to explain donor reactions to the giving of one another, it would be more useful to explain variation in lead donorship by way of measures that help triangulate the publicness or rivalness of the goods donor governments get out of their aid allocation. Based on the logic outlined earlier in this section, if lead donorship emerges primarily when and where the public goods properties of aid are greatest and where marginal returns are concentrated in but one or a few donors, this would support the claim that lead donorship is the product of uncooperative buck-passing. Alternatively, if lead donorship emerges primarily when and where the rival goods properties of aid are greatest and where marginal returns are concentrated in one or a few donors, this would support the claim that lead donorship is the product of donor collaboration. The key question, of course, is how to identify which kind of good is at work and how best to capture the returns different donors get from

promoting these goods in recipients. This is the subject of the next section.

### **Triangulating Public and Rival Goods in Aid Allocation**

The motivations behind giving foreign aid have intrigued IR scholars and economists alike ever since the practice emerged in its modern form after World War II. Early contributions to the literature were divided with respect to whether the factors driving aid giving were primarily humanitarian in nature, or else cynical, driven by the self-serving foreign policy, economic, and security goals of donors. McKinlay and Little (1979) set the tone for future studies by pitting measures of recipient need against measures of donor interest in their analysis of US aid data from 1960 to 1970. Future studies would adopt a similar approach (see Alesina and Dollar 2000; Maizels and Nissanke 1984; Schraeder, Hook, and Taylor 1998).

Contemporary research has since moved away from the sharp dichotomy between recipient need and donor interest. Instead, scholars recognize that donor governments' motives are often mixed and vary over time. Existing studies point to a number of factors that correspond either with donor interest or recipient need as drivers of donor giving. Studies show that foreign aid is linked to donors' geostrategic goals, interest in promoting bilateral trade, combating global terrorism, maintaining influence over former colonies, gaining international prestige, complementing military deployments, and addressing the root causes of discontent and instability, to name but a few (Alesina and Dollar 2000; Bearce and Tirone 2010; Bermeo 2017, 2018; Kilby and Dreher 2010; Kisangani and Pickering 2015; Round and Odedokun 2004; van der Veen 2011).

Given the numerous motives behind foreign aid, the more interesting question addressed by recent scholarship centers not on the question of *whether* donors are altruistic or self-serving, but instead on *when*. In one prominent example, Heinrich (2013) shows that when recipient policy choices have salience for donors, aid is driven by "selfish" donor motives. Alternatively, greater awareness of poverty in the recipient country increases "selfless" aid giving.

Bermeo (2017, 2018) goes further, arguing that because of the increasing interconnections between industrialized and developing countries in a globalizing world, addressing recipient needs also

serves the self-interest of donor governments. She shows this is especially true in proportion to the strength of the connections between an industrialized country donor and a developing country recipient.

Both Heinrich's (2013) and Bermeo's (2017, 2018) studies point to two variables that will help to triangulate the public or rival goods properties of foreign aid. The first is variation in the salience of recipient countries to donor governments. We might also label this as donor-recipient ties. These are factors that determine the returns that donor governments get out of their aid allocation to a particular recipient. In Heinrich's telling, this concept relates to the salience of recipient policy deals to donors (e.g., donor foreign policy interest), but it also corresponds with the strength of donor-recipient connections that, for Bermeo, make responding to recipient need important for donors as well.

While these views of the significance of donor-recipient ties seem to be in tension, the argument made here is that recipient need helps to resolve the tension. One example of this is donor relationships with former colonies. Several studies show a strong pro-colonial bias in the aid allocation decisions of donor governments, and this finding is often attributed to the neo-colonial aspirations of donors (see Chiba and Heinrich 2019). By targeting economic assistance to former colonies, old colonial powers are thought to exercise political influence absent formal colonial rule. However, colonial ties also make donor countries especially sensitive to problems rooted in underdevelopment in their former colonies (Bermeo 2017, 2018). These ties increase the likelihood that negative spillovers due to poverty or conflict will have an impact on the population of the former colonizer. It also bears noting that former colonizers may have a comparative advantage in promoting public goods in their former colonies. This could be due to lower marginal costs that result from greater expertise in working with the recipient government or greater marginal benefits because of the presence of diasporas living in the donor country that provide side-payments. Whatever the cause (and none of the ones proposed are mutually exclusive), ex-colonies may be important targets of foreign aid, both for reasons rooted in donor interest and reasons rooted in recipient need. The argument laid out here is that the key factor determining when one or the other objective is front and center is variation in recipient need. Greater need may signal greater likelihood of instability and possible negative spillovers, which will be

most salient to a donor that is a former colonizer. However, in recipients where need is low, this may create opportunities to pursue non-development foreign policy goals, which may be most relevant to a donor that is a former colonizer Heinrich (2013).

This discussion points to a simple proposition, namely, that depth of recipient need interacts with the strength of donor-recipient connections to shape the kinds of, and returns from, goods donors get out of their aid allocation. As recipient need deepens, the public goods properties of aid should be more pronounced. Conversely, as recipient need becomes more shallow, the political opportunities that giving aid affords donors may take on greater salience, giving way to rival goods as donors vie for influence. Donor ties with recipients may in turn determine the returns that donors receive from their aid allocation.

These dynamics in turn should influence donor behavior with respect to each other. Depending on the depth of recipient need and strength of donor ties with a recipient, donor governments will have differing strategic incentives in how they respond to the aid giving of peers in a particular developing country. In some recipients, incentives to compete for top-donor status will be substantial, while in other recipients, incentives to free-ride on the giving of others will dominate donor decisionmaking. When we expect one or the other of these incentives to be at work will hinge on whether public versus rival goods are the primary motive for donor giving.

Of course, this characterization of how donor-recipient ties interact glosses over a multitude of details. But tractability is gained in exchange for exactness. The next section continues this discussion and lays out two alternative hypotheses for lead donorship given the interaction of recipient need and donor-recipient ties.

## **Hypotheses**

The discussion up to now points to two competing hypotheses. These competing hypotheses follow from two different scenarios, one where donor governments cooperate in the provision of foreign aid and the other where they fail to do so and thus engage in a mix of competition and buck-passing depending on the goods (public or rival) in question.



Following Steinwand (2015), donor cooperation implies a delineation of spheres of influence in a rival goods context and a mitigation of buck-passing or free-riding with public goods. This means lead donorship should arise with the greatest frequency when and where rival goods have disproportionate weight relative to public goods and where one donor obtains comparatively more marginal returns relative to others. Further, lead donorship should occur with less frequency with public goods, even if one donor obtains more marginal returns relative to others, as donors agree to mitigate free-riding. This may be called the “collaboration” hypothesis stated simply as:

**H1 (Collaboration):** *Lead donorship should emerge when and where foreign aid provides more rival than public goods and marginal returns are concentrated in a single donor.*

Alternatively, the absence of cooperation implies an absence of clear spheres of influence with rival goods and the presence of buck-passing with public goods. This means that lead donorship will have a low likelihood of arising with rival goods, even when one donor obtains disproportionate marginal returns. However, lead donorship will have a greater likelihood of arising with public goods, especially when one donor obtains greater marginal returns relative to others. We may call this the “elusive collaboration” hypothesis. The word “elusive” is used to modify “collaboration” to signify a *systematic* pattern of cooperation failure. If donors fail to cooperate, but this is localized to only some recipient countries, the elusive collaboration hypothesis will fail to obtain. Collaboration must truly be elusive/systemic for the following pattern to hold:

**H2 (Elusive Collaboration):** *Lead donorship should emerge when and where foreign aid provides more public than rival goods and marginal returns are concentrated in a single donor.*

Each hypothesis implies different patterns in lead donorship across developing countries, which may be difficult to intuit. Figures 1 and 2 aid in the description of these patterns. Figure 1 shows the variation in lead donorship that we would observe with donor collaboration. The x-axis shows

variation in the level of recipient need, and by symmetry inverse variation in opportunity for using aid to realize non-development goals. The y-axis shows variation in the degree to which recipient ties with donors are relatively even or else concentrated in a single donor. Under collaboration, lead donorship occurs with greatest frequency in the upper-left quadrant of the figure where recipient need is low and a single donor obtains greater marginal returns from private goods relative to other donors.

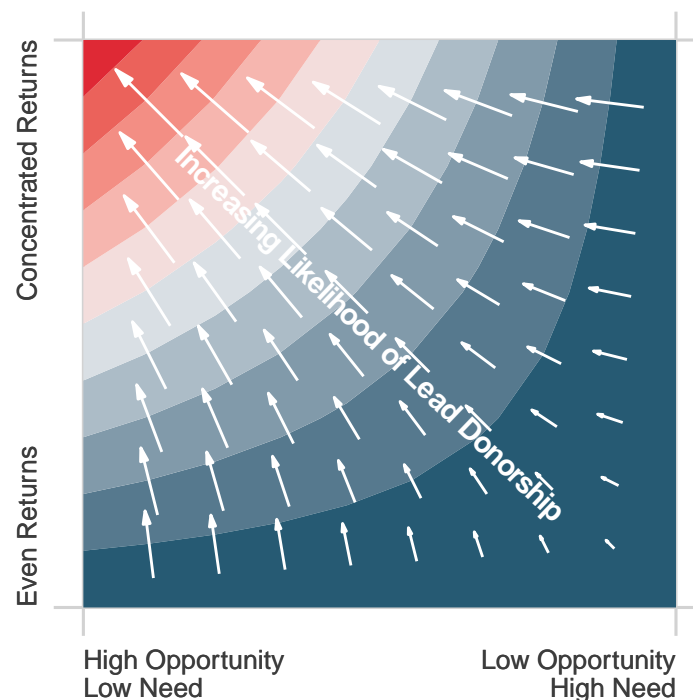


Figure 1: (Collaboration) Expected variation in lead donorship if donor governments collaborate in the provision of foreign aid. Lead donorship should be concentrated where recipient need is lowest and a single donor has disproportionate marginal returns.

Figure 2 shows variation in lead donorship absent donor collaboration. Like with Figure 1, the x-axis shows variation in recipient need and conversely opportunity in realizing non-development or rival goods. The y-axis shows the degree to which marginal returns are disproportionately enjoyed by a single donor or spread more evenly across donors. Here, if collaboration eludes donors, lead donorship will have the greatest likelihood of occurrence where recipient need is especially high and marginal returns are disproportionately obtained by a single donor.

