

Lead Donorship: Patterns, Preferences, and Competition

Martin C. Steinwand*

April 6, 2010

Abstract: Stable and long-lasting relationships between individual donors and recipient countries are one of the most persistent, yet understudied features of foreign aid provision. This paper attempts to redress this situation. It develops a theory that attributes lead donorship to strategic interactions between donors, as well as a new conceptual measure of lead donorship. The empirical part tests hypotheses about the causes of lead donorship for five major western donors, and 118 recipient countries of bilateral aid for 1974 to 2006. The evidence provides support that strategic interactions play an important role in giving rise to lead donorship.

Prepared for 68th Annual MPSA National Conference, Chicago, April 22-25,
2010

Work in progress – Please do not cite without author’s permission.

*Department of Political Science, Stony Brook University, martin.steinwand@stonybrook.edu

1 Introduction

Giving aid to poor developing countries is a central foreign policy tool of western nations, and increasingly rising powers such as China. While much research seeks to identify domestic factors in donor and recipient countries that drive aid provisions, we know surprisingly little about a persistent and prominent feature of donor-recipient relationships. Individual countries frequently act as lead donor for a given recipient country, sometimes by themselves, sometimes in cooperation with other donors. These lead donor-recipient relationships sometimes last for decades. Their relevance for overall aid policy is reflected in the fact that the international aid community often expects lead donors to shoulder a larger burden than others when dealing with problem states. Examples of this include the US role in Haiti, British leadership in Zimbabwe, and the – now diminished – role of France in Rwanda.

Lead donorship differs from other forms of aid provision on two dimensions. First, lead donors have longstanding ties with recipient countries. Second, this relationship is exclusive, i.e. no or few other donors vie for the role as top aid contributor. This is why studying lead donorship is different from work that seeks to identify domestic causes of aid policy. Lead donorship only persists if other donors do not seek the top spot for themselves.

In order to systematically explore the causes of lead donorship, I draw on public goods and oligopoly theory. We can identify two basic mechanisms that would allow a single donor to remain the top contributor to a given country over long periods of time. First, donors could have aligned preferences, or a donor could seek to obtain benefits from giving aid that other donors do not care about. In this situation, lead donorship will naturally arise from a lack of competition. If others do not care, the one donor who cares will automatically become the lead donor. If others share the goal of the lead donor, but this goal has public good properties, higher costs or weaker preferences will prevent them from joining into the lead donor's effort.

The second mechanism operates if donors have opposing preferences. If they use aid to compete for private benefits, we need to explain why an individual donor would be able to secure those goods exclusively for itself over long periods of time. A possible explanation is that donors collude to limit competition among themselves. In an oligopoly, the exclusive nature of the donor recipient country relationship directly results from an explicit or implicit agreement between donors to respect each others' spheres of influence.

In order to identify which causal pathway best explains the empirical patterns of lead donorship I use the following strategy. To learn more about the phenomenon on a descriptive level, I identify cases of lead donorship drawing on the criteria of long-lasting donor-recipient ties and exclusive donor-recipient relationships.

In the next step, I statistically test whether lead donorship can be explained by the presence of cooperative behavior between donors. This involves two steps. I first need to differentiate between aid with private and public good properties. As lined out above, the logic of strategic interactions between donors is quite different in the two scenarios. Drawing on the existing aid literature, private good aid has the potential to generate private benefits for the donor through facilitating political favors by the recipient government. This type of aid is typically not project bound but either enters the recipient's general budget, or is designated to go towards administrative entities. In contrast, public good aid supports goals that have non-excludable properties. This category includes broader developmental goals such as lower child mortality, increased literacy rates, and the like.

After categorizing private and public good aid, I estimate the probability of whether a recipient country has a lead donor in a given year. I use this estimate in the next step to test whether aid allocation patterns result from cooperative behavior or not. To this end, I fit a modified spatial autoregressive model (SAR) of aid allocations. The SAR setup allows us to explicitly model strategic interconnections in the aid allocations of donors. Specifically, we can incorporate connectivity weights that correspond to lead donorship and equal burden

sharing, and estimate to what extent aid allocation decisions depend on how much aid other donors give. In this context, the predicted probabilities of lead donorship are used to model which of the two strategic structures is more likely to drive aid allocation decisions. This analysis is performed separately for private and public good aid.

In the following, I first introduce a novel theory of lead donorship, and derive testable hypotheses. I then introduce my measure of lead donorship. The empirical analysis is divided into two parts. The first directly explores the determinants of lead donorship, and the second part tests hypotheses about aid allocation behavior that follow from the theory. I draw on data from the five OECD top donors and 118 aid recipient countries from 1974 to 2006. I find that preference asymmetries and economic interests are a good predictor of lead donorship and that strategic interactions between donors play an important role in how lead donorship arises.

2 Theory

The literature that seeks to explain aid allocation decisions is too large to cover comprehensively. Authors have looked at the role of donor preferences such as geo-political interests (e.g. Alesina and Dollar 2000; Stone 2006; Dreher *et al.* 2008), and economic self-interest (Younas 2008). Others have researched the effects of recipient country properties such as political and economic institutions (Alesina and Weder 2002; Bandyopadhyay and Wall 2007), adherence to human rights norms (Neumayer 2003), and internal armed conflict (Balla and Reinhardt 2008). Yet another strand of the literature looks at shared properties of donors and recipient countries, such as colonial ties (Alesina and Dollar 2000).

The goal of this study is not to add another element to the collection of factors that determine the allocation of foreign aid. Instead, it focuses on a recurrent yet under-appreciated pattern of foreign aid practice. Some donors act as top contributors to individual countries

over long periods of time. This form of lead donorship is consequential on several dimensions. Exclusive interactions can lead to close ties between aid officials of the donor country and the recipient country bureaucracy, raising the potential for corruption and inefficiencies.¹ Also, lead donorship generates expectations in the international community with regard to policy leadership towards recipient countries. For example, despite the francophone roots of Haiti, in the late 1980s and 1990s France steered clear of greater involvement in the country's crisis because of long-standing American engagement in the country (Pezzullo 2006).

The phenomenon of lead donorship has received scant academic attention. An extensive search only produced one piece that explicitly deals with the topic. Lebovic (2005) argues that donors benefit from being the largest aid contributor beyond the payoff associated with a given level of aid. In other words, lead donors receive a bonus for being in the top position. This raises several important questions. If it is lucrative to be the top donor, why do other donors not compete for this position? Under this premise, how can we explain the rise and persistence of long-lasting lead donorship?

To answer these questions, we need to move beyond the notion that the largest aid provider is automatically a lead donor. Lead donorship can be characterized by two properties. First, it is in essence a longitudinal phenomenon. It is precisely the ongoing and exclusive commitments that some donors have towards select recipient countries that make them worth studying. Germany, for example, has served as top donor to Iran in either the number one or two position for 23 years between 1974 and 2006, starting in 1978 and running all the way to 2006. During this time, Iran underwent the Islamic Revolution, fought a deadly war with Iraq, and was subject to the destabilizing regional effects of the two American-Iraqi wars. In the face of this variety of circumstances, we want to explain the steadfastness of Germany's aid commitments.

¹This criticism has been repeatedly leveled against the French aid efforts in Sub-Saharan Africa, that are deemed to rely too heavily on personalistic networks stemming from colonial times (Gabas 2005).

A second aspect of lead donorship is the exclusivity of the relationship between a donor and a recipient country. Going back to the previous example, the German commitment to Iran was not only characterized by its longevity, but also by a lack of competition from other donors for Germany's top spot. This forms an important part of the puzzle of lead donorship. If donors use aid to secure private benefits they should face pressures to compete with each other. To the extent that this is true for Germany's engagement in Iran, we need to explain why such competition did not materialize. If, on the other hand, Germany's engagement in Iran mainly produced benefits with public good characteristics, we need to explain why Germany remained a top donor and did not succumb to incentives to free-ride on the efforts of other donors. We will develop a theory of lead donorship that provides plausible explanations for both scenarios below.

At the other side of the spectrum that defines exclusive donor–recipient country ties lie those countries that attract much support from the international donor community. These recipient countries have a great number of engaged donors which alternate as top aid providers. They frequently receive much attention from the global public as a result of humanitarian needs or political crises. Examples include Rwanda after the 1994 genocide and Zimbabwe during its current decade-long descent into economic dissolution and political violence. Broad support can also result from aspirational motives. Botswana has attracted much support as a role model for political stability and economic progress in Sub-Saharan Africa. Similar support went to South Africa after the fall of Apartheid and Lebanon after the end of its civil war.

The longevity and exclusiveness criteria can overlap if long-standing donor–recipient country ties go hand in hand with broad support from other donor countries. For example, Cambodia's tragic story of internal violence and occupation has garnered sympathy and wide support from the international donor community, with 8 different Western nations taking the top contributor position between 1974 and 2006. Nonetheless, the US has filled a role

as largest-or second largest provider of aid during 19 years, both prior to the Vietnamese occupation, and as sponsor of the peace process in the late 1980s and thereafter.

Below I will use the longevity and exclusiveness dimensions to develop a measure of lead donorship. Before doing so, we need to introduce our theory of lead donorship, and review the motives that drive the aid policies of the five top donors.

2.1 A Theory of Lead Donorship

When thinking about long-lasting leadership roles in the provision of public aid, we have to distinguish two principal scenarios. In the first scenario, leaders have aligned incentives, and aid is used to produce public goods. In the second scenario, aid helps to secure benefits that are exclusively enjoyed by the donor.

Let us start with the public goods scenario. It is worth reemphasizing that public goods in the sense used here are not the same as publicly provided goods such as better roads, schools, and the like (though such infrastructure aid may help produce public goods). The public good properties of aid we are interested in arise from the donors' perspective. This means that donors who give aid to foster things like economic development, reduce infant mortality, increase literacy, etc., cannot exclude other donors from enjoying success in these areas. Nor does the value of these development achievements decrease if the number of donors taking an interest in them grows. Together, these two properties are the classic criteria for the existence of a public good.

The insight that international aid given for development purposes forms a public good was first formulated by Olson and Zeckhauser (1966). While their piece is better known for its explanation of asymmetric contributions in military alliances, their causal logic underlies our argument about the source of lead donorship if aid has public good properties. The authors show that if contributors enjoy differences in marginal returns on contribution to a public good, the contributor with the largest marginal returns carries the largest burden. In

the context of aid with public good properties this implies that the donor with the greatest marginal returns on giving aid will end up as lead donor.

Strictly speaking, differences in marginal returns on aid can result from two different sources. One is variation in the costs of providing aid, the other variation in tastes for development. In practice, this distinction is quite inconsequential. What matters is that donors value helping some developing countries more than others. We have clear anecdotal evidence that this is the case. In former colonial powers, such as Britain and France, there exist lobbies that advocate for an ongoing involvement in former colonies. Another factor are ethnic minorities from the donor country that live in former colonies. For example, Germany's engagement in Namibia since its independence in 1990s seems mostly due to the small German minority living in the country, rather than to the country's brief spell as German colony at the turn of the 19th century.

