Green Contracts:

The Global Environment Facility and the Politics of Procurement

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ABSTRACT:

Studies of multilateral aid organizations suggest that they balance formal rules and recipients' decision-making discretion at all stages of the project cycle. The focus of existing research is primarily on development programs, which represent one sector of multilateral assistance. This paper explores the interaction of formal rules and a familiarity effect in an environmental organization – the Global Environment Facility (GEF). Implementation of environmental projects requires purchases of goods, consulting and non-consulting services; hence, the GEF's funding flows to suppliers in all eligible countries. On the one hand, such purchases follow procurement procedures that rely on competitive bidding, which maximize efficient use of scarce financial resources. On the other hand, recipient countries seek to mitigate their uncertainty in bid selection by allocating more contracts to familiar suppliers. I use data on contract awards for GEF-funded projects from 1995 through 2015 to evaluate patterns of contract allocation and identify beneficiaries of GEF-funded project procurement.

INTRODUCTION

After multilateral aid organizations approve projects in developing countries, and before project implementation can commence, aid recipients need to identify potential providers of goods, works, consulting and non-consulting services and choose which suppliers to sign contracts with. Projects funded by the Global Environment Facility (GEF) support activities that help to address pressing global environmental problems, including climate change, desertification, and biodiversity loss. Similar to other aid-funded projects, these activities require various types of equipment, expert advice, and skilled workers.

Consider the example of a biodiversity conservation project in Bolivia. When the GEF approved this project in 1992 and allocated a grant of 4.5 million USD, the amount was split into 207 contracts. These contracts helped Bolivia to establish the National System of Protected Areas and increase the number of managed protected areas by providing the recipient country with four-wheel drive vehicles, external audit services, training sessions for park rangers, and services of a number of specialists, including economists, sociologists, and wildlife coordinators. Bolivia allocated 93 percent of the contracts to domestic firms and experts (equivalent to 87 percent of the total amount of awarded contracts), while Canadian, Japanese and Australian companies received the rest of the contracts. What explains procurement outcomes in this case and beyond?

To explain patterns of contract allocation, we need to consider recipient governments' decision-making (i.e., recipient governments) and constraints that funding organizations place on their procurement decisions. Multilateral organizations, such as the GEF, aim to promote international cooperation by structuring it through a set of rules. By making interstate interactions more predictable, rules underpinning multilateral organizations reduce transaction costs, thereby enhancing opportunities for mutually beneficial cooperation. Donor organizations' procurement rules aim to facilitate cooperation during the process of contract allocation. Yet, benefits of greater predictability and improved information may not flow equally to all parties. I argue that the benefits mainly accrue to highly competitive companies from non-recipient countries, whereas governments that receive multilateral assistance and have the responsibility for awarding contracts and implementing projects remain at an informational disadvantage vis-à-vis contract bidders. As a result, recipient governments seek to address their informational asymmetries by relying on more familiar partners in the contract award process. This familiarity effect should favor bidders from countries with closer past or present links to the recipient country. Hence, I expect that patterns of green contract allocation will show evidence of rules-based interactions, as well as familiarity-based biases.

The focus of my paper is the GEF, which was formed in 1991 as a three-year pilot program, but in March 1994 it was re-established as a permanent organization. The GEF was a joint initiative developed by the World Bank and the United Nations with functional support from a small Secretariat, located in the World Bank's headquarters in Washington, D.C. The World Bank's greater influence over the GEF is also due to the Bank's roles as the trustee of GEF trust funds, and one of the GEF's main implementing agencies.[1] Therefore, I focus on GEF-funded projects

[1] The GEF does not implement its own projects; instead, it relies on implementing agencies. The World Bank, UNEP and UNDP are the largest and most influential. Other partner organizations include regional development

implemented by the World Bank, and analyze associated contracts allocated under World Bank procurement rules.

This paper seeks to examine factors that determine outcomes of green contract allocation. I begin by discussing informational asymmetries that present challenges to the procurement process, an important part of multilateral aid programs. I argue that multilateral organizations design procurement rules to reduce companies' informational asymmetry, but recipient governments do not receive the same amount of informational benefits from these rules. Consequently, recipients rely on informational shortcuts – that is, they turn to suppliers that are more familiar to recipients. I then describe the research design for statistical tests of the two informational mechanisms associated with the procurement process. I use data on GEF-funded contract allocations over the period between 1995-2015 to code dependent variables that capture patterns in procurement outcomes. My analyses provide empirical evidence that both informational mechanisms are at work and operate as significant determinants of green contract allocation. I also show that the familiarity effect exerts a stronger influence on procurement than do formal procurement rules.

MITIGATING INFORMATIONAL ASYMMETRIES IN PROCUREMENT: INSTITUTIONAL RULES AND FAMILIARITY

Implementation of projects funded by multilateral organizations requires recipient countries to purchase required goods and services to achieve project objectives. Therefore, multilateral aid disbursed to recipients moves to the final allocation stage: i.e., aid-funded procurement process. At this stage, recipient governments select suppliers of goods and services by awarding contracts to most qualified and competitive bidders. Multilateral organizations do not play a direct role in the selection process, but they set procurement rules and review recipient governments' procurement decisions.