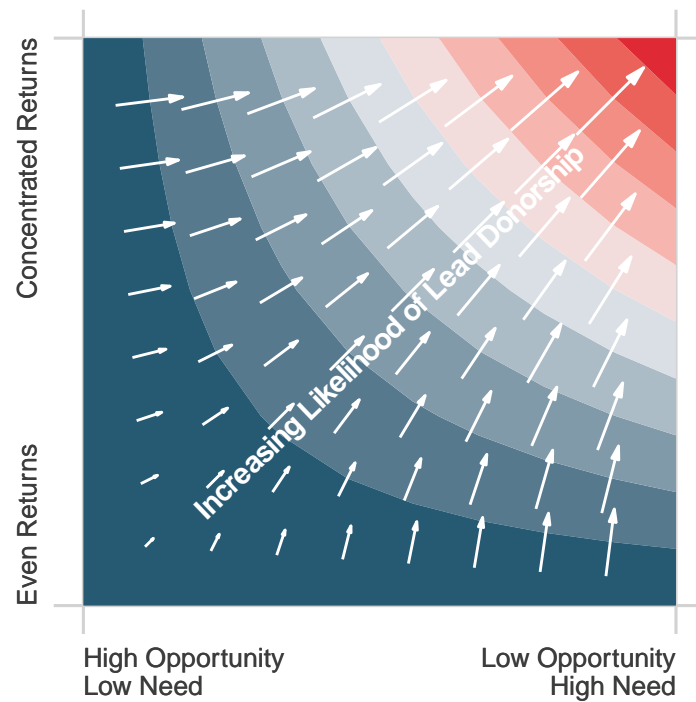


Figure 2: (Ellusive Collaboration) Expected variation in lead donorship if donor governments fail to collude in the provision of foreign aid. Lead donorship should be concentrated where recipient need is greatest and a single donor has disproportionate marginal returns.

These predictions are straightforward, but testing them empirically is not. Need is a multi-dimensional concept, as is the strength of donor-recipient ties. After first detailing the measurement strategy for lead donorship, the section that follows describes a novel empirical strategy to measure need and ties. It is one that comes with some costs to precision, but the return is a more tractable analysis that permits a macro-level evaluation of variation in lead donorship.

## Measuring Lead Donorship

Building on past research, Steinwand (2015) proposes the following criteria for lead donorship:

1. The Herfindahl Index (HI) for a given recipient in a given year is greater than the median HI for the data sample;
2. The difference between the total amount of aid given by the top donor relative to the next largest donor to a recipient in a year is greater than the sample median of this difference;
3. The share of aid to a recipient in a given year from the top donor is greater than the sample median of aid shares.

This measure combines elements of various techniques for quantifying the degree to which aid flows into a single recipient are from only one donor versus many donors. The Herfindahl Index (HI) is the most commonly applied such measure in the aid literature (see Djankov, Montalvo, and Reynal-Querol 2009; Gehring et al. 2017; Knack and Rahman 2007; Steinwand 2015). With respect to a recipient  $r$  in year  $t$  HI is given as

$$HI_{rt} = \sum_{i=1}^N \pi_{irt}^2, \quad (1)$$

where  $\pi_{irt}$  is the share of aid given to recipient  $r$  in year  $t$  that donor  $i$  is responsible for. The final measure is equal to the probability that two randomly drawn dollars from the overall aid given to a recipient in a given year come from the same donor. The higher this probability, the more concentrated

the donor pool. While this measure is commonly used, it lacks specificity with respect to lead donorship. This is why the criteria for lead donorship measure also includes the two additional benchmarks highlighted above. The goal is to take into account not only the degree of donor concentration, but also the absolute and relative amount of aid given to a recipient from the top donor. To further capture the temporal dynamic of lead donorship, Steinwand (2015) adds the following longitudinal criteria:

4. A donor must have top donor status for at least 5 out of 9 consecutive years;
5. A donor must not drop from top donor status for more than 2 consecutive years in that 9 year time span.

In devising a measure of lead donorship for this study, I adopt some, but not all, of these decision rules. In particular, I rely on the first three while I opt for a slightly more flexible approach to deal with the longitudinal dimension of lead donorship. Instead of the year-based criteria, I use a simple lagged rolling average of lead donorship:

*For a given year, I calculate the proportion of times a donor meets the criteria specified in points 1-3 in that year and the two previous.*

With this approach, if a donor met criteria 1-3 in 1999 and 2000, but fell short in 2001, its lead donor status would be 2/3 in 2001. This strategy adds a fuzziness to lead donorship that Steinwand's measure lacks. Rather than being entirely present or absent, lead donorship may wax and wane with a certain degree of granularity. For interested readers, the Online Appendix, available on the Review of International Organizations' webpage, includes a more in depth discussion of this measurement approach by looking at a pair of recipient country cases—Mexico and Mozambique.

The choice to account for the longitudinal element of lead donorship has a practical, in addition to methodological, purpose. Namely, it provides more variation in the concept of interest. However, to facilitate comparisons with Steinwand (2015), in robustness checks I apply his more stringent longitudinal criteria as well.

Figure 3 reports how the yearly average of lead donorship within aid recipients compares to the yearly average of HI. For comparison, a measure of lead donorship based on Steinwand’s more restrictive temporal criteria is included as well. Because it involves a longer bandwidth, the measure has no valid observations for 1996 to 1999, and then from 2011 to 2014. Interestingly, while HI—which measures the probability that two randomly drawn dollars of aid given to a recipient originate from the same donor—slightly declined from 1998 to 2014, lead donorship saw an increase in recipients over this same period. This pattern runs counter to that reported by Steinwand (2015). Though he summarizes lead donorship over a slightly different period, 1970 to 2010, even for the years that overlap with the results presented here, we identify opposite trends in lead donorship, both for the modified measure preferred here and a measure based on Steinwand’s original criteria. Notably, because they are more restrictive, Steinwand’s measure provides a more conservative estimate of average lead donorship over time.

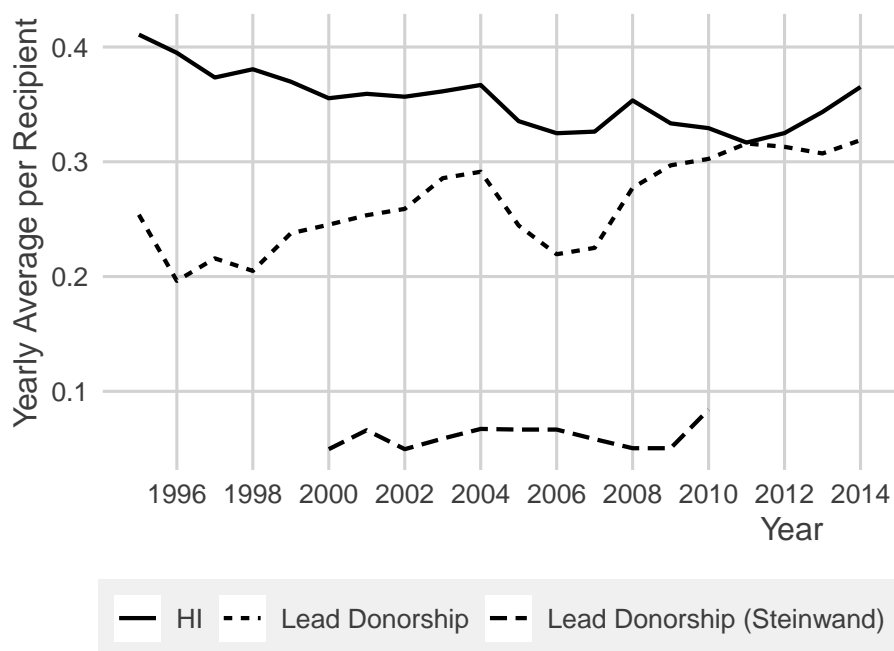


Figure 3: Values computed using the giving of 29 DAC countries across 24 development sectors to 127 recipient countries.

Part of the incongruence between these results may lie in the choice of aid variable. While Stein-

wand (2015) uses aid disbursements, I use aid commitments. The former often closely reflects the latter but with varying lags since commitments most closely match immediate changes in donor policy while disbursements represent downstream realizations of that policy over time. In a given year, Germany may commit a certain amount of aid to Indonesia, but that aid may be disbursed in installments over several years, for instance.

An additional difference is my choice to use the OECD's Creditor Reporting System (CRS) to isolate aid dollars committed specifically toward the 24 development sectors defined by the OECD. The total package of aid donors give often includes funds for overhead, staffing, administration, etc. I exclude such costs since they can be highly idiosyncratic to donors and across recipients and do not capture the types of budget support, debt relief, and sector-specific resources that have greatest material relevance for recipient outcomes. That Steinwand (2015) observes a decline in lead donorship over time may follow from the inclusion of overhead in aid totals—which will have increased across donors over time as aid agencies and start-up costs for projects grow. Including these funds, then, may have obscured the degree to which lead donorship across development sectors has, in fact, increased over time.

With a measure of lead donorship in hand, the next section describes the method for measuring donor-recipient ties and need.

### **Measuring Need and Donor-Recipient Ties**

There are many measures that capture variation in donor interest in particular recipients and level of development need in developing countries. When examining only a small sample of studies, the count of unique covariates is staggering. Bueno de Mesquita and Smith (2009) and Berthelemy and Tichit (2004) use 15 different measures each. Schraeder, Hook, and Taylor (1998) use over 20 and McKinlay and Little (1979) use over 30.

Including so many variables in a regression analysis is not difficult. The harder task is interpreting so many coefficients, each of which reflects only a partial relationship in the data. For these reasons, scholars like Achen (2002) complain and Pearl (2009) warn of the increasing complexity of causal

relationships and room for potential biases in regression analysis that arise with each new covariate added to the model.

The difficulties only worsen when incorporating interactions, as is the goal of this study. Even if measures of recipient need and donor-recipient ties could be reduced to just a handful of covariates, because both the collaboration and elusive collaboration hypotheses imply an interaction between these buckets of variables, the number of  $n$ -order interactions that would be required would strain our ability to draw sensible inferences and, worse yet, eat up valuable degrees of freedom in exponential fashion.

The empirical challenge, then, is not the identification of variables. Instead, the challenge lies in finding a satisfactory way of collapsing them along the two dimensions of interest—donor-recipient ties and recipient need.

However, before proceeding, a caveat on the value of collapsing measures bears noting. While dimensionality reduction offers several advantages, it is not an appropriate choice in all circumstances. While some questions in international aid are truly about macro-level issues and thus could benefit from synthesizing a fewer number of measures out of many, other questions center on particular mechanisms that drive patterns in aid giving. For example, Bermeo and Leblang (2015) in their study test hypotheses linked to donor immigration policy and migrant political mobilization as factors driving foreign aid to migrant-sending countries. Aggregate variables would have been too blunt an instrument for testing these mechanisms.

By contrast, composite measures are valuable in this study given the focus on identifying general patterns in lead donorship given the interaction of recipient need and donor-recipient ties as singular concepts. By first reducing each to two variables, it is more tractable to quantify how their interaction influences donor behavior. Specifically, these measures make it possible to triangulate contexts where motives for donor giving will be primarily rooted in genuine interest in development promotion or in opportunistic efforts to exercise political influence to obtain policy deals and concessions from developing countries.

There are many approaches to dimensionality reduction, some of which are more or less appro-



appropriate for the task at hand. Shrinkage approaches, such as LASSO, can be tuned to eliminate variables that have little predictive power with respect to an outcome from a model, and methods of feature projection can be used to combine a set of covariates into a single measure. An index could alternatively be constructed. The polity index, for example, is a composite of several component measures such as regime durability, regulation of chief executive recruitment, political competition, and so on (Marshall and Gurr 2020).