In a public goods situation with asymmetric marginal returns on the provision of aid, lead donorship essentially arises as a result of free-riding. Free-riding leads to an under-provision of public goods. This is suboptimal from a social welfare perspective. Attempts to overcome collective action problems and coordinate aid programs have been a subject of the aid debate and donor efforts at least since the early 1980s (Aldasoro *et al.* 2009).

Successful coordination between donors will reduce asymmetries in aid provision. The observable implications of this relationship between asymmetric aid contributions and donor coordination are the following. If a lead donor exists, this is indicative of a relative lack of coordination. We therefore should be able to detect free-riding behavior (i.e. substitution effects) or only weak complementarities in aid provision. The absence of a lead donor is indicative for coordination. Therefore, we should see complementarities in aid provision that are significantly stronger than in the lead donorship case.

Next, we consider the situation in which donors use aid to secure private benefits. The notion that donors use aid to attain goals unrelated to development is so old as foreign aid

itself. We will review some of the diplomatic and economic uses of aid that the literature has identified below.

A central feature of the private uses of aid is that donors who try to obtain the same sort of benefit should be locked in competition with each other. While scholars of political economy have recognized that in the domestic arena competing interest groups can use money to influence policy outcomes (Grossman and Helpman 1994), the obvious parallel in the aid realm has been ignored so far. Competition prevents the rise of a lead donor. This is because competing donors have incentives to match the top contributor's aid commitments and thus ensure their share of the pie.

Lead donorship under competition for private benefits therefore can only arise in two ways. First and trivially, if donors do not seek to obtain the same kind of benefits there will be no competition. Second, if donors are able to reduce competition between themselves, they will be collectively better off. They therefore have incentives to try to coordinate their aid allocations. This type of coordination is the equivalent of collusion in oligopoly theory (e.g. Varian 1992, chapter 16). Lead donorship therefore arises as a result of explicit or implicit collusive agreements to carve up exclusive spheres of influence for individual donors.

The observable implications of these theoretical considerations are twofold. First, in the absence of lead donorship we have competition between donors. Since competition implies that donors match each others' aid contributions, in this situation we should see complementarities in aid provision. On the other hand, lead donorship is indicative of collusion. In the presence of a lead donor we therefore expect that complementarities in aid provision will decrease or substitution effects arise.

Of central conceptual importance is our ability to distinguish between aid with public goods character and aid allocations that serve to secure private benefits. To help us make this distinction in an informed fashion, and to gather the building blocks for a statistical model of lead donorship, the next section reviews some of the historic driving forces behind

aid programs.

2.2 Motivations for Giving Aid

As we have seen in the previous section, donor preferences play an important role for lead donorship. If preferences and the resulting cost-benefit analysis are asymmetric, donors who give aid to foster development face collective action problems that give rise to lead donorship. Conversely, donors who use aid to secure private influence are locked into competition with each other only if they share preferences for the same goods. Lead donorship then will arise in an attempt to limit this competition.

Given this important role of preferences, if we want to model instances of lead donorship statistically it is necessary to account for similarities and asymmetries in donor preferences. In this section I review what drove the aid programs of the five largest providers of bilateral aid, the US, Japan, France, Germany, and the UK. We will take a brief look at each of those donor's aid policies.

After its early years as diplomatic tool in the Cold War, US foreign aid was and continues to be characterized by a duality of diplomatic and development purposes (Lancaster 2007, p. 79). Carol Lancaster identifies the countries in which American aid has been used for primarily diplomatic purposes as Israel, Egypt, and other countries of the Middle East, Cambodia, the Philippines, and El Salvador, Nicaragua, and Honduras. Motives for support ranged from fundamental strategic goals in the Middle East, over concerns about left-leaning popular movements in Central America, the need to secure support for military bases in South-East Asia, to post-conflict reconstruction in Cambodia, and starting in the 1990s, the former Yugoslavia and again Central America.

The duality of American aid currently finds expression in institutional innovations such as the Millennium Challenge Corporation that aims to strengthen the development aspect of American aid. At the same time, the Pentagon plays an increased role in distributing

official American development aid (upwards of 20%), with an eye to support governments that deny terrorist organizations safe haven (Brown and Patrick 2007).

While some works argue that the US employs aid to influence voting behavior in the UN general assembly (Dreher *et al.* 2008, but see Stone 2006), there is relatively little evidence that US aid is geared towards fostering commercial interests. However, American aid tying practices remain opaque, as the US has stopped reporting the relevant numbers in the early 1990s.

Of all five donor countries, French foreign aid policy most directly grew out of its colonial experience. There is little dispute that from its inception, French aid was overtly diplomatic in purpose and designed to maintain a political sphere of influence in Sub-Saharan Africa. However, this also resulted in personalistic ties between France and its client states that frequently were used to benefit French industries through non-competitive bidding, and aid-financed development projects (Lancaster 2007, p. 154). Serious organizational reform was only tried in 1998. However, the new structures appear unsuccessful in isolating diplomatic influence on French aid decisions (Lancaster 2007, p. 159), a fact that is underlined by the largely unchanged composition of French aid in the post-Cold War period (Quinn and Simon 2006; Gabas 2005).

Japanese aid policy has been commonly attributed to commercial motives. Until the 1970s, aid also served Japan to rehabilitate relations with its regional neighbors. The oil shocks together with agricultural shortages caused by a US export embargo on soybeans lead to a reorientation of aid towards securing access to raw materials. For example, Japan began to undertake aid financed infrastructure projects in Arab oil producing countries and in Brazil (Lancaster 2007, p. 116 f.). In the 1980s, Japanese aid strongly increased. It started to be directed also towards overarching Western diplomatic goals, for example in the Middle East. Despite widespread suspicion of the opposite, it appears that Japan also significantly reduced its tying practices during this time (Lancaster 2007; Tuman *et al.* 2009, p. 120). Still,

Japanese aid practices traditionally have put an emphasis of infrastructure and equipment purchases. This also did not change after new policy fields such as environmental aid gained prominence. Overall, the enduring combination of regional political goals, concerns about access to raw materials, and a mode of aid giving that at least potentially benefits Japanese industries makes the Japanese aid program the most commercially oriented of all five major Western donors.

Neither the UK nor Germany had economic or strategic interests driving their aid programs in a regionally concentrated fashion as those of the US, France or Japan. In its early days, West Germany gave aid in support of overall Western diplomatic goals, but also to benefit German export industries (Lancaster 2007, p. 171 ff.). Special diplomatic status had German support for Israel. Despite early professionalisation of aid practices through the creation of a fully dedicated ministry of development (Bundesministerium für Wirtschaftliche Zusammenarbeit, BMZ), a focus on infrastructure projects remained an important facet of German aid policies throughout the 1970s and 80s. German aid drastically decreased during the 1990s in reaction to budgetary constraints resulting from the need to finance German unification. Beginning in the late 1990s, developmental goals moved to the center stage of German aid programming.

Similar to the French case, British aid developed out of the country's colonial experience. Unlike France though, Britain did not use these historic relationships to satisfy global political ambitions. Instead, successive governments emphasized Britain's moral obligation for the development of its former dependencies. Under Margaret Thatcher, the government announced it would change aid practices to pay more attention to Britain's commercial interests. But there was little following through in terms of policy (Cumming 2001, p. 74 ff.). Despite the persistent development orientation, British aid retained one of the highest tying rates of the five donor countries (Cumming 2001, p. 90), which directly benefited British industries and service providers. This changed under Tony Blair's Labour govern-

ment. British aid increased manifold, as general budget support gave more flexibility to recipient governments (Seldon 2007, p. 559), and aid tying was formally ended as a policy practice.

2.3 Operationalizing Donor Preferences

As the preceding overview has shown, we can categorize the main motives for giving aid as diplomatic, economic, and developmental. The next step is to operationalize measures that will allow us to capture those preferences for the statistical analysis. Let us look at economic interests first. The historic record shows that two areas of economic activity played a role in aid programs, export promotion and building relationships with oil producing countries.

The case for export promotion is relatively straightforward. The focus of Japanese and German aid programs on infrastructure aid, past British aid tying practices, and French insider dealings with African client countries all point towards the promotion of domestic exports. In addition, all five countries are producers and exporters of major capital goods and durable consumables, such as planes, machinery, and cars, and thus compete for export markets. Beyond this anecdotal evidence, a recent piece by Younas (2008) finds that exports of capital goods are associated with increased aid flows from donor countries, controlling for a wide variety of recipient country properties. We can measure exports from donor to recipient countries using the readily available Comtrade database (United Nations 2009).

What relationship should we expect between trade flows from donors to recipient countries, and the incidence of lead donorship? Donors that use aid for export promotion should compete for influence. This, in turn, will increase incentives to limit competition through collusion. We therefore should expect that higher exports are associated with an increased incidence of lead donorship.

There is some anecdotal evidence that donor countries, in particularly Japan, have used aid to improve relationships with oil producing countries, but the case is less clear-cut.

It is certainly true that the economies of all five donors in our analysis were and remain dependent on foreign oil imports. However, oil is traded on an international spot market that does not discriminate against individual buyers on political grounds. It is therefore not immediately apparent why donor countries would seek to use aid to influence oil producing countries. However, there is a direct mechanism that has the potential to drive donor policy. Even though all of the six largest private oil companies are multinationals, three of them have histories as national champions of their European countries of origin (Royal Dutch Shell, BP, and Total S.A.). All oil majors, including the US based ExxonMobil (the largest global oil major), Chevron (number 4), and ConocoPhillips (number 5), generate massive benefits in form of taxes and employment opportunities for the countries where they have their headquarters. Since decisions about new oil concessions in producer countries are often political in nature (Yergin 1991), donor governments that are home of multinational oil companies have incentives to provide political support for these companies.

More anecdotal evidence for the relevance of oil for aid policy comes from the behavior of China on the international aid scene. China, a relative parvenu as donor, openly uses its bilateral aid to secure oil concessions. For example, in 2004 China secured rights to a portion of future Angolan oil output by giving the Angolan government a comprehensive loan and aid package worth \$2 billion (Hanson 2008). Western donors do not use such open means to exert influence, but concerns for supply security will exert pressure on them to pay attention to Chinese actions on this front.

What relationship does our theory predict for oil imports and the incidence of lead donorship? As in the case of trade, donors are locked into competition with each other if they use aid to influence oil producing countries. This, in turn, will increase the incentives to collude. Higher imports from an oil producing country therefore should increase the probability that this country has a lead donor. Data on oil imports and exports is also available from the Comtrade database.

Let us now turn to diplomatic and strategic interests. With the possible exception of France, the five donors in our analysis have enjoyed closely aligned foreign policy preferences during the Cold War and beyond. However, due to its unique military strength, the US plays an exceptional role in projecting military power worldwide. In particular in the Pacific region, the permanent presence of US troops continues to produce regional strategic stability, benefiting Japan in particular. A similar effect can be attributed to the US troop presence in the Middle East in the wake of Iraq's invasion of Kuwait.

