The Importance of Oil in the Allocation of Foreign Aid*

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This paper investigates the role of oil in aid allocationof the major OECD donors(G7 countries) over the 1980-2010 period.First, we confirm that aid allocated by these countries increases significantlywith oil endowment of recipient countries.Looking more deeply, we also show that their strategic interests in terms of oil security play a role in theirprovision of aid. Finally, we find evidencefor competition for access to oil suppliesamong OECD donors.

Keywords:aid allocation, oil competition, spatial lag model

JEL classification: F35; Q35; C31

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1. Introduction

Foreign aid in direction of developing countries has had, and continues to receive, a considerable amount of attention in the economics literature (see Neumayer, 2003 for an overview). More recently, some observers have argued that a large portion of this foreign aid has been in direction of oil-rich developing countries (Lee, 2012; Arezki and Banerjee, 2014).But, despite some evidence that donor countriesuse aid to improve relationships with oil producing countries, the empirical literature still remainssparse. Indeed, apart from some exceptions (Lee, 2012; Arezki and Banerjee 2014), the strategic role of oil in aid allocation is found to be absent in this abundant literature (for a recent survey, see Bandyopadhyay and Vermann, 2013).Moreover, the existing literature typically examines the effect of oil on aid allocation, relying on theimplicit assumption that it exclusively originates from oil endowment of recipient countries. However, given that energy security has been recently in the forefront of foreign policy concerns, there are substantial grounds for believing that donors also use aid to cover their energy interests. In the light of this, their aid allocation in favor of oil producing countries can be considered as a central part of their foreign energy policy sinceoil is a strategic good for most donor countries, whose economies still heavily rely on oil imports.

The aim of this paper is then to provide new evidence of the effect of oil on aid allocation,by identifying the different incentives associated with oil which best explainthe aid allocation pattern of the major OECD donors (G7 countries). Accordingly, we use the following strategy. We check whetheroil endowment of recipient countries influences foreign aid allocated by donors. We then determine whether donors, when deciding aid allocation,also considertheir national interests by using foreign aid as means to ensure their energy security. In a final step, we investigate whether this energy security motive leads to competition for oil markets among donors, by analyzing their strategic interaction through the estimation of empirical spatial-lag models.We then explicitly investigate for the first time inthe aid literature the strategic role of oil on both aid allocation and competition between donor countries.

Several interesting results emerge from our analysis. First, we confirm that oil endowment of recipient countries impacts positively the aid allocation pattern of the major OECD donors. Second, we show that donors' energy security plays an important role inaid allocation: a higher oil import exposure of donor countries results in greater aidallocation.Third, when we investigate

the potential competition for oil between donors, we evidence that donors account for the aid decisions of other donors with which they compete for oil supply.Indeed, the evidence suggests that recipient countries that increase their share in OECD donor's oil imports are likely to benefit from an increase from all OECD oil-importing donors.Finally, we find that cross-country differences in the magnitude of competition can be explained by the relevance of oil for the domestic economy. In particular, the impact of oil competition seems to matter more for the aid allocated by large European donors that are also more vulnerable to oil supply shocks.

The paper proceeds as follows. Section 2 provides somebackground on the importance of oil in aid allocation. In section 3, we investigate empirically the different channels through which oil may influence aid allocation. In section 4, we examine to what extendthe importance ofoil in aid allocation is driven by strategic interactions between donors. Finally, section 5 reports some robustness exercises, and section 6 concludes.

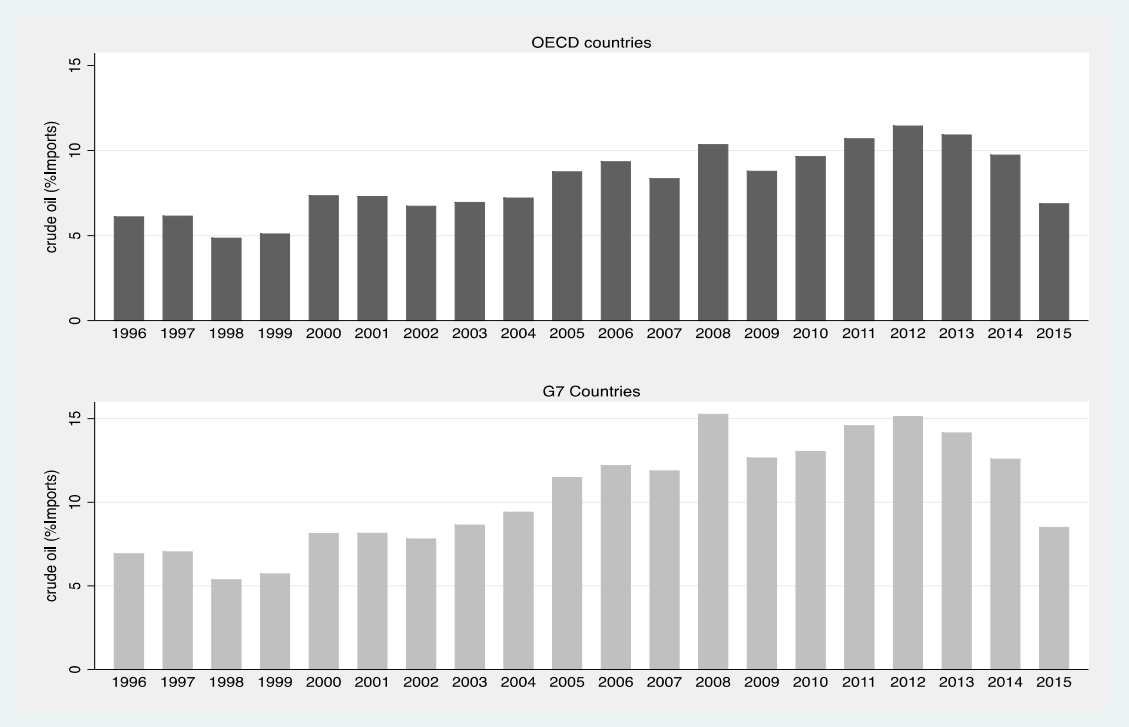
2. Motivations of the paper

Despite tremendous interest in, and speculation about, a link between oil and aid allocation, systematic research on the subject has been slow to materialize. Scholars have highlighted a linkagebetween oil and aid allocation (Arezki and Banerjee, 2014), or conducted studies in which aid allocation is explained in light of the presenceof oil (Lee, 2012; Carbonnier and Voicu, 2014). However, it seems not clear whether the role of oil in aid allocation is more sensitive to donor's interests or to recipient needs as these studiesdo not isolate the complex set of incentives associated with oil.

The close connection between oil and aid derives from the strategic nature of oil which is likely to affect importers and exporters economiessimultaneously, as well as their relationship.On the one hand, developing oil exporters possess a lucrative asset that can be used for great wealth and attractiveness. In that sense, the strategic nature of oil can be associated to opportunities in terms of export promotion and/oreconomic interests related to increased oil revenues. Burnside and Dollar (2000) argue that a country enjoying any positiveshock to growth, as a commodity boom, may receive special favorfrom some donors. On the other hand, oil can also be considered as a key objective of the foreign policies followed by oil importers. Indeed, as oil plays a critical role

in the stability of the global economic system, the national interests of most developed nations are themselves tied to oil.In particular, any prolonged shortage in oil availability can produce a global economic recession, as evidenced by the two episodes of large increases in the price of oil during the 1970's.[1]Even if the effects of fluctuations in the oil price have changed substantially over time, with much lower effects on inflationand activityin developed countries (Blanchard and Galli, 2007), oil still plays a central role in those economies. This holds true in particular for the major OECD donor countries (G7 countries),which are still highly dependent on oil for meeting their energy requirements, as shown byFigure 1.[2]

Figure 1.*Share of oil imports in total imports in OECD and G7 countries, current prices, 1996-2015*