Procurement rules seek to increase transparency of the contract allocation process, reduce informational asymmetries among governments and companies, and create a level playing field for all eligible suppliers. For non-recipient companies, limited information about recipient countries' local markets, rules and regulations could lead to difficulties in securing lucrative foreign contracts. For instance, a shipping company owner described informational challenges in entering foreign markets: "In the West Africa region we see imports from suppliers in Portugal, France, Brazil and other countries. The quality of these manufactured goods is generally inferior to US made products. What stops us from aggressively getting into an export business is financing and a lack of up to date market information."[2] Hence, knowledge about local markets or informational shortcuts that could overcome limited local knowledge should be useful to foreign companies.

banks, United Nations Industrial Development Organization, Food and Agriculture Organization, and International Fund for Agricultural Development.

[2] Manuel Medina, owner of Cape Verdean-American Import/Export, Inc., testified before the Subcommittee on International Development, Finance, Trade and Monetary Policy at the US House of Representatives on November 18, 1993.

One of the key objectives for multilateral development organizations in adopting and enforcing procurement rules is a predictable and transparent set of expectations and reduced transaction costs – i.e., conditions that mitigate non-recipient companies' informational asymmetry regarding recipient countries. An effective method to create such stable and clear expectations for interested companies is international competitive bidding. The World Bank, which executes a significant share of the GEF's projects and supervises associated procurement, relies primarily on the International Competitive Bidding (ICB) process for goods and non-consulting services contracts, and Quality- and Cost-Based Selection (QCBS) for consulting contracts, with some exceptions.[3] ICB and QCBS require recipient governments to allow qualified firms from all eligible countries to bid on recipients' orders of goods, works and services, and publicize contract opportunities nationally and internationally. These procedures reduce transaction costs for firms interested in receiving contracts to provide services and goods to recipient countries.

Companies and their home governments acknowledge the benefit of reduced transaction costs and expanded business opportunities. A testimony by a former Treasury Department and National Security Council official Benjamin Leo in the Subcommittee on International Monetary Policy and Trade of the Committee on Financial Services at the US House of Representatives highlights the outcome of procurement rule implementation: "MDB [Multilateral Development Bank] contracts are posted publicly, transparently, and are open to all companies from MDB member countries. […] In light of weak government institutions and corruption in many developing countries, these best practice policies help to ensure that U.S. companies can compete for business on the merit of their goods and services." (US House 2011: 19). The benefits of increased transparency and predictability do not flow to all companies equally: only competitive suppliers can take advantage of greater export opportunities.

While procurement rules that center on transparency and efficiency reduce informational asymmetry for non-recipient companies, public notices of procurement opportunities and competitive bidding by a broad range of companies from around the world do little to reduce informational asymmetry for recipient governments. If they strictly adhere to multilateral organizations' procurement procedures, recipients may end up awarding bids to companies unknown to recipients. Some of these companies may provide goods and services as expected, while others may not. Hence, recipients may face risks due to suppliers' inability to complete all works on time and in compliance with specified standards, delivery of defective goods, cost overruns, or other problems that could emerge during project implementation. The World Bank seeks to alleviate such concerns by allowing recipient governments to require security as an insurance against a supplier's breach of contract. Contracts also include provisions for dispute settlement: the World Bank requires recipient-supplier disputes to be resolved through international commercial arbitration.

Such institutional mechanisms for protecting recipient governments' interests may help reduce governments' exposure to supplier-related risks, but cannot eliminate such risks entirely.

[3] For instance, for goods and non-consulting services, the estimated size of a contract may help determine whether ICB is appropriate: smaller contracts qualify for more restrictive national competitive bidding. For consulting services, the complexity of a task is another important criterion: when project assignments are complex and highly specialized, and require innovative approaches that are hard to specify at the outset, the Quality-Based Selection method may be chosen over QCBS.

Moreover, dispute resolution takes time, and delayed projects can be reputationally and financially costly for recipient governments. Therefore, governments have strong incentives to rely on their existing relations with companies and their home governments as they evaluate bids submitted by suppliers.

I argue that recipients' familiarity with suppliers plays an important role in recipients' decision-making process. When recipients can draw on more extensive past experiences or ongoing interactions with suppliers, uncertainty associated with suppliers' willingness and ability to comply with the terms of their GEF-funded contracts is lower than in the case of less familiar suppliers. That means that greater familiarity should be associated with reduced transaction costs for recipients and, hence, they should be more likely to allocate contracts to more familiar suppliers. Previous research identifies a similar familiarity effect in the case of foreign direct investment: greater familiarity of investors with potential host countries reduces investors' uncertainty and transaction costs, thereby leading to more significant investment flows to these host countries (Leblang 2010; Kim et al. 2015).