America's worldwide military engagement arguably reflects its relatively lower marginal costs in projecting power abroad and providing regional stability. To capture the asymmetry in the American cost-benefit calculus for providing this public good, we can look at the number of troops stationed in individual aid recipient countries. To the extent that the ability to provide military might also translates into a cost advantage for providing aid, we should expect more US troops to increase the probability of US lead donorship.

Historically, the US has claimed Central and South America as its zone of influence, albeit mostly without supporting this claim with a troop presence. There is no reason to believe that any of the other four donor countries in the analysis harbors desires to exert a similar influence in the region.² America's preeminence therefore is an expression of asymmetric diplomatic preferences between the US and the other major donors.

In order to capture these asymmetries, I rely on a geographic definition of the American zone of influence. This is in line with historic announcements of American politicians, going all the way back to the Monroe Doctrine from 1823. In addition, there are no readily available other measures that come to mind. For the statistical analysis I narrowly limit the American zone of influence to include Mexico and the states of Central America. This seems reasonable since large states in South America such as Brazil often have defined their

²In fact, it was arguably the conscious British disengagement from the Caribbean in the late 19th century that averted military confrontation between the then declining British Empire and the rising USA.

interests in active dissociation from American policy.

The argument with regard to the French sphere of influence in Sub-Saharan Africa is similar. The value of this political connection to French policy makers did arise from the unique history and continuing economic and security ties between France and her former colonies. No other donor could gain the same political benefits from simply increasing aid to countries in the French sphere of influence. To illustrate this, economic policy ties between France and its client states include the CFA Franc zone, which currently pegs the currencies of 14 African countries to the Euro (originally the French Franc) and is underwritten by the French treasury. This arrangement has helped reduce the costs of stationing French troops in some of these countries, which form the backbone of an ongoing security cooperation. Accordingly, the French engagement in Sub-Saharan Africa is an expression of asymmetric preferences between France and the other donors.

As measure of the French sphere of influence we include all countries that are former French colonies. An alternative would be to use membership in the CFA France zone, but this can generate problems in some statistical settings.³

Britain did not maintain a sphere of influence as clearly defined geographically and in political purpose as the French. However, we have seen that parts of the British aid program were driven by a sense of moral responsibility towards former colonies. This motive for giving aid, in conjunction with large minority groups from former colonies living in the country, arguably give Britain a higher marginal utility for helping its former colonies than other donors. We therefore include a measure in the analysis that identifies recipient countries that were former British colonies.

From the inception of its aid program, Japan used aid as tool to achieve political reconciliation with the countries in Asia that had suffered under its occupation. While not

³When estimating lead donorship on a donor-by-donor basis, the CFA dummy variable perfectly predicts cases where France is not a lead donor. This approach was used in an earlier version of this paper.

comparable to the relatively clear-cut spheres of influence of the US and France, Japan therefore had a unique diplomatic motivation to give aid to Asian countries. This, too, constitutes an asymmetry in donor preferences. These ties also found expression in close commercial cooperation. However, we are interested in the role of trade on lead donorship for its own sake. I therefore use another geographic dummy variable as measure of special Japanese preferences. The variable includes all countries of South-East and South Asia.⁴

What should we expect for the four spheres of influence with regard to the effect on lead donorship? Obviously, our assignation of areas with asymmetric donor preferences was in part made through observing donor actions. This is particularly true for France in Africa and Japan in Asia. However, in neither case did we determine what counts as sphere of influence by looking at aid alone. Still, we expect that the asymmetry in preferences makes it more likely that lead donorship arises within these spheres of interest.

3 Empirical Analysis

3.1 Patterns of Lead Donorship

In the following, I develop a scheme that categorizes aid recipient countries along the longitudinal and exclusiveness dimensions discussed above. As a measure of long-lasting donor commitments, I count the number of years from 1974 to 2006 that a specific donor took the top or second place position in providing aid. As measure of exclusiveness, I count the number of different top contributors a recipient country did have over the same time period.

Tables 1 to 3 report how the countries in the sample break down. In table 1, we have a list of countries with individual long-term top aid contributors. The donors held the top contributor position more than 50% of the time, or 16 out of the 33 years in the sample. This group of recipient countries also fares strongly on the the exclusivity dimension. Table 3 lists

⁴I count Pakistan as part of the Middle East.

the countries that have a large number of different top contributors (≥ 8). Not surprisingly, there is no overlap between the countries in tables 1 and 3, with one exception.⁵ We therefore label the countries represented in table 1 as cases of strong lead donorship.

A quick glance at the list shows that strong lead donorship to a large extent corresponds with the spheres of diplomatic and economic influence identified in the aid literature. In the US case, the American government acts as strong lead donor mainly in Central America, and for select Southern American and Caribbean countries. This is in line with the strong historic American claim to this area as sphere of exclusive diplomatic influence. In addition, US support of Israel, Egypt, and Jordan underlines the long-standing strategic American commitments in this region. The only African country in which the US acts as strong lead donor is Liberia. This commitment speaks to the shared history of resettling freed American slaves from the US to Liberia. It is remarkable that no Asian country made the list of strong American lead donorship. American strategic interests in the region do not seem to require stronger aid engagements.⁶

In the case of France, the list of strong lead donorship countries maps exceptionally well onto the French sphere of influence in Sub-Saharan Africa. It includes all but two current members of the CFA Franc zone,⁷ and covers a large number of former French colonies in West and Central Africa. The only case of strong French lead donorship outside Sub-Saharan Africa is Morocco, which also is a former French colony.

Japan is overwhelmingly engaged as strong lead donor in South Asia and South-East Asia. The list encompasses all large countries in the region, including China, India, Indonesia, and the Philippines. Japan's lead donorship behavior fits well with the description of its aid

⁵The exception is Madagascar. France acts a number one donor 19 out of 33 years, with the remaining 12 years split between 7 other donors.

⁶The reason for this is probably that Japan, as strong American ally, substituted for American lead donorship in the region.

⁷The exceptions are Equatorial-Guinea and Guinea-Bissau, which joined the CFA Zone only in 1985 and 1997 respectively.

Table 1: **Largest Donor ≥ 50 % of Time**

Donor	Recipient		
USA	<i>Americas</i>		
	Bolivia	Haiti	
	Dominican Republic	Honduras	
	Ecuador	Jamaica	
	El Salvador	Panama	
	Panama	Peru	
	Guatemala		
		<i>Middle East/Maghreb</i>	
	<i>Africa</i>	Egypt	
	Liberia	Israel	
		Jordan	
	France	<i>Africa</i>	
		Benin	Cote d'Ivoire
		Burkina Faso	Madagascar*
Cameroon		Mali	
Central African Republic		Mauritius	
Chad		Niger	
Comoros		Senegal	
Congo (Brazzaville)		Togo	
Djibouti			
Gabon		<i>Middle East/Maghreb</i>	
Guinea		Morocco	
Japan	<i>Asia</i>		
	Bangladesh	Myanmar	
	China	Nepal	
	India	Philippines	
	Indonesia	Sri Lanka	
	Laos	Thailand	
	Malaysia		
	Maldives	<i>Americas</i>	
	Mongolia	Paraguay	
UK	<i>Americas</i>	<i>Africa</i>	
	Belize	Malawi	
	Saint Kitts and Nevis		
Germany	<i>Middle East/Maghreb</i>		
	Iran		

Countries marked with * have 8 or more top aid contributors as defined in table 3.

program as driven by the desire to secure regional economic influence. The only country outside Asia for which Japan plays a strong lead donor role is Paraguay. This relationship does not easily fit strategic or security interest based explanations. In addition, Japanese trade relations with Paraguay largely mirror those of the other four major donor countries.⁸

There is only a handful of countries for which Great Britain or Germany serve as strong lead donor. Great Britain supports three relatively small former colonies. Their size and location make it unlikely that this is due to strategic interests. Germany is engaged in Iran. Historically, Germany has enjoyed relatively good relations with Iran. Of course, Iran is also a major producer of oil. For both countries, their restraint in taking strong lead donorship roles is in line with a lack of well-defined spheres of diplomatic or economic influence.

Overall, table 1 gives an impression of strong lead donorship as driven by strategic and commercial interests, that center on specific regions. Important donors such as Germany and Great Britain that do not have such clearly pronounced spheres of influence do not act as strong lead donors.

How does the picture change if we slightly relax the exclusivity requirement? To answer this question, I also look at second biggest aid contributions. Maintaining the longevity criterion, table 2 lists the countries that have one and the same donor acting either as largest or second largest aid contributor for 17 out of 33 years under consideration (ignoring cases of strong lead donorship). A substantive number of the countries that meet this criterion failed on the wider exclusivity requirement because they attracted support from 8 or more other top donors. These countries are marked with an asterisk. I call the instances of lead donorship in table 2 moderate lead donorship.

The picture of moderate lead donorship emerging from table 2 is mixed when compared to the patterns of strong lead donorship. There is only a small number of countries that matches the diplomatic and economic spheres of influence described above.

⁸However, a tiny Japanese minority exists in Paraguay.

Table 2: Largest or Second Largest Donor ≥ 50 % of Time

Donor	Recipient		
USA	<i>Africa</i>	<i>Americas</i>	<i>Middle East/Maghreb</i>
	D.R. Congo	Belize	Afghanistan*
	Ethiopia	Costa Rica	Lebanon*
	Gambia*	Guyana	Oman
	Guinea		Pakistan
	Sierra Leone	<i>Asia</i>	
	Somalia	Cambodia*	
	Sudan	Philippines	
	Swaziland	South Korea	
	France	<i>Middle East/Maghreb</i>	<i>Oceania</i>
Algeria		Vanuatu	Burundi
Lebanon*			Equatorial Guinea
Mauritania*		<i>Americas</i>	
Tunisia		Mexico	
Japan	<i>Americas</i>	<i>Middle East/Maghreb</i>	<i>Oceania</i>
	Brazil	Pakistan	Fiji
		Syria*	
	<i>Asia</i>		
	Bhutan*		
UK	<i>Africa</i>	<i>Americas</i>	<i>Asia</i>
	Ghana	Dominica	India
	Kenya*	Grenada	
	Uganda		
	Zimbabwe*		
Germany	<i>Middle East/Maghreb</i>	<i>Africa</i>	<i>Americas</i>
	Egypt	Togo	Brazil
	Israel		
	Syria*	<i>Europe</i>	
	Jordan	Turkey	

Countries marked with * have 8 or more top aid contributors as defined in table 3. This table omits countries listed in table 1.

Looking at the US, an active engagement with a number of Sub-Saharan African countries emerges. This engagement is not easily explained by economic self-interest. The affected countries are among the poorest on earth. However, they shared a role as pawns in the positioning between the superpowers during the Cold War. Thus, strategic interests did play a role for some of the sample period. Yet in most cases, the US retained top donor status after the end of the Cold War, which is not easily explained by strategic or economic self-interest. On the other hand, US engagement as moderate lead donor in Asia fits its long-standing strategic interests in the region, particular with respect to South Korea and the Philippines.