Source: Authors' calculation based on UNComtrade

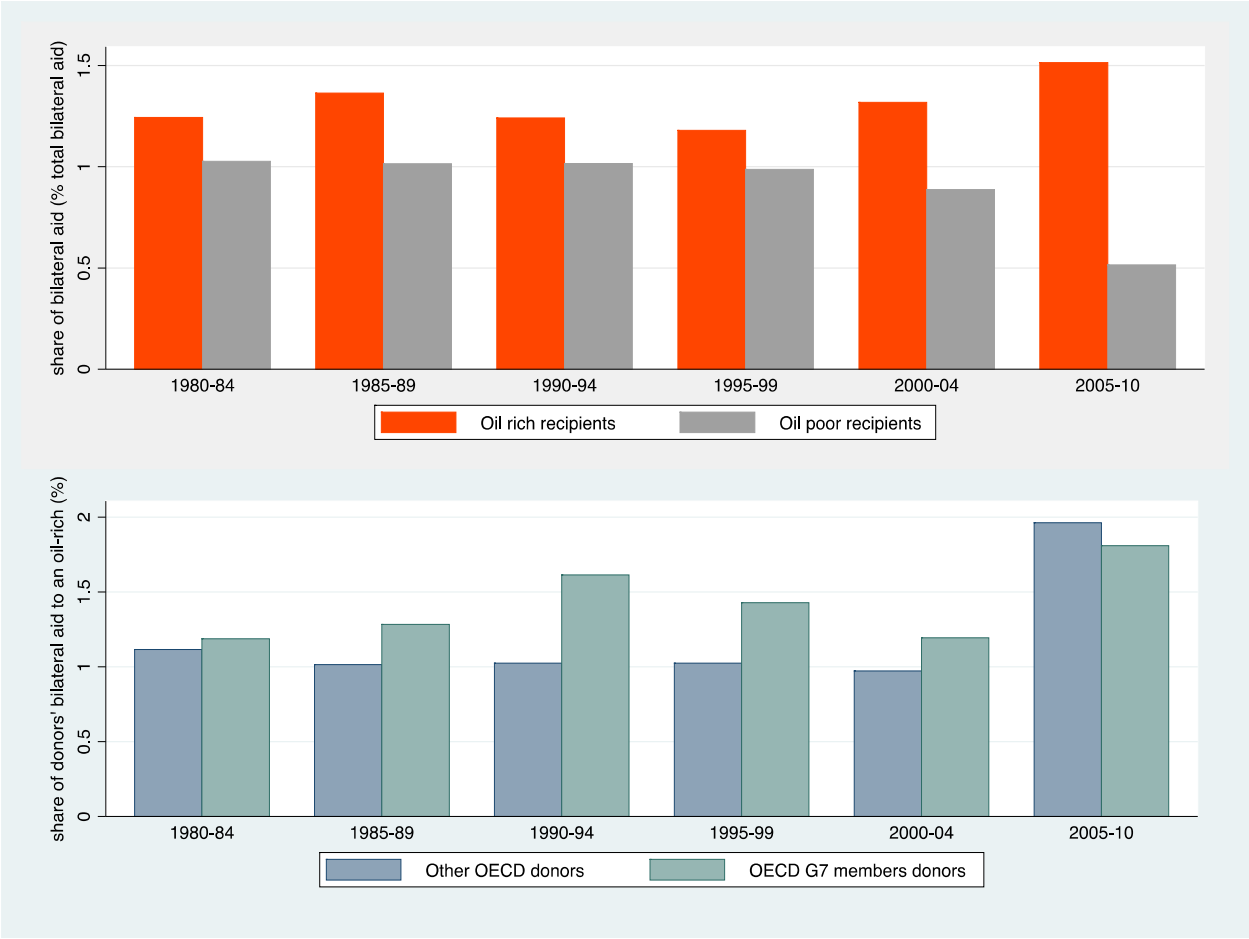
[1]In 1974, following the Arab oil embargo and in 1979, following the Iranian revolution.

[2]Major OECD donors have been recently facing new competitors in the race to secure long-term energy supplies, in particular China. We do not include in our sample new emerging donors, as there is not sufficient data, unlike data coming from the Organization for Economic Cooperation and Development's Development Assistance Committee (OECD DAC) countries.

As the reliance on imported oil exposes economies to disruption in global oil supplies andputs energy security at increased risk,oil importing countries havean interest in ensuring a reliable access to oil from foreign sources.[3]Therefore energy security isalso an important feature of trade and foreign policies vis-a-vis resource abundant regions, especially in those industrializedcountries that are very dependent on external sources for theirenergy procurement.The importance of expanding and ensuring access to energy resources has for instances encouraged the diversification of oil procurement and foreign investments towards oil-rich regions in Central Asia and Africa (see for instance Ikenberry 1986; Li 2005; Vivoda 2009). It has also encouragedmajor donors to increase their aid assistance towards oil-rich countries,as illustrated by Figure 2. Indeed, the upper part of Figure 2 suggests that differences in oil endowment across recipient countries play a significant role in aid allocation from members of the OECD's Development Assistance Committee, while the lower part shows that over the last decades, developed countries, particularly the G7, have given priority to oil-rich countries in their aid allocation.

Figure 2.*The importance of oil in aid allocation*

[3]Developed countries have also been encouraged to invest in energy security through the development of domestic energy resources, such as natural gas and wind power as well as strategic stockpiling (Cohen et al., 2011; Devarajan and Weiner 1989).



Note: Share of oil-rich countries in aid allocation from OECD countries and share of all OECD donors versus seven major donors in aid allocation towards rich-oil countries

Source: Authors' calculation based on OECD CRS data.

It seems then reasonable to think that foreign aid in favor of oil producing countries can be considered as a way to cover security energy interests of donors.Indeed, as foreign aid policy can help to secure several aspects linked to oil supply such as foreign investment for exploration, state ownership of production companies, long-term nature of supply contracts, etc…, donors can be incited to distribute aid allocation in oil rich countries as a policy option for coping with their dependence on external energy sources. Therefore, ignoring those strategic interests could significantlydistort any assessment of theimpact of oil on aid allocation.

3. Oil and Aid allocation: basic premise

3.1. Empirical strategy

Theeffectsof oil on aid allocation areanalysed within theframeworkofa standard model of aid allocation which addsthe oil wealthof recipient countriestoa set ofusual explanatory variables, while conditioning on the past level of aid allocation(Lee, 2012). In a panel data setting, this suggests a specification where aid receipts from donor *i*to recipient country *j* are explained by both recipient countries' features - including their oil endowment - and strategic links between donor and recipient countries:

$$Aid_{ijt} = \alpha_{ij} + \beta Aid_{ijt-1} + \gamma Oil\_R_{jt} + \delta X_{jt} + \zeta Z_{ijt} + \eta_j + u_i + \lambda_t + \varepsilon_{ijt} \quad (1)$$

With subscripts i, j and t indicate the donor country, the recipient country and time period. The dependent variable, Aid_{ijt} , is defined as the recipient country j's share in the total of aid commitments allocated by a donoriin a given year t.Typically, research on aid allocation uses this variable because of its scale neutrality, as it is not affected by proportionalincreases in aid to all recipient countries (Barthelet al., 2014).$X_{jt}$is a k-dimensional vector of variables thatcontrol for recipients' needs and merits.The variable Oil_R_{jt} refers to oil reserves held by recipient countries. Compared toproxies of oil dependence, which are usually used, such as oil exports, proxies of oil wealth - as oil reserves - capture the true oil endowments and are likely to be less endogenous.$Z_{ijt}$is a vector of variables that reflect strategic links between donor and recipient countries.Time-fixed effects, λ_t, country-fixed effects for recipient (u_i) and donor countries (η_j) and time-invariant dyad-specificeffect, α_{ij} , are included in order to control respectively for common shocks, fixed spatial characteristicsand unobserved spatial heterogeneity.Finally, $\varepsilon_{ijt}$is an independent and identically distributed(i.i.d.) random term.