One unintended consequence of World Bank procurement rules is that they accommodate recipient governments in their desire to choose more familiar suppliers. Specifically, the multilateral organization's provision for domestic company preference gives recipient governments significant leeway to choose suppliers from the pool of most familiar companies – i.e., domestic companies. This provision applies to goods and non-consulting services contracts, and consulting contracts: "The Borrower may, with the agreement of the Bank, grant a margin of preference in the evaluation of bids under ICB procedures to bids offering certain goods manufactured in the country of the Borrower, when compared to bids offering such goods manufactured elsewhere" (WB 2011a: 42). Similarly, one of the main criteria shaping the Bank's consulting procurement policies is "the Bank's interest in encouraging the development and use of national consultants in its developing member countries" (WB 2011b: 2). Therefore, regardless of the contract type, domestic suppliers are in the best position to receive contracts.

When it comes to non-domestic companies, recipient governments can use other types of information to gauge their familiarity with suppliers. For instance, strong bilateral trade relations reduce transaction costs because of established flows of goods and services. Similarly, deep political ties decrease uncertainty regarding supplier governments' willingness to enforce contracts and reduce the likelihood of disruptions in flows of goods and services due to different types of dyadic conflict. Finally, the greater frequency of bilateral interactions because of shared characteristics, such as membership in international organization, neighbor status, or easier communication due to shared language, should enhance recipients' knowledge about potential suppliers and, hence, place more familiar companies in an advantageous position during contract bidding.

This discussion suggests that procurement outcomes should be shaped by two sets of factors. On the one hand, World Bank rules requiring a fair and open bidding process should increase the likelihood that the most competitive and experienced suppliers would receive more in contract allocations. On the other hand, recipients' effort to reduce their informational assymetries should result in a greater contract flows to more familiar suppliers. The following hypotheses summarize these expectations.

Hypothesis 1 ("experience hypothesis"): *As suppliers' relevant experience increases, their green contract allocation should also increase.*

Hypothesis 2 ("competitiveness hypothesis"): *As suppliers' competitiveness increases, their green contract allocation should also increase.*

Hypothesis 3 ("familiarity hypothesis"): *As recipient-supplier familiarity increases, suppliers' green contract allocation should also increase.*

RESEARCH DESIGN

The main source of data for this analysis is the World Bank's Contract Awards Database.[4] The database provides information on major contracts financed in whole or in part by the World Bank or a fund administered by the World Bank. For each contract, details include the size of the contract award, contractor identity, recipient and supplier countries, project sector, contract signing date, and procurement method. Due to the focus of this paper on GEF-funded projects, I impose a selection rule: that is, my contract sample includes only contracts associated with GEF grants. This results in 8,075 contracts awarded between 1995 and 2015. Countries that received the largest number of GEF contracts during this period are China (503 awards), the US (400), Benin (390), South Africa (316), and Mexico (305). However, if recipient countries that serve as their own suppliers are excluded, developed economies display their dominance in contract bidding. Nine out of top ten suppliers come from industrialized countries, with the US (400 awards), the UK (258), and France (185) at the top of the ranking.

I use the information from the Contract Awards Database to construct a dataset in the dyad-year format. For every aid recipient/supplier country dyad, I calculate contract awards on the annual basis. In addition to measures of overall contract flows, I construct variables for two procurement groups: goods and services, and consulting. The two contract types have somewhat different bidding rules, so I use these group-specific variables to gauge whether procurement outcomes change significantly under different sets of procurement rules.

Dependent variables

I create three dependent variables to test my hypotheses linking supplier qualifications and dyadic familiarity to procurement outcomes. The first variable is a binary indicator (*Contract dummy*), which equals one when at least one contract was allocated in a recipient-supplier dyad in a given year, and zero otherwise. Of 1,465 contract observations in my dataset, 671 cases represent annual allocations to companies from the recipient country, i.e., domestic contracting accounts for 46% of my contract sample. The second variable, *Contract count*, relies on more nuanced information: instead of using the dummy, which codes one or more contracts as one, and no contracts as zero, the count variable captures the annual number of contracts awarded within a recipient-supplier dyad. The median value of this variable, when excluding no-contract observations, is 2, and the mean is 4.6. The third dependent variable, *Contract amount*, is the natural log of (one plus) total

[4] The database is available at http://projects.worldbank.org/?lang=en.

contract amount from an aid recipient to a supplier country in a given year. The maximum contract allocation within a dyad is 97.4 million USD: in 2013, the Indian government allocated 23 contracts to domestic suppliers. However, the median value of the total contract amount, excluding no-contract observations, is much lower: just 242,266 USD. In addition, consulting contracts tend to be much smaller than contracts for goods and services: while a median contract allocation for the latter is 363,329 USD, the median value for the former is just 173,393 USD.