The method used here can be thought of as a blend of the feature projection and index construction approaches. Using an objective function, it finds the optimal set of weights with respect to both direction and magnitude to construct a linear combination (or index) given a set of component measures. The final product is optimized to maximally covary with its components, appropriately weighted on the basis of their variation. The objective function used in optimization is the sum of the squared covariances (SSC) of each variable with a possible linear combination of all the variables. Readers interested in the technical details and a deeper discussion of the approach are welcome to read the summary in the Online Appendix. The gist is that SSC provides advantages in constructing the composite measures of donor-recipient ties and development need relative to more familiar methods like principal components analysis (PCA) or multivariate factor analysis (MFA). The first is too atheoretical, optimizing on total variance rather than balancing the need to create a linear combination that is maximally correlated with its components. The second is too sensitive to variable correlations with each other, which means the linear combination may be overly influenced by the most strongly correlated components, leaving variation due to other theoretically important variables on the table. As is also summarized in the discussion in the Online Appendix, SSC yields measures of the concepts of interest with greater predictive power than versions constructed via PCA and MFA. This superiority in terms of explanatory power is demonstrated via both within and out-of-sample predictions and using various modeling techniques, ranging from parametric linear regression to random forests and neural networks.

With a method for measuring the concepts of interests identified, the next challenge is to identify the appropriate component variables. The concepts of donor-recipient ties and recipient need have

some well established sets of measures that are used to proxy for each. Of course, the universe of available variables is quite large, and it would be excessive to include all possibly relevant measures. Instead, the selection of variables is narrowed down to four in the case of ties and five in the case of need. These choices certainly are not the only valid options, but they capture many of the most salient dimensions thought to correspond to each concept. Taken together, these choices reflect common measures used in the aid literature and capture a wide range of signals related to interest- and needs-based drivers of foreign aid.

The need measure is composed of the following sub-measures:

- yearly per capita gross domestic product (GDP);
- yearly population size;
- the yearly number of individuals killed due to natural disasters;
- an indicator for whether the recipient is experiencing a civil war in a given year;
- the yearly level of political and civil liberties of a recipient.

The first two measures were drawn from version 9.1 of the Penn World Table (Feenstra, Inklaar, and Timmer 2015),<sup>1</sup> and were log-transformed to normalize values. The third, which captures the severity of natural disasters in a given year, is drawn from the Institute of Health Metrics and Evaluation's database on natural disaster deaths reported by countries in a given year (2021).<sup>2</sup> Values are transformed via the inverse hyperbolic sine rather than the natural log to retain zero values. The indicator for civil war is drawn from the UCDP/PRIO armed conflict database (Gleditsch et al. 2002; Pettersson et al. 2021).<sup>3</sup> It takes the value 1 for all years where there was a violent conflict between at least two parties that involved the deaths of at least 25 combatants and which included the government as at least one of the parties in the conflict. The final measure, recipient civil and political liberties, is the sum of the Freedom House's political rights and civil liberties scores for a given recipient country in a given year.<sup>4</sup> The rights and liberties scores each range from 1 to 7, with higher values

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<sup>1</sup> Available at <https://doi.org/10.15141/S50T0R>.

<sup>2</sup> Available at <https://ghdx.healthdata.org/gbd-results-tool>.

<sup>3</sup> Available at <https://ucdp.uu.se/downloads/index.html>.

<sup>4</sup> Available at <https://freedomhouse.org/>.

denoting more violations. After summing the values, the scores were reversed so that higher values denote greater freedom.

Each of these measures has been studied in the foreign aid literature, and while each has an obvious correspondence with recipient need, it bears noting that not all scholars are in agreement on whether these factors capture recipient need or donor interests. GDP per capita, which is often treated as a proxy for average income, has long been a variable of interest to political scientists and economists studying donor giving because of its obvious connection to recipient need. Early studies looking to determine whether major donors such as the United States allocated aid on the basis of need treated the predictive power of GDP per capita as a telling indicator of altruistic donor motives McKinlay and Little (1979). Basically, if donors give more aid to poorer countries this should indicate that donors are responsive to recipient need. However, others contend that economic size may also correspond to the price that donors need to pay to extract political concessions through aid allocation, with concessions being cheaper from countries with poorer economies (Bueno de Mesquita and Smith 2009). By and large, the aid literature consistent finds an inverse relationship between aid and GDP per capita (Bermeo 2017).

Population also is a variable that has long been of interest to aid scholars and whose correspondence with recipient need is obvious. However, the question of how to interpret its relationship with donor giving has been the subject of some debate. As an indicator of recipient need, we should expect, all else equal, a larger country to have more need relative to an otherwise similar but smaller country (Bermeo 2017). As a result, many have used the predictive power of population as a driver of donor giving as a test of donor motives. However, some argue that population might also be tied to donor's strategic interests as well. For instance, policy concessions might be cheaper to buy from smaller countries (Bueno de Mesquita and Smith 2009). Alternatively, donors may see value in gaining access to larger markets. Research on the whole shows that donors target more aid in larger countries supporting both the idea that donors are motivated to respond on the basis of recipient need as well as the idea that donors have an interest in using aid to get access to larger markets. However, some argue that when considered in the broader context of the determinants of donor giving, population

likely is primarily an indicator of relative need (Bermeo 2017).

Natural disasters are an obvious indicator of recipient need, with the number of individuals killed by disasters a reasonable proxy for severity. Cheng and Minhas (2021) recently use natural disasters as an exogenous measure of recipient need that motivates a donor response. As the authors note, immediately following a natural disaster “services like electricity, gas, water and telecommunications may all be disrupted” (945). In many developing countries, such disruptions can be especially severe if the government lacks the capacity to quickly and effectively restore power and other essential services. Therefore, more disaster deaths should indicate deeper need for donor action.

Civil war, similarly, is a good proxy for recipient need because, as some scholarship such as that by Collier et al. (2003) argues, civil war is effectively development in reverse. Violent conflict, because of its destructive potential, can set back economic and social development within a country by years or possibly decades. As a result, the presence of an ongoing civil war serves as a useful identifier of the need for a donor response to help offset any setbacks to recipient development caused by a violent conflict.

Finally, the presence (or absence) of political and civil liberties can be an important contributor to recipient need. Whether such factors are causally related to economic development is the subject of much debate captured by a literature far too fast to cite here, it is an empirical fact that democratic countries enjoy, on average, higher levels of economic development. This may in part result from some factors associated with more repressive and undemocratic regimes that may hurt development such as poor respect for property rights, higher likelihood of public unrest in response to government crackdowns, and so on. In short, poor political and civil liberties can on net be yet another indicator to donors of the level of development need in a particular recipient country.

Taken together, these five measures contribute to an overall picture of the relative need developing countries have for economic assistance. They also relate in important ways. Level of income surely should matter to donors, but the size of the country contextualizes the relative importance of income. Conflict, too, not only contextualizes poverty, but can in many ways be a driver of it and be driven by it. Limited freedoms further directly play into both poverty and conflict, and vice versa. Natural

disasters, meanwhile, are exogenous, but how many people are killed by them is both a function of total population size and a country's ability to adequately respond. For all these reasons, estimating separate partial relationships in a regression analysis for all these variables poses obvious challenges for interpretation and may result in unreliable signs and magnitude of coefficients. But, by combining these measures into a single composite variable, we can gain greater insight into how the movement of need in its various manifestations predicates the public or rival goods donors obtain from their aid allocation.

The measure of ties, meanwhile, is constructed from the following four variables:

- bilateral distance (in kilometers) between a donor and a recipient;
- bilateral trade (in dollars) between a donor and a recipient;
- an indicator for whether the donor and recipient are formal allies;
- an indicator for whether the donor and recipient share a colonial past.

The first and second measures were taken from CEPII. Distance comes from CEPII's gravity dataset (Mayer and Zignago 2011), and trade comes from CEPII's TRADEHIST dataset (Fouquin and Hugot 2016).<sup>5</sup> The former is log-transformed, while the latter is transformed via the inverse hyperbolic sine. The alliance measure is drawn from the ATOP database and takes the value 1 if the donor and recipient share an alliance (Leeds et al. 2002).<sup>6</sup> The colony measure comes from the same CEPII dataset as the bilateral distance measure, and takes the value 1 if the donor was a former colonizer of the recipient.

Study of the role of such strategic factors highlighted above has a well-established tradition in the literature. Extensive research has been done to test the range of foreign policy objectives that motivate foreign aid giving (Bearce and Tirone 2010; Bermeo 2017, 2018; Kilby and Dreher 2010; Kisangani and Pickering 2015; Round and Odedokun 2004; and van der Veen 2011). These studies and others usually subdivide donor interests under various umbrellas. The four measures included in the construction of ties capture four specific dimensions of donor interest: geographic, material, strategic, and social.

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<sup>5</sup>Both available at [http://www.cepii.fr/CEPII/en/bdd\\_modele/bdd\\_modele\\_item.asp?id=32](http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=32).

<sup>6</sup>Available at <http://www.atopdata.org/>.

Donors tend to give more aid to countries that are geographically closer, which suggests an interest in promoting influence within their sphere of influence. At the same time, proximity can make donors especially vulnerable to spillovers of developing country problems (Bermeo 2017, 2018). Distance of course is inversely proportional to trade, a measure that captures a donor's material or economic interests. The correspondence between distance and trade may explain why regression analyses that include both measures have yielded conflicting results about the significance of distance.<sup>7</sup> Alliances meanwhile reflect geostrategic objectives and security commitments between donors and recipients. Research on the specific role of alliances in predicting aid has only received limited attention from scholars, and then only in the context of total aid flows.<sup>8</sup> However, the existence of signed treaty agreements between donors and recipients certainly provides material evidence of strategic interests. This implies a role for aid in helping donors provide their allies assurances of their security commitments. At the same time, if an ally suffers due to instability or natural disasters, this increases the salience of responding to recipient need. Colonial status, finally, captures historical ties between donors and recipients. Former colonies may not only be targeted by donors as a means to perpetuate influence, but also because of the enduring social connections between colony and colonizer (Alesina and Dollar 2000; Bermeo 2017).

Of course, different measures might have been used to capture need and ties. Further, some measures associated with need—like political freedoms or civil war—could be alternatively argued to relate to donor interest. With respect to variable selection, these variables were chosen on the basis of availability and judgments about their ability to capture as much of a particular dimension of their associated concept as possible. For example, for geostrategic interests, measures other than alliances were considered such as arms transfers or military aid. However, the first did not provide as much coverage as alliance data—it contained invalid measures for a number of dyad years for which I do have valid measures for alliances. The second, meanwhile, is a measure that only exists in greatest detail and reliability for the United States. While some have used US military aid to proxy for the

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<sup>7</sup>Bueno de Mesquita and Smith (2009) fail to identify a significant coefficient on distance once they control for trade, while Bermeo (2017) does not observe such a reversal of statistical significance.

<sup>8</sup>See Morgan and Palmer (2000) for an example.

geostrategic interests of other donor governments (Bermeo 2017), there are advantages to using measures that are, at minimum, unique to the donor-recipient level.