However, Equation (1) doesnotallowthe aid allocation tobedriven by specific oil security interests from donors. To accountforthis oil security channel,weaugment Equation (1) by a set of control variables to account for donors' energy security (Y_{it}) and for instabilities in the oil market(W_t). This resultsinthefollowing core estimatingequationofourempiricalanalysis:

$$Aid_{ijt} = \alpha_{ij} + \beta Aid_{ijt-1} + \gamma Oil\_R_{jt} + \delta X_{jt} + \zeta Z_{ijt} + \theta Y_{it} + \varphi W_t + \eta_j + u_i + \lambda_t + \varepsilon_{ijt} \quad (2)$$

In general there are at least two concerns in estimating regressions(1)and (2). First, these equations are dynamic specifications containing a lag of the dependent variable. In this case,

estimating equations (1) and (2) *via*Ordinary Least Squares (OLS) yields biased and inconsistent results. The "fixed effect" (FE) estimator controls for the unobserved (time-invariant) heterogeneity, but it also yieldsbiased coefficient estimates. Indeed, since the dependent variable is a function of the fixed effect, the lagged dependent variable is correlated with the errorterm (Baltagi, 2008). However, the bias declines with panel length as with higher *T* the correlation between the lagged dependent variable and the regression errors becomes smaller.Another problem is the existence of observations for which thedependent variable is zero, simply because many donors only give aid to a subset of potential recipient countries. Following the work of Acht*et al.* (2015),we use a Pseudo Poisson Maximum Likelihood (PPML) estimatordeveloped by Santos Silva and Tenreyro (2006, 2011). This estimator has the advantage to be consistent in the presence of heteroskedasticity and to provide a way of dealing with zero values of the dependent variable. PPML is a special case of the generalized linear model (GLM) framework, in which the variance is assumed to be proportional to the mean. It is then more accurate to estimate constant-elasticity models using the PPML estimator, instead of applying traditional OLS estimation techniques to log-linearized models.[4]We then estimate our two bilateral aid allocation models using two alternative estimation methods for the sake of robustness: a standard fixed effects model (FE) and Poisson Pseudo-Maximum likelihood (PPML)estimation.[5]

3.2. Data description

We use for aid commitments OfficialDevelopment Assistance (ODA) datataken from theOECD's Creditor Reporting System (CRS) dataset. This dataset provides, among other things, time-series data onthe official statistics on aid flows to developing countries, provided and validated by themembersof the OECD's Development Assistance Committee (DAC).[6]For the purposes of this paper, we consider observations on aid flows from the G7 countries, which are also the major

4 Likelihood-based approaches (ML) are preferred to method-of- moments (GMM) counterparts in terms of finite-sample performance (see Anderson et al., 1982) and ML is more efficient than GMM under normality. Moral-Benito (2013) compares the widely-used panel GMM estimator of Arellano- Bond (1991) with its likelihood-based counterpart and confirms these results in the case of dynamic panel models with predetermined regressors.

[5]Fixed effect estimations are reported in Table B.1 in Appendix B to save space.

[6] Validated CRS data are made public by the OECD DAC Secretariat and are freely available on the OECD website: www.oecd.org/dac/stats /idsonline.

donor countries: Canada, Germany, France, Italy, Japan, the United Kingdom and the United States.

Our other main variable of interest, oil reserves (Oil_R)is drawn from the dataset compiled by Cotet and Tsui (2013).[7] The set of other control variables for recipient-related features, represented by the vector(X_{jt}) in equations (1) and (2), follows the literature on aid allocation. Itencompasses first indicators of beneficiary needs: the GDPper capita, multilateral aid by capita, a human development index,the Human Assets Index (HAI),taken from the database developed by the United Nations Department of Economic and Social Affairs (UN-DESA) and combining indicators of health/nutrition and of education.[8]To take into account recipients' merits, we use the inflation rate (Inf) and the democracy indicator (Democracy) taken from theDemocracy and Development Revisiteddataset compiled by Cheibub, Gandhi andVreeland (2010)as proxies of both good governance and good policy. As numerous empirical studies found that donors tend to be biased toward countries with small populations (Isenman, 1976; Dowling and Hiemenz, 1985; Arvin and Drewes, 2001, Bandyopadhyay and Wall, 2007), we include population size (Pop)to controlfor scale effects.

Aid may also be used to deepen political allianceswith a recipient. Adonor country's foreign assistance policy based on its self-interest willtypically be biased toward recipients who are potentialpolitical allies (Alesina and Dollar, 2000).We catch this effectthrough a dummyvariable (UNSC) forUnited Nations Security Council membership of recipient countries, which is, according to Dreher*et al.* (2009), a credibly exogenous regressor, compared to other geo-political variables as voting patterns in the United Nations General Assembly. We also control for the bilateral trade (Trade)between donor and recipient countries to account for their commercial linkages. Indeed, donors may be interested in giving more aid with a view to boosting their exports to the recipient country. Finally, the role played by oil security concerns in aid allocation is captured by the introduction of two different categoriesof variables: oil interests of donors and

[7]This dataset uses oil exploration and discovery data from the Association for the Study of Peak Oil (ASPO), oil reserves for each country at any particular year are calculated by subtracting cumulative production from cumulative discovery.

[8]The HAI is a composite index based on the following indicators. (i) nutrition (percentage of the population that is undernourished); (ii) health (child mortality ratio); (iii) school enrolment (gross secondary school enrolment ratio); and (iv) literacy (adult literacy ratio);
See http://www.un.org/en/development/desa/policy/cdp/ldc/ldc_criteria.shtml

instabilities in the oil market.Donors' interests for oil are proxied by an indicator of oil dependency, measured by the net oil imports on oil consumption ratio (Oil_M). To estimate the effect of instabilities in the oil market on aid allocation, we include the volatility of the oil price, Oil_P_t, defined as the standard deviation of oil prices. The underlying rationale is that oil price fluctuations can give an indication of the supply in relation to demand on the oil market, reflecting scarcity and thus depletion of oil resources. We also account for political risks in Middle East and North Africa (MENA) countries (Rivalries in MENA)as an exogenous measure of instabilities in the oil market. This measure includes the total number of militarized interstate disputes, as well as the total number of episodes of political violence, engaged in MENA zone at time t. This variable better captures geopolitical risk than the oil price. Like the oil price, this indicator affects global oil markets as a whole, and thus, affects all the importing and exporting countries alike. Political risks in MENA countries are measured on the basis of the major rivalries in the region. In identifying rivalries, we rely on Klein et al. (2006)and Marshall (2016), who consider not only enduring rivalries but alsoshorter-term rivalries.

All data are annual series for the period 1980-2010. The sources and the definitions of all ourvariables are described in greater detail in Table A.1; summary statistics are presented inTable A.2 in Appendix A.

3.3. Results

Table 1provides theresultsof our estimations,using the PPML estimator.The first column reports the results for the most parsimonious specification with the variable of interest, oil endowment, but without the additional controls.Columns (2)shows theresultswhenaddingthe set of control variables, specified in Equation (1) while columns (3) to (6) shows the results when adding the controls for donors' energy security and instabilities in the oil market as well.

In allofthespecificationsof Table 1, columns(1)to(6),thecoefficientofthe variable oil reserves, is positive andstatisticallysignificantat the one and five percent levels,consistentwith an oil effect on the allocation of foreign aid.The coefficient is also significant and positive with the static fixed-effects estimates (Table B.1., Appendix B). This initial finding suggests that higher oil reserves

significantly increase the share of a recipient country in the total of aid commitments allocated by a donor country.

Wenowturntotheother control variables specified in Equation (1).The coefficient of the lagged dependent variable is positive and robustly significant at 1 percent. This resultconfirms the administrative inertia in aid allocation. The coefficient of the GDP/capita variable is - as expected - negative and significant, suggesting that a lower income implies higher aid receipts and that aid allocation responds to economic needs. Our results also show a statistically significant and positive relationship between aid allocation and multilateral aid per capita, indicating that more aid goes to countries receiving higher shares of multilateral aid. As expected, bilateral trade is also positively associated with aid allocation, meaning that donors tend to provide aid to countries with which they trade. The share of aid increases with a larger population, indicating a bias against smaller countries.A higher level of democracy in the recipients results in receiving less aid, as reflected by the negative and significant coefficient on democracy variable. Aid driven largely by strategic considerationscan be biased towards less democraticrecipients asthese latter are perceived by donorsas countriesthat are more likely to provide policy concessions in exchange for aid (Alesina and Weder,2002;Bueno de Mesquita and Smith, 2009). Finally, the recipient's level of inflation and the human development index are not significant at conventional levels.