Supplier-level independent variables

To evaluate supplier characteristics linked to suppliers' ability to submit successful contract bids, I include six variables. The first three indicators represent economic competitiveness. *GDP per capita*, logged, measures the level of economic development, which is a proxy of the country's ability to produce advanced technology, including goods compliant with more advanced environmental standards. *Trade openness* is calculated as the sum of the supplier country's exports and imports, divided by the GDP. Higher levels of international economic exchanges signal greater competitiveness and experience with foreign markets. The World Bank's World Development Indicators serve as the data source for *GDP per capita* and *Trade openness.*

The third competitiveness indicator is *Green RCA* (logged): this is a measure of revealed comparative advantage (RCA) in the green sector. To identify goods that fall into the category of environmental goods, I rely on the OECD classification. Goods and services that are relevant to pollution management, cleaner technologies and products, and resource management are considered EGs (or environmental goods). Companies manufacturing and exporting EGs are expected to be direct beneficiaries from procurement funded by GEF projects. Sectoral trade data are from UN COMTRADE Dataset.[5] I extract information on EG exports, using the OECD classification, calculate the value for total EG exports by country and globally, and then construct a measure of green comparative advantage using the following formula. The RCA of country *j* in the trade of environmental product cluster *g* is represented by the EG cluster's share in the country's overall exports relative to the EG cluster's share in world exports (Balassa 1965). In other words, if X_{gj} is the value of country *j*'s exports in EG cluster *g* and X_{tj} is the country's total exports, then its green RCA index is:

$Green\ RCA_{gj} = \frac{X_{gj}/X_{tj}}{X_{gw}/X_{tw}}$, where subscripts *gw* and *tw* denote green and total export values for the world, respectively.

The second set of variables captures supplier countries' experience with GEF procurement and environmental policy implementation. Institution-specific and policy-specific knowledge can make suppliers more attractive implementation partners for GEF-funded environmental projects. Therefore, more extensive experience should be associated with more favorable procurement outcomes for bidding countries. I use data from the Contract Awards Database to calculate *Supplier's share of green contract allocations* as a measure of a supplier country's familiarity with GEF procurement: this is a country's (logged) share of the total amount of green contracts funded by the GEF in a given year. For policy-specific knowledge, I turn to the baseline score of the

[5] The dataset is available at https://comtrade.un.org/data/.

Environmental Performance Index (EPI), which ranks countries on a range of indicators gauging countries' implementation of environmental policy goals.[6] Best performers (i.e., countries with higher values of *EPI score*) should be in an advantageous position when they submit their contract bids, especially for consulting services contracts.[7]

Dyadic independent variables

I expect bilateral closeness and familiarity to influence recipient governments' choice of suppliers. I construct several variables gauging the strength of dyadic ties between countries to evaluate the influence of these ties on contract allocation. If a recipient government uses bilateral links as a mechanism of screening out less familiar suppliers, I expect to identify a positive relationship between these dyadic indicators and green contract allocations.

Three measures represent political links between aid recipients and other countries. First, *Foreign policy dissimilarity* is a variable that indicates the level of alignment between two countries' foreign policies. I rely on a measure of absolute distance between the supplier's and the recipient's ideal points, derived from their voting patterns in the United Nations General Assembly (Bailey, Strezhnev and Voeten 2017). When *Foreign policy dissimilarity* takes its minimum value of zero, the recipient and supplier countries share similar foreign policy preferences, and the recipient government should be more likely to allocate contracts to a company from a friendly state. The likelihood of contract award should decline as the countries' foreign policy positions diverge.

Joint membership in international organizations can result in increased flows of green contracts: previous research suggests that trade flows tend to increase between countries with greater IGO membership connections between them (Ingram, Robinson and Busch 2005). Therefore, joint membership in a trade organization should be associated with increased contract allocations within a dyad. I construct a binary indicator, *Trade agreement*, which takes the value of one when a dyad has joint membership in at least one international trade agreement, and zero otherwise. The data source is the Design of Trade Agreements (DESTA) database, which collects information on different types of international trade agreements (Dür, Baccini and Elsig 2014).

The third measure that I include is *Contiguity*. This binary variable indicates whether the recipient and a potential supplier country share a border (Head, Mayer and Ries 2010). If countries prioritize relations with their neighbors, they may do so because of a greater frequency of bilateral interactions between bordering states and, hence, greater familiarity. In addition, trade exchanges tend to intensify when distance between countries declines, so there are likely established trade

[6] The EPI report and data are available at https://epi.envirocenter.yale.edu/. I use baseline scores, which rely on data from a decade or so ago prior to the most recent EPI report, released in 2018. Hence, the EPI score has two limitations: its values represent countries' rankings corresponding to the midpoint of the time period of my dataset, and the scores are time-invariant. Nonetheless, this is a useful proxy of suppliers' environmental performance because EPI rankings tend to change little over time due to stickiness of institutions, policies and investments in the environmental sector. Top performers tend to be countries of Western Europe, such as Switzerland, France, and Denmark.

[7] I conducted robustness checks with alternative measures of supplier countries' environmental performance: access to clean fuels and technologies for cooking as a share of population; CO2 emissions per capita; CO2 emissions divided by GDP; GDP per unit of energy use; and renewable energy consumption as a share of total final energy consumption. My results are robust to the use of these alternatives.

links between the recipient and neighboring suppliers. Offering contracts to familiar companies from neighboring countries should be more attractive to recipient governments than to other possible suppliers, all else being equal.

