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Abstract

NGO campaigns criticizing firms for infringements along their internationalized value chains are a salient feature of economic globalization. We argue that understanding the international patterns of NGO campaigns requires accounting for the geography of their targets' economic activities. We propose a model of global sourcing and international trade in which heterogeneous NGOs campaign against heterogeneous firms in response to infringements along their value chains. We find that campaigns are determined by a *triadic* gravity equation involving the country of the NGO, the country of the firm as well as the sourcing country. Importantly, independent of the location of the NGO, trade costs between the supplier and the firm shape the patterns of NGO campaigns. We use recently available data to estimate our triadic gravity equation at the NGO level and find strong support for this prediction as well as for other predictions specific to our modeling approach.

JEL-Codes: F120, F600, F630, L310, O350.

Keywords: international trade, international sourcing, gravity, NGOs, campaigns, social activism.

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1. Introduction

Economic globalization faces a legitimacy crisis that is fueled by scandals along the globalized value chains characterizing modern-day international production.[1] Campaigns by internationally active advocacy (or *watchdog*) NGOs like Greenpeace, Rainforest Action Network, China Labor Watch, etc., play a key role in exposing and creating awareness of what they consider "unethical" practices in international value chains. These NGOs respond to a regulatory gap left open by national governments who have failed to provide binding and enforceable environmental and labor regulation at the international level.[2] With the trend of the internationalization of production unbroken and consumer consciousness continually on the rise (see, e.g., Cone 2013), advocacy NGOs and their campaigns can be expected to remain salient phenomena in the decades to come.

In response to the surge of global value chains and difficulties in directly targeting independent upstream suppliers, NGOs have adjusted their strategies and resort to *value chain campaigns* (Baron 2016). In these campaigns, NGOs target large downstream firms with well-known brands for infringements by upstream suppliers – even if the firms have no legal control over their suppliers. Over the last decades, a large number of firms from a diverse set of industries have become the targets of international value chain campaigns.[3] These observations suggest that the internationalization and geographical structure of *NGO campaigns* are closely intertwined with the patterns of *global production and trade*.

Our aim in this paper is to contribute to a better understanding of the factors that drive the geography of international social activism. More specifically, we ask how advocacy NGOs respond to economic globalization and how global sourcing and exporting decisions of firms shape the internationalization of NGO campaigns.

We develop a model of international trade and global sourcing in which NGOs campaign against firms in response to infringements along their international value chains. A campaign targets a final goods producer in country i, is carried out by an NGO (and financed by consumers/donors) in country j and targets an infringement by an upstream supplier in country k. If production in the sourcing country occurred under unethical circumstances, this can trigger NGO campaigns against the final goods producer.

In a market for social activism, NGOs offer potential campaigns to domestic consumers/donors who derive warm glow utility from financing campaigns. The warm glow is higher when the campaign has a high salience and therefore more salient campaigns are more likely to get funded. We assume that the salience of a campaign depends positively on three elements: the factor content of unethical inputs in final products, the prominence of these final products in the domestic (the donor's) consumption basket, and the efficiency of

[1] The collapse of the Rana Plaza factory building in Bangladesh in 2013 is an example that received global attention.

[2] Battaglini & Harstad (2020) highlight that while over the last decades, democratic countries have signed hundreds of international environmental agreements, most of these agreements are weak, implying that they generally do not include effective enforcement or monitoring mechanisms.

[3] See Herkenhoff & Krautheim (2022, footnote 1) for a list of examples. More examples can be found in, e.g., Baron (2012, 2013) or Krautheim & Verdier (2016).

the NGO stimulating the salience of the campaign it offers. Because of this, international trade and sourcing decisions by firms matter for NGO campaigns. Through their effect on international trade and international sourcing, trade costs therefore also shape the geographical patterns of NGO campaigns in our model. This takes the form of a triadic gravity equation characterizing the equilibrium determinants of *i*-*j*-*k* campaigns at the NGO level.

From this framework, we derive three main theoretical results. First, we show that there is negative assortativity in the pattern of social activism and targeted firms in the international economy. More efficient NGOs campaign against a broader set of target firms and their targets are, on average, less attractive. By the same token, more productive firms are targeted by more NGOs, that are, on average, less efficient.

Second, we derive a triadic gravity equation where each campaign involves a sourcing country, a firm country and an NGO/consumer country. Our triadic gravity equation implies that two out of the three bilateral trade costs matter for value chain campaigns: τ_{ki}, the sourcing trade costs that affect the relative factor content of country k inputs embedded in country i products; and τ_{ij}, the export cost for the final product that affects its prominence in the domestic consumption basket in the NGO country j. Our model predicts no role for trade costs between the NGO country j and the sourcing country k, τ_{kj}. The negative effect of the sourcing trade costs, τ_{ki}, differentiates our model from other conceivable alternative gravity models.

We also analyze other determinants that affect the triadic NGO campaigns and highlight in particular the importance of a multilateral sourcing trade resistance of the firm country i on *i*-*j*-*k* campaigns. The reason is that for a given level of the sourcing trade costs, τ_{ki}, a high average trade resistance for importing inputs increases the factor content of inputs imported from country k, driving up the salience of a campaign if the input from k was produced unethically.

Finally, our theoretical framework highlights that increased economic globalization (falling trade costs) induces an internationalization of NGO activity, even when (as in our setup) NGOs act as intrinsically domestic agents, proposing campaigns to a domestic audience and raising funds only domestically. Indeed, increased trade openness in inputs and final goods increases the number of campaigns that involve one or two foreign countries, drawing local NGOs to the international stage, turning them into "local global watchdogs".

The paper then brings the main testable implications of our three theoretical results to the data. We use data collected by Sigwatch, a consultancy firm that provides international corporations with daily monitoring of NGO activity in their sector. Each observation in the data (a campaign) contains the *i*-*j*-*k* information needed to estimate triadic gravity equations.