Table 1.*Oil and aid allocation (1980-2010)*

	(1)	(2)	(3)	(4)	(5)	(6)
Oil_R	0.0507***	0.0270***	0.0270***	0.0270***	0.0288***	0.0245**
	(0.00810)	(0.00941)	(0.00941)	(0.00941)	(0.00961)	(0.0106)
$Rivalries\ in\ MENA$			0.0332***			
			(0.00634)			
Oil_P				0.0298***	0.0282***	0.0425***
				(0.00899)	(0.00909)	(0.0120)
Oil_M					-0.191	1.014***
					(0.205)	(0.229)
Aid_{-1}	10.07***	7.443***	7.443***	7.443***	7.352***	7.429***
	(0.440)	(0.440)	(0.440)	(0.440)	(0.466)	(0.366)
$Multilateral\ aid\ per\ cap$		0.235***	0.235***	0.235***	0.221***	0.182***
		(0.0365)	(0.0365)	(0.0365)	(0.0383)	(0.0441)
$Trade$		0.275***	0.275***	0.275***	0.272***	0.421***
		(0.0350)	(0.0350)	(0.0350)	(0.0357)	(0.0452)
Inf		-3.48e-05	-3.48e-05	-3.48e-05	-0.000130	-0.000167
		(3.43e-05)	(3.43e-05)	(3.43e-05)	(0.000113)	(0.000151)
HAI		0.000151	0.000151	0.000151	0.000814	0.00357
		(0.00264)	(0.00264)	(0.00264)	(0.00277)	(0.00268)
$GDP\ per\ capita$		-0.221***	-0.221***	-0.221***	-0.223***	-0.200***
		(0.0794)	(0.0794)	(0.0794)	(0.0814)	(0.0775)
Pop		0.263***	0.263***	0.263***	0.259***	0.107**
		(0.0425)	(0.0425)	(0.0425)	(0.0426)	(0.0480)
$UNSC$		-0.00711	-0.00711	-0.00711	0.0128	-0.0533
		(0.0510)	(0.0510)	(0.0510)	(0.0571)	(0.0725)
$Democracy$		-0.204***	-0.204***	-0.204***	-0.210***	-0.224***
		(0.0704)	(0.0704)	(0.0704)	(0.0732)	(0.0859)
Constant	-4.717***	-10.88***	-11.92***	-11.18***	-10.94***	-11.39***
	(0.0799)	(0.954)	(0.974)	(0.957)	(0.985)	(1.035)
Observations	12,663	8,792	8,792	8,792	8,092	5,713
R-squared	0.180	0.351	0.351	0.351	0.335	0.366
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Dyadic FE	YES	YES	YES	YES	YES	YES
						UK & CAN excluded

*Note: this table presents the Pseudo Poisson Maximum Likelihood estimates of the gravity model of bilateral aid allocation. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. ***, **, and * indicate 1%, 5%, and 10% significance levels.*

In columns 3-6 we turn to the question of whether oil security concerns matter for the amount of bilateral aid commitments. Among our variables of interest,the two indicators of instabilities in the oil market are significant at the one and five percent levels. This result indicates that larger aid allocation is driven not only by oil endowment of recipient countries but also when the volatility of the oil price increases. The same holds forconflicts and political instability in the MENA region which also act as another driving force of aid allocation (column 3).Donors may allocate more aid to countries in other regions to diversify their sources of supply. Furthermore, those who feel their interests threatened by this instability may also direct their aid towards this region. Whatever the case, the main motivation is to strengthen energy security. The estimation results also confirm that effects of donors' featureson aid allocation depend on the role of oil in the economies.If oil dependence rises, donors increase their aid allocation —excluding donors that are net oil-exporters as the UK and Canada. Indeed, oil dependence of donors, measured by the ratio of net oil imports to oil consumption,becomes significant when excluding net oil exporters. Then energy security concerns seem to matter in aid allocation especiallyin donor countries that are more oil dependent.Those results bring us to examine another dimension of donors' behavior.Since foreign aid seems to be considered as a mean to ensure energy security, donors may havecompeting interests in recipient countries, from which theyimport oil. Therefore, one interesting issue is to analyze whether oil can be regarded as a potential source of competition between donors.

4. Oil competition among donor countries

Several arguments with respect to oil competition among donors in their aid allocation can be advanced. First, if foreign aid is used to pursue oil security interests, we can expect that a donor also has to observe aid allocation decisions by other donors and take changes in their aid giving into account when allocating its own aid. Second, aid provided by other donors to oil-rich countries may serve as a signal for a good investment in this sector and reduce the uncertainty on

the effectiveness of aid projects. Finally, as the production in non-OPEC regions (such as the North Sea) is declining, all theconsuming countries are progressively becoming dependenton a few countries for oil imports. The growingdependence on the same sources can increasingly stimulate intense geopolitical competition among the major donor countries to strive and secure their potential imports (Gupta, 2008). For these various reasons, donors may then spatially depend on each other in their aid provision,especially when they allocate their aid in order to satisfy their strategic and economic interests in terms of energy security.

In this section, we examineempirically the potential competition for oil between donorswith spatial lag models. Spatial lag techniques have been recently used as a tool to analyze strategic dependency patterns in aid allocation decisions (Neumayer and Plumper, 2010a; Barthelet al., 2014; Steinwand, 2015). This method capturesthe reciprocal influences that donors exert on one another, in their aid allocation decision, by including as endogenous right-hand side component a contagion effect. Specifically this effect measures the extent to whichthe aid flow between a donor *i* and a recipient *j* depends on the aid flows of other donors *k* with the same recipient country *j*.[9] With this approach, it is therefore possible to quantify the existence, the nature and the strength of these strategic interactions between donors.

4.1. Panel data estimates

We perform the analysis by estimatinga parsimonious spatial lag model(Equation 3) and a spatial lag augmented model(Equation 4) which in addition allows for dependence on the set of control variables previously used and specified in Equation (1):

$$Aid_{ijt} = \alpha_{ij} + \rho \sum_{k \neq i} W_{ikt} Aid_{kjt} + \eta_j + u_i + \lambda_t + \epsilon_{ijt} \quad (3)$$

$$Aid_{ijt} = \alpha_{ij} + \rho \sum_{k \neq i} W_{ikt} Aid_{kjt} + \beta Aid_{ijt-1} + \gamma \text{Oil\_R}_{jt} + \delta X_{jt} + \zeta \text{Trade}_{ijt} + \eta_j + u_i + \lambda_t + \varepsilon_{ijt} \quad (4)$$

[9]For other forms of spatial contagion, such as aggregate source or aggregate target contagion, and specific target contagion, see Neumayer and Plümper (2010b).

where W_{ik} ,aN by N by T spatial weighsmatrix, that capturesthe connectivity between dyadsthat form the spatial dependence, i.e. how much donors k influence i's aid decision whengiving aid to j. $\rho$is the spatialautoregressive coefficient that measures mutual influence between donors in aid provision.If there isoil supply competition in aid provision,then ρ is expected to be positive:donors will increase their own allocationsin reaction to increases by others. Oil_R_{jt}, X_{jt} and Trade_{ijt} arethe vectors of variables previously used,which respectively control for recipients'oil endowment, recipients' needs and meritsas well as bilateral commercial trade.η_j andu_i are country-fixed effects, α_{ij}, time-invariant dyad-specificeffectandλ_t, time-fixed effects.ε_{ijt} is an independently and identically distributed error term.