The largest group of states for which France acts as moderate lead donor consists of former colonies located in the Maghreb region. This is in line with the strategic motives of French aid provision on the African continent. French support for Mexico was particularly pronounced during the Latin American debt crisis in the 1980s and coincides with a temporary surge of French oil imports from Mexico. Growth of French exports to Mexico was relatively anemic compared to the competition from the US, Germany, and Japan, and only outdid British exports.

Only a handful of countries received moderate lead donorship support from Japan. Pakistan and Syria likely made the list because of Japanese support for Western strategic concerns in the Middle East. Brazil was and remains Japan's largest trading partner in Latin America, though its exports are less than German and American numbers.

British moderate lead donorship is completely directed towards former colonies. Again, there are no obvious commercial, economic or diplomatic interests that drive this policy.

Finally, Germany is engaged as moderate lead donor in a number of Middle Eastern countries. As in the case of Japan, this can be seen as support for general Western concerns about stability in the region. In addition, Germany's support for Israel results from the unique historic ties between the two countries. Like Japan, Germany is also a moderate

lead donor to Brazil, which is Germany's largest trading partner in Latin America. Two idiosyncracies are Germany's support for Togo, which briefly was a German colony in the early 20th century, and its role in Turkey. Turks form the largest group of immigrants in Germany, suggesting motives for aid provision that go beyond strategic and regional security concerns.

It is interesting to note that a number of recipient countries have both a strong and a moderate lead donor. These countries are Israel (USA and Germany), the Philippines (Japan and the US), Belize (USA and Britain), and Togo (France and Germany). Except for perhaps Israel, all of these pairings fall into the sphere of influence of the strong lead donor, with the moderate lead donor sharing historic ties with the recipient country.

The countries with moderate lead donor that fail on the exclusivity criterion are not easily categorized. They include countries in post-conflict situations such as Lebanon, former poster children of colonial independence such as Zimbabwe, but also key players for regional strategic relations such as Syria.

We now turn to the countries on the other end of the exclusivity spectrum. Table 3 lists those countries that during the 33 years in the sample received aid from 8 or more different top donors. Choosing a cutoff of eight is guided by the empirical distribution of the number of top contributors in the sample, and thus arbitrary to some degree. The variable is distributed approximately normal, with the median lying at 5, and the 75th percentile lying at 8 (the maximum is 10). Thus, we label 25 percent of recipient countries in the sample as having a large number of different top donors.

A look at table 3 shows a heterogenous picture. The list contains a number of oil exporting countries, such as Venezuela, Nigeria, Iraq and Lybia. Others were of significance for strategic reasons during the Cold War (many of the African countries, but e.g. also Cambodia, Cuba, and the former Yugoslavia). Finally, the countries in the Middle East were of strategic value to all Western donors.

Table 3: Recipient Countries with Eight or More Different Top Contributors

Region	Country
<i>Americas</i>	
	Argentina
	Barbados
	Chile
	Colombia
	Cuba
	Nicaragua
	Trinidad and Tobago
	Uruguay
	Venezuela
<i>Africa</i>	
	Botswana
	D.R. Congo
	Gambia*
	Kenya*
	Lesotho
	Madagascar*
	Nigeria
	Rwanda
	Tanzania
	Zambia
	Zimbabwe*
<i>Asia</i>	
	Bhutan*
	Cambodia*
<i>Middle East/Maghreb</i>	
	Afghanistan*
	Iraq
	Lebanon*
	Libya
	Mauritania*
	Syria*
<i>Europe</i>	
	Former Yugoslavia / Serbia
	Malta

Countries marked with * also have lead donor as defined in tables 1 & 2.

Table 4: **Remaining Countries With ≤ 7 Top Contributors**

Region	Country	
<i>Americas</i>	Bahamas	Saint Lucia
<i>Africa</i>	Guinea-Bissau	South Africa
<i>Asia</i>	Taiwan	Singapore
	Vietnam	
<i>Middle East</i>	Saudi-Arabia	Bahrain
	Yemen	Qatar
	Kuwait	United Arab Emirates
<i>Europe</i>	Albania	Cyprus

It remains to take a look at the residual category, countries that neither had a strong or moderate lead donor, but that also did not generate enough donor interest to have a high number of different top aid contributors. Fifteen such countries are in the sample. They are listed in table 4.

The biggest homogenous group of countries in the residual category are the big Arab oil producers of the Middle East. While all of them received some aid at some point in the sample, neither of them enjoyed broad aid support or had a lead donor. There are not many similarities between the remaining countries. Taiwan and Singapore were already on the way to economic success during the sample period. South Africa did not receive any foreign aid before 1987. Both Albania and Vietnam were firmly lodged in the Eastern Bloc during the Cold War, even though they were not members of the Warsaw Pact.⁹ However, while Albania only started to receive Western aid after 1988, Vietnam received Western aid

⁹Albania formally withdrew from the Pact in 1968, having withheld support since 1961 as reaction to the Sino-Soviet split.

throughout the sample period.

The discussion of our categorization scheme allowed for impressionistic evaluations of the possible causes for lead donorship. The overall picture shows that strong lead donorship is an important feature of the American, French and Japanese spheres of influence. However, donor preferences are only part of the explanation for persisting lead donorship. Britain and Germany also act as strong lead donors in a few cases, and moderate lead donorship maps less well onto the spheres of influence. To understand how donors are able to persist as top contributors we need to take strategic interactions into account. We will do this in the following statistical analysis.

3.2 Statistical Setup

In this section we take a more systematic look at the sources of lead donorship. The goal is to develop a statistical setup that will allow us to test the theorized relationship between strategic donor interactions and lead donorship. Our argument about the effects of strategic interactions on donor aid allocations points to three empirical quantities of interest. These are aid allocations, lead donor patterns, and whether aid has private or public good characteristics. Which of these variables are endogenous, which are exogenously determined? To answer this question it will be useful to revisit the logical structure of the argument.

We have argued that strategic interactions between donors have quite distinct consequences dependent on whether aid is used to secure private benefits or contributes to a public good. What both scenarios have in common is that aid allocations and resulting lead donorship patterns arise as a result of donors anticipating other donors' actions, and optimally adjusting their own aid policies. In other words, aid allocations reflect equilibrium behavior. We will maintain the assumption that the empirical record reflects equilibrium behavior throughout the empirical analysis, for three reasons.

First, this assumption allows us to gain explanatory leverage from our theory. Without

this assumption, we are left without clear empirical predictions. Second, while real world political actors such as aid agencies can make mistakes, there are a multitude of mechanisms providing incentives to avoid perpetual suboptimal behavior. These incentives include resource scarcity, political oversight, and professional recognition. Thirdly, since observed aid policies and the phenomenon of lead donorship are stable over long time periods, it seems sensible to conclude that these observations are not the result of a random walk.¹⁰

What follows from the assumption that aid allocations are observed equilibrium behavior for the empirical analysis? While aid allocations result endogenously from the actors' best response calculus, the logic of game-theoretic deduction implies that we need to treat game type and equilibrium selection as exogenously fixed. The game type is whether aid is given to serve public or private good purposes. Equilibrium selection refers to whether donors choose to cooperate or give aid in a non-cooperative fashion.

In terms of the statistical analysis, this means that we need to model aid allocations as a function of both, the type of aid provided (public vs. private good aid), and the presence or absence of a lead donor. The exogeneity of equilibrium selection allows us to model lead donorship and the type of aid provided without accounting for allocated amounts of aid.

I incorporate these features into the following econometric setup. To differentiate between aid that goes towards public goods and aid that generates private benefits, I divide the sample into two parts. As measure of aid with private good characteristics I code all aid that is channeled through existing recipient government agencies. Codings are based on sectoral data provided by the OECD-DAC's Creditor Reporting System (CRS, OECD 2009). Aid has private good characteristics if it allows donors to garner political favors from recipient governments. I argue that this is more likely if aid is not bound to a particular project, but is either given as general budget aid, or directed towards building administrative capacity.

¹⁰These arguments do not preclude the possibility that aid agencies act suboptimal from a welfare perspective, or that aid policies are subject to dynamic interactions. Such arguments are best dealt with in an equilibrium framework, and imply a more complicated model of policy making.

Since these aid moneys are under complete purview of the recipient government, accounting mechanisms are relatively weak, which means the money can be used as payoff for political favors. In contrast, aid that is spent on concrete projects, as well as aid that is not channeled through recipient government hands, cannot easily be diverted to pay off government officials. I therefore code public good aid as all aid that is given directly as project aid, or through NGOs.

This distinction between private and public good aid is certainly not the only possible option. Another measure of the private goods character of aid that comes to mind is the tying status of aid. I have used this measure elsewhere (Steinwand 2009). But the fact that the US stopped reporting aid tying practices in the early 1990s sharply limits the temporal domain of this measure. In addition, an imputation strategy for missing US tying data is only plausible for the early 1990s. This is because the end of the Cold War caused Western donors to reevaluate their aid policies, and those changes began to shape policy outcomes in the late 1990s.

Arguably, there are also other ways to divide the data based on the sectoral breakdown found in the CRS. However, scholars have just begun to explore the wealth of information contained in sectoral aid data (e.g. Bermeo 2008). What is more, the small literature that explicitly deals with the private and public goods characteristics of aid looks exclusively at aggregate aid levels (Mascarenhas and Sandler 2006). The measurement strategy employed here, while possibly imperfect, breaks conceptual ground.

I use a logit setup to model lead donorship. The logit equation generates predicted probabilities of lead donorship. I use these predicted probabilities in turn in the aid allocation equation to identify which equilibrium donors play. Because equilibrium selection comes logically prior to aid allocation decisions, the lead donor and aid allocation equations form a fully recursive system of equations (Greene 2003, p. 395 & 397). This means we can estimate sequentially the probability of lead donorship, and then use the generated predicted

probabilities as independent variable in the aid allocation equation. Since the sequential approach leads to incorrect standard errors in the second step, I choose to estimate both equations simultaneously in an MLE framework.

The aid allocation equation is a modified Spatial Autoregressive (SAR) model (Anselin 1988; Franzese and Hays 2007b). In Steinwand (2009), I have shown the similarity between a structurally derived estimator of an impure public goods games and the SAR model. Here, I use a more general setup that does not represent any particular game structure. Instead, it allows us to statistically detect complementarities and substitution effects in simultaneous donor aid allocation decisions (Franzese and Hays 2008). In the context of aid given for private benefit, complementarities can be interpreted as evidence of competition, while substitution effects are evidence of collusion. In the public goods scenario, substitution effects are evidence of free-riding, while complementarities show the presence of coordination between donors.