We start by testing our second result on the effect of bilateral trade costs. To do so, we use a sample of our data that contains only campaigns where all three countries differ ($i \neq j \neq k$), which we refer to as "all-international" campaigns. We estimate a triadic gravity equation at the NGO level and find strong evidence for the negative effects predicted by our

model for the sourcing trade costs τ_{ki} and for the export trade cost τ_{ij}. Interestingly, we do not find significant results for the third possible trade cost, τ_{kj}, which does not play any role in our model.

We then test our third result on "local global watchdogs", that implies that we should observe home bias in the activity of – intrinsically domestic – NGOs. Indeed, 74% of campaigns have at least one domestic component, that is, either the country of the firm, i, and/or the country where the criticized action occurs, k, are identical to the NGO country j. At the same time, however, there is a significant amount of *international* activity of NGOs in the data, with 60 % of campaigns involving at least one foreign country (from the viewpoint of the NGO). This is explained by the fact that one third of campaigns in our data have one domestic and one international component. We use a sample including campaigns with domestic elements to estimate triadic gravity equations. For this, we include a measure of intra-country distance and dummy variables for internal trade ($i = j$), internal sourcing ($i = k$) and internal action ($j = k$). In line with the theoretical predictions, we find a strong domestic component (home bias) of NGO activity with the dummy variables for internal trade and internal sourcing coming out highly significant.

Finally, we test our theoretical implication of negative assortativity in campaigns, implying a negative correlation between NGO efficiency and the attractiveness of its target firms. We first highlight that heterogeneity looms large in the data on both sides: about 20% of NGOs account for about 80 % of campaigns and about 80 % of campaigns go against roughly 20% of firms in the sample. Exploiting then our results from the NGO-level triadic gravity estimation, we use the NGO fixed effects estimated from our preferred specification as a measure of NGO efficiency and correlate it with a measure of firm attractiveness as a target. Our analysis confirms the predicted negative correlation in the data.

At a general level, this paper is motivated by the extensive sociological and political science literature on the emergence of what has been described as "transnational civil activism" (Keck & Sikkink 1998; Batliwala & Brown 2006; Tarrow 2005) or "global civil society" (Edwards & Gaventa 2001; Lipschutz & Rowe 2005). Vogel (2008) provides an extensive review of this literature.

From an analytical perspective, our framework is deeply rooted in the gravity literature in International Trade (see Head & Mayer (2014) for an overview). While the gravity literature is mainly concerned with the analysis of international trade in goods, it has been extended to the analysis of other international activities such as service offshoring (Head, Mayer & Ries 2009), migration flows (Anderson 2011), FDI flows (Head & Ries 2008), financial investment (Portes & Rey 2005) and, most relevant in our context, trade in intermediate goods (e.g., Bergstrand & Egger 2010; Conconi, Magerman & Plaku 2020). We extend both the theoretical and the empirical gravity literature to the analysis of international NGO campaigns.

On the theoretical side, we contribute to the gravity literature by extending the model of international trade in Chaney (2008) to trade in intermediate inputs and by embedding NGOs into this framework. From our model we derive a triadic gravity equation for NGO

campaigns. Paying close attention to the gravity forces shaping sourcing decisions, our paper relates to recent work on multinational production (Tintelnot 2017; Arkolakis, Ramondo, Rodríguez-Clare & Yeaple 2018; Bernard, Jensen, Redding & Schott 2018; Head & Mayer 2019). In these models, firms decide where to set up production plants and/or which markets to serve from which plant. This implies that, similar to our model, international sourcing matters and three countries are involved. With respect to the sourcing decision, our modeling also relates to Antràs, Fort & Tintelnot (2017) and Bernard, Jensen, et al. (2018). As these studies investigate the structure of multinational production, the models include mechanisms that limit and specify the number of sourcing countries and sourcing relations of a firm. As the focus of our analysis is on NGO campaigns, the exact determinants that shape the geography of multinational production and international sourcing are not our primary concern. This allows us to use a parsimonious model of international sourcing, which preserves tractability. The key difference to the above papers is our object of study: While models of international sourcing and multinational production stop at the analysis of international trade flows, we take the analysis a step further and analyze how these trade flows shape international social activism.

Our work also connects to research in International Trade and related fields that analyzes the growing discontent with economic globalization, the so-called "globalization backlash" (Colantone, Ottaviano & Stanig 2022; Harms & Schwab 2020). This includes, among others, studies on trade and inequality (e.g., Helpman, Itskhoki & Redding 2010 and Egger & Kreickemeier 2012), trade and the environment (e.g., Copeland & Taylor 1994 and, also using a gravity framework, Aichele & Felbermayr 2015), "fair" and "unfair" trade (e.g., Richardson & Stähler 2014 and Zavala 2020) or the influence of lobbies on Free Trade Agreements (e.g., Blanga-Gubbay, Conconi & Parenti 2021). While these are examples for common sources of discontent with economic globalization, some recent studies also analyze this globalization backlash more directly. Grossman & Helpman (2021) study its role in populist trade policy. Egger & Fischer (2020) show that it may originate in the effect of increased trade in tasks. We contribute to this analysis by placing advocacy NGOs at center stage: a new type of agent that embodies, channels and institutionalizes this increased resistance to (some aspects of) economic globalization.

With NGOs as a new agent that responds to firms' internationalization decisions, we introduce elements of the literature on "private politics" into the field of International Trade. Starting with Baron (2001, 2003), this literature focuses on activists attempting to affect firm behavior not through lobbying for regulation (public politics) but through campaigns and boycotts of firms (private politics). It takes an Industrial Organization perspective and analyzes the interaction between activists, firms and possibly a regulator in partial equilibrium under different market structures, allowing for strategic interactions between all parties.[4] Strongly cutting back on the specifics of the interactions between activist (NGO) and firm, we take a more macro-level perspective by analyzing the industry equilibrium of

[4] Some of the main contributions include Innes (2006), Baron & Diermeier (2007), Lyon & Salant (2013), Baron (2010), as well as Baron (2016), Egorov & Harstad (2017) and Daubanes & Rochet (2019).

our model, which allows us to analyze patterns of the NGO sector as a whole. Moreover, we are interested in the activity of activists (NGOs) in the context of economic globalization. We therefore embed these activists into a model of international sourcing and trade in final goods and thereby bridge the gap to the literature on international trade and global production.