A crucial decision when specifying spatial effects concerns the choice of weights in the matrix W_{ik} (Neumayer and Plumper, 2010b). Our intuitionis thataid decision making among donor countries that compete for the same sources of oil procurement are interdependent. In order to capture this oil competition in aid provision,we create spatial weights that capture the degree to which donors compete in the same recipient country,according their share of oil imports in recipient's total oil exports. In other words, we assume that the influence of donor $k$over donor i regarding aid to recipient j depends onthe share of the donor $k$in the oil exports of recipient j on the one hand and the share of donor $i$in the oil exports of recipient j on the other hand:

$$W_{ikt} = \frac{oilimports_{ijt}}{oilexports_{jt}} \times \frac{oilimports_{kjt}}{oilexports_{jt}} \quad (5)$$

Therefore the weights compare the oil trade flows between donors andthe recipient country:the more important recipient j is for oil imports from both donor i and donor k, the stronger donor i will be influenced by donor k, in its allocation to the recipient j.

As countries influence each other's aid policies reciprocally, the spatially lagged aid variable, $\rho \sum_{k \neq i} W_{ikt} Aid_{kjt}$,, in Equations (3) and (4) is likely to be endogenous. Then estimating the spatial lag model by OLS (spatial OLS, S-OLS) will lead to biased results. Barthel*et al.* (2014) suggest that ignoring this endogeneity does not produce strongly biased results as long as the degree of interdependence, ρ, is smalland exogenous factors are well-specified. Arguing that this bias

should be less pronounced in aid shares than in aid levels, they lag by one year the spatial lag to further mitigate thisendogeneity problem[10] and estimate their empirical model byspatial OLS.An alternative solution suggested by Anselin (2001) and Franzese and Hays (2007) is to estimate the spatial lag model byMaximum Likelihood (spatial Maximum Likelihood, S-ML). While S-ML is computationally intense, especially whenboth cross-section and timedimensionsincrease, it produces parameter estimates consistent and asymptotically efficient (Ord, 1975).

Table 2 displays the results derived from the estimation of the two spatiallag models,using S-OLS and S-ML estimators.

Table 2.*Donors' competition for oil* (1980-2010)

Model	Spatial lag model	Spatial lagaugmented model	Spatial lag model	Spatial lagaugmented model
	S-ML	S-ML	S-OLS	S-OLS
$\boldsymbol{W}$: *oil competition*	6.322***	2.255*	0.116***	0.0593**
	(1.377)	(1.250)	(0.0301)	(0.0234)
Oil_R		0.125***		0.110***
		(0.0403)		(0.0375)
Aid_{-1}		5.553***		0.333***
		(0.605)		(0.0754)
Multilateral aid per capita		0.133		0.243*
		(0.119)		(0.138)
$Trade$		0.180*		0.0151
		(0.0924)		(0.191)
Inf		-7.63e-05		-8.73e-05
		(0.000145)		(7.87e-05)
HAI		-0.0185**		0.0120
		(0.00765)		(0.0274)
GDP per capita		-0.596**		-1.043
		(0.299)		(0.765)
Pop		-0.0164		-1.541
		(0.155)		(1.745)
$UNSC$		0.206*		-0.0404
		(0.123)		(0.166)
$Democracy$		-0.0632		0.665***

10Franzese and Hays (2007) suggest that the omitted-variable biases of the current default practice of nonspatial OLS generally are large, whereas the simultaneity biases of S-OLS are typically smaller, especially as the strength of interdependence remains quite modest, and when domestic and exogenousexternal factors are well-specified as well as powerful explanatory variables.

		(0.213)		(0.161)
Constant	-2.697***	-2.932	-4.025***	29.94
	(0.392)	(4.302)	(0.516)	(34.87)
Observations	1,097	668	1,068	627
R-squared	0.085	0.450	0.080	0.321
Number of dyads	137	91	135	92
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Dyadic FE	YES	YES	YES	YES

*Notes: This table presents estimates of the two spatial lag model using OLS and maximum likelihood estimators The dependent variable is donor aid_share. W is the spatial component, which captures donors' competition for oil. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. ***, **, and * indicate 1%, 5%, and 10% significance levels. UNSC: United Nations Security Council*

Looking at the estimation results, we find that the spatial coefficient is positive and statisticallysignificant for both models, corroborating our intuition: if other donors provide aid to a specific recipient countryfrom which they import oil, then this makes more likely that an oil-importing donor will also provide aid to this specific recipient country. Results fromOLS estimations indicate a lowlevel of oil competition between donors, but as aforementioned these results may be subject to bias. Indeed, the S-LM estimatorleads to a higher spatialcoefficient, revealing a downward bias in OLS estimations and thepresence of a rather strong oil competition between donors. Specifically, countries that increase their share in donor's oil importsby 10% are likely to benefit from an increase by 2.3% in aid from all oil-importingdonors.Regarding the other control variables, the coefficients associated to recipient's oil endowment and needs are statically significant and have the expected sign, suggesting that bilateral aid is still positively relatedto oil endowment and needs of recipient countries. The coefficient on the dummyvariable (UNSC) forUnited Nations Security Council membership of recipient countries becomes significant while we do not find any more a robust average effect of the variables democracy and multilateral aid by capita.

4.2. Cross-country differences

However these results relate to aggregate bilateral aid. It isthen not clear whether donorsall behave similarly. In particular, additionally to differences resulting from politicaland commercial

situations, individual donors also differ with respect to their energy situation. Table 3 shows some key aspects of energy securityin the G7 economies as well as the OECD average value.The first aspect measures the exposure of the economies to supplies of oil.The second aspect relates to the magnitude of energy costs tonational economies. Finally, the third aspect measures energy use in relation to populationand economic output. All figures are obtained from the U.S. Chamber of Commerce's Institute (Institute for 21st Century Energy,2016)and are calculated over the period 1980–2010.

Oil exposure risks are clearly very differentacross countries. The US, Japan and the threelargest European economies (France, Germany and Italy) rely on imports for muchof their energy supply.Import risks are thereforea big factor influencing energy security riskscores of those countries, compared tothe UK and Canadawhich are large energy producers. Oil imports risks are considerably higher in theEuropean countries and Japan compared to the US. The latter country also has a domesticoil producing sector that cannot be ignored. Overall, Canada and the US are the most oilintensiveeconomies, which is also reflected in a higher energy consumption per capita.

Table 3.*Indicators of energy security risk, G7 countries and OECD average, 1980-2010*

	Oil Import Exposure[a]	**Fossil Fuel Import Expenditure per GDP[b]**	**Petroleum Intensity[c]**
Canada	3	4	948
France	1253	716	494
Germany	1282	751	518
Italy	1239	796	535
Japan	1300	874	595
UK	14	58	463
USA	572	575	854
OECD	799	640	708

Source: Authors' calculation over the period 1980-2010 based on U.S. Chamber of Commerce's Institute data

Notes: a. Net oil imports as a percentageof total national oil supply; b. Net fossil fuel import costs as a share of GDP; c: Million Btu of petroleum consumed per$1,000 USD of real GDP.

As energy situations differ across donors, the weight given to oil interests as well as competitive incentives for oil markets in aid allocation decisions are likely to be different too.

Table 4 reports results fromthe spatial lag augmented model estimated separately for each G7 country.The regression results largely substantiate the findings for aggregate bilateral aid. Indeed, we find evidence for oil-competition-driven spatial dependence in the allocationof aid for most countries, except Japan and the United Kingdom. For countries for which estimatesof the coefficient of the spatial dependence are significant, the range of variation of estimates of the parameter varies from about 6.62 for Canada to 49.1 for Italy and seems consistent with the range of variation in terms of energy security riskscores. In particular, European countries which are large consumer of oil have a high dependence on oil imports and seem to react more to oil competition. However, this finding does not hold forJapan who seems to pursue rather a needs-basedaid allocation strategy. Indeed, for this latter donor, the spatial lag coefficient is not significant, while the (negative)coefficients on GDP per capita and on the human asset index prove to be significant. Another interesting finding is that other individual donor countries also seem to care about needs in recipient countries, except the United States and United Kingdom for which trade concerns appear to be stronger. Finally, there is still evidencein Table 4 that oil endowment increases the probability for recipient countries to receive larger aid allocation, while the (positive)coefficient on oil reserves proves to be insignificantat conventional levels with regard to donors that are producers of oil like the United Kingdom and the United States.