Bilateral socioeconomic links serve as another set of factors encouraging contract allocations within dyads. I use data on trade flows, bilateral aid disbursements and shared language to measure such dyadic relations. First, I use UN COMTRADE data to construct two logged export measures: one captures each potential supplier's total exports to the recipient country (*Imports from supplier country*), while the other captures the volume of suppliers' green exports to the recipient country (*Green imports from supplier country*). Both types of trade links should reflect the strength of existing economic relationships, and hence the familiarity between recipient and supplier countries. However, *Green imports from supplier country* focuses more narrowly on the trade sector relevant to the implementation of GEF-funded projects; therefore, the relationship between this indicator and contract allocation should be stronger.

The second type of economic relationship that is relevant in the context of procurement politics is inflows of aid from the recipient government's bilateral donors. Previous research indicates that multilateral aid recipients seek to maintain existing bilateral aid relations by treating donor countries' companies more favorably than companies from other states (McLean 2017). To capture this effect, I rely on data from AidData.org: *Foreign aid* is calculated as the natural log of (one plus) total bilateral aid disbursement from a supplier country to a recipient government in a given year. If companies from donor countries do indeed receive favorable procurement decisions, there should be a positive association between bilateral aid inflows and green contract allocation.

I also consider the role that shared language plays in procurement outcomes. Studies of foreign direct investment suggest that common language reduces transaction costs, thereby increasing the attractiveness of countries to foreign investors (Leblang 2010; Kim et al. 2015). This familiarity effect should also help governments, which implement GEF-funded projects, to identify suppliers that are easier to communicate with. Communication is particularly salient when companies provide consulting and non-consulting services because language differences could interfere with project activities. To capture potential communication challenges, I include a binary indicator (*Common language*), which takes the value of one when the recipient and a potential supplier country share the official or primary language, and zero otherwise (Head, Mayer and Ries 2010). I expect shared language to have a positive effect on green contract awards.

Finally, I account for the domestic company advantage identified in previous research (McLean 2017). World Bank procurement rules acknowledge the importance of using development aid to strengthen domestic capacity in recipient countries, thereby authorizing some degree of preferential treatment for recipient countries' companies. Using information on the identity of recipient and supplier countries available in the Contract Awards Database, I construct a dummy variable, *Recipient as supplier*, which takes the value of one when the recipient's domestic company bids on a contract award, and zero when a non-recipient country's company does so.

Methods

I specify three sets of models based on three dependent variables of contract allocation. In the first set of models, *Contract dummy* is the dependent variable; therefore, I estimate logit models. For

models with *Contract count* as the dependent variable, I use negative binomial regression. Finally, I derive OLS estimates in models with *Contract amount* as the dependent variable. All models include fixed effects for year and recipient country. I lag all explanatory variables by one year, with the exception of *Recipient as supplier, EPI score, Trade agreement, Contiguity,* and *Common language.* I cluster standard errors on recipient-supplier dyad to account for potential heteroskedasticity. In addition, all specifications include the lagged dependent variable to address concerns of path dependence in procurement processes.

DISCUSSION

Tables 1-3 report results of green contract allocation models that analyze procurement outcomes for GEF-funded projects. Each table provides four specifications: Model 1 includes all contract bidders (from the recipient country, and non-recipient countries); Model 2 includes dyadic explanatory variables and hence the sample is limited to non-recipient supplier countries; Model 3 replicates the analysis in Model 2 for goods and services contracts only; and Model 4 replicates the analysis in Model 2 for consulting contracts.

To summarize the main results, my analyses yield empirical evidence in support of the familiarity hypothesis. Specifically, dyadic measures of familiarity, such as *Recipient as supplier, Foreign aid, Trade agreement, Contiguity,* and *Common language*, are consistently linked to favorable procurement outcomes. I also find that supplier countries' green exports to the recipient are associated with an increased likelihood of a contract award and a greater number of awards, but not with the total award amount. In addition, procurement outcomes reflect suppliers' competitiveness and experience: companies from countries with higher values of *Green RCA* and *GDP per capita*, as well as countries that receive larger shares of GEF-funded contract allocations, tend to receive more contracts and larger contract amounts. However, supplier countries with stronger environmental performance do not appear to enjoy any advantage in the GEF-funded procurement process.

Turning to the set of results based on models of contract allocation choice (see Table 1), I find that formal procurement rules with their emphasis on competitiveness and expertise exert influence on the supplier selection process. Specifically, variables that measure country-level experience with green contracts (*Supplier's share of green contract allocations*) and economic competitiveness (*Green RCA* and *GDP per capita*) have a positive and statistically significant relationship with green contract awards in all four specifications. Bids from these countries are in a better position to conform with procurement requirements of providing goods and services "of satisfactory quality" and "priced so as not to affect adversely the economic and financial viability of the project" (WB 2011a: 3); hence, such bids are more likely to win. At the same time, the non-sector specific measure of economic competitiveness (*Supplier trade openness*) and a measure of expertise in the area of environmental policy implementation (*EPI score*) yield results contrary to Hypotheses 1 and 2: these variables are associated with reduced likelihood of contract award, even though the results are not robust to various specifications. Still, these results indicate that firms from trade-dependent and environmentally friendly countries do not fare well in the green procurement process.