Closest to our work are therefore several other papers that also introduce elements of private politics into the field of International Economics. Conconi (2003) studies the effect of green lobbies on trade and environmental policies. Aldashev & Verdier (2009) analyze the international competition for funds among development-oriented NGOs. Aldashev, Limardi & Verdier (2015) consider the impact of NGO campaigns on industry structure in a setting with endogenous mark-ups and monopolistic competition. Krautheim & Verdier (2016) analyze the endogenous emergence of a consumer-financed NGO in response to the offshoring decision of a firm. Herkenhoff & Krautheim (2022) introduce ethically concerned consumers and consumer boycotts into a property rights model of the international organization of production.[5]

Our analysis contributes to empirical studies addressing the interaction of activists and firms in the context of global production. Most contributions use qualitative information and case studies (Hendry 2006; Lenox & Eesley 2009; O'Rourke 2005). Some exceptions stand out: Harrison & Scorse (2010) identify a causal effect of the campaign against Nike on wages in the Indonesian textile sector. Couttenier & Hatte (2016) and Couttenier, Fleckinger, Glachant & Hatte (2019) use quantitative information on NGO activity based on a data set with a focus on very large firms. Fontagné & Limardi (2021) study the role of social activists for the effect of preferential market access, granted conditional on compliance with labor rights, on wages in Indonesia.

Our paper uses the same data source as Hatte & Koenig (2020), who introduce the Sigwatch data on NGO campaigns to the research community. Aside from presenting stylized facts on international and domestic NGO activity, Hatte & Koenig (2020) present gravity-style regressions aggregated at the (bilateral and triadic) country level, without making use of NGO-level information. Their paper's main goal is to provide theory-free estimation of frictions in international NGO campaigns. Different from that piece of work, our analysis contributes to the literature in the following way. First, we propose to our knowledge the first theory of triadic NGO campaigns explicitly modeling firms' sourcing and export decisions, value chain campaigns and two-sided heterogeneity between firms and NGOs. Importantly, this framework allows us to make two predictions at the NGO level: sourcing frictions affect the triadic NGO-level campaigns; and two-sided heterogeneity combined with fundraising implies negative assortativity. Second, we test these NGO-level predictions with NGO-level

[5] A related emerging literature includes what we would consider the response of firms to activist pressure (Corporate Social Responsibility, Responsible Sourcing, Corporate Codes of Conduct, relational contracts, ...) into the context of international sourcing (Herkenhoff, Krautheim, Semrau & Steglich 2021; Amengual & Distelhorst 2020; Boudreau 2021; Cajal-Grossi, Macchiavello & Noguera 2020). While these papers are interested in the interaction of international sourcing and private politics measures taken by firms, we are interested in the geography of international economic activity shaping the geography of international social activism.

empirics, especially NGO-level triadic gravity regressions – a dimension of the data that has not been exploited to date. A notable feature of our theory-grounded estimation is that we can use the estimated NGO fixed effects to test key theoretical predictions.

The remainder of the paper is structured as follows: Section 2 presents our model of international trade and sourcing with heterogeneous firms, campaign targeting and fundraising by heterogeneous NGOs. Section 3 tests the implications of our triadic gravity equation of international NGO activism at the NGO level and at the country level. Section 4 offers some conclusions and avenues for future research.

2. Theory

In this section we analyze a model of international trade and global sourcing in which NGOs campaign against firms in response to infringements along their international value chains. We use the model's international economic transactions by firms to analyze the geography of value chain campaigns that arises from NGOs responding to firm choices in a globalized economy.

2.1. NGOs and the salience of value chain campaigns

Baron (2016) argues that after largely unsuccessful attempts to campaign against supplier firms, a major shift in NGO strategy has been the implementation of *value chain campaigns*. In value chain campaigns, NGOs leverage the prominence of final goods producers in order to mobilize donors. A campaign κ therefore involves up to three different countries: the country of the NGO (j), the country of the final goods producer (i) and the sourcing country (k), where the "unethical" infringement took place. As an example, take *Greenpeace USA* campaigning against *Nestlé* (Switzerland) for the use of palm oil produced by the independent supplier *Sinar Mas* in Indonesia (see Greenpeace 2010).[6]

We model the objective of an NGO as maximizing the number of campaigns it runs against unethical infringements.[7] To run a campaign, the NGO has to incur a cost of p_C, which is identical for all campaigns. This implies that a campaign is carried out if and only if the NGO manages to raise sufficient funds to pay its price p_C.[8]

[6] Note that the same agents may be involved in different campaigns: *Greenpeace USA* may for example propose other campaigns against *Nestlé* (same firm) for different infringements or against other firms for sourcing palm oil from *Sinar Mas* (same infringement), so that a single campaign is defined by the triplet of actors involved.

[7] Note that we are not taking any normative stand on what constitutes unethical production. In our context, this simply constitutes a precondition for successful fundraising.

[8] This may appear as painting an excessively opportunistic picture of the NGOs. One may object that in practice, NGOs are often run by motivated agents, who may not only let the funding opportunities decide on the campaigns to be chosen. We will see below that in our model, this preference for some campaigns over others is attributed to consumers/donors. This approach is isomorphic to attributing an intrinsic preference for some campaigns to motivated agents working in NGOs and combining this with consumers/donors being indifferent with respect to which campaigns are implemented. Ultimately, we simply need the NGO-donor nexus to generate a ranking of the desirability of the different possible campaigns according to their salience. In reality, NGO and donor preferences are hard to distinguish, as they interact in multiple ways with NGOs tailoring campaigns to donor preferences as well as NGOs influencing donor perceptions and priorities towards the NGOs' preferences.