Table 4.*Importance of Energy Security in Foreign aid policy, 1980-2010*

	Canada	France	Germany	Italy	Japan	UK	USA
$\boldsymbol{W}$: *oil competition*	6.62***	10.29***	28.24***	49.1***	-9.782	1.908	11.39***
	(1.174)	(3.633)	(3.017)	(10.4)	(7.457)	(9.498)	(2.480)
Oil_R	0.268***	0.230**	0.268**	0.662***	1.203***	0.396	0.0463
	(0.0758)	(0.113)	(0.111)	(0.171)	(0.332)	(0.559)	(0.0339)
Aid_{-1}	-3.302	6.300**	5.042***	5.582***	2.300	-2.259	7.374***
	(2.999)	(2.573)	(1.865)	(1.658)	(2.163)	(5.146)	(1.532)
Multilateral aid pe	0.640***	0.607***	0.569*	0.617***	0.412	0.833	0.815***
	(0.206)	(0.169)	(0.328)	(0.184)	(0.295)	(0.745)	(0.143)
$Trade$	0.143	1.013***	-0.751***	1.541**	0.791	0.936***	0.420*
	(0.193)	(0.391)	(0.277)	(0.627)	(0.525)	(0.282)	(0.215)
Inf	0.000499***	-0.000446**	-6.25e-05	-0.000178	-0.000127	-0.0222	-0.000253**
	(0.000166)	(0.000226)	(0.000185)	(0.000228)	(0.000194)	(0.0350)	(0.000110)
HAI	-0.0343*	-0.0250**	-0.0631***	0.0162	-0.0706***	0.00161	-0.0200*
	(0.0182)	(0.0113)	(0.0173)	(0.0188)	(0.0124)	(0.0395)	(0.0103)
GDP per capita	0.265	-2.134***	-0.895*	-3.145***	-0.767**	-1.910	-0.453
	(0.621)	(0.512)	(0.543)	(0.993)	(0.384)	(2.606)	(0.443)
Pop	0.807**	-0.872***	0.708	-2.042**	-1.204	-0.193	0.356*
	(0.365)	(0.231)	(0.436)	(0.821)	(0.861)	(0.557)	(0.215)
$UNSC$	-0.593	-0.217	0.823	0.111	0.0568	-0.755	-0.112
	(0.429)	(0.326)	(0.608)	(0.528)	(0.278)	(0.809)	(0.216)
$Democracy$	0.527	-0.275	-1.661**	-0.941*	-0.0170	0.875	-0.452
	(0.342)	(0.411)	(0.667)	(0.543)	(0.236)	(0.737)	(0.352)
Constant	-22.99**	9.117	1.243	29.40**	-4.633	-0.603	-12.87**
	(11.65)	(6.391)	(7.172)	(12.25)	(7.364)	(26.40)	(5.948)
Observations	134	204	185	161	100	108	218
R-squared	0.50	0.647	0.80	0.79	0.98	0.37	0.73

*Notes: This table presents the coefficients estimates of W, the spatial component that captures donor's competition for oil in our individual spatial lag model using maximum likelihood estimators The dependent variable is donor aid_share. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. ***, **, and * indicate 1%, 5%, and 10% significance levels.*

5. Robustness check

Our previous results are based on information collected through the Creditor Reporting System (CRS). The CRS is maintained by the OECD's Development Assistance Committee (DAC), which compiles annual statistics on aid commitments from its 22 member governments based on declarations from donors. In this section, we conduct additional tests considering aid data from another dataset of foreign assistance, AidData. This dataset aims to augment the CRS database with more donors, more projects, and more dollars by tracking and counting unreported donors' aid activities (Tierney *et al.*, 2011). Thus, the information provided by AidData would coversome other dimensions of donors' strategic behaviors that may not be captured by the CRS.

As can be seen in tables 5, 6 and 7, using data from AidData instead of data from OECD-DAC's Creditor Reporting System (CRS) donor systems supports the results of our benchmark specifications.Oil endowment still appears to be animportant determinant of aid allocation,even controlling for a spatial dependence between donors, although in this case, the effect is statistically significant only for the spatial lag-model estimated by Maximum Likelihood (S-ML). The estimated coefficient on oil dependence is positive and significant at the 1% level, when excluding the oil-exporting donors, confirming that donorswhichrely most heavily on oil provide, in average, moreaid.Our results also confirm that aid provision increases with instability in the oil market, including political instability in major oil exporters, especially those in the Middle East(Table 5).What the results also indicateis still a clear pattern of oil competition in the aid allocated by OECD donors. The spatial coefficient remains positive and statistically significant for both the parsimonious spatial lag modeland the spatial lag augmented model (Table 6).Turning finally to country-by-country results (Table 7) the results also remain unchanged. Except for Japan and the United Kingdom, all individual donors seem to compete foraid allocation to the same the recipients from which they import oil.

Table 5.*Oil and aid allocation (1980-2010), AidData database*[11]

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Oil_R	0.0649***	0.0264**	0.0264**	0.0264**	0.0289**	0.0251*
	(0.00957)	(0.0110)	(0.0110)	(0.0110)	(0.0114)	(0.0136)
$Rivalries\ in\ MENA$			0.0355***			
			(0.00570)			
Oil_P				0.0571***	0.0584***	0.0707***
				(0.0134)	(0.0144)	(0.0179)
Oil_M					-0.115	1.122***
					(0.249)	(0.393)
Aid_{-1}	8.254***	5.450***	5.450***	5.450***	5.609***	5.249***
	(0.759)	(0.613)	(0.613)	(0.613)	(0.644)	(0.694)
$Multilateral\ aid\ per$		0.222***	0.222***	0.222***	0.214***	0.186***
		(0.0428)	(0.0428)	(0.0428)	(0.0456)	(0.0581)
$Trade$		0.333***	0.333***	0.333***	0.333***	0.503***
		(0.0396)	(0.0396)	(0.0396)	(0.0413)	(0.0508)
Inf		-0.000111**	-0.000111**	-0.000111**	-0.000139	-0.000102
		(4.42e-05)	(4.42e-05)	(4.42e-05)	(8.88e-05)	(8.54e-05)
HAI		-0.000921	-0.000921	-0.000921	-0.000832	0.000844
		(0.00303)	(0.00303)	(0.00303)	(0.00322)	(0.00347)
$GDP\ per\ capita$		-0.157*	-0.157*	-0.157*	-0.178*	-0.186**
		(0.0907)	(0.0907)	(0.0907)	(0.0931)	(0.0860)
Pop		0.290***	0.290***	0.290***	0.278***	0.131**
		(0.0469)	(0.0469)	(0.0469)	(0.0514)	(0.0560)
$UNSC$		-0.0610	-0.0610	-0.0610	-0.0185	-0.0672
		(0.0680)	(0.0680)	(0.0680)	(0.0706)	(0.0927)
$Democracy$		-0.305***	-0.305***	-0.305***	-0.309***	-0.382***
		(0.0826)	(0.0826)	(0.0826)	(0.0898)	(0.115)
Constant	-4.416***	-12.37***	-13.29***	-12.98***	-12.59***	-13.18***
	(0.147)	(1.193)	(1.173)	(1.149)	(1.240)	(1.258)
Observations	10,052	7,515	7,515	7,515	6,996	5,036
R-squared	0.056	0.259	0.259	0.259	0.234	0.242
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Dyadic FE	YES	YES	YES	YES	YES	YES
						UK & CAN excluded

Notes: This table presents the Pseudo Poisson Maximum Likelihood estimates of the gravity model of bilateral aid allocation. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. a, b, and c indicate 1%, 5%, and 10% significance levels. Oil_M: Net oil import/total petroleum consumption; UNSC: United Nations Security Council; Dependent variable: aid_share

[11]Fixed effect estimations are reported in Table B.2 in Appendix B to save space.