Results in Table 1 lend strong support to Hypothesis 3: several variables measuring dyadic familiarity are robustly associated with procurement outcomes. Recipients' bid selection tends to favor domestic suppliers as well as firms from bilateral donor countries. Countries that export EGs to recipients and share membership in trade agreements, language, or border with recipients also benefit from more favorable procurement outcomes. Moreover, of all regressors, four familiarity measures (and the lagged dependent variable, which can serve as a proxy for prior dyadic procurement interactions and hence dyadic familiarity) have the largest substantive effects on bidder selection: *Recipient as supplier, Trade agreement, Common language,* and *Contiguity.*

The tests also suggest that outcomes of goods and services procurement are largely similar to those of consulting procurement, with two caveats. First, competitiveness in the EG sector and existing trade links in this sector have a stronger association with contract allocation in the goods and services sample than in the consulting sample. And second, recipient governments appear to steer goods and services contracts away from unfriendly countries' firms, but do not follow the same approach with consulting contracts. Given the fact that goods and services contracts tend to be more sizeable, this bias means that adversarial bilateral relations may deprive suppliers of important commercial opportunities.

[Table 1 about here]

Contract count models shown in Table 2 yield findings that are comparable to those in Table 1. Both rules-based and familiarity-based theoretical expectations find empirical support in these models, but measures of dyadic familiarity exert greater substantive impact on the number of green contracts awarded by aid recipients. Variables gauging characteristics indicative of suppliers' ability to satisfy procurement rules (i.e., experience with green contracts, advanced economic development, and competitiveness in the EG sector) have a positive and statistically significant effect on the number of awarded green contracts. However, economic openness and advanced environmental policies do not help, and may even hurt, suppliers' ability to win more contracts. On the flipside, recipient-supplier familiarity – measured by firms' domestic or donor-country origins, supplier countries' environmental export volumes to recipients, and shared trade agreement membership, language, or border – results in larger numbers of GEF-funded contracts allocated to more familiar suppliers, all else being equal. The familiarity measures that had the most substantively significant impact on contract choice in Table 1 (i.e., the lagged dependent variable, *Recipient as supplier, Trade agreement, Common language,* and *Contiguity*) remain the most influential determinants of green contract allocation. Finally, outcomes of goods and services procurement are similar to those of consulting procurement, as before and with the same exceptions: *Green RCA* and *Green imports from supplier country* have a stronger association with the number of contracts in the goods and services sample than in the consulting sample; and companies from adversarial countries are at a disadvantage in the goods and services sample, but not in the consulting sample.

[Table 2 about here]

The final set of models evaluates the relationship between competitiveness, expertise and familiarity, on the one hand, and total contract amount, on the other (see Table 3). Most of the findings are consistent with those reported in Tables 1 and 2, with one notable difference.

Coefficients on measures of experience with green contracts (*Supplier's share of green contract allocations*) and competitiveness (*Green RCA* and *GDP per capita*) remain positive and significant in all specifications, indicating that larger contract allocations flow to more experienced supplier countries and those most likely to satisfy procurement requirements of providing high-quality environmental goods and services at lower prices. Environmental policy performance is not a robust determinant of contract allocation, just as before, while trade openness is negatively and significantly associated with contract amount. Most of the familiarity results also remain unchanged in this set of models. Namely, recipients' domestic firms, donor-country firms, and suppliers whose countries share trade agreement membership, language, or border with the recipient receive larger volumes of GEF-funded contracts. Past contract amounts are also positively associated with contract amounts allocated in the current year. *Imports from supplier country* exert the opposite (i.e., negative) effect on contract amount, as before. The only noteworthy change is that EG exports from the supplier country to the recipient do not have a positive and statistically significant relationship with contract allocation: this suggests that, while recipient-supplier familiarity makes recipients more inclined to turn to known sources of environmental goods and services, they do not award larger contracts to familiar suppliers and, possibly, the per-contract amount may even go down, given that my dependent variable aggregates contract volumes on the annual basis. Interestingly, differences between outcomes of goods and services procurement and those of consulting procurement become less pronounced than in Tables 1 and 2. The coefficient on *Green RCA* does not change in Models 2-4, i.e., the pooled model and split-model samples. Since *Green imports from supplier country* is no longer a significant predictor of contract allocation in any of the specifications, again, no statistically significant differences can be identified between two types of procurement. One result that remains unchanged from Tables 1 and 2 is the disadvantage experienced by companies from adversarial countries: they are less likely to receive larger goods and services contract amounts than companies from friendly countries, but in the consulting sample there is no difference between companies from friendly and adversarial supplier countries.

[Table 3 about here]

CONCLUSION

This paper has argued that outcomes of GEF-funded contract allocation are shaped by institutional procurement rules and recipient-supplier familiarity. Both of these factors help reduce informational asymmetries and transaction costs associated with green contracts. Companies reap the greatest benefits from transparent and predictable procurement rules maintained by the multilateral organization: these rules make it easier for competitive companies to identify and win GEF-funded contracts. At the same time, bilateral familiarity is more effective for reducing recipient governments' uncertainty regarding suppliers. When recipients have more extensive past experiences or ongoing interactions with potential suppliers, recipients are in a better position to assess suppliers' likely performance in providing required goods and services for GEF-funded projects. Therefore, I expect that both types of mechanisms that reduce informational asymmetries should be linked to a greater flow of contracts within recipient-supplier dyads.