We consider N countries. Country j is endowed with L_j units of labor. There is a measure of NGOs in country j proportional to economic country size. We model NGOs as intrinsically domestic agents. Specifically, we assume that NGOs tailor their campaigns to their national audience only, so that campaigns by an NGO in country j are exclusively funded by donors in j. This appears plausible as NGOs tend to be founded by local activists, rely at least in part on the work of local volunteers and tend to be financed by domestic donors. This allows us to highlight how campaigns by intrinsically domestic NGOs are globalized by their targets' international sourcing and export decisions.[9] When NGOs cater to domestic donors, they have an incentive to choose those campaigns their domestic donor base and stakeholders can best relate to, which we refer to as a campaign with high *salience*.

We assume that NGOs are heterogeneous with respect to their efficiency ξ. This implies that, everything else equal, an NGO with a high efficiency can generate a higher salience for its proposed campaigns and is therefore more likely to secure the necessary funding compared to an NGO with a low efficiency. We can therefore think of this efficiency as a fundraising efficiency, with some NGOs being better than others at convincing donors that their campaigns deserve funding.

Even very efficient NGOs may find it more or less difficult to raise funds for different campaigns. This depends on how difficult it is to mobilize donors for a given campaign. Campaigns in our model take their starting point at the domestic consumption basket – the basket of goods the domestic donors consume. We assume that final products that feature prominently in the consumption basket also generate higher salience when they are criticized for containing unethically produced inputs. But it also matters to which extent they contain the criticized input: a high factor content of an unethical input in the final product, relative to the other inputs, also scales the salience of a proposed campaign.

We label a sourcing transaction of a firm the complete amount of the country k intermediate sourced by the firm. We assume that for each sourcing transaction, there is an exogenous probability δ that production took place under unethical conditions. This may lead an NGO to raise funds for a campaign κ against the firm on the grounds of the infringement in its value chain. Such a campaign is characterized by the offering NGO in country j (with efficiency ξ), by the targeted firm in country i (producing variety ω) and the sourcing country k (where the sourcing transaction originates). The salience of such a proposed campaign is given by

$$\mathcal{S}(\kappa) = \xi \; x_{ij}(\omega) \; s_{ki}(\omega). \tag{1}$$

This implies that the salience a given NGO can generate for a given campaign κ increases in the NGO's efficiency ξ, increases when consumption in country j of variety ω (produced in country i), $x_{ij}(\omega)$, is high and when the relative factor content of the criticized input in variety ω, $s_{ki}(\omega)$, is high.

[9] These value chain campaigns – driven by international trade an sourcing of firms – are at the center of our analysis. In section 2.6.3 we discuss how the case of NGOs organized in international networks relates to our approach.

As the salience of a campaign determines the fundraising success, we can already see from equation (1) how campaigns of a domestic NGO proposing campaigns to domestic donors can be "globalized" by the sales ($x_{ij}(\omega)$) and sourcing ($s_{ki}(\omega)$) decisions of firms. Take for example two chocolate bars, one traditionally produced and sold exclusively in the US and the other in Australia only. As US consumers/donors are much more exposed to the US chocolate bar (know about it, consume it, see its market share and marketing, ...), US NGOs will find it much easier to secure the support of volunteers and donors if they start a campaign against the US chocolate bar producer than when suggesting a campaign against the widely unknown Australian chocolate bar producer. With increasing trade in final goods, the Australian chocolate bar may, however, enter the US market at large scale, turning the previously unknown producer into a prime target for campaigns by US NGOs. Moreover, assume that both chocolate bars are produced with palm oil from Indonesian plantations, which were established by destroying old-growth rain forest. In this case, the internationalization of the US chocolate bar producer's value chain turns a domestic campaign into an international one.

2.2. Preferences: Consumption and Donations

In each country, there are three sectors producing a homogeneous consumption good, an intermediate input and a differentiated product, respectively. Consumers in country j derive utility from the consumption of varieties of the differentiated good and the homogeneous good. Moreover, consumers derive "warm glow" utility from financing campaigns.[10] The warm glow is higher for financing campaigns with a higher salience $\mathcal{S}(\kappa)$. When financing a campaign with higher salience, consumers are under the impression that their donation matters more.

Preferences are summarized by the following functional form:

$$U_j = \left(h_j + \int_{\mathcal{K}_j} \mathcal{S}(\kappa)\, \mathrm{d}\kappa \right)^{1-\mu} \left[\int_{\Omega_j} q_j(\omega)^{\frac{\sigma-1}{\sigma}}\, \mathrm{d}\omega \right]^{\frac{\sigma}{\sigma-1}\mu}, \tag{2}$$

where $0 < \mu < 1$ and $\sigma > 1$. The quantities h_j and $q_j(\omega)$ denote consumption levels of the homogeneous good and the differentiated varieties, respectively, and Ω_j is the set of varieties available in j (including domestic as well as imported varieties). Moreover, consumers draw warm glow utility from donating for campaigns $\kappa \in \mathcal{K}_j$, where $\mathcal{K}_j$ is the set of all campaigns by j NGOs that receive funding.[11] The term $\int_{\mathcal{K}_j} \mathcal{S}(\kappa)\, \mathrm{d}\kappa$ therefore represents total warm glow donors in j obtain.[12]

Besides the warm glow term, this is a standard preference structure. CES preferences

[10] We adopt the concept of preferences featuring a "warm glow" of charitable giving from Andreoni (1989, 1990). Introducing donations as a component of the utility function has become standard in the literature on charitable giving.

[11] Recall that only j NGOs offer campaigns to donors in country j. These campaigns can involve any combination of target and sourcing countries (i and k). Therefore, $\mathcal{K}_j$ includes the entire set of campaigns financed by donors in country j.