Table 6.*Donors' competition for oil (1980-2010), AidData database*

Model	Spatial lag model	Spatial lagaugmented model	Spatial lag model	Spatial lagaugmented model
	S-ML	S-ML	S-OLS	S-OLS
$\boldsymbol{W}$: *oil competition*	5.329***	2.994**	0.102***	0.0551*
	(1.346)	(1.479)	(0.0317)	(0.0309)
Oil_R		0.125**		0.00596
		(0.0521)		(0.0772)
Aid_{-1}		4.438***		0.283***
		(0.612)		(0.0626)
Multilateral aid per c		0.124		0.318**
		(0.154)		(0.144)
$Trade$		0.353***		-0.152
		(0.114)		(0.185)
Inf		-4.44e-05		-1.54e-05
		(0.000147)		(0.000134)
HAI		-0.0189**		0.0453
		(0.00814)		(0.0369)
GDP per capita		-0.687**		-0.575
		(0.309)		(0.792)
Pop		-0.104		-0.0310
		(0.181)		(1.645)
$UNSC$		0.00112		0.0389
		(0.125)		(0.187)
Democracy		-0.276		0.731***
		(0.253)		(0.232)
Constant	-2.920***	-3.164	-4.792***	0.899
	(0.423)	(4.945)	(0.387)	(33.46)
Observations	1,105	672	1,075	643
R-squared	0.081	0.334	0.092	0.272
Number of dyads	137	94	135	94
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Dyadic FE	YES	YES	YES	YES

*This table presents estimates of the two spatial lag model using OLS and maximum likelihood estimators The dependent variable is ln(aid_share). W is the spatial component that captures donor's competition for oil. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. ***, **, and * indicate 1%, 5%, and 10% significance levels. UNSC: United Nations Security Council*

Table 7.*Importance of Energy Security in Foreign aid policy, AidData database*

VARIABLES	Canada	France	Germany	Italy	Japan	UK	USA
$\boldsymbol{W}$: *oil competition*	9.766***	10.20***	40.24***	55.9***	1.608	4.550	9.617***
	(2.308)	(3.192)	(7.222)	(12.2)	(17.87)	(4.722)	(2.907)
Oil_R	0.298**	0.164	0.131	1.091***	1.383***	0.0382	0.0244
	(0.122)	(0.105)	(0.185)	(0.197)	(0.435)	(0.0853)	(0.0461)
Aid_{-1}	-5.275	7.372***	2.615	-0.390	-0.206	-5.118	10.60***
	(6.852)	(2.648)	(2.875)	(0.696)	(1.809)	(3.762)	(2.037)
Multilateral aid per	0.678**	0.404**	-0.0651	0.828***	0.379	0.903*	0.935***
	(0.271)	(0.189)	(0.321)	(0.177)	(0.427)	(0.505)	(0.129)
$Trade$	0.0973	1.236***	-0.141	1.528***	0.974	1.337***	0.263
	(0.196)	(0.397)	(0.246)	(0.529)	(0.757)	(0.446)	(0.208)
Inf	0.000525*	0.000163	-0.000172	-0.000495*	0.000139	-0.0723***	-0.000230*
	(0.000319)	(0.000137)	(0.000305)	(0.000283)	(0.000391)	(0.0244)	(0.000131)
HAI	-0.0492	-0.0191*	-0.0446**	-0.00261	-0.0681***	0.0241	-0.0258**
	(0.0358)	(0.00989)	(0.0174)	(0.0120)	(0.0245)	(0.0277)	(0.0115)
GDP per capita	0.590	-1.708***	-1.198**	-3.679***	-0.733	-3.061	-0.226
	(1.030)	(0.438)	(0.508)	(0.964)	(0.589)	(2.313)	(0.625)
Pop	0.920	-0.881***	-0.115	-2.236***	-0.890	-0.432	0.692***
	(0.575)	(0.257)	(0.441)	(0.649)	(1.087)	(0.534)	(0.240)
$UNSC$	-1.506***	0.0289	0.921	-0.198	-0.329	-1.006**	-0.547**
	(0.542)	(0.347)	(0.688)	(0.626)	(0.497)	(0.508)	(0.261)
$Democracy$	0.953*	-0.509	-2.204***	-0.900**	-0.725*	1.976**	-0.264
	(0.514)	(0.349)	(0.504)	(0.430)	(0.421)	(0.906)	(0.358)
Constant	-25.41	4.329	10.44	37.42***	-17.05**	9.013	-18.11**
	(18.04)	(5.823)	(8.388)	(10.01)	(7.800)	(22.45)	(8.244)
Observations	135	204	187	162	100	109	220
R-squared	0.55	0.61	0.70	0.69	0.85	0.45	0.68

*Notes: This table presents the coefficients estimates of W, the spatial component that captures donor's competition for oil in our individual spatial lag model using maximum likelihood estimators The dependent variable is donor aid_share. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. ***, **, and **

indicate 1%, 5%, and 10% significance levels

6. Conclusion

In this paper we investigated the role played by oilin the aid policy of the seven major OECD donors. Our empirical analysis covers 82recipient countries over the 1980-2010 period. Several important insights emerge from this analysis. Our resultsshow that oil endowment of recipient countries increases the probability to receive larger aid commitments of OECD donors, after controlling for other important determinants of aid. Our second contribution relates to the importance of energy security motives for the aid allocation. Major OECD donors with high oilsupply risk commit more bilateral aid. We also find that aid provision increases with instability in the oil market, including political instability in major oil exporters, especially those in the Middle East. We attribute those findings to the importance of foreign aid as a way to ensure the security of oil supply.Finally, we demonstrated the existence of competition for oil among donors, by estimating the degree to which donors compete in the same recipient country, according their share of oil imports in recipient's total oil exports. By using the cross-country dimension, we find that the role and share of oil in the economies of donors' countries is important for understanding aid allocation driven by oil competition, the magnitude of this effect being more important for donors that are more exposed to oilsecurity risks. These keyresults are robust to several checks, including additional tests run with other aid database and with others estimators,

Our paperthen contributes to the literature on the role of self-interest of thedonors, by addinga security energy motive to the usualgeopolitical or commercial motives. The paper also makes a significant contribution to the literature by linking energy security policy in donor countries with the formation of their foreign aid policies.We evidence that, among the different energy policiesimplemented by industrialized countries to address energy security concerns, aid allocation can be considered as a way to expand and ensure access to energy resources.Furthermore, as aid is at least partly given for these strategic reasons, there is some evidence of competition acrossdonors that use their aid provision to secure national energy interests.

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APPENDIX A

Data Source and Description

Our samples of countriesincluded in our analysis are as follows:

1. Donor countries: Canada, Germany, France, Italy, Japan, the United Kingdom and the United States.

2. Recipient countries: Afghanistan, Angola, Bangladesh,Belize, Benin,Bhutan,Bolivia, ,Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Rep., Chad, Comoros, Congo Rep., Côte d'Ivoire, Djibouti, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Indonesia, Irak, Kenya, Kiribati, Korea, Dem. Rep., Kosovo, Laos, Lesotho, Liberia, Madagascar, Malawi, Mali, Marshall Islands, Mauritania, Moldova, Mongolia, Morocco, Mozambique, Myanmar (Burma), Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Rwanda, Samoa, Sao Tome & Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sri Lanka, Sudan, Swaziland, Syria, Tanzania, Togo, Tonga, Tuvalu, Uganda, Ukraine, Vanuatu, Vietnam, Yemen, Zambia, Zimbabwe.