The choice to limit measures of donor interest to bilateral factors further relates to the decision to categorize variables like civil war and freedom as needs-based factors rather than interest-based. While the latter in particular has been argued to relate to donor foreign policy goals—such as supporting the democratic regimes of developing countries (Alesina and Dollar 2000)—it, and civil war as well, also provides substantive information about development need. Civil wars have been called by some as “development in reverse” because of the detrimental effects conflict can have on economies, security, and political stability (Stojek and Tir 2014). Civil and political freedoms, meanwhile, have been linked with long-term economic growth and societal development (Acemoglu et al. 2019). These measures, then, capture important signals about the overall development need of developing countries. Further, since they are measured at the recipient, rather than bilateral, level, it is hard to assess the unique signals they would capture about the interests of specific donor governments. As other scholars have argued, interest-based considerations imply that donor governments make their aid allocation decisions on the basis of their unique relationships with different recipient countries.<sup>9</sup> Furthermore, at the same time that factors like democracy or conflict signal need, their correspondence with strategic goals actually strengthens the claim that low need (e.g., democratic governance and peace) may signal greater opportunity for donors to realize non-development foreign policy interests. The U.S. has long recognized the value of stable democracy abroad for its national interest.<sup>10</sup>

The measures of ties and need were constructed using data from 1995 to 2014, overlapping with the period covered by the CRS data used to capture lead donorship. Even though the CRS data are available for more recent years, covariates like civil war were only available up to the year 2014. Each measure was constructed by converting each of the relevant components to z-scores. The final linear combination produced using SSC was then normalized to reflect z-scores as well. That means that a value of -1 for need means that need for a particular recipient is 1 standard deviation below average need in the sample. The distribution of each is shown in Figure 4. Both follow relatively normal

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<sup>9</sup>See Berthelemy (2006).

<sup>10</sup>As emphasized in a recent *Congressional Research Service* report: <https://sgp.fas.org/crs/row/R44858.pdf>.

distributions, though ties has a somewhat left-skewed distribution.

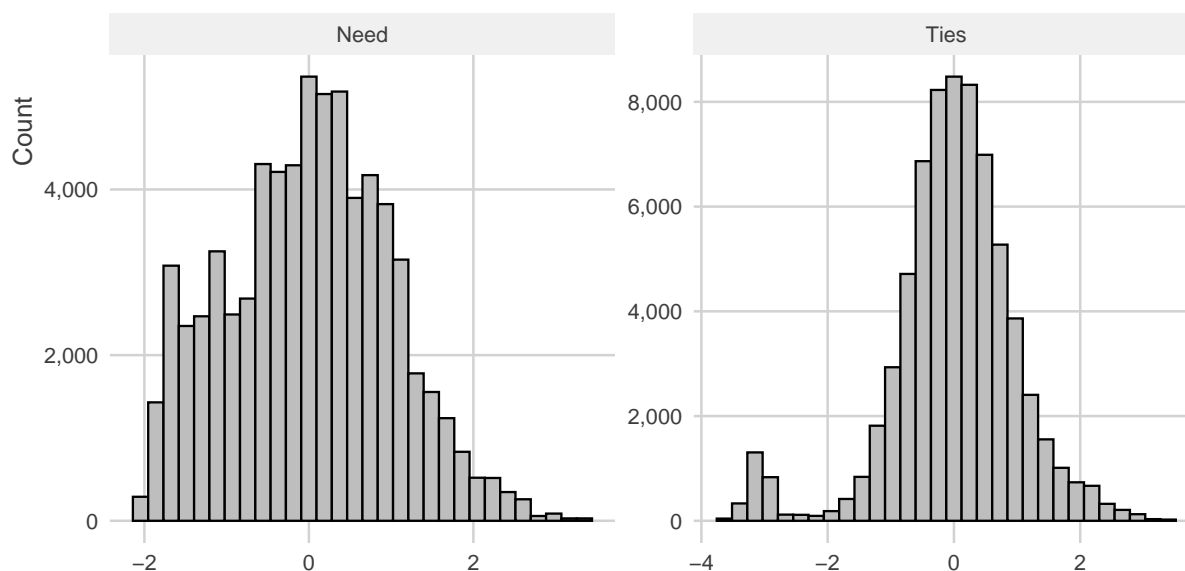


Figure 4: Distribution of donor-recipient ties and recipient need.

Figures 5 and 6 summarize the correlation between the measures of ties and need with their respective components. A correlation matrix is shown, where blue indicates a negative correlation and red a positive correlation. Shading is used to highlight the relative strength of the correlation. The bivariate correlation coefficient is shown as well. Figure 5 summarizes the correlations for the ties measure. The correlations are not only generally strong, but they run in the appropriate direction for the concept of donor-recipient ties. Stronger ties correspond with more bilateral trade, less geographical distance, sharing military alliances, and sharing a colonial past.

Figure 6 shows correlations for need. Again, the measure captures variation in the components in the expected direction. Greater need corresponds with less GDP per capita (Income), greater population, more severe disasters, lower quality of democracy, and the presence of civil conflict.



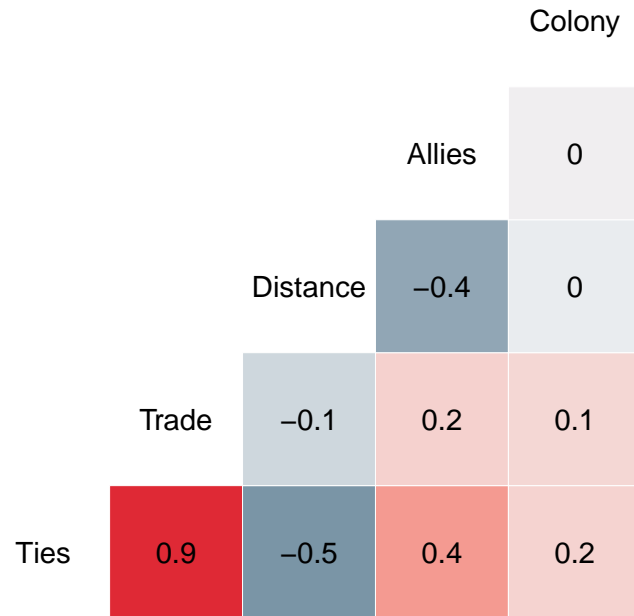


Figure 5: Correlation matrix for the composite measure of ties created via SSC and its components.

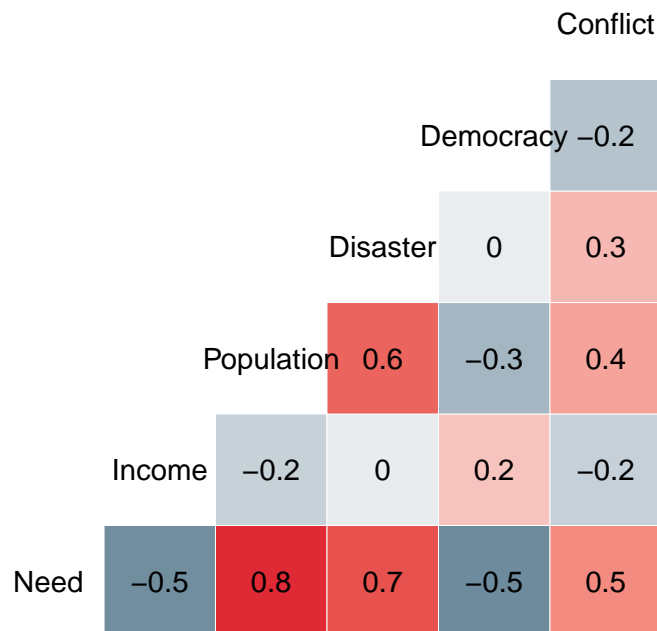


Figure 6: Correlation matrix for the composite measure of need created via SSC and its components.

## Research Design

To test the collaboration and elusive collaboration hypotheses, variation in lead donorship is modeled as a joint function of recipient need and the concentration of donor-recipient ties. The analysis is done at the recipient-year level. The following empirical model is estimated:

$$\text{logit}(\text{Lead Donorship}_{rt}) = s(\tau_{rt}, \nu_{rt}) + \alpha_t + \rho_r + \epsilon_{rt}. \quad (2)$$

The outcome is the strength of lead donorship in a developing country for the top donor. The logit transformation is there to denote that the model is estimated using a quasi-binomial logit link using maximum likelihood (e.g., a fractional logit). This helps to ensure that fitted values for lead donorship remain constrained to the unit interval.

The function  $s(\cdot)$  is a multivariate nonlinear smoother that permits estimating the joint, interactive relationship between lead donorship and the measures of interest. In particular, a thin plate regression spline is used. This particular smoother has a number of documented advantages over several alternatives including computational efficiency, avoiding problems associated with knot placement, and a sensible way to model interactions (Wood 2003). This more flexible non-linear approach is adopted because the goal is to test not a simple directional linear hypothesis, but instead a pair of competing conjoint conditions under which lead donorship will emerge. A multivariate smoother is not only sufficient for this task, it has the advantage of not being sensitive to the parametric assumptions that would attend a more conventional linear regression with a second order interaction term. For more information about the model used here and about generalized additive models in general, interested readers should refer to Wood (2020).

The multivariate smoother has two variable inputs:  $\tau_{rt}$  and  $\nu_{rt}$ . The first is a measure of donor tie concentration. After, first, using the SSC method outlined in the earlier discussion to create a measure of donor-recipient ties, an HI index of the ties variable was created at the recipient-year level. After log-transformation to normalize the data, the resulting measure, denoted  $\tau_{rt}$ , captures the degree to which ties between a recipient a donor country are concentrated in a single donor. Higher

values equal greater concentration. The measure  $\nu_{rt}$  denotes the level of recipient need as constructed via SSC. Higher levels equal greater development need. To guard against overfitting while ensuring sufficient flexibility to handle nonlinearities in the data,  $k = 15$  degrees of freedom is set as the upper bound for the smoother.

The model contains two additional terms.  $\alpha_t$  captures year specific intercepts that adjust for unobserved year-to-year shocks. This ensures that variation in lead donorship reflects within-year variation rather than across years. The second term,  $\rho_r$ , denotes recipient random effects that adjust for unobserved recipient level heterogeneity and dependence over time. Finally, the model is rounded off with a zero-mean error term.

The data used to fit the model consists of 2,398 unique recipient-year observations from 1997 to 2014. These are comprised of a total of 133 unique developing country aid recipients.

The analysis in the next section proceeds as follows. Before summarizing the main results, a dyadic analysis of donor aid commitments is done to provide some face validity for the measures of donor-recipient ties and recipient need. If the measures prove to be poor determinants of dyadic aid flows, this would raise doubts about their ability to help triangulate the publicness or rivalness and relative marginal returns of goods donors get from their aid allocation. A summary of the main analysis follows.

## **Analysis**

### *Face Validity*

Table 1 summarizes regression coefficients from five linear models. Each was estimated with OLS with standard errors clustered by dyad. All include year and donor fixed effects. They were estimated using a total of 68,856 dyad-year observations.

Model 1 was estimated using each of the separate component measures used in the construction of ties and need. Model 2 replaces the separate measures for ties with the composite ties measure. Model 3 does the same, but for the need measure. Model 4 includes only the composite measures while excluding the components. Model 5 adds an interaction between ties and need.