Statistical tests yield results consistent with this expectation. More competitive and experienced suppliers receive more GEF-funded contracts and greater contract amounts. At the same time, recipient governments give preferential treatment to domestic companies in the contract allocation

process, consistently with World Bank procurement rules as well as the familiarity effect. At the dyadic level, I find that recipient governments' bid selection favors suppliers from countries that share significant political and socioeconomic ties with recipients. Specifically, recipients' bilateral donors, trading partners, neighbors and countries sharing the official language with recipients receive greater allocations of green contracts than countries that do not benefit from the familiarity effect. Moreover, the substantive impact of four recipient-supplier familiarity measures (*Recipient as supplier, Trade agreement, Common language,* and *Contiguity*) on outcomes of the contract allocation process is greater than that of rules-based variables.

The findings presented in this paper suggest that environmental project procurement may fail to reach the objective of using scarce aid resources in the most efficient way possible. While competitive companies have some advantage in winning green contracts, factors unrelated to competitiveness or expertise play a far more influential role. Some of these factors, such as the status as a recipient's domestic company, align with the development mission of the World Bank, the GEF's implementing agency. Yet, the GEF is an international organization whose primary goal is to address urgent environmental problems, rather than promote development of domestic-level capacity to produce goods and deliver services. Hence, the domestic preference granted to recipients' companies diverges from the GEF's goal. Other factors, such as favorable treatment offered to recipients' bilateral donors, are even less consistent with mandates of the two multilateral organizations. At the same time, assuming that the familiarity effect arises due to the causal mechanism specified in my theoretical argument, selection of more familiar suppliers could help recipients purchase goods and services of desired specifications, delivered on time, and without cost overruns or quality disputes. In that case, recipients would experience fewer implementation obstacles and, consequently, the procurement biases would lead to more successful outcomes of GEF-funded projects. Future research should consider what effect, if any, green contract allocation has on the effectiveness of environmental projects.

REFERENCES

Bailey, Michael A., Anton Strezhnev, and Erik Voeten. 2017. "Estimating Dynamic State Preferences from United Nations Voting Data." *Journal of Conflict Resolution* 61(2): 430-456.

Balassa, Bela. 1965. "Trade Liberalization and 'Revealed' Comparative Advantage." *The Manchester School of Economics and Social Studies* 33 (2): 99-123.

Dür, Andreas, Leonardo Baccini and Manfred Elsig. 2014. "The Design of International Trade Agreements: Introducing a New Database." *Review of International Organizations* 9(3): 353-375.

Head, Keith, Thierry Mayer and John Ries. 2010. "The Erosion of Colonial Trade Linkages After Independence." *Journal of International Economics* 81(1): 1-14.

Ingram, Paul, Jeffrey Robinson, and Marc L. Busch. 2005. "The Intergovernmental Network of World Trade: IGO Connectedness, Governance, and Embeddedness." *American Journal of Sociology* 111(3): 824-858.

Kim, Moonhawk, Amy H. Liu, Kim-Lee Tuxhorn, David S. Brown, and David Leblang. 2015. "Lingua Mercatoria: Language and Foreign Direct Investment." *International Studies Quarterly* 59(2): 330–343.

Leblang, David. 2010. "Familiarity Breeds Investment: Diaspora Networks and International Investment." *American Political Science Review* 104(3): 584–600.

McLean, Elena V. 2017. "The Politics of Contract Allocation in the World Bank." *Review of International Organizations* 12(2):255–279.

U.S. House. 2011. *The Impact of the World Bank and Multilateral Development Banks on U.S. Job Creation*. Subcommittee on International Monetary Policy and Trade of the Committee on Financial Services. 112th Cong., 1st sess., 27 July.

World Bank. 2011a. *Guidelines: Procurement of Goods, Works, and Non-Consulting Services Under IBRD Loans and IDA Credits & Grants by World Bank Borrowers.* Washington, DC.

World Bank. 2011b. *Guidelines: Selection and Employment of Consultants Under IBRD Loans and IDA Credits & Grants by World Bank Borrowers.* Washington, DC.