To allow for both an equilibrium with and without lead donor, I include two endogenous elements in the SAR setup.¹¹ I interact each element with the predicted probability that the donors play this particular equilibrium. The resulting equation has the following form:

$$\mathbf{Y}_{i,t} = \rho_l E(Z_{i,t}) \mathbf{W}_l \mathbf{Y}_{i,t} + \rho_d (1 - E(Z_{i,t})) \mathbf{W}_d \mathbf{Y}_{i,t} + \mathbf{X}_{i,t} \boldsymbol{\beta} + \boldsymbol{\varepsilon}, \quad (1)$$

where the $\mathbf{Y}_{i,t}$ is a 5×1 column vector of aid allocations from the five donor countries in the analysis to recipient country i in time period t . The endogenous element capturing the lead donorship situation is $\rho_l E(Z_{i,t}) \mathbf{W}_l \mathbf{Y}_{i,t}$, where $E(Z_{i,t})$ is the predicted probability of lead donorship, \mathbf{W}_l is a 5×5 matrix of strategic connectivity weights $w_{k,j}$ described in detail below, and ρ_l is the estimated connectivity parameter for the lead donor situation. It takes on positive values for complementarities in aid provision and negative values for

¹¹The inclusion of two different endogenous structures does not present a problem in terms of estimation (Franzese and Hays 2007a).

substitution effects.¹² The endogenous element capturing non-lead donorship equilibrium play is $\rho_d (1 - E(Z_{i,t})) \mathbf{W}_d \mathbf{Y}_{i,t}$. The probability of no lead donor is $1 - E(Z_{i,t})$, the complement of the estimated probability of lead donorship. Parameter ρ_d captures complementarities and substitution behavior in this equilibrium. Its interpretation is equivalent to ρ_l .

The weight matrices \mathbf{W}_l and \mathbf{W}_d are made up of weights $w_{k,j}$, where j indexes the row donor, and k indexes the column donor. The choice of connectivity weights is one of the central tasks the analyst faces in specifying an SAR model. Unless connectivity weights are explicitly derived from a strategic model,¹³ there is necessarily an element of arbitrariness in this decision. I follow a simple intuition in making this choice. In an equilibrium with lead donor, donors pay more attention to the actions of the lead donor than to other non-lead donors. In an equilibrium without lead donor on the other hand, donors put equal weight on the actions of all other donors.

To justify this, consider first the public goods situation. Here, the lead donor enjoys lower marginal costs of providing the public good,¹⁴ which induces it to give more than other donors. Thinking about equation (1) as a system of best response functions, we can capture this difference in the marginal utility calculus by giving the lead donor greater relative connectivity weights.¹⁵ In the private goods scenario, lead donorship results from collusion. It is the substance of the collusive agreement that the lead donor enjoys privileged political access to recipient governments. It therefore seems natural that other donors pay special attention to the lead donor's actions.

The following example features the weight matrix \mathbf{W}_l for the lead donor equilibrium, with donor number 3 acting as lead donor. In the statistical analysis, the matrix reflects the

¹²Since I use connectivity weights that sum to 1, and $E(Z_{i,t})$ is bounded above at 1 (resembling a weighted average), parameter ρ_l is naturally bounded between -1 and 1.

¹³See Steinwand (2009)

¹⁴Or, equivalently enjoys a greater marginal utility from consuming the public good.

¹⁵To see why, consider equal connectivity weights for all donors. In this situation, the best response functions of all donors would be identical, which would lead to symmetric aid allocations, and lack of lead donorship.

actual lead donor for each recipient country and year.¹⁶

$$\mathbf{W}_l = \begin{bmatrix} 0 & \frac{1}{6} & \frac{1}{2} & \frac{1}{6} & \frac{1}{6} \\ \frac{1}{6} & 0 & \frac{1}{2} & \frac{1}{6} & \frac{1}{6} \\ \frac{1}{4} & \frac{1}{4} & 0 & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{6} & \frac{1}{6} & \frac{1}{2} & 0 & \frac{1}{6} \\ \frac{1}{6} & \frac{1}{6} & \frac{1}{2} & \frac{1}{6} & 0 \end{bmatrix}. \quad (2)$$

Each row j reports how aid allocations of donor j are affected by aid allocations of column donors $k = 1 \dots 5$.¹⁷ The weights $w_{k,j}$ sum to 1 across rows. The disparity between the strategic impact of the lead donor and other donors is captured in the difference between connectivity weights for the lead donor $w_{j,3} = \frac{1}{2}$, $j \neq 3$, and connectivity weights for other donors $w_{j,k} = \frac{1}{6}$, $j \neq 3, k \neq 3$. In addition, the lead donor itself assigns equal weight to the actions of all non-lead donors, $w_{3,k} = \frac{1}{4}$, $k \neq 3$.

For cases without lead donor, we have no theoretical reason to give different strategic weights to different donors. Accordingly, the weight matrix reflects a symmetric arrangement:

$$\mathbf{W}_d = \begin{bmatrix} 0 & \frac{1}{4} & \frac{1}{4} & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & 0 & \frac{1}{4} & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{1}{4} & 0 & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{1}{4} & \frac{1}{4} & 0 & \frac{1}{4} \\ \frac{1}{4} & \frac{1}{4} & \frac{1}{4} & \frac{1}{4} & 0 \end{bmatrix}. \quad (3)$$

With all elements of the statistical setup in place, we can now turn to the data.

3.3 Data

As mentioned above, all aid data is taken from the OECDs Creditor Reporting System (OECD 2009). The raw data cover the years 1974 to 2006. However, we lose four years due to the lag structure of the dependent variable that I discuss below. The data structure are

¹⁶For reasons of clarity of exposition, I suppress subscripts i and t for matrix \mathbf{W}_l .

¹⁷Note that $w_{j,j} = 0$, i.e. aid allocations are not reflexive.

donor-recipient years. We start with a balanced panel with 19740 observations, arranged in 33 years, with 118 recipient countries and five lead donors. Due to taking lags and missing data on independent variables, the actual analysis uses 13160 observations, with 109 recipient countries. Panels are unbalanced.

The econometric setup features three different dependent variables. The first is lead donorship, a binary variable, the second and third are aid allocations with private and public good characteristics.

Let us start with the lead donorship variable. In the descriptive part of the analysis we utilized the entire history of aid provision in the data. We labeled a donor as strong lead donor if it provided aid to one recipient country 50 percent of the times or more. This approach is not feasible in the econometric analysis if we want to make use of the information that is contained in the temporal dimension of the data. We therefore need a modified measure of lead donorship that preserves the core characteristics of the longevity and exclusivity criteria, while not giving up too much temporal variation.

As solution, I take a sliding count of the number of years during which each donor was the largest donor to a given country over a time period of five years. Maintaining the concept that a lead donor acts as top contributor a majority of times, I code lead donors as giving most for 3 or more out of the five years. This measure does not directly tap into the exclusivity criterion, but it maps very well into the descriptive analysis. The variable correctly labels strong lead donors for most of the cases listed in table 1. Exceptions result from the need to drop some observations for taking lags and missing data in independent variables.

Not surprisingly the new measure assigns lead donor status to a number of recipient country-donor pairs that do not appear on the original list of strong lead donorship. In this regard, the five year sliding count is more sensitive to changes in donor-recipient country relationships than when we sum up over 33 years. For example, the new measure picks up

US lead donorship in Nicaragua before the Reagan administration curbed US aid to the new Sandinista regime in 1981.

An important issue arises from long-time character of the lead donor variable in the logit analysis. Taking a sliding count over five years uses up four years worth of data from the sample. Since we started out with 33 years in the sample, the data loss is modest, leaving us with 29 years worth of data. In cross-sectional time-series analysis it is common practice to lag independent variables to ensure the proper sequential order of events. Since in our case the dependent variable covers five years, $t = -4$ to $t = 0$, we enter all independent variables with a four year lag into the logit analysis. While this ensures sequential ordering, it substantively means that our logit model is forward looking. In other words, it captures whether a donor will be a lead donor in the present and in the next four years to come.

The second and third dependent variables are allocation of aid with private and with public good characteristics. Both variables are measured as absolute aid committed by a donor to a recipient country per year, in constant (2005) US dollars. The decision to use absolute aid contributions, rather than aid scaled by recipient country GDP or population is due to our focus on donor interactions. The key point of strategic decision making is that donors make their own contributions in the light of the actions of other donors. Since our theory tells us that donors decide over actual dollar amounts, we keep this measure.

The two dependent variables are constructed using the sectoral breakdown of aid data found in the OECD Creditor Reporting System. As discussed before, I use the sectoral data to divide aid contributions into a part with private goods characteristics and a part with public good characteristics. Aid with private good characteristics is given as General Budget Support or directed to develop administrative capacity in a specific policy area.¹⁸ Public good aid, on the other hand, is under greater donor purview, thus reducing its use to serve

¹⁸A list of included purposes codes can be found in the appendix.

Table 5: **Aid Channeled Through Government Agencies**

Donor	Percentage of Total Aid
Germany	18.04%
France	33.82%
Japan	25.71%
UK	21.48%
USA	29.73%

as pay off for political favors.¹⁹

Table 5 reports the share of donor commitments that is classified as aid with private goods characteristics, averaged over the 32 sample years. France has the largest share (33.8 percent), followed by the US (29.7 percent) and Japan (25.71 percent). Germany (18.0 percent) and the UK (21.5 percent) have the smallest and second smallest share of this type of aid. This breakdown corresponds well with how the literature describes the aid programs of the five donors. France, the US and Japan are thought to be more prone to use aid to further bilateral goals, of a diplomatic (France, US) or commercial nature (Japan), while the British and German aid programs are deemed to be more development oriented. This correspondence lends credence to the validity of our coding scheme.

We next look at the independent variables. For both the lead donorship and aid allocation equations, we are interested in capturing the effects of exports from donor to recipient countries, and oil imports that flow in the opposite direction. I take export data from the Comtrade database (United Nations 2009).²⁰ For each donor-recipient pairing, I calculate annual total exports from the donor to the recipient country. Data on oil imports comes from the same source. The variable reflects annual oil sales from recipient to donor country, for each donor-recipient country pairing. Both variables are measured in constant (2005) US Dollars. The variables are included in both the lead donorship and aid allocation equations.

¹⁹I code public good aid as all CRS codes not falling into the private good category.

²⁰The data accords to the SITC Revision 1 reporting standard.

To capture asymmetries in donor preferences towards certain donor countries, I use a variety of measures. To capture US strategic interests, I take the number of US troops stationed in a recipient country. The source are the Department of Defense Personnel Statistics Online (Department of Defense 2009). For the American sphere of interest, I code a dummy variable that captures all countries of Central America and Mexico.²¹ For the French sphere of influence, I originally coded a dummy variable with the members of the CFA Franc zone. However, this variable has a strong disadvantage for use in statistical analysis. In some settings, it perfectly predicts cases without French lead donorship, and therefore cannot be used in the logit analysis. As alternative measure of French strategic interests, I instead use a dummy variable that is coded 1 for former French colonies and 0 otherwise. I take this variable from Fearon and Laitin (2003). I rely on the same data source for the dummy variable for former British colonies. For Japan's sphere of influence, I code a dummy variable that covers all countries in Asia.²²

The last substantive independent variable in the lead donorship equation accounts for changes in aid policies after the end of the Cold War. I include a dummy variable that is coded 1 for years prior to 1991, and 0 for later years. The end of the Cold War caused a shock to the aid system that forced all donors in the sample to reevaluate their aid programs. Since the aid system was more stable during the Cold War years, I expect that during this time lead donorship was more likely.