Table 1: OLS Estimates for Dyadic Aid Commitments

	Bilateral ODA Commitments				
	Model 1	Model 2	Model 3	Model 4	Model 5
Trade (asinh)	0.01* (0.00)		0.03*** (0.00)		
Distance (asinh)	-0.27*** (0.03)		-0.20*** (0.03)		
Colony	1.94*** (0.13)		1.94*** (0.14)		
Alliance	-0.10 (0.05)		-0.12* (0.06)		
Income (log)	-0.27*** (0.02)	-0.31*** (0.02)			
Population (log)	0.22*** (0.01)	0.19*** (0.01)			
Disaster (asinh)	0.04*** (0.01)	0.04*** (0.01)			
Civil War	0.14*** (0.04)	0.17*** (0.04)			
Democracy	0.03*** (0.00)	0.03*** (0.00)			
Ties		0.20*** (0.02)		0.19*** (0.02)	0.24*** (0.02)
Need			0.51*** (0.02)	0.50*** (0.02)	0.50*** (0.02)
Ties $\times$ Need					0.21*** (0.02)
Year FE	Yes	Yes	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes	Yes	Yes
N	68,856	68,856	68,856	68,856	68,856
R <sup>2</sup>	0.51	0.48	0.48	0.45	0.47
Adj. R <sup>2</sup>	0.51	0.47	0.48	0.45	0.47
RMSE	1.20	1.23	1.22	1.26	1.24

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

As would be expected with any method of dimensionality reduction, the R-squared value slightly worsens when the component measures are replaced by their composites. However, the reduction in variance explained is not substantial. Indeed, given the reduction from nine covariates to two, the composite measures explain an impressive amount of variation in dyadic aid commitments.

The direction of the estimates is further consistent with what we would expect. Both stronger bilateral ties and greater recipient need correspond with greater bilateral aid commitments from donors. The results for Model 5 are especially interesting. There is a statistically significant and substantial positive interaction between donor-recipient ties and recipient need. This pattern is consistent with recent arguments that donor governments have additional incentives to respond to recipient need when they share stronger bilateral connections (Bermeo 2017, 2018). Taken together, these results are encouraging for the main analysis because they provide some face validity for the composite measures. Not only are they strong predictors of dyadic aid flows, but they also interact in accordance with recent arguments about donor behavior.

### *Predicting Lead Donorship*

The analysis now turns to the main results. Recall that the unit of observation is the recipient-year and the outcome of interest the strength of lead donorship for the top donor in a recipient. Table 2 reports estimates for two fractional logistic models with semi-parametric smoothers for the measures of ties concentration and recipient need. In one, the measure of ties and of need were given as inputs to separate smoothing functions. In the other, they were inputs to a joint smoothing function. Models were estimated using year fixed effects and recipient random effects. Values reported are not regression coefficients but effective degrees of freedom. The statistical significance of each corresponds to the overall quality of the fit for the smoother function. The magnitude of the EDF corresponds to the degree of nonlinearity of the smoothers. An EDF of 1 would imply a linear relationship while values of increasing magnitude indicate nonlinear relationships. The values reported in Table 2 imply a high degree of nonlinearity.

A comparison of the separate and joint smoothers for ties concentration and need provides clear

Table 2: Logistic GAM Estimates

	Lead Donorship	
	Separate	Joint
Ties Concentration	1.001 (1.001)	
Recipient Need	5.909*** (7.088)	
Joint Ties and Need		12.217*** (13.557)
Year FE	Yes	Yes
Recipient RE	Yes	Yes
N	2,398	2,398
Recipients	133	133
Deviance	1592.773	1556.629
Deviance explained	0.059	0.080
Dispersion	0.591	0.584
R <sup>2</sup>	0.056	0.080
GCV score	738.768	722.695

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

reason to favor a joint smoother. In model 1, only the measure of need has a significant relationship with lead donorship, but in model 2 the joint smoother on need and ties is statistically significant. While Model 1 suggests that ties concentration does not explain variation in lead donorship, Model 2 makes clear that once ties are considered in combination with recipient need, this factor does help explain variation in lead donorship. As shown in the model diagnostics, with the joint smoother the model explains greater variation in lead donorship than when need and ties are treated separately. This is consistent with both the collaboration (H1) and elusive collaboration (H2) hypotheses which hold recipient need interacts with concentration of marginal returns from aid to determine lead donorship. However, this conclusion is as far as an examination of Table 2 can take us. Because of the nonlinear and interactive relationship implied by the model, visualization of the results is necessary to see how ties and need jointly predict lead donorship.

Figure 7 summarizes these predictions. Along the x-axis is variation in recipient need. The y-axis shows variation in the concentration of donor ties. Across the range of possible values of each mea-

sure, the likelihood of lead donorship is plotted. Blue denotes that the probability of lead donorship is less than 50% while red indicates that the probability is greater than 50%. Arrows help to highlight the direction of an increase in the likelihood of lead donorship.

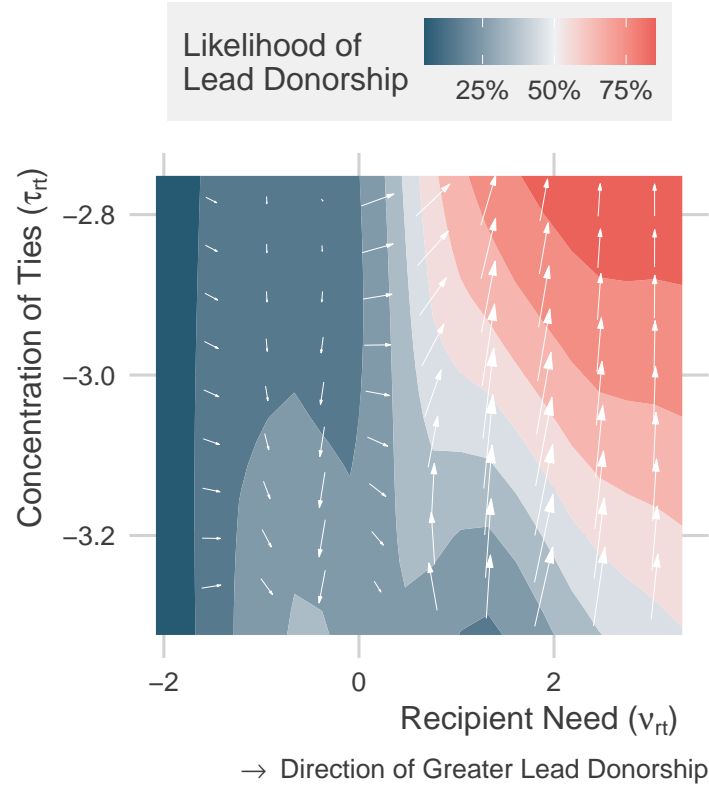


Figure 7: Predicted (%) likelihood of lead donorship given recipient need and concentration of donor-recipient ties. Fitted logistic GAM estimates using recipient-year data from 1997-2014.

Both the collaboration and elusive collaboration hypotheses imply different corners of the figure in which we should see lead donorship arise with the greatest likelihood (see Figure 1 and Figure 2 earlier in the paper). Collaboration implies that lead donorship should emerge disproportionately in the upper left quadrant, while an absence of collaboration implies that lead donorship should emerge more often in the upper right.

The results in Figure 9 leave little to the imagination. Lead donorship clearly occurs with the greatest frequency at the intersection of both high recipient need and strongly concentrated donor-recipient ties. This is consistent with the elusive collaboration hypothesis. That is, the pattern in

Table 3: Logistic GAM Estimates

	Lead Donorship (Steinwand)	
	Separate	Joint
Ties Concentration	2.585 (3.246)	
Recipient Need	6.582* (7.726)	
Joint Ties and Need		12.167*** (13.532)
Year FE	Yes	Yes
Recipient RE	Yes	Yes
N	1,318	1,318
Recipients	123	123
Deviance	559.029	541.707
Deviance explained	0.073	0.102
Dispersion	1.016	1.019
R <sup>2</sup>	0.020	0.048
GCV score	117.249	103.880

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

lead donorship is what we would expect if donors fail to cooperate in the delineation of spheres of influence with rival goods and fail to mitigate free-riding with public goods. In short, the results are consistent with systematic cooperation failure.

#### *Do the Results Hold with a More Restrictive Measure of Lead Donorship?*

It is important to check whether using lead donorship criteria established by Steinwand (2015) yields different results to those above. As noted, Steinwand's measure of lead donorship differs from that used in the main analysis in two ways. First, it sets a higher bar along the temporal dimension. Second, it is binary. That means it is much more conservative in assigning lead donor status and that it provides less variation that might be exploited to test the hypotheses. How do the results hold up with this more restrictive measure?

Table 3 reports the EDF for the nonlinear smoothers for logistic models similar to the ones specified before. The difference is that the semi-continuous measure of lead donorship is replaced with the



binary measure of lead donorship based on Steinwand’s longitudinal criteria. As before, the model includes year fixed effects and recipient random effects. The first column shows results for separate smoothers applied to donor tie concentration and recipient need. The second column shows results for a joint multivariate smoother applied to both measures. Because the new measure of lead donorship lacks valid observations for the first four and last four years in the time-series, the sample of recipient-year observations is smaller than in the previous analysis.

Despite these differences, an inspection of Table 3 provides results consistent with the main analysis. While tie concentration is not a significant predictor, but recipient need is, in the first model, the model with a joint smoother provides a better fit than the model with separate smoothers for need and ties suggesting that ties concentration does explain variation in lead donorship once it’s relationship with lead donorship is allowed to be conditioned by recipient need.

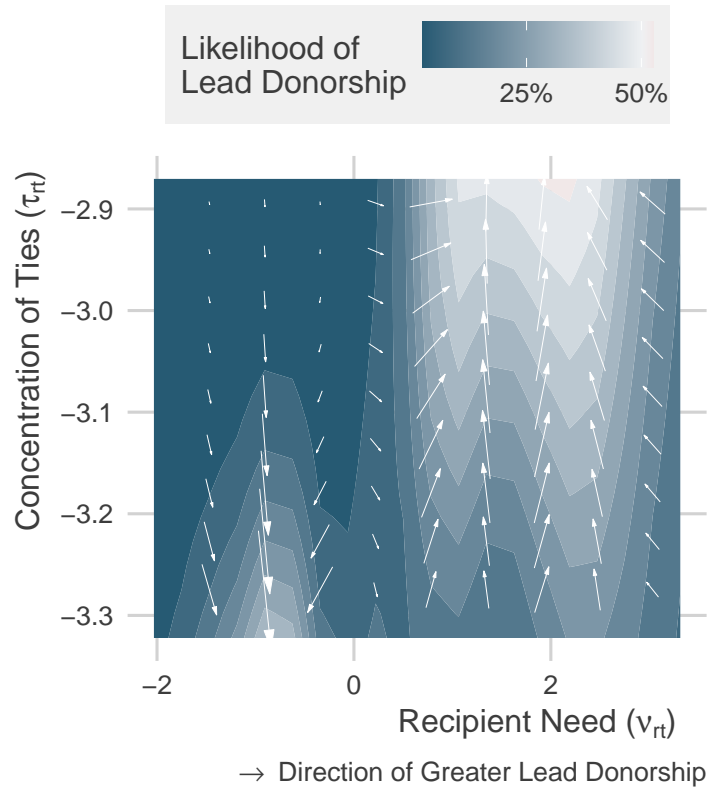


Figure 8: Predicted (%) likelihood of lead donorship based on Steinwand’s (2015) more restrictive longitudinal criteria, given recipient need and concentration of donor-recipient ties. Fitted logistic GAM estimates using recipient-year data from 1997-2014.