[12] Note that the salience an NGO can generate for a given campaign opportunity is independent of the number of other NGOs choosing the same campaign opportunity, i.e., there is no crowding out along this dimension.

determine utility from the consumption of the available varieties of the differentiated good and utility from the consumption of the homogeneous good directly stems from its consumption level. Both elements are then combined with a Cobb-Douglas structure, implying that consumers spend a constant fraction of their income on both components. The warm glow term being added to the consumption of the homogeneous good implies that warm glow utility is traded-off against the consumption of the homogeneous good. This modeling choice has the advantage that it allows for flexible expansion and contraction of NGO donations depending on opportunities to finance campaigns with high salience. To see this, note that due to the Cobb-Douglas structure of utility (equation (2)), consumers allocate a fixed fraction $(1-\mu)$ of their income to consumption of good h and donations. To determine the demand for campaigns, we can therefore exclusively focus on the sub-utility $h_j + \int_{\mathcal{K}_j} \mathcal{S}(\kappa)\,\mathrm{d}\kappa$. On the one hand, each unit of h that is consumed yields a sub-utility of 1 at a price of 1. On the other hand, campaigns provide different levels of warm glow (see equation (1)) for a price of p_C per campaign. This implies that all campaigns receive funding where the funding condition $\mathcal{S}(\kappa) \geq p_C$ holds. This determines the set of campaigns by NGOs in country j that receive funding ($\mathcal{K}_j$ in equation (2)). The remainder of the fraction $(1-\mu)$ of income is spent on good h.[13] Our modeling choice of having the warm glow of donations traded off against the numeraire has the great advantage that shocks like falling trade costs with one partner may change the number of campaigns involving that partner, but leaving campaigns involving other partners unaffected.[14]

2.3. Goods and Input Market Determinants of Salience

We now turn to the economic determinants of the salience function (equation (1)) by characterizing the goods and input market equilibrium of our multi-country model of international trade and global sourcing. The focus of our analysis is on how economic globalization shapes the internationalization of NGO campaigns – not the other way around. For the sake of tractability, we have therefore chosen a modeling structure which implies that the goods and input market equilibrium can be determined independently of the equilibrium on the market for social activism. The intuition is that NGOs observe economic globalization and respond to it by carrying out campaigns to meet demand by consumers. These campaigns do not feed back, however, into decisions at the firm level. This allows us to pin down the determinants of the salience of a campaign (international sourcing and

[13] As standard in the literature, we consider only equilibria in which the homogeneous good is produced in all countries, which amounts to assuming that the size of the differentiated goods sector in the economy is sufficiently small. We make a related assumption regarding the warm glow: we only consider settings where financing NGOs does not entirely crowd out consumption of the homogeneous good. This assumption is complementary to the first assumption, as a small differentiated goods sector also limits the number of possible campaigns.

[14] Including the crowding out of domestic campaigns by increasingly attractive foreign targets (e.g., by placing warm glow in a third Cobb-Douglas nest) would strongly reduce tractability. While it appears an interesting issue in its own right, it seems unlikely that this could have any effect on those implications of our model we highlight and test in this paper.

trade) from the goods and input market equilibrium of the model.[15]

We will then turn to the market for social activism in section 2.4, where we analyze how the economic globalization of firms shapes the patterns of international NGO campaigns.

2.3.1. Production

The homogeneous consumption good h is produced under perfect competition. Total output of the homogeneous good in country i is given by $w_i L_i^h$, where w_i represents the exogenous labor productivity in the homogeneous goods sector in country i and L_i^h is the amount of labor allocated to this sector. We use good h as the numéraire. It is freely traded and in line with the literature (Chaney 2008) we consider only equilibria where good h is produced in all countries. With frictionless mobility of labor across sectors, the wage in country i is then equal to w_i. We define the effective labor endowment of country i as $w_i L_i$, which represents total labor in efficiency units expressed in terms of the homogeneous good.

A country-specific intermediate input b is produced in the second sector. Firms operate under perfect competition and we normalize productivity in sector b to 1 in all countries. Therefore, total output of sector b in country k is given by L_k^b, the amount of labor allocated to the production of the intermediate input. Wage equalization between sector h and sector b implies that the (domestic) price of the intermediate input in country k equals w_k.

We now turn to the discussion of the differentiated goods sector. As in Chaney (2008), we assume that the mass of firms in country i is exogenous and proportional to country size, which we capture by the effective labor endowment, $w_i L_i$. Without loss of generality, we normalize the factor of proportionality to 1. Each firm produces a differentiated variety ω and firms operate under monopolistic competition. Firms differ in their levels of productivity. A firm with productivity φ transforms an input bundle B_i into φB_i units of output.

Firms combine the country-specific intermediate inputs from all countries into the input bundle B_i with Cobb-Douglas technology:

$$B_i = \prod_{k=1}^{N} b_{ki}^{\beta_k}, \qquad \text{where} \qquad \sum_{k=1}^{N} \beta_k = 1. \tag{3}$$

The country of origin of the intermediate input is indexed by k and b_{ki} is the quantity of the country k input in one unit of the input bundle used by firms in country i. We denote iceberg trade costs of exporting the intermediate input from country k to country i by τ_{ki}.

[15] Clearly, for a micro-level analysis of the firm-NGO interaction, an effect of NGO campaigns on demand should be a key feature of the analysis (e.g., Krautheim & Verdier 2016). With our focus on the general geographical patterns of NGO campaigns, we take a more macro-level perspective and abstract from this effect, assuring tractability of the model. If we introduced a negative impact of campaigns on demand, this would imply an incentive to reduce sales in order to be less visible and therefore less prone to become the target of a campaign. Neither do we think that reducing sales in order to be less visible to consumers only to dampen the risk of campaigns is a key mechanism in real-world firm-NGO interactions; nor do we see reasons to believe that introducing this incentive would alter our main mechanisms or the gravity patterns we seek to model. In a micro-level study, where firm strategies of avoiding or coping with damaging NGO campaigns were at the center of the analysis, one would probably model more appropriate instruments (like advertising, CSR investment or "greenwashing") for firms to respond to the threat of NGOs. This would be an interesting, but very different type of analysis from the one we undertake in this paper.

The price of the intermediate input from k in i is therefore given by $p^b_{ki} = w_k\,\tau_{ki}$.

For trade in differentiated goods, we denote the exporting country by i and the importing country by j, such that trade costs are given by τ_{ij}. For a firm in i with productivity φ, total cost to deliver q units to j are given by $c_{ij}(q) = \frac{P^B_i\,\tau_{ij}}{\varphi}\,q$, where P^B_i is the price of one unit of the optimal input bundle.