Table 1: Models of Green Contract Allocation Choice

	Model 1 (all contracts)	Model 2 (all contracts)	Model 3 (goods & services contracts)	Model 4 (consulting contracts)
Recipient as supplier	5.70**			
	(0.26)			
Green RCA	0.28**	0.20**	0.33**	0.15**
	(0.06)	(0.05)	(0.08)	(0.06)
Supplier's share of green contract allocations	0.19**	0.13**	0.12**	0.12**
	(0.03)	(0.03)	(0.04)	(0.03)
GDP per capita	0.69**	0.53**	0.40**	0.56**
	(0.09)	(0.08)	(0.11)	(0.09)
EPI score	-0.01	-0.02**	-0.02	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
Supplier trade openness	-0.01**	-0.01**	-0.01*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Foreign policy dissimilarity		-0.02	-0.52**	0.16
		(0.08)	(0.17)	(0.09)
Foreign aid		0.06**	0.07**	0.07**
		(0.01)	(0.02)	(0.01)
Green imports from supplier country		0.28**	0.66**	0.24**
		(0.04)	(0.09)	(0.05)
Imports from supplier country		-0.27**	-0.59**	-0.26**
		(0.03)	(0.07)	(0.04)
Trade agreement		0.81**	0.83**	0.87**
		(0.10)	(0.18)	(0.11)
Common language		1.56**	1.85**	1.57**
		(0.11)	(0.19)	(0.12)
Contiguity		2.25**	2.53**	2.53**
		(0.15)	(0.24)	(0.18)
Lagged D.V.	1.82**	2.11**	1.50**	1.88**
	(0.16)	(0.14)	(0.25)	(0.15)
Observations	89,504	86,055	65,861	82,326
LL	-2949.24	-2815.99	-1096.56	-2347.39

Logit models with recipient and year fixed effects; DV = Contract award dummy; standard errors clustered on dyads in parentheses. Unit of analysis: dyad-year.
* $p<0.05$, ** $p<0.01$

Table 2: Models of Green Contract Count

	Model 1 (all contracts)	Model 2 (all contracts)	Model 3 (goods & services contracts)	Model 4 (consulting contracts)
Recipient as supplier	8.23**			
	(0.30)			
Green RCA	0.33**	0.20**	0.36**	0.13*
	(0.08)	(0.06)	(0.09)	(0.06)
Supplier's share of green contract allocations	0.19**	0.11**	0.21**	0.08*
	(0.03)	(0.03)	(0.05)	(0.03)
GDP per capita	0.81**	0.70**	0.50**	0.73**
	(0.12)	(0.10)	(0.12)	(0.12)
EPI score	-0.01	-0.03**	-0.02	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)
Supplier trade openness	-0.01**	-0.01**	-0.01	-0.01**
	(0.00)	(0.00)	(0.01)	(0.00)
Foreign policy dissimilarity		0.01	-0.61**	0.23*
		(0.09)	(0.17)	(0.10)
Foreign aid		0.08**	0.05**	0.10**
		(0.01)	(0.02)	(0.01)
Green imports from supplier country		0.31**	0.66**	0.24**
		(0.05)	(0.10)	(0.05)
Imports from supplier country		-0.30**	-0.59**	-0.29**
		(0.04)	(0.08)	(0.04)
Trade agreement		0.96**	0.97**	1.09**
		(0.13)	(0.22)	(0.13)
Common language		1.78**	1.94**	1.74**
		(0.14)	(0.22)	(0.15)
Contiguity		3.33**	3.07**	3.60**
		(0.22)	(0.28)	(0.23)
Lagged D.V.	0.07*	0.25**	0.27*	0.19**
	(0.03)	(0.08)	(0.11)	(0.05)
Observations	97,664	94,115	94,283	94,283
LL	-5295.01	-5155.54	-1948.08	-4149.45

Negative binomial models with recipient and year fixed effects; DV = Contract award count; standard errors clustered on dyads in parentheses. Unit of analysis: dyad-year.
* $p<0.05$, ** $p<0.01$

Table 3: Models of Green Contract Allocation Amount

	Model 1 (all contracts)	Model 2 (all contracts)	Model 3 (goods & services contracts)	Model 4 (consulting contracts)
Recipient as supplier	6.90**			
	(0.43)			
Green RCA	0.01**	0.03**	0.03**	0.03**
	(0.00)	(0.00)	(0.00)	(0.00)
Supplier's share of green contract allocations	0.02**	0.02**	0.01**	0.02**
	(0.00)	(0.00)	(0.00)	(0.00)
GDP per capita	0.03**	0.05**	0.03**	0.05**
	(0.00)	(0.01)	(0.01)	(0.01)
EPI score	0.00	-0.00**	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Supplier trade openness	-0.00**	-0.00**	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Foreign policy dissimilarity		-0.01	-0.02**	0.00
		(0.01)	(0.00)	(0.01)
Foreign aid		0.01**	0.00**	0.01**
		(0.00)	(0.00)	(0.00)
Green imports from supplier		0.00	-0.00	-0.00
		(0.00)	(0.00)	(0.00)
Imports from supplier country		-0.03**	-0.02**	-0.02**
		(0.00)	(0.00)	(0.00)
Trade agreement		0.11**	0.06**	0.10**
		(0.01)	(0.01)	(0.01)
Common language		0.20**	0.12**	0.17**
		(0.02)	(0.02)	(0.02)
Contiguity		0.82**	0.53**	0.73**
		(0.09)	(0.07)	(0.08)
Lagged D.V.	0.14**	0.34**	0.31**	0.32**
	(0.02)	(0.02)	(0.03)	(0.03)
Observations	97,832	94,283	94,283	94,283
LL	-141075.45	-141918.64	-102729.71	-130349.33

Linear models with recipient and year fixed effects; DV = Contract award amount; standard errors clustered on dyads in parentheses. Unit of analysis: dyad-year.
* $p<0.05$, ** $p<0.01$