Turning to Figure 8, the predicted likelihood of lead donorship based on the model shown in the second column of Table 3 follows a pattern consistent with that shown in the main analysis. Notably, the results are less crisp, which is to be expected. Also, because this measure of lead donorship is more conservative, predicted levels of lead donorship do not rise to the levels observed in the previous analysis. Even so, the highest probabilities of lead donorship are still observed in recipients that are both high need and that have bilateral ties concentrated in one or a few donors. This pattern is again consistent with the elusive collaboration hypothesis.

#### *Are the Results Driven by the Measurement Method?*

A valid question to consider is whether the method (SSC) of constructing the measure of recipient need and donor-recipient ties concentration is responsible for driving the results. If alternative approaches (PCA or MFA) yield different conclusions, this would be problematic. To test whether this is the case, as a robustness check the main analysis was repeated using PCA and MFA constructed versions of the measures of interest. Figure 9 reports the results using PCA, and Figure 10 reports the results using MFA.

With the PCA constructed measures the same substantive conclusions are drawn from the data as in the main analysis—we observe lead donorship emerge at the influx of high need and high concentration of donor-recipient ties. However, the analysis with MFA diverges from both the SSC and PCA derived measures. Rather than seeing lead donorship emerge at the upper right quadrant (as we do with SSC and PCA) or the upper left, it arises with greatest frequency across the entirety of the right in only the most extreme cases of need. Correlations between the MFA measure and the alternatives as well as the component measures show that the MFA constructed measure of need may not do an adequate job of capturing variation in the targeted construct. While it is strongly correlated with the PCA and SSC versions of need, its correlations with the components used to construct are comparatively weaker, save for the case of recipient population. In short, the MFA based measure of need is not strongly correlated with the component measures used to capture need, save for recipient population. Meanwhile, the PCA and SSC versions of need are nearly identical and more strongly correlated

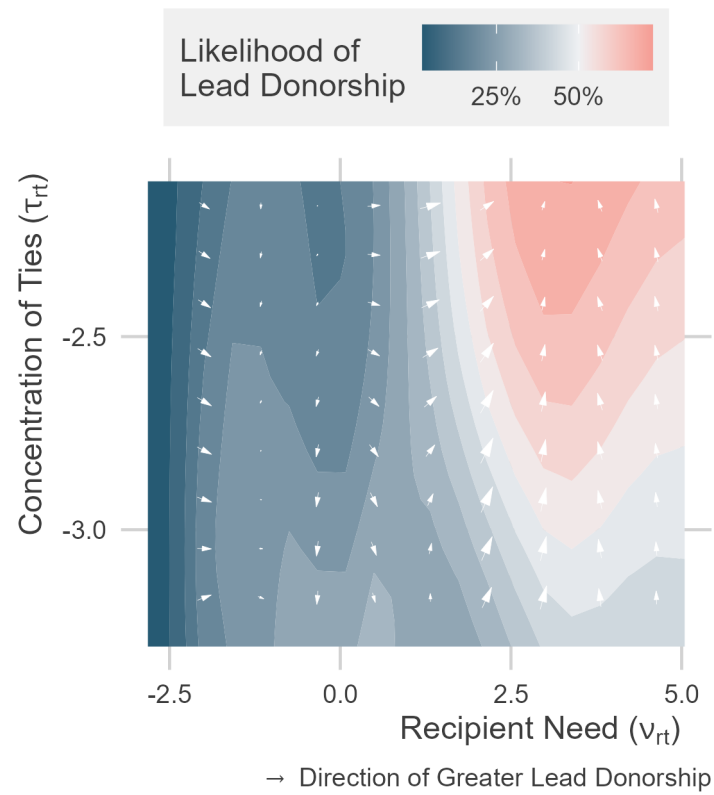


Figure 9: Predicted likelihood of lead donorship given recipient need and concentration of donor-recipient ties using PCA constructed measures. Fitted logistic GAM estimates using recipient-year data from 1997-2014.

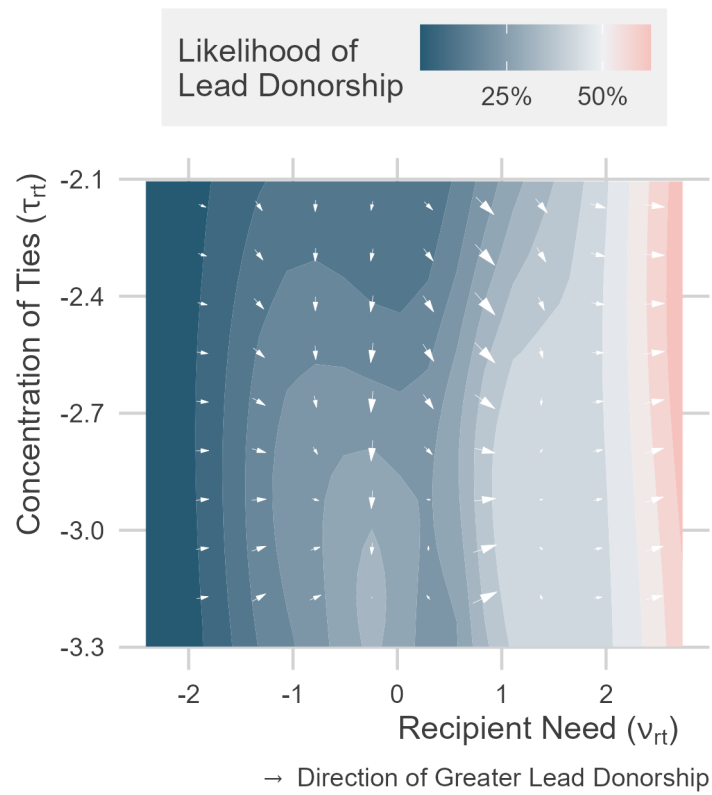


Figure 10: Predicted likelihood of lead donorship given recipient need and concentration of donor-recipient ties using MFA constructed measures. Fitted logistic GAM estimates using recipient-year data from 1997-2014.

with their component measures. This does not prove, but does suggest, that MFA does a worse job of capturing the concept of recipient need from the component measures. PCA, on the other hand, seems to do a better job.

### *Is It Really Cooperation Failure?*

Based on the theoretical argument made by Steinwand (2015), the results in this study are consistent with systemic cooperation failure in the allocation of foreign aid to developing countries. This cooperation failure would seem to be characterized by a mix of donor competition for top spot in some aid recipients and buck-passing in other recipients, leading to a pattern of lead donorship emerging primarily in higher-need developing countries that have bilateral ties concentrated in one or a few donors. However, other explanations are worth exploring. Two in particular bear special mention.

On the one hand, it could be that lead donorship arises in high-need recipients with ties disproportionately concentrated in a single donor due to donor coordination to limit redundancies in aid projects and to ease burdens on recipient bureaucracy in high need developing countries. On the other hand, it could be that the role of donor interactions in driving patterns in lead donorship is overstated—that instead lead donorship is epiphenomenal to the interests of donor countries. An admitted limitation with this study is that it is difficult to tease out these different explanations empirically. These arguments can all be consistent with the patterns we observe in the data. However, there are reasons to view these alternative explanations with some skepticism. Let us consider them in order.

### *Could It Be Coordination?*

The first idea—that lead donorship is a function of donor coordination rather than cooperation failure—would certainly be consistent with some research on aid fragmentation and aid effectiveness that suggests recipient outcomes are better when they only have to work with one or a few donors (Kanbur 2006; Knack and Rahman 2007; Anderson 2012; Hernandez 2017; Zeitz 2021). By coordinating on lead donorship, the idea would be that the donor community is able to optimize development out-

comes in developing countries. If this is really what is going on, then it is encouraging that we observe lead donorship emerge among many high-need developing countries that would benefit the most from aid effectiveness; albeit, donor coordination in this view would appear to be limited to recipients where heterogeneous donor-recipient ties serve as an organizing principal for which donor will assume lead donor status.

However, for coordination to be the best explanation for the pattern of lead donorship observed in the data, a couple of assumptions must be met. To start, it must be that coordination in high-need recipients really is optimal. Not all scholarship is in agreement on this issue. Some recent evidence suggests that concerns about aid fragmentation for aid effectiveness are overstated and that in some cases fragmentation can actually support rather than detract from achieving development goals (Gehring et al. 2017). This is not only the case with respect to development, it also seems to be true in the case of political destabilization and conflict in aid recipients. As Gutting and Steinwand (2017) find, fragmentation can actually limit the severity of so-called “aid shocks” (sudden and severe cuts in foreign aid from a donor) and thereby mitigate the risk of violent civil conflict.

An emerging idea in the literature is that aid fragmentation’s consequences are conditional, depending on the type of aid given and the recipient context (Gehring et al. 2017; Carlitz and Ziaja 2023). The idea that fragmentation’s consequences for aid effectiveness are conditional is actually central to the argument Steinwand (2015) makes as well. In his view, fragmentation is inefficient in the context of donor competition, while it is beneficial in the context of public goods. Indeed, studies that look at mechanisms for aid fragmentation often find that competition is often to blame, as Barthel et al. (2014) and Fuchs, Nunnenkamp, and Öhler (2015) find in the case of donor interests in gaining access to export markets and shoring up political support. In short, if coordination is to be in the best interest of the actors involved, it would be where rival goods are at stake rather than public goods. Thus, if lead donorship is a function of coordination, it would make sense that it would appear where public goods are less salient, that is, in low-need recipients where donor-recipient ties can serve as a basis for coordinating on which donor will assume lead donor status. This prediction is consistent with the competing “collaboration” hypothesis proposed in this study, which the main analysis fails

to support.

A second assumption that must hold is that the level of coordination required to allow lead donorship to arise where and when it does is possible or, for that matter, recognized as such by actors in the international development community. By the numbers, some non-zero level of lead donorship exists in approximately 45% of developing country-years in the data sample used in the main analysis. This suggests a level of donor coordination that would be surprising to anyone familiar with evaluations on donor progress on various development targets set at high-level fora. As the OECD notes regarding the history of these fora in the twenty-first century, the first of which was in Rome in 2003, “success has not always been evident: lack of co-ordination, overly ambitious targets, unrealistic time and budget constraints and political self-interest have too often prevented aid from being as effective as desired.”<sup>11</sup> Some observers have gone so far as to call efforts to promote and maintain donor collaboration in meeting effective development goals as beyond “insufficient”—these efforts might as well be “dead.”<sup>12</sup> If evidence of lead donorship at the intersection of high need and high donor-recipient ties is evidence of effective donor coordination in many aid recipients across time, this would be news to the community of international development actors.