2.3.2. Determinants of salience: the relative factor content, $s_{ki}(\omega)$

Firms maximize profits π_{ij} by choosing their optimal input bundle and setting their price. The optimal input bundle B_i is determined by choosing the cost-minimizing combination of inputs b_{ki}, taking into account input prices p^b_{ki}: $\min_{b_{ki}} \sum_{k=1}^{N} p^b_{ki}\; b_{ki}$ s.t. $B_i = 1$. This leads to the following optimal quantity of country k's intermediate input in each input bundle used by i firms:

$$b_{ki} = \Big(\frac{w_k\;\tau_{ki}}{\beta_k}\Big)^{-1}\; P^B_i, \tag{4}$$

where P^B_i is the price of one unit of the optimal input bundle in i, which is given by

$$P^B_i = \prod_{l=1}^{N}\Big(\frac{w_l\;\tau_{li}}{\beta_l}\Big)^{\beta_l}. \tag{5}$$

Note that equation (4) is independent of firm productivity, which implies that all firms have the same optimal input bundle. This implies that the relative factor content of the input from country k is the same for all firms in country i, i.e., $s_{ki}(\omega) = s_{ki}\,\forall\,\omega$.[16] What does differ across firms, however, is the volume of the sourcing transaction (the total amount of the input b_{ki}) and whether this sourcing transaction is considered unethical by NGOs (with probability δ) and may therefore trigger a campaign.

If the sourcing transaction is considered unethical, its volume matters for campaign financing. This is because the relative factor content of a final product, s_{ki}, affects the salience of a proposed campaign in equation (1). As labor is the only factor of production, this amounts to the relative quantity of labor from country k that is embodied in the production of the input bundle used by firms from country i, which is given by $s_{ki} = \frac{b_{ki}}{\sum_{l=1}^{N} b_{li}}$. Using the optimal input quantities from equation (4), this allows us to compute the relative factor content of input k in the production of variety ω as

$$s_{ki} = \Big(\frac{w_k\;\tau_{ki}}{\beta_k}\Big)^{-1}\,\mathcal{C}^s_i, \qquad \text{where} \qquad \mathcal{C}^s_i \equiv \Big[\sum\nolimits_{l=1}^{N}\Big(\frac{w_l\;\tau_{li}}{\beta_l}\Big)^{-1}\Big]^{-1}. \tag{6}$$

The relative factor content of k-inputs in the input bundle of firms in i, s_{ki}, is the first

[16] Note that for the sake of analytical tractability we take the probability δ that a given sourcing transaction if of the unethical type (and can therefore trigger a campaign) to be exogenous. This implies that we abstract from any deliberate endogenous choice of the final good producer to source unethical inputs or the supplier to use unethical technology or not. While some papers like, e.g., Fu, Gong & Png (2018) or Herkenhoff & Krautheim (2022), place the determinants of this technology decision in a specific firm-supplier match at center stage, we are interested in the "big picture" of campaigns emerging from an NGO sector responding to economic globalization.

variable from the goods market side that affects NGO campaigns through the salience function in equation (1). It decreases in the total cost (factor costs w_k and bilateral trade costs τ_{ki}) of providing the input to firms in i and is higher when the factor intensity of the k input (β_k) is high. Moreover, it increases in $\mathcal{C}_i^s$, which we term *multilateral sourcing trade resistance*. It summarizes total costs of providing all N inputs to firms in country i, weighted by their respective factor intensities.

2.3.3. Determinants of salience: exports, $x_{ij}(\omega)$

We derive equilibrium exports of a variety of the differentiated good from country i to country j, $x_{ij}(\omega)$. Consumers in j maximize utility subject to their budget constraint $Y_j = w_j L_j (1 + \pi)$, where Y_j represents total income stemming from labor income and firm profits.[17]

Our choice of preferences in equation (2) implies that consumers spend μY_j on the differentiated goods sector. Demand for variety ω is then given by

$$q_{ij}(\omega) = p_{ij}(\omega)^{-\sigma} \; P_j^{\sigma-1} \; \mu Y_j, \tag{7}$$

where the price $p_{ij}(\omega)$ is the price charged by an i firm to a j consumer. With Ω_{nj} denoting the set of varieties from country n available in j, the price index in country j is $P_j = \left(\sum_{n=1}^{N} \int_{\Omega_{nj}} p_{nj}(\omega)^{1-\sigma} \, \mathrm{d}\omega \right)^{\frac{1}{1-\sigma}}$. Taking into account costs of the optimal input bundle (equation (5)), firms do standard mark-up pricing:

$$p_{ij}(\varphi) = \frac{\sigma}{\sigma - 1} \; \frac{P_i^B \; \tau_{ij}}{\varphi}. \tag{8}$$

We assume that productivities are distributed according to a Pareto distribution with the following density function: $g_\varphi(\varphi) = \gamma \; \varphi^{-\gamma-1}$. We impose a minimum productivity level of unity and the standard assumption of $\gamma > (\sigma - 1)$, which allows to compute the equilibrium price index:

$$P_j = \frac{\sigma}{\sigma - 1} \left(1 - \frac{\sigma - 1}{\gamma} \right)^{\frac{1}{\sigma-1}} \theta_j, \qquad \text{where} \qquad \theta_j \equiv \Big[\sum_{n=1}^{N} w_n L_n (P_n^B \; \tau_{nj})^{1-\sigma} \Big]^{\frac{1}{1-\sigma}}. \tag{9}$$

The second key determinant of the salience function in equation (1) are equilibrium

[17] We follow Chaney (2008) in assuming the existence of a global mutual fund which owns all firms, therefore collects aggregate world profits and redistributes them to its shareholders. Each consumer owns a number of shares equal to her productivity in sector h and π is the dividend per share. This implies that there is no home bias in the investment portfolio. Arkolakis, Demidova, Klenow & Rodríguez-Clare (2008) show how an extreme (complete) home bias can be introduced into such models. Reality clearly lies between the two polar cases. The Chaney (2008) variant has a great advantage in terms of tractability in our context. All consumers owning w_i shares of the global fund, equalizes income from dividends across countries by the scaling constant w_i. Moreover, the assumption of the freely traded homogeneous good renders wages across countries equal by the same constant w_i. Therefore, the two assumptions taken together assure that income of consumers in all countries is identical by the constant w_i. This greatly improves tractability (but clearly precludes any analysis of endogenous cross-country income differences and welfare effects, which are not within the scope of this paper).