The logit model includes a final set of variables that play a technical role. To model temporal dynamics of changes in lead donorship, I include a third order polynomial of the time since the last spell of lead donorship for individual donors into the analysis (Carter and Signorino 2007). This polynomial provides the equivalent of a baseline hazard.

²¹The complete list includes Belize, Costa Rica, El Salvador, Panama, Former Panama Canal Zone, Guatemala, Honduras, Mexico, and Nicaragua.

²²The list includes Bangladesh, Bhutan, Burma, Cambodia, China, South & North Korea, India, Indonesia, Laos, Malaysia, Maldives, Mongolia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Vietnam.

The aid allocation equation contains a second set of independent variables. As already mentioned, I include the oil imports and export variables. To capture effects of lead donorship on levels of aid commitment, I include the predicted probability of any of the five countries acting as lead donor as independent variable. Since the logit equation generates one predicted probability for each donor-recipient country pair, I added up those individual probabilities for all five donors.²³

In addition, I chose a number of standard measures designed to capture recipient country characteristics. GDP per capita measures wealth. Many studies find that wealth plays a role in donor aid allocation decision, but the direction of the effect is contested. I also include a population variable. Larger countries should receive more aid, at least in the aggregate.

Two variables address econometric issues. To address concerns about autocorrelated errors, I include the lagged dependent variable as independent variable. In addition, aid allocation decisions are subject to an overarching budget constraint. While the actual process of inter-agency budget decision making is too complex to be modeled in statistical analysis, I include a variable that adds up total aid given by each donor to all recipient countries per year. Finally, all independent variables enter the analysis with a one year time lag. Similar to the logit equation, this ensures the proper sequential ordering of cause and effect.

Do we have to be concerned about meeting exclusion restrictions? As I have argued extensively above, lead donorship is not endogenous to aid allocation decisions. From this perspective, a weak condition on the variance-covariance matrix is met that ensures identification of the entire system of equations.²⁴ However, our setup also contains a set of variables that can serve as credible instruments to meet exclusion restrictions. The logit equation features a third-order polynomial of time since the last lead donorship episode. This measure

²³In the analysis, in about 10 percent of the cases, the sum of predicted probabilities exceeded 1. I decided to keep the these imputed values in the analysis.

²⁴ Σ is diagonal, as disturbances do not co-vary, ensuring the entire structure is identified (Greene 2003, p. 395)

should be largely uncorrelated with individual private and public good aid allocations. From a theoretical perspective, we treat each year as an independent realization of a stage game. More importantly however, from an empirical perspective individual donor aid allocations do not determine lead donorship status. Changes to lead donorship status are a result of the actions of all donors in the system, over a sustained period of time (including actions of donors other than the five largest in the sample). The data bears this out. The correlation between dyadic aid commitments and the time since the least lead donor spell is low, $r = -0.133$ for the private good case, and $r = -0.140$ for the public good case.

3.4 Results

As mentioned before, the logit and SAR equations are estimated simultaneously, using MLE. Table 6 has results for both equations. The table shows two different models (each with one logit and one SAR equation). In the first model, aid allocations fall under private good aid given to recipient government entities. In the second model we look at public good aid, i.e. aid given directly to projects or to NGOs.

Let us consider the lead donorship equations first. The point estimates are almost identical for both models. This should come as no surprise, as the dependent and independent variables are identical across setups. A brief glance at coefficient signs and statistical significance levels shows the following. As expected, both oil exports to donor countries and imports of goods and services from donor countries increase the probability that a developing country has a lead donor. Former French colonies are more likely to have a lead donor, but the same is not true for former British colonies. Nor does the number of stationed US troops affect lead donorship. Surprisingly, the Cold War has a negative effect on lead donorship, i.e. after 1990 a recipient country was on average more likely to have a lead donor than prior to this year.

To gauge the size of these effects, consider predicted probability plots for oil exports and

Table 6: **Lead Donorship & Committed Allocation**

	Aid Given To Government		Other Forms of Distribution	
<i>Lead Donorship</i>				
Oil Imports	0.188**	(0.0282)	0.171**	(0.0287)
Exports	0.314**	(0.0855)	0.320**	(0.086)
US Soldiers	-0.0673	(0.0705)	-0.0472	(0.0697)
Cold War	-1.17**	(0.0765)	-1.16**	(0.0769)
French Colony	0.576**	(0.0845)	0.566**	(0.084)
British Colony	0.058	(0.0816)	0.0646	(0.0809)
Asia	0.406**	(0.0816)	0.382**	(0.0851)
Central America	0.350**	(0.128)	0.323**	(0.127)
Time	-0.546**	(0.0349)	-0.547**	(0.0347)
Time ²	2.69**	(0.331)	2.70**	(0.329)
Time ³	-4.83**	(0.823)	-4.85**	(0.817)
Constant	0.706**	(0.0992)	0.703**	(0.0993)
<i>Committed Aid</i>				
ρ_d , No Lead Donor	0.00155	(0.0242)	0.122**	(0.0224)
ρ_l Lead Donor	-0.0317**	(0.0122)	0.0361**	(0.0113)
Pr(Lead Donor)	-0.00246	(0.00205)	0.00904**	(0.00315)
Aid _{t=-1}	0.032**	(0.00041)	0.0323**	(6e-04)
Donor Total Aid	-0.000459	(0.000346)	0.000648	(0.000505)
GDP Per Capita	0.0319*	(0.0165)	0.0778**	(0.0241)
Population	-0.0158**	(0.00517)	0.109**	(0.00801)
Exports	-0.00201	(0.00267)	0.0137**	(0.00391)
Oil Imports	0.000126	(0.000907)	0.00572**	(0.00133)
Constant	-0.00144	(0.00308)	-0.0164**	(0.00454)
s ²	0.00635**	(7.25e-05)	0.0136**	(0.000165)

imports of all goods.²⁵ In figure 1, the x-axis features oil exports in million US Dollars. Because the variable is highly right-skewed, it is shown on a logarithmic scale. The y-axis shows the predicted probability that the oil importing donor acts as lead donor. The probabilities are calculated setting other continuous variables to their respective sample medians, the Cold War dummy to 1, and all four spheres of influence variables to 0. The graph shows a strong association between oil exports and the likelihood of lead donorship.

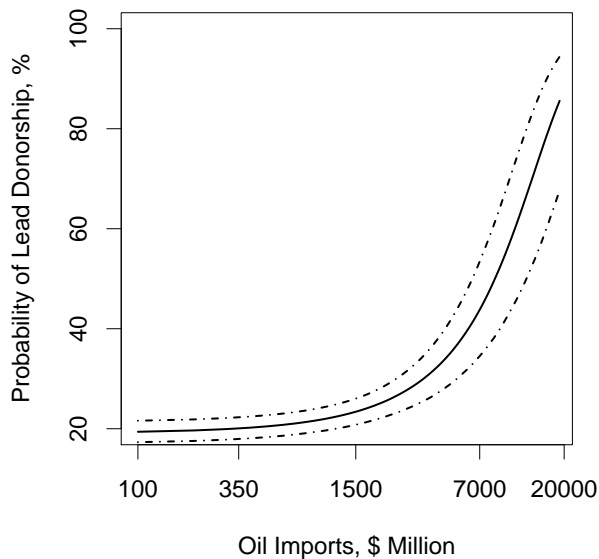
²⁵I report substantive effects and goodness-of-fit based on model 1, with private good aid. The numbers for model 2, with public good aid, are nearly identical.

The logarithmic scale masks that the marginal effect of oil exports does not vary much over the sample range. The probability of lead donorship increases by between 0.18 percentage points and 0.47 percentage points for each \$100 mil. in additional oil sales.

However, only a few aid recipient countries export oil at a scale that by itself is large enough to push the probability of lead donorship to substantive heights by itself. From the 109 recipient countries in the sample, 17 have absolutely no oil exports. 24 have oil exports that surpass \$1 billion to an individual donor in some years. It is for those countries that oil exports have a palpable effect on the likelihood of lead donorship. For example, doubling exports to one donor from \$1 billion to \$2 billion increases the probability that this donor will act as lead donor by about 3.5 percent. If the increase in sales occurs vis-à-vis two donors, the increase in the cumulative probability of one of them acting as lead door is 7 percent. Increasing exports to one donor from \$1 billion to \$5 billion leads to a 15.3 percent jump in the probability that this donor acts as lead donor. In a few cases, donors even surpass the \$10 billion hurdle. This is the case for oil deliveries from Saudi Arabia to Japan, the US, and France; oil sold from Mexico, Venezuela, and Nigeria to the US; and – in one year only – oil deliveries from the United Arab Emirates to Japan.

Next, in figure 2 we look at the substantive impact of imports of all goods and services from donor countries. Again, the x-axis features a logarithmic scale. The impressive effect that exports from the donor country at first glance have on the probability of lead donorship is misleading. Most aid recipient countries import too little to be affected at all. While exports topped \$100 billion in one case (Mexico and USA in 2000 and 2001), exports for the median case were less than \$100 million per year, and not more than \$380 million at the third quartile. Moving from \$0 imports to \$100 million only increases the probability of attracting a lead donor by 0.05 percentage points. For the majority of cases in the sample, lead donorship is therefore not affected by imports from donor countries. The greatest marginal effect occurs around \$45 billion, when each additional \$1 billion in imports adds

Figure 1: Imports by Lead Donor Type



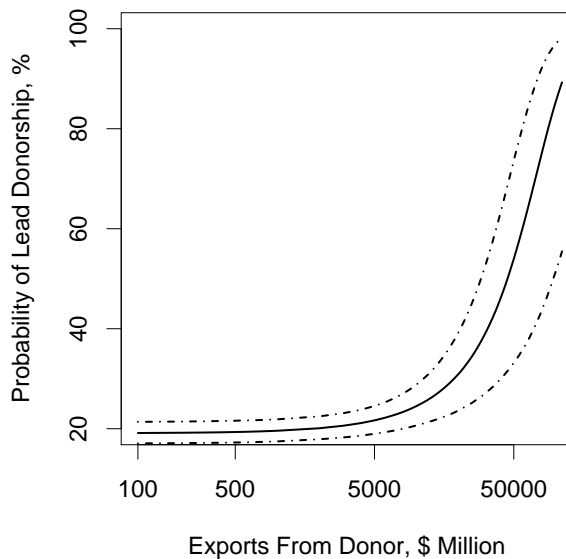
about 0.8 percentage points to the probability of having the trade partner as lead donor. Only China, Mexico and South Korea import that much.²⁶

For the dummy variables, table 7 reports marginal effects holding all continuous variables at their medians, and other dummies at 0. The large negative effect (-23.9%) of the Cold War on the probability of lead donorship comes as somewhat of a surprise. The list of strong and moderate cases of lead donorship in tables 1 and 2 show a number cases in which Western support can be attributed to Cold War concerns (e.g. the US engagement in Sub-Saharan Africa and Cambodia, broader Western support for the Middle East). Thus, our finding challenges the usual narrative that the Cold War forced Western donors into maintaining stable relationships with aid recipient countries based on strategic needs.