Supposing the above assumptions can be met, there is the additional issue that where public goods are concerned, the aid literature by and large treats free-riding as the most likely problem to arise among donors (Bermeo 2018; Mascarenhas and Sandler 2006; Steinwand 2011, 2015). Just because this is a common framework for understanding aid allocation in the context of public goods does not imply that this is the best framework. However, free-riding does offer a simple explanation for why lead donorship has the greatest likelihood of arising when and where it does. Also, if lead donorship is the product of uncooperative behavior, this is easier to square with the fact that there is limited evidence that coordination improves aid effectiveness with respect to many development outcomes and the fact that actors in the international development community express chronic disappointment about progress on donor collaboration.

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<sup>11</sup>“The High Level Fora on Aid Effectiveness: A history.” Accessed May 7, 2024. <https://www.oecd.org/dac/effectiveness/thehighlevelforaonaideffectivenessahistory.htm>.

<sup>12</sup>“After Geneva, the Effectiveness Agenda Still Lacks Direction.” Accessed May 7, 2024: <https://www.cgdev.org/blog/after-2022-geneva-effectiveness-summit-effectiveness-agenda-still-lacks-direction>

### *Is Lead Donorship Just a Function of Donor Interest?*

A second alternative explanation for when and where lead donorship arises is that lead donorship is epiphenomenal to the interests of donor countries. To be sure, it is reasonable to assume that donor interest in giving aid has a higher baseline in higher need developing countries, and that by extension stronger ties magnify this interest. This is, in fact, what the dyadic aid analysis in the “Face Validity” section seems to demonstrate when donor-recipient ties are interacted with recipient need.

This fact on its own could certainly drive some of the results in the main analysis, even if the basic theoretical argument still holds true. Indeed, an examination of the data shows that average and median aid received in high-need recipients with concentrated ties is higher than in other subsets of the sample. However, for this to be the only factor driving lead donorship requires some additional assumptions to hold. The first assumption is that donors by and large give aid without regard for the giving of other donors. The second assumption is that donors derive no benefit from the production of public goods in recipients they share weak ties with. The third assumption is that in low-need recipients, variation in donor-recipient ties does little to differentiate which donors are likely to be responsible for giving the greatest aid.

The first of these assumptions seems especially tenuous. Whether the source of donor interaction is presumed to be public goods or rival goods, many studies have found evidence that donors react to the giving of their peers, whether that be in the aggregate or in specific aid recipients, and whether the reaction be positive or negative (Barthel et al. 2014; Davies and Klasen 2019; Dudley 1979; Fuchs, Nunnenkamp, and Öhler 2015; Mascarenhas and Sandler 2006; Steinwand 2011, 2015). These patterns could be an artifact of omitted variable bias, yet the finding that donors react to the giving of peers remains a persistent finding across studies.

With respect to the second assumption, it is theoretically possible for a donor to get zero benefit from the production of public goods in a recipient that is geographically, politically, and economically remote from it. However, in an increasingly interconnected world, problems rooted in underdevelopment in remote places can all-too-easily pose negative externalities for a distant donor. Indeed, in summarizing the proclamations of many industrialized country governments, Bermeo (2018) notes



a clear awareness on the part of country leaders of the threat that poverty in even the most faraway places can pose to a donor's national interest and the wellbeing of its domestic population. The forces of globalization are not constant, to be sure. The whole point of needing to measure the strength of donor-recipient ties is that donor susceptibility to negative externalities rooted in underdevelopment is variable. However, to say that this susceptibility is effectively zero for a non-trivial number of donors with respect to a non-trivial number of aid recipients is a strong assumption—one that is made increasingly hard to maintain with the seemingly unstoppable inertia of globalization.

The idea with the third assumption is that donors receive negligible returns from giving aid in low-need recipients, which is why lead donorship is less common among this subset of recipients even when donor-recipient ties are concentrated. This is proposed as an alternative to the claim made in the present study that donor competition in this subset of recipients is the reason why lead donorship does not emerge. Again, on this front, among the subset of studies that focus on the role of donor competition, the idea that competition does not account for the absence of a top donor in at least a few aid recipients seems tenuous. Whether the source of competition be generic or specific to particular donor interests like trade, a number of studies point to donor competition playing a role in their aid allocation decisions.

The idea that lead donorship is entirely a product of the interdependence of donor aid allocation decisions is, of course, far fetched. Without a doubt, donor interests likely play an independent role in driving lead donorship as well. It would be surprising if this were not the case. However, the converse argument that donor interests are all that matter for determining lead donorship is difficult to reconcile with past research and globalization.

#### *What about Endogeneity?*

Another issue with the above analysis worth considering is whether lead donorship is endogenous with donor-recipient ties. For example, could it be the case that donor governments develop stronger ties with some recipients over others because they are also lead donors? This is an interesting question to consider because answering it in the affirmative implies that lead donorship and donor-recipient

ties are mutually reinforcing. Such a view would not be unreasonable. In a recent survey of the aid literature, Dreher, Lang, and Reinsberg (2024) conclude that the evidence supports a positive effect of foreign aid on promoting various bilateral donor interests, which certainly suggests endogeneity may be an issue for the measure of donor-recipient ties used in the main analysis. Of course, the question that must be answered is how much is endogeneity an issue such that it threatens the inferences made in this study?

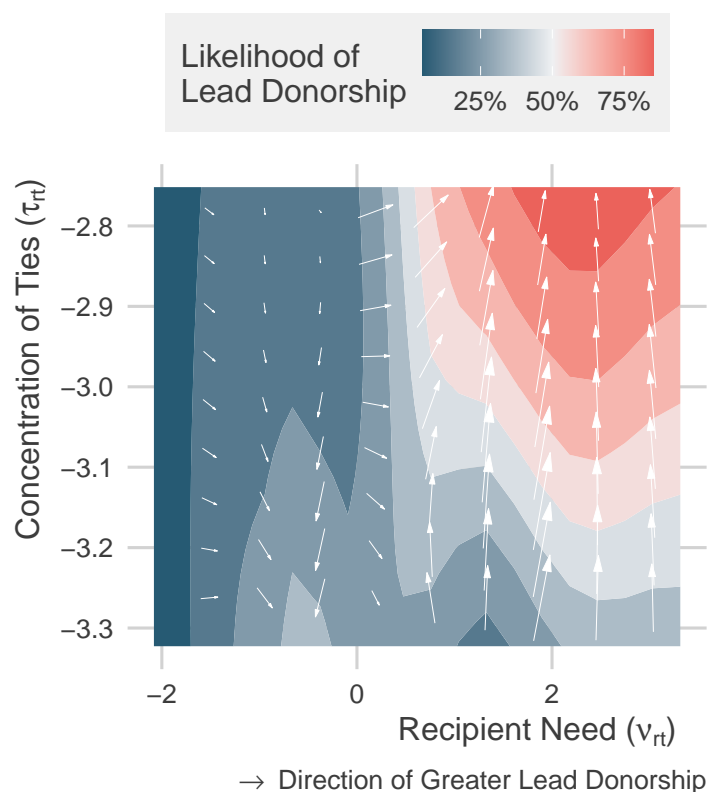


Figure 11: Predicted (%) likelihood of lead donorship given recipient need and concentration of donor-recipient ties using a two-year lag of ties concentration. Fitted logistic GAM estimates using recipient-year data from 1997-2014.

Fortunately, at least two of the component variables used to construct the measure of donor-recipient ties are plausibly exogenous: bilateral distance and colonial past. While a donor's generosity cannot warp space to narrow its geographic distance to a recipient, past donor colonization of recipients is such a distant historical fact that contemporary donor giving is not determinative of the

former-colony status of recipients today.

However, the remaining two component measures of donor-recipient ties (trade and alliances) may suffer from an endogeneity problem. Trade in particular is likely the most problematic. A sizable body of research has emerged around the question of whether donors reward trade partners with more aid and whether aid promotes greater levels of future trade between recipients and donors. Summarizing the results from several studies, Dreher, Lang, and Reinsberg (2024) conclude that donors both target aid to recipients on the basis of trade and also that aid has a positive impact on trade between recipients and donors. Though alliances also may be endogenous to donor giving, research on the link between aid and alliances is less well-developed. More than three decades ago, Walt (1990) argued that aid's ability to strengthen formal military alliances or to lead to the creation of new ones is likely limited; although he based this claim only on a limited set of case studies and descriptive analyses. Other empirical research at the intersection of aid and alliances considers whether aid giving is determined by alliances but does not test the reverse relationship (Palmer, Wohlander, and Morgan 2002; Zhang 2023). This is not to say that we can reject the presence of endogeneity in the relationship between aid and alliances; rather it is still mostly a matter of speculation rather than evidence one way or the other.

Taking the above into consideration, while some variation in donor-recipient ties is exogenous, some of its variation is presumably endogenous to donor aid giving and, by extension, lead donorship. The usual method of accounting for endogeneity is to take an instrumental variables approach, however a convincingly exogenous instrument that explains variation in trade and alliances that does not also explain variation in lead donorship is hard to find. An alternative strategy is simply to use a lagged version of the explanatory variable suspected of endogeneity. In their study on the impact of aid on trade, Martínez-Zarzoso, Nowak-Lehmann D, and Rehwald (2017) use a two-year lag of aid to account for endogeneity. So as an additional robustness check, the main analysis was repeated using a two-year lagged version of donor-recipient tie concentration in place of the within-year version of the measure. The results are visualized in Figure 11. As can be seen, the results remain unchanged. While this does not mean we can rule out endogeneity as a major threat to inference in this study, this

finding is at least reassuring.

### *What About Odd Cases of Lead Donorship?*

The theory posits that concentrated marginal returns (donor-recipient ties) are a necessary but insufficient condition for lead donorship. Recipient need likewise is a necessary but insufficient condition for lead donorship; with the caveat that donor behavior (cooperation or cooperation failure) should determine whether recipient need is proportional or inversely proportion to lead donorship under the condition of concentrated marginal returns. The theory, and by extension the hypotheses, are essentially Boolean in this regard because they are dealing with a logical AND condition under which lead donorship is predicted to arise with greatest frequency. However, it is important to remember that this Boolean logic is not deterministic; it is probabilistic. It therefore should not be a surprise to observe lead donorship where the theory postulates that it should have a lower probability of arising. Beyond this, the measurement strategy adopted in this paper is not perfect. It is possible that it has blind spots, so looking at exceptional cases can be instructive about where and why the measurement strategy fails.

Figure 12 breaks the data down by ties concentration and need quartiles and summarizes the frequency of lead donorship strength within each. The counts shown indicate the number of recipient-years in the data where a certain level of lead donorship is observed. It should come as no shock that the frequencies are consistent with the results in the main statistical analysis. Non-zero levels of lead donorship are observed with the greatest frequency in the upper-right quadrant while cases with no lead donor are most commonly observed when need and/or ties are low. However, in no quartile does even the maximum level of lead donorship go unobserved. Clearly, while the general pattern in the data is consistent with the elusive collaboration hypothesis, there are clearly exceptional cases.