firm-level exports from country i to consumers in j, which are given by

$$x_{ij}(\varphi) = \mathcal{C}^x \; Y_j \left(\frac{P_i^B \; \tau_{ij}}{\theta_j} \right)^{1-\sigma} \varphi^{\sigma-1}, \qquad \text{where} \qquad \mathcal{C}^x \equiv \mu \Big(1 - \frac{\sigma - 1}{\gamma} \Big). \tag{10}$$

Export sales of a firm in country i to consumers in country j increase in the productivity of the firm, φ, and market size; they decrease in bilateral trade costs, τ_{ij}. Moreover, they increase in θ_j, which we term *multilateral consumption trade resistance* of country j and decrease in P_i^B, which we label *multilateral upstream trade resistance* of country i.

Country i is at a pivotal position in the triadic geographical structure of our model. Gravity forces shape its sourcing patterns and other gravity forces shape its connections to its export markets. This also implies that two trade resistance terms affect exports of firms in country i. Multilateral upstream trade resistance P_i^B is the price (index) of the optimal input bundle used in country i. It measures how costly it is for a firm in i to source one unit of the optimal input bundle. This cost crucially depends on all the bilateral trade costs between country i and its input suppliers: high trade resistance against upstream suppliers drives up production costs in country i – and therefore reduces exports of final products. Note that despite the fact that x_{ij} from equation (10) is a *bilateral* gravity equation, the *triadic* structure of the model is reflected in the multilateral upstream trade resistance term. The multilateral consumption trade resistance θ_j includes the bilateral trade costs firms from all countries have to incur when exporting final consumption goods to consumers in j. When θ_j is high, the market environment is relatively favorable for firms serving market j from country i.

To close the model, we compute equilibrium dividends per share (π) in appendix B.4. We have now derived all the components of trade in intermediates and final goods that we need in order to determine the salience of a triadic NGO campaign in equation (1). This allows us to characterize the equilibrium campaigns arising from the market for social activism.[18]

2.4. Market for Social Activism with Two-Sided Heterogeneity

The equilibrium patterns of international trade in intermediates and final consumption goods constitute the environment that NGOs observe and respond to. In this section, we analyze how NGOs offer campaigns on a market for social activism, where consumers/donors have a demand for campaigns that appear relevant to them.

We take the measure of NGOs in country j as exogenous and proportional to the effective labor endowment. It is therefore given by $\psi_j \, w_j L_j$, where $\psi_j > 0$ is an exogenous scaling factor. Recall that NGOs are willing to carry out any campaign for which they can raise sufficient funds.[19] Therefore, a campaign is supplied if and only if the necessary funds p_C

[18] To keep the presentation focused on the derivation of our main results, we do not present an analysis of our triadic gravity model concerning trade in intermediate inputs. We refer the interested reader to section 2.2 in the working paper version of this paper (Koenig, Krautheim, Löhnert & Verdier 2021).

[19] Also recall that we discussed in footnote 8 that in reality, NGOs may have their own opinions and priorities over campaigns and so may consumers. We argued that it is not essential which of the two agents generates the ranking of the desirability of campaigns. In our modeling we attribute it to consumers.

can be raised from donors. From the perspective of consumers, p_C therefore represents the price of a campaign.

We now characterize the equilibrium of the market for social activism, analyzing which *i*-*j*-*k*-ξ-φ combinations will lead to NGO campaigns. Put differently, we ask: for a given triad of countries, which combinations of NGO efficiency and firm productivity generate the required salience to raise the necessary funds?

Note that we have two-sided heterogeneity in our model: it is the *combination* of NGO efficiency ξ (its *ceteris paribus* ability to generate higher salience) and the productivity of the firm φ (through $x_{ij}(\varphi)$) that determines whether a campaign on a country triad receives funding. We define the cutoff productivity $\tilde{\varphi}_{ijk}(\xi)$ as the productivity of a firm in i which implies sales volume (and hence an implied salience) that is just high enough to stimulate donations for a campaign by a j NGO with efficiency ξ criticizing conduct in k. This cutoff productivity makes the funding condition hold with equality, for a given ξ and some *i*-*j*-*k* triad of countries:

$$\xi \; s_{ki} \, x_{ij}(\tilde{\varphi}_{ijk}) \equiv p_C. \tag{11}$$

Plugging in equations (6) and (10) and using the results from the previous section, solving for $\tilde{\varphi}_{ijk}$ yields the following expression for the equilibrium cutoff productivity:

$$\tilde{\varphi}_{ijk}(\xi) = (w_i L_i)^{\frac{1}{\gamma}} \; \Delta_{ijk}^{-\frac{1}{\gamma}} \; \xi^{\frac{1}{1-\sigma}}. \tag{12}$$

At this point we first encounter the *triadic gravity term*, Δ_{ijk}:

$$\Delta_{ijk} \equiv \mathcal{C} \; w_i L_i \, (w_j L_j)^{\frac{\gamma}{\sigma-1}} \; \underbrace{\left(\frac{w_k \; \tau_{ki}}{\beta_k \; \mathcal{C}_i^s} \right)^{-\frac{\gamma}{\sigma-1}}}_{G_{ki}} \; \underbrace{\left(\frac{\tau_{ij} \; P_i^B}{\theta_j} \right)^{-\gamma}}_{G_{ij}}, \tag{13}$$

where $\mathcal{C} \equiv \left[\left(1 - \frac{\sigma-1}{\gamma} \right) \frac{\mu}{\sigma-\mu} \frac{\sigma}{} \, p_C^{-1} \right]^{\frac{\gamma}{\sigma-1}}$. The term Δ_{ijk} is at the core of our paper and the Greek letter representing it is chosen for its triangular shape. This term collects all the relevant gravity variables shaping the trade in intermediates and final goods that affect the funding of NGO campaigns. As it will be at the core of our main results, we provide a detailed interpretation in the next section.