More in line with existing arguments is the finding that former French colonies are on average about 14.1 percent more likely to have a lead donor. Since the analysis averaged over all 5 donors in the sample, this number represent the probability that *any* of the five

²⁶The list of countries that reaches at least \$10 billion in imports from a single donor additionally includes Brazil, Indonesia, Malaysia, Philippines, Saudi Arabia, Singapore, and Thailand.

Figure 2: Imports by Lead Donor Type



donors is a lead donor. The probability that *France* acted as lead donor in its former colonies is likely substantively higher.²⁷

Former British colonies are not more likely to have a lead donor than the reference category, i.e. countries outside the four spheres of influence. Since British diplomatic interests and its aid program had the least sharply delineated geographic focus, this negative finding is not surprising. For Asia and Central America, the model shows the expected positive effects. Countries in Asia have a probability of lead donorship that is 9.49 percent greater than the reference category. For Central America, this number is 8.02 percent.

Since we use the logit equation to generate predicted probabilities of lead donorship, the question of prediction accuracy arises. To gauge this, in table 8 I tabulated how well the model predicts lead donorship. It does reasonably well. Using 50% probability as cut-off for a positive prediction, the model correctly predicts 70.4 percent of all instances of lead donorship. For cases of non-leadership, this number is somewhat lower at 54.9 percent.

²⁷Capturing this separate effect for each of the four spheres of influence would have required a cumbersome interaction term design.

Table 7: **Effect On Probability of Lead Donor**

Variable	Effect	95% Confidence	
		Bounds	
Cold War	-23.9%	-27.4%	-20.4%
French Colony	14.1%	10.0%	18.1%
British Colony	0.016%	-0.023%	5.41%
Asia	9.49%	5.31%	13.6%
Central America	8.02%	1.85%	14.1%

Table 8: **Lead Donorship, Accuracy of Prediction**

Actual	Predicted	
	0	1
0	672 (54.9%)	552 (45.1%)
1	417 (29.6%)	991 (70.4%)

Next, we look at the SAR equation that models aid allocation decisions. Of central interest are the strategic connectivity coefficients, ρ_d and ρ_l . Let us begin with the private goods model that captures aid given through government channels. Our theoretical expectation was that for cases without lead donor, aid is given in complementary fashion, as donor seek to compete for political influence. In lead donor cases however, we expected a substitution effect.

Coefficient estimates for the connectivity parameters give support to the second half of this prediction. Parameter ρ_l is negative ($\rho_l = -.0317$), and statistically significant. This means that donors substitute aid given by the lead donor for their own aid. In the case of no lead donorship, parameter ρ_d is positive as expected, but the estimate is too small to reliably distinguish it from zero ($\rho = 0.0015$). Thus, the model fails to find evidence of competition between donors in the provision of private aid, in the absence of a lead donor.

Instead of looking at estimates for the connectivity parameters, a more intuitive way to grasp the effects of strategic donor interactions is to look at predicted aid allocations \hat{Y} , with and without strategic endogeneity. We can directly measure the size of substitution

and complementarity effects by first calculating \hat{Y} s with strategic endogeneity,

$$\hat{\mathbf{Y}}_{i,t} = (\mathbf{I} - \hat{\rho}_l E(Z_{i,t}) \mathbf{W}_l - \hat{\rho}_d (1 - E(Z_{i,t})) \mathbf{W}_d)^{-1} \mathbf{X}_{i,t} \mathbf{b}, \quad (4)$$

where $\hat{\rho}_l$, $\hat{\rho}_d$ and \mathbf{b} are coefficient estimates. We then calculate predicted values for aid allocation without strategic interactions, $\tilde{\mathbf{Y}}_{i,t}$. To this end we set $\hat{\rho}_l = 0$ and $\hat{\rho}_d = 0$, reducing equation (4) to

$$\tilde{\mathbf{Y}}_{i,t} = \mathbf{X}_{i,t} \mathbf{b}. \quad (5)$$

Next, we calculate the substitution or complementarity effect for each observation by subtracting $\hat{\mathbf{Y}}_{i,t} - \tilde{\mathbf{Y}}_{i,t}$, element by element, and sum across donors to obtain the cumulative effect by country i and year t .

Going back to private good aid, the result of this exercise shows that coordination between donors in countries with lead donorship on average reduced individual aid allocations between 0.4 percent and 49.7 percent, with a mean of 3.5 percent. In countries without lead donor, despite the positive (but statistically insignificant) coefficient estimate of ρ_d , we still find a substitution effect. Strategic interactions between donors account for an average reduction in aid commitments by 0.98 percent. The evidence therefore supports our theoretical argument that lead donorship dampens the provision of private good aid. However, in the absence of a lead donor the model fails to find complementarities in aid provision. These would have been indicative of competition between donors.

For project-bound aid with public good characteristics, the analysis produces the following results. Our main argument was that lead donorship arises from asymmetries in the marginal utility calculus of providing a public good. Coordination between donors should lead to lesser asymmetries, and more complementarities in the provision of aid. This is essentially what we find. While there is no evidence of actual free-riding in lead donor cases

($\rho_l = 0.0361$), complementarities in aid provision are much bigger if there is no lead donor ($\rho_d = 0.122$).

Using the method described above, the predicted complementarities in cases with lead donor amount on average to 5.8 percent of additional aid on top of what would have been allocated without coordination. For individual recipient countries, this effect ranges from 0.02 percent to 9.12 percent of additional public goods aid.

Recipient countries without lead donor experience substantively larger complementarities, with an average of 9.87 percent of additional aid resulting from coordination. Estimates for individual recipient countries lie between 7.95 percent and 11.6 percent. Clearly, in the absence of a lead donor, the donor community is better able to coordinate in the provision of public good aid.

Let us now turn to the independent variables. We included the expected probability of lead donorship as independent variable in the analysis. The interpretation of its coefficient estimate is not straightforward since the variable does double duty in weighing the endogenous components $\rho_l \mathbf{W}_l \mathbf{Y}$ and $\rho_d \mathbf{W}_d \mathbf{Y}$. Instead we need to look at the marginal effect that the probability of lead donorship (denoted as $E(Z_{i,t})$) has on aid allocations. To this end, we differentiate equation (1) with respect the $E(Z_{i,t})$:

$$\frac{\partial Y}{\partial E(Z_{i,t})} = \rho_l \mathbf{W}_l \mathbf{Y}_{i,t} - \rho_d \mathbf{W}_d \mathbf{Y}_{i,t} + \beta, \quad (6)$$

where β is the coefficient for the probability of lead donorship. Note that the marginal effect of the probability of lead donorship is conditioned on the parameter estimates ρ_l and ρ_d , as well as aid allocations by other players $\mathbf{Y}_{i,t}$, weighed by the connectivity matrices \mathbf{W}_l and \mathbf{W}_d . When calculating estimated marginal effects, we therefore have to make assumptions about aid allocations \mathbf{Y} . Instead of counterfactual values for \mathbf{Y} , I use the actual data on aid

allocations.

In the case of private good aid, the coefficient estimate is negative but not statistically significant. However, the marginal effect of lead donorship is statistically significant. Moving from no lead donorship ($E(Z_{i,t}) = 0$) to certain lead donorship ($Pr(E(Z_{i,t}) = 1)$), aid allocations by individual donors on average decrease by \$807,000 on an annual basis, with a 95 percent confidence interval of [-\$1,411,000, -\$217,000].²⁸ For individual recipient countries, extreme cases range between a zero reduction of aid and a decrease by \$48.6 million. This provides strong evidence that lead donorship leads to substitution effects in the provision of private good aid and thus limits competition in aid allocations.

For aid with public good characteristics, the average effect of moving from no lead donorship to lead donorship is associated with an average increase of aid allocations by \$1.72 million annually (with a 95 percent confidence interval of [\$0.648 million, \$2.79 million]). For individual cases, the largest estimated effect is an increase by \$138 million, and the smallest is a zero increase.

Our theory suggests that, in a public goods scenario, lead donorship helps to overcome free-riding problems. A corollary is that, *ceteris paribus*, donors should give *less* aid under lead donorship compared to when coordination succeeds. In contrast, we find that lead donorship has a *positive* marginal effect on aid provisions. How can this be squared with our evidence that greater complementarities in aid provision exist in situations without a lead donor? The two findings indicate that the direct positive effect of lead donorship on aid allocations, as captured in the coefficient β , is stronger than the negative strategic effect of lead donorship.

There are at least two possible explanations for this result. First, it is possible that our measure of public good aid is contaminated by aid used for other purposes. If some of the strong lead donors in our sample give aid for idiosyncratic reasons that do not fit the public

²⁸Confidence intervals are based on simulations using the estimated variance-covariance matrix.

goods category, these allocations could outweigh any possible gains from coordination on public good aid.

Second, our theoretical and statistical analysis potentially fails to account for the relationship between how much aid a recipient country needs, and how easy it is for donors to coordinate. If donors find it more difficult to coordinate when facing countries with greater aid needs, and easier if needs are smaller, we would end up with an empirical pattern similar to what we observe. This is because successful coordination would produce relatively small complementarities in aid provision (due to low need), while countries with big aid needs would see coordination failure, lead donorship, and relatively high aid allocations (because of their big needs). A more detailed look at this relationship needs to await future research.

We next turn towards the substantive effects of the other independent variables in the aid allocation equation. Only two variables behave identically for both, the private and public goods models. Recipient countries with higher GDP per capita on average attract more of both aid types. The literature generally reports mixed findings with regard to GDP per capita. In our setup, we control for the predicted probability of lead donorship and strategic interactions, but running the analysis without those controls does not substantively change results for this or the other independent variables. The second variable that behaves similar in both models is the lag of the dependent variable, indicating that both dependent variables have an autoregressive component.

An interesting contrast exists between the effect of recipient country population size on the different types of aid. Aid going towards government agencies decreases with population size, but public good aid increases. While the literature usually identifies a negative relationship between population size and aid, these findings are typically built on the analysis of aggregate data. What could account for the discrepancy? Possibly it is more difficult to pay off leaders for political favors through aid the larger a recipient country is. This could either be the case because larger countries have inherently larger winning coalitions, making pub-

lic goods provision more desirable from the perspective of incumbents (Bueno de Mesquita *et al.* 2003). Or, it could be a function of larger countries having a more decentralized bureaucracy. Arguably, with more autonomous institutions, the political gains from channeling money through them decreases. The discrepancies in the effects of the population variable highlight the relevance of looking at aid allocations from a sectoral perspective.

The variables that capture oil imports and exports of all goods and services have no effect on private good aid, but are statistically significant and positive for public good aid. We included these variables into the analysis to capture donor motivations for gaining private advantage through aid. Our expectation was that these measures would affect private good aid more heavily than public good aid. This is not the case. The finding does not change if we run the analysis without the probability of lead donorship as independent variable and without the SAR setup. Our private goods model of lead donorship fails to find support on this account.