Consider cases in the fourth quartile of need and the first quartile of ties concentration. The elusive collaboration hypothesis holds that recipients in this subset of the data are subject to underfunding of aid by donors in equilibrium, but that no one donor will be left to bear the lion's share of the responsibility for doing so. However, there are nonetheless recipient-years in this subset of the data

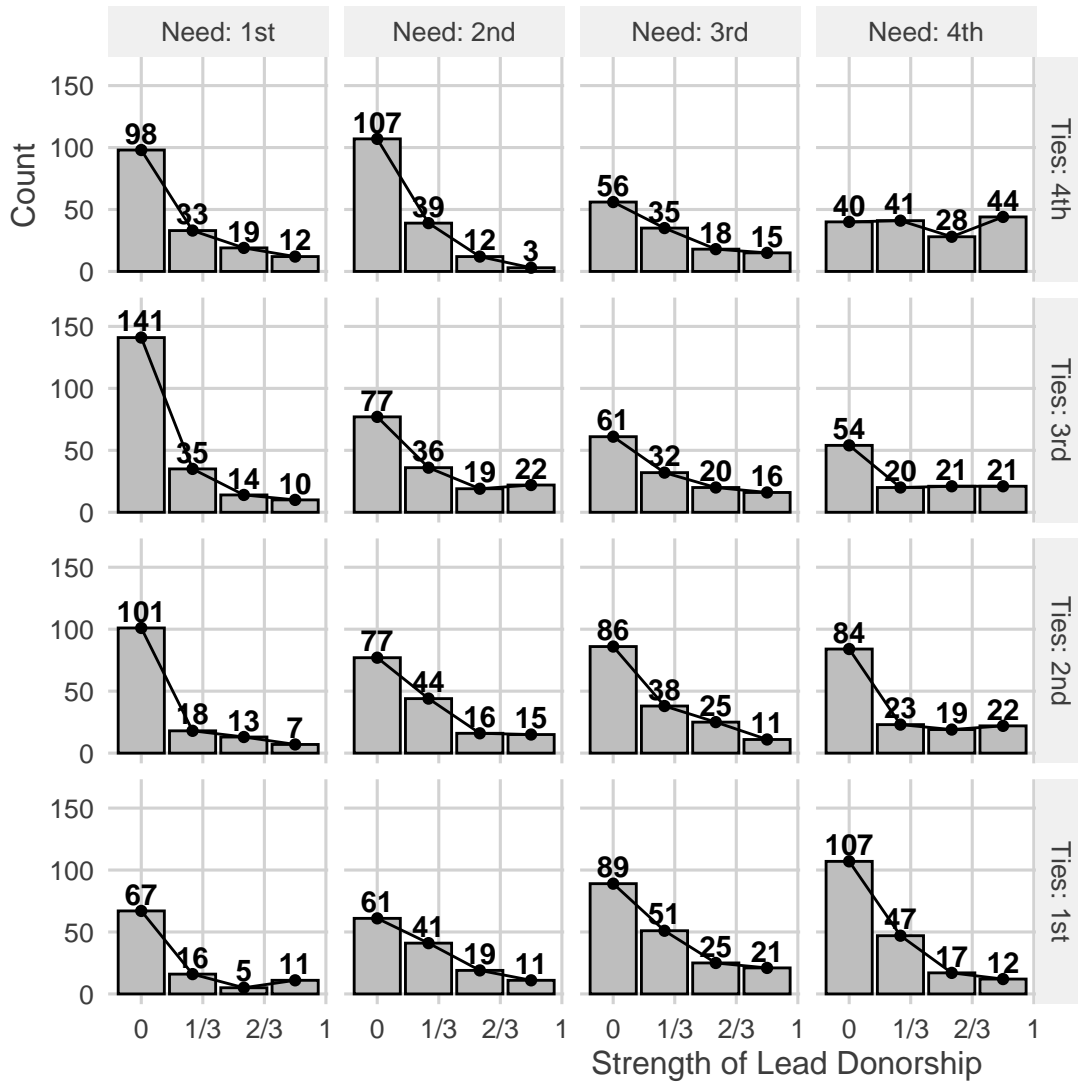


Figure 12: Frequency of lead donorship per recipient-year by ties concentration and need quartiles.

with a positive level of lead donorship. There are even 12 recipient-year observations where lead donorship is at the maximum level of 1. A closer look at the data reveals that this maximum lead donorship is observed in five unique aid recipients: Cameroon, Haiti, Iraq, Sudan, and Vietnam. In three of these donors, a lead donorship score of 1 arises in only one year for each (1999 in Cameroon, 2006 in Iraq, and 1995 in Vietnam). Maximum lead donorship is observed in Haiti in three years (2004, 2007, and 2009), and it is observed in Sudan in six years (2004, 2005, 2007, 2008, 2009, 2011).

The identities of the lead donor in each of these cases is not surprising. The lead donor in Cameroon was France in 1999. In fact, France was the lead donor here in 1995 and 2000 as well, but these observations for Cameroon fall outside of quartiles for need and ties under consideration here. The reason is that need in Cameroon spikes in 1999 but is lower in 1995 and 2000 because of the 1999 eruption of Mt. Cameroon that led to disastrous earthquakes, many deaths, and substantial internal displacement. Why is France the donor that has been left to bear the greatest share of the burden in responding? This first case reveals a clear limitation with the measurement strategy in this study. Cameroon is a former colony of France, making the recipient of clear importance and salience to French policymakers. Clearly, the measure of donor-recipient ties does not adequately weight former colonial status in the case of Cameroon.

Haiti, Iraq, and Sudan are also interesting cases that reveal possible limitations with this study's measurement strategy. The United States is Lead Donor in all of these countries (and for years beyond those highlighted above). Haiti is a small country but one that has been subject to notoriously systemic political instability, poverty, and destruction from a combination of hurricanes and earthquakes. Even though it is a former colony of France, its proximity to the United States means that the US is especially sensitive to negative externalities from Haiti's tumultuous past and present. Clearly, this is another case where the measure of donor-recipient ties fails to appropriately weight one of the dimensions of these ties (distance). Furthermore, other dimensions of ties such as trade may not be substantial enough to help differentiate the US relationship with Haiti compared to other donors since, as a poor country, total trade volume between Haiti and other countries has a lower overall baseline compared to trade relations between donors and other aid recipients.

Iraq and Sudan are exceptions for a different reason—their strategic military importance to the US. This is a dimension of donor-recipient ties that alliances is meant to capture, but this approach has clear limitations. Countries can be the object military importance to donors without the presence of a formal military alliance. Israel is an important strategic partner with the US, and yet the two countries have not formalized this relationship with a military pact. This blind spot in the measure of recipient-donor ties reflects the unfortunate reality that measures of this specific dimension of donor ties to recipients are not readily available for most donor countries. The best data is for the United States, both with respect to factors like troop deployments and military aid. Such factors may be especially relevant for the United States because of its unique role in global politics.

Finally, Japan is the lead donor in the case of Vietnam. This example again reveals how distance as a dimension of donor-recipient ties may be under-weighted in the measurement strategy. Compared to all the other donor countries in the data, Japan has the closest proximity to Vietnam, making it especially sensitive to needs that arise there and, thus, the most likely to take the lead in responding to these needs while other donors sit on the sidelines.

Taken together, this handful of examples shows that the measurement strategy for identifying donor-recipient ties has blind spots. However, in each example, these exceptional cases would seem to support the main theoretical argument rather than conflict with it. That is, these are exceptions that prove the rule. Clearly, donor-recipient ties vary in ways that the measure constructed in this study is too blunt an instrument to capture. This, admittedly, is a limitation with any method that collapses multiple factors into one. This may be an important issue for future research to address.

## **Conclusion**

This study began by asking a simple question: does lead donorship arise because donor governments cooperate or fail to cooperate in the allocation of foreign aid? This is a question that past research has tried to address, but using spatial models and some strong assumptions about how to interpret correlations in donor giving. While helpful, this approach is subject to circular causation and unmeasured endogeneity and heterogeneity in the spatial correlation in donor giving, raising questions

about how best to interpret the results. This study adopts a different approach, modeling variation in lead donorship as the outcome of interest using novel measures to triangulate the goals of donor governments and, thus, to determine whether the distribution of lead donorship in developing countries is consistent with donor cooperation or systematic cooperation failure.

Following arguments laid out by Steinwand (2015), if donors cooperate, we should observe that they (1) agree to a delineation of spheres of influence when and where non-development or rival goods dominate and (2) forego free-riding when development or public goods dominate. Alternatively, if donors fail to cooperate, they will (1) compete for top spot when non-development or rival goods dominate and (2) engage in free-riding when development or public goods dominate. The first pattern is formalized in this study as the “collaboration” hypothesis and the second as the “elusive collaboration” hypothesis.

The analysis presented here supports the second hypothesis. That is, the empirical evidence consistent with a systematic absence of cooperation among donors in the allocation of aid. Buttressing this conclusion are a few important assumptions and new aggregate measures capturing variation in donor-recipient ties and recipient development need that help in triangulating when public goods are predominant and marginal returns from either public or private goods are concentrated in a single donor. While these measures are admittedly blunt instruments, what is most important is that they can capture the right signals in the data. On this front, these measures appear to succeed; albeit, with some exceptions that show there is yet room for improvement.

The findings of this study are important for ongoing policy debates and raise significant theoretical questions. Lead donorship remains under-appreciated in the political economy literature, but as Steinwand (2015) argues the concept has important welfare implications, both for donor countries and aid recipient countries. The lack of cooperative behavior among donors on a macro level is frustrating, considering the efforts made over decades to foster greater donor cooperation in high-level fora. This study calls for further inquiry into why collaboration remains elusive. Are there specific characteristics of the strategic environment inhabited by donors and recipients that hinder cooperation? Future work should also consider whether the emergence of lead donorship really enhances or



hampers aid effectiveness.

Future research should also expand the scope of this analysis by considering how the entrance of many so-called un-traditional donors influences patterns in lead donorship. China in particular has emerged as an important actor in international development over the past decades (Dreher et al. 2022), and many other countries in South America, the Middle East, and Asia have begun giving foreign aid as well (Dreher, Nunnenkamp, and Thiele 2011). Many of these emerging donors appear to behave similarly to traditional donors, but as research by Dreher, Nunnenkamp, and Thiele (2011) shows, these donors seem to be less concerned about recipient need. This suggests these donors may make donor cooperation in delineating spheres of influence even more difficult. This is likely especially the case with China since many policymakers in Western donors, particularly in the United States, explicitly see China's foreign aid as a strategic threat.<sup>13</sup>

In sum, the existence of lead donorship in the allocation of foreign aid does not appear to be good news about donor cooperation. However, this finding will surely not be the final word on this issue. It is this author's hope that future scholarship will refine and expand on the analysis presented here and will further consider whether lead donorship, since it appears to be the product of uncooperative behavior, is bad for aid effectiveness.

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<sup>13</sup>See, for example, the policy recommendations of Andrew Natsios (2020), former head of the United States Agency for International Development, and also the 2021 "Countering Chinese Communist Party Malign Influence Act" which called for raising funds in response to Chinese overseas development project (link: <https://www.congress.gov/bill/117th-congress/house-bill/2329/text?r=82&s=1>).

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