Table A.1. Data Description

Variable	Definition	Source
Aid_{ijt}	Bilateral ODA commitments from donor i to recipient j in year t in constant 2010 US$.	OECD-CRS
Project Aid	Project level aid commitments from donor i to recipient j in year t in constant 2010 US$	AidData
Multilateral aid	Multilateral aid received by recipient j in year t in constant 2010 US$.	OECD-CRS
HAI	100-Human asset index	United Nations, Development Policy and Analysis Division
Democracy	Dummy variable coded 1 if the regime qualifies as democratic following the definition of measured from Cheibub, Gandhi, & Vreeland (2010) published in Public Choice.	Cheibub et al. 2010
$GDP\ per\ capita$	Gross Domestic Product per capita, in constant 2005 US$	World Bank, World Development Indicators
Pop	Recipients' total population	World Bank, World Development Indicators
trade	Value of bilateral trade between a donor and a recipient country	WITS
Oil_R	Recipients' Oil reserves (in thousands million barrels)	Cotet and Tsui (2013)
Oil_M	Donors net oil imports, expressed relative to oil consumption	International Energy Agency
Oil_P	Oil price volatility	International Energy Agency
Rivalries MENA	Number of rivalries in MENA. Based on Major Episodes of Political Violence (MEPV) database & Klein, Goertz& Diehl (2006) International rivalries dataset	Author's calculation
MEPV	Major Episodes of Political Violence, coded on a scale of one to ten according to an assessment of the full impact of their violence on the societies that directly experience their effect	Monty G. Marshall, Center for Systemic Peace (2016)
UNSC	Dummy variable coded 1 if a country is temporarily serving on the United Nations Security Council, and 0 otherwise.	United Nations

Table A.2. Summary statistics

VARIABLES	Obs.	mean	sd	min	max
Year	17,794	1995	8.945	1980	2010
Aid share (allocated by donor)	15,459	0.0112	0.0281	5.83e-07	0.561
Oil production (metrics tons)	16,023	5.924e+06	1.876e+07	0	1.390e+08
Oil reserves (barrels)	15,400	216,238	2.865e+06	0	5.750e+07
Import crude oil (k barrels/d)	13,940	2,896	2,758	354.9	11,564
UNSC	17,010	0.0424	0.201	0	1
Multilateral aid per capita (log)	16,261	1.797	1.339	-2.394	7.170
Human Asset Index	16,100	50.25	22.79	1.098	95.77
GDP per capita (cst 2005 usd)	15,575	978.9	1,055	50.04	14,901
Inflation_cpi	13,524	29.05	314.3	-17.64	11,750
Population	16,261	3.227e+07	1.114e+08	144,416	1.225e+09
Bilateral trade (log)	14,715	10.07	2.418	0.465	17.01
Rivalries in mena	17,794	16.65	11.96	0	32
Net oil imports ratio on consumption	13,940	0.684	0.215	0.234	1.129
Democracy	16,100	0.322	0.467	0	1

APPENDIX B

Table B.1. ***Oil and aid allocation (1980-2010), Fixed Effect estimator***

VARIABLES	(1)	(2)	(3)	(4)	(5)
Oil_R	0.0207***	0.0208***	0.0208***	0.0208***	0.0216***
	(0.00595)	(0.00625)	(0.00625)	(0.00625)	(0.00657)
$Rivalries\ in\ MENA$			0.0500***		
			(0.0108)		
Oil_P				0.0247**	0.0228*
				(0.0123)	(0.0122)
Oil_M					-0.127
					(0.254)
Aid_{-1}	0.541***	0.424***	0.424***	0.424***	0.393***
	(0.0221)	(0.0276)	(0.0276)	(0.0276)	(0.0297)
$Multilateral\ aid\ per\ ca$		0.0703***	0.0703***	0.0703***	0.0582***
		(0.0175)	(0.0175)	(0.0175)	(0.0184)
$Trade$		0.135***	0.135***	0.135***	0.125***
		(0.0203)	(0.0203)	(0.0203)	(0.0211)
Inf		-1.43e-05	-1.43e-05	-1.43e-05	2.37e-05
		(1.33e-05)	(1.33e-05)	(1.33e-05)	(4.39e-05)
HAI		-0.00218	-0.00218	-0.00218	0.000742
		(0.00384)	(0.00384)	(0.00384)	(0.00433)
$GDP\ per\ capita$		-0.164*	-0.164*	-0.164*	-0.137
		(0.0969)	(0.0969)	(0.0969)	(0.107)
Pop		0.0674	0.0674	0.0674	0.0729
		(0.274)	(0.274)	(0.274)	(0.300)
$UNSC$		0.0138	0.0138	0.0138	0.00727
		(0.0372)	(0.0372)	(0.0372)	(0.0411)
$Democracy$		0.0558	0.0558	0.0558	0.0551
		(0.0363)	(0.0363)	(0.0363)	(0.0400)
Constant	-2.754***	-5.066	-5.066	-5.227	-5.538
	(0.136)	(4.989)	(4.989)	(4.996)	(5.465)
Observations	12,530	8,554	8,554	8,554	7,620
R-squared	0.321	0.251	0.251	0.251	0.222
Number of Dyads	540	476	476	476	476
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Dyadic FE	YES	YES	YES	YES	YES

*Note: this table presents the Fixed Effect estimates of the gravity model of bilateral aid allocation. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. The dependent variable is log(aid_share). ***, **, and * indicate 1%, 5%, and 10% significance levels.*

Table B.2. ***Oil and aid allocation (1980-2010), AidData database, Fixed Effect estimator***

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Oil_R	0.0145**	0.0152**	0.0152**	0.0152**	0.0155**	0.0164**
	(0.00580)	(0.00627)	(0.00627)	(0.00627)	(0.00641)	(0.00777)
$Rivalries\ in\ MENA$			0.0430***			
			(0.0101)			
Oil_P				0.00405	0.00213	0.00323
				(0.00764)	(0.00766)	(0.00847)
Oil_M					0.590**	0.668*
					(0.251)	(0.342)
Aid_{-1}	0.245***	0.177***	0.177***	0.177***	0.170***	0.161***
	(0.0228)	(0.0228)	(0.0228)	(0.0228)	(0.0240)	(0.0306)
$Multilateral\ aid\ per\ cc$		0.0710***	0.0710***	0.0710***	0.0507***	0.0623***
		(0.0180)	(0.0180)	(0.0180)	(0.0182)	(0.0201)
$Trade$		0.0666***	0.0666***	0.0666***	0.0678***	0.0820***
		(0.0184)	(0.0184)	(0.0184)	(0.0183)	(0.0235)
Inf		-4.48e-05**	-4.48e-05**	-4.48e-05**	-4.86e-05**	-4.86e-05**
		(2.07e-05)	(2.07e-05)	(2.07e-05)	(2.22e-05)	(1.96e-05)
HAI		-0.00374	-0.00374	-0.00374	-0.00229	0.00505
		(0.00407)	(0.00407)	(0.00407)	(0.00423)	(0.00510)
$GDP\ per\ capita$		-0.0725	-0.0725	-0.0725	-0.0461	-0.0515
		(0.0985)	(0.0985)	(0.0985)	(0.0992)	(0.110)
Pop		0.433*	0.433*	0.433*	0.315	0.0288
		(0.252)	(0.252)	(0.252)	(0.269)	(0.296)
$UNSC$		-0.00964	-0.00964	-0.00964	-0.0238	-0.0341
		(0.0427)	(0.0427)	(0.0427)	(0.0407)	(0.0443)
$Democracy$		0.103**	0.103**	0.103**	0.127***	0.153***
		(0.0411)	(0.0411)	(0.0411)	(0.0443)	(0.0501)
Constant	-4.154***	-12.29***	-12.29***	-12.34***	-10.99**	-6.746
	(0.135)	(4.614)	(4.614)	(4.601)	(4.836)	(5.400)
Observations	10,052	7,406	7,406	7,406	6,898	4,965
R-squared	0.096	0.091	0.091	0.091	0.087	0.091
Number of rec_don	527	454	454	454	454	326
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Dyadic FE	YES	YES	YES	YES	YES	YES
						UK & CAN excluded

*Note: this table presents the Fixed Effect estimates of the gravity model of bilateral aid allocation. Robust standard errors are in parentheses. Independent variables are lagged to reflect aid allocation process and avoid simultaneity bias. The dependent variable is log(aid_share). ***, **, and * indicate 1%, 5%, and 10% significance levels*