Overall, the empirical analysis produces some successes, and some mixed results. Preference asymmetries and commercial interests appear as good predictors of lead donorship. Big oil producing countries and important trading partners of donors states are more likely to have a lead donor. Lead donorship is also more likely to occur in the spheres of influence of France (Sub-Saharan Africa), the US (Central America), and Japan (Asia), but not in former British colonies, and not as a function of US troops being stationed in a country.

The test of the role of strategic interactions between donors for lead donorship produces mixed results. For private good aid, we are able to identify a strong relationship between lead donorship and substitution effects in aid provision, as predicted by our theory. In addition, we find that lead donorship has a strong overall negative effect on aid allocations. This confirms our hypothesis that collusion serves to reduce competition in aid allocations. However, the statistical analysis fails to uncover evidence of actual competitive behavior in the absence of a lead donor. Our measures for private interests, oil imports and exports

of goods and services, also fail to register as drivers of aid allocations with private good character. We therefore conclude that collusion as driver of lead donorship in the private goods realm receives moderate support in the data.

The evidence in the case of aid with public goods characteristics is similarly mixed. Confirming the central tenets of our theory, we find that donors give aid in a more complementary fashion the less likely a recipient country is to have a lead donor. However, we also find that lead donorship increases aid allocations. This unexpected finding points to the role of recipient country needs in the ability of donors to coordinate. Further research is needed to clarify this relationship. In addition, we find that richer countries and larger countries receive more public good aid, which is in line with existing research. Also, oil imports and exports of goods and services are associated with higher public goods aid.

4 Conclusion

This paper presented an analysis of the understudied phenomenon of lead donorship. It introduces a theory that innovates on several accounts. International aid serves many purposes, some of which have public good properties, and some of which generate private benefits to donors. The theory is one of the first to systematically integrate this distinction into the analysis of aid allocations. It also breaks ground by explicitly tying lead donorship to strategic interactions between donors. While there has been some recognition of the importance of these interactions, its role in shaping aid policies remains understudied.

On the empirical side, this paper contributes to our knowledge by developing and applying a new conceptualization of what constitutes lead donorship. The resulting overview of the five biggest providers of bilateral aid (France, Germany, Japan, UK, and USA) since the 1970s shows that diplomatic, commercial, and developmental goals are an important driver of lead donorship.

Going beyond description, the statistical analysis uses a novel setup to test for strategic interactions in the provision of aid with public and private good characteristics, with and without lead donorship. It finds strong evidence that in the provision of public good aid, lead donorship is associated with a lower degree of coordination between donors than in more symmetric arrangements. This is in line with the theoretical premise that preference asymmetries and a lack of coordination drive lead donorship in the provision of public good aid.

For aid that generates private benefits to donors, the analysis finds that lead donorship leads to increased substitution effects. This provides support for the theoretical claim that in private goods scenarios lead donorship serves to suppress competition between donors. However, the analysis was not able to recover reliable evidence for competitive behavior in the absence of a lead donor.

These findings open up a number of exciting venues for future research. First, we need to come to a more systematic understanding how to measure the different purposes that aid is serving. While the paper introduces a novel distinction of aid with and without public good properties based on sectoral aid allocations, this and related measures should be subjected to systematic evaluation in a variety of settings. The results would greatly benefit the future study of strategic interactions between donors, including those giving rise to lead donorship.

Second, the finding that strategic interactions play an important role in producing lead donorship raises the question which channels, institutional and otherwise, allow donors to coordinate aid provision. To answer this, we need to know more about variation in strategic outcomes. Why is it that donors succeed to coordinate in some cases, but not in others? In the same vein, what role do private benefits play for lead donors who also care about development and other public goods? These and other questions have important implications for how aid is given and ultimately whether aid is an effective foreign policy tool. Lead donorship is just one of many facets of contemporary aid practice that is affected by strategic

interactions between donors. Looking deeper into the role of strategic interactions promises to improve our understanding of foreign aid policy as a whole.

References

- Aldasoro, Iñaki, Peter Nunnenkamp, and Rainer Thiele. 2009. “Less Aid Proliferation and More Donor Coordination? The Wide Gap between Words and Deeds.” *Kiel Institute for the World Economy Working Paper* 1516.
- Alesina, Alberto, and David Dollar. 2000. “Who Gives Foreign Aid To Whom And Why?” *Journal of Economic Growth* 5:33–63.
- Alesina, Alberto, and Beatrice Weder. 2002. “Do Corrupt Governments Receive Less Foreign Aid?” *The American Economic Review* 92:1126–1137.
- Anselin, Luc. 1988. *Spatial Econometrics: Methods and Models*. Studies in Operational Regional Science, Springer.
- Balla, Eliana, and Gina Yannitell Reinhardt. 2008. “Giving and Receiving Foreign Aid: Does Conflict Count?” *World Development* 36:2566–2585. Special Section: Social Movements and the Dynamics of Rural Development in Latin America (pp. 2874-2952).
- Bandyopadhyay, Subhayu, and Howard J. Wall. 2007. “The Determinants of Aid in the Post-Cold War Era.” *Federal Reserve Bank of St. Louis Review* 89:533–547.
- Bermeo, Sarah Blodgett. 2008. “Aid Strategies of Bilateral Donors.” Paper presented at 2008 Annual Meeting of the International Political Economy Society, Philadelphia.
- Brown, Kaysie, and Stewart Patrick. 2007. *Center for Global Development Working Paper* 131.
- Bueno de Mesquita, Bruce, Alastair Smith, Randolph H. Siverson, and James D. Morrow. 2003. *The Logic of Political Survival*. Cambridge, MA: MIT Press.

- Carter, David, and Curtis S. Signorino. 2007. "Back to the Future: Modeling Time Dependence in Binary Data." Peace Science Society 2007 North American Meeting.
- Cumming, Gordon. 2001. *Aid to Africa: French and British Policies from the Cold War to the New Millennium*. Aldershot: Ashgate.
- Department of Defense. 2009. "Personnel & Procurements Statistics Online." <http://siadapp.dmdc.osd.mil/index.html>, accessed 10/2/2009.
- Dreher, Axel, Peter Nunnenkamp, and Rainer Thiele. 2008. "Does US Aid Buy UN General Assembly Votes? A Disaggregated Analysis." *Public Choice* 136:139–164.
- Fearon, James D., and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97:75–90.
- Franzese, Robert J., and Jude C. Hays. 2007a. "Empirical Models of Spatial Interdependence." Working Paper. University of Michigan. Accessed online on 2/2/2010 at https://netfiles.uiuc.edu/jchays/www/FranzeseHays_OxfordHandbook.pdf.
- Franzese, Robert J., and Jude C. Hays. 2007b. "Spatial Econometric Models of Cross-Sectional Interdependence in Political Science Panel and Time-Series-Cross-Section Data." *Political Analysis* 15:140–164.
- Franzese, Robert J., and Jude C. Hays. 2008. "Interdependence in Comparative Politics: Substance, Theory Empirics, Substance." *Comparative Political Studies* 41:742–780.
- Gabas, Jean-Jacques. 2005. "French Development Co-operation Policy." In *Perspectives on European Development Co-operation: Policy and Performance of Individual Donor Countries and the EU*, eds. Paul Hoebink and Olav Stokke. London: Routledge, 242–267.

- Greene, William H. 2003. *Econometric Analysis*. Fifth ed. Upper Saddle River: Prentice Hall.
- Grossman, Gene M., and Elhanan Helpman. 1994. "Protection for Sale." *American Economic Review* 84:833–850.
- Hanson, Stephanie. 2008. "China, Africa, and Oil." *Council on Foreign Relations Backgrounder*. <http://www.cfr.org/publication/9557>, accessed 10/20/2009.
- Lancaster, Carol. 2007. *Foreign Aid: Diplomacy, Development, Domestic Politics*. Chicago: University of Chicago Press.
- Lebovic, James H. 2005. "Donor Positioning: Development Assistance from the U.S., Japan, France, Germany, and Britain." *Political Research Quarterly* :119–126.
- Mascarenhas, Raechelle, and Todd Sandler. 2006. "Do Donors Cooperatively Fund Foreign Aid?" *Review of International Organizations* 1:337–357.
- Neumayer, Eric. 2003. "Do Human Rights Matter in Bilateral Aid Allocation? A Quantitative Analysis of 21 Donor Countries." *Social Science Quarterly* 84:650–666.
- OECD. 2009. *International Development Statistics on CD ROM*. Paris: OECD Publishing.
- Olson, Jr., Mancur, and Richard Zeckhauser. 1966. "An Economic Theory of Alliances." *The Review of Economics and Statistics* 48:266–279.
- Pezzullo, Ralph. 2006. *Plunging into Haiti: Clinton, Aristide, and the Defeat of Diplomacy*. University Press of Mississippi.
- Quinn, John James, and David J. Simon. 2006. "Plus ca change,...: The Allocation of French ODA to Africa during and After the Cold War." *International Interactions* 32:295–318.

- Seldon, Anthony. 2007. *Blair's Britain: 1997 - 2007*. Cambridge: Cambridge University Press.
- Steinwand, Martin C. 2009. "Free-Riding, Recipient Country Properties and The Provision of Foreign Aid." Working Paper. University of Rochester.
- Stone, Randall W. 2006. "Buying Favors: The Political Economy of Bilateral Development Assistance." presented at Annual International Studies Association Convention, San Diego, CA.
- Tuman, John P., Jonathan R. Strand, and Craig F. Emmert. 2009. "The Disbursement Pattern of Japanese Foreign Aid: A Reappraisal." *Journal of East Asian Studies* 9:219–248.
- United Nations. 2009. *United Nations Commodity Trade Statistics Database*. <http://comtrade.un.org/db/default.aspx>. Accessed on 20 July 2009.
- Varian, Hal R. 1992. *Microeconomic Analysis*. 3rd ed. New York: Norton.
- Yergin, Daniel. 1991. *The Prize: The Epic Quest for Oil, Money and Power*. New York: Free Press.
- Younas, Javed. 2008. "Motivation for Bilateral Aid Allocation: Altruism or Trade Benefits." *European Journal of Political Economy* 24:661–674.

Appendix

Table 9: List of CRS Codes, Private Good Aid

Code	Description
11110	Education policy and administrative management
12110	Health policy and administrative management
13010	Population policy and administrative management
14010	Water resources policy and administrative management
15110	Economic and development policy/planning
15140	Government administration
160	Other social infrastructure and services, all sub-codes
21010	Transport policy and administrative management
22010	Communications policy and administrative management
23010	Energy policy and administrative management
24010	Financial policy and administrative management
25010	Business support services and institutions
25020	Privatisation
31110	Agricultural policy and administrative management
31210	Forestry policy and administrative management
31310	Fishing policy and administrative management
32110	Industrial policy and administrative management
322	Mineral resources and mining, all sub-categories
32310	Construction policy and administrative management
33110	Trade policy and administrative management
33181	Tourism policy and administrative management
41010	Environmental policy and administrative management
43030	Urban development and management
43040	Rural development
51010	General budget support
53030	Import support (capital goods)
53040	Import support (commodities)