Equation (12) highlights the role of two-sided heterogeneity in our model. Due to $\sigma > 1$, the cutoff productivity decreases in NGO efficiency ($\partial \tilde{\varphi}_{ijk}(\xi)/\partial \xi < 0$). This implies that more efficient NGOs reach deeper into the pool of potential targets than less efficient NGOs. At the receiving end, a more productive firm is a more attractive target allowing even NGOs with lower efficiencies to start a campaign. Among other things, the triadic gravity term Δ_{ijk} affects this relationship: financing campaigns involving stronger gravity impediments to final goods trade and sourcing requires higher NGO efficiency.

This two-sided heterogeneity is an important feature of our model, as it determines both the portfolio of target firms of an NGO and the set of NGOs campaigning against a given

firm. According to equation (12), it also implies that there is negative assortative matching between NGOs and target firms. The firms targeted by an NGO with lower efficiency are a subset of the firms targeted by a more efficient NGO. The latter faces a lower cutoff productivity and therefore adds less attractive (i.e., less productive) firms to its portfolio. This implies that more efficient NGOs choose targets that are on average less attractive. By the same token, highly productive firms are tarted by less efficient NGOs on average. The following proposition summarizes this result, which will be tested empirically in section 3.5.

Proposition 1 (Two-Sided Heterogeneity)**.** *NGOs with higher efficiency perform a larger measure of campaigns and more productive firms receive a larger measure of campaigns. More efficient NGOs target firms that are on average smaller (i.e., less productive); larger (more productive) firms are targeted by NGOs with lower average efficiency levels (negative assortativity).*

Proof. Proof in the text. □

Note that firm productivities are distributed on $[1, \infty)$. We make the analog assumption for NGO efficiency: we normalize its minimum level to unity and do not impose an upper bound.[20] As for tractability we do not truncate the efficiency distribution of NGOs, there will be a small measure of NGOs that are so efficient in generating salience that they could even secure funding for campaigns against firms with productivities below 1. As no such firms exist, for these "hyper-efficient" NGOs, the effective cutoff is equal to 1.[21] While this case can arise in theory, this is clearly not a case with empirical relevance.[22]

We denote the *effective cutoff productivity* as

$$\tilde{\varphi}^*_{ijk}(\xi) \equiv \max\left\{\tilde{\varphi}_{ijk}(\xi); 1\right\}. \tag{14}$$

This includes the case of NGOs that are so efficient that they target *all* firms that use questionable inputs in a given *i*-*j*-*k* country triad. This is the case for NGOs above the *discontinuity threshold*, which is defined as $\tilde{\varphi}_{ijk}(\bar{\xi}_{ijk}) \equiv 1$ and given by:

$$\bar{\xi}_{ijk} = (w_i L_i)^{\frac{\sigma-1}{\gamma}} \ \Delta_{ijk}^{\frac{1-\sigma}{\gamma}}. \tag{15}$$

[20] Note that for the derivation of our main results (which are at the level of an individual NGO), we do not have to take a stand on the efficiency distribution. When aggregating across NGOs in our country-level analysis in the Online Appendix, we assume a Pareto distribution for NGO efficiencies.

[21] This is a common issue that arises in models with heterogeneous agents in the absence of fixed costs; see, for example, Bernard, Moxnes & Ulltveit-Moe (2018).

[22] In the spirit of Eaton, Kortum & Kramarz (2011), we can think of the observations in the data as the result of a *finite* number of draws from our *continuous* distributions. This implies that while the very small density of almost infinitely efficient NGOs carrying out all possible campaigns occurs in the theory (as for tractability the distributions are not truncated), these NGOs will, however, not be of empirical relevance as in the empirical analysis the number of observations is finite and the theoretical density goes to zero as efficiency approaches infinity.

2.5. The Geography of Social Activism

We have now derived all the elements of the model needed to compute the measure of campaigns at the NGO level. In section 2.5.1 we find that the measure of i-j-k campaigns at the NGO level is pinned down by a triadic gravity equation, which takes a very clear multiplicative form. Based on this equation, we derive and discuss our main theoretical results on triacic gravity for NGO campaigns in sections 2.5.2 to 2.5.3.

2.5.1. Triadic Gravity for NGO Campaigns

Our main theoretical results presented in this and the following two subsections concern the equilibrium campaigns of an individual NGO with efficiency ξ. We denote the measure of campaigns conducted by an NGO in j with efficiency ξ targeting firms in i for infringements in k as $n_{ijk}(\xi)$. Recall that δ is the share of ethically questionable sourcing transactions and that the NGO can target all firms with $\varphi \geq \tilde{\varphi}^*_{ijk}(\xi)$. It follows that $n_{ijk}(\xi)$ is given by

$$n_{ijk}(\xi) = \begin{cases} n^S_{ijk}(\xi) = \delta \; w_i L_i \int_{\tilde{\varphi}_{ijk}(\xi)}^{\infty} g_\varphi(\varphi)\,\mathrm{d}\varphi & \text{if} \quad \xi < \bar{\xi}_{ijk} \\ n^L_{ijk} \quad = \delta \; w_i L_i \int_{1}^{\infty} g_\varphi(\varphi)\,\mathrm{d}\varphi & \text{if} \quad \xi > \bar{\xi}_{ijk} \end{cases} \tag{16}$$

where the indices S and L stand for "small" and "large", respectively. The latter label is a euphemism in the sense that this describes the case of an NGO being so efficient that it carries out the entirety of all possible campaigns, therefore integrating from $\varphi_{\min} = 1$ to infinity. We argue in footnote 22 that these "large" NGOs are not empirically relevant when the theoretical model is brought to the data. We therefore focus our analysis here on the "small" NGOs, reporting results on the "large" ones only for completeness in appendix B.2.

Using the productivity distribution and the cutoff $\tilde{\varphi}_{ijk}(\xi)$, we can compute the NGO-level measure of campaigns $n^S_{ijk}(\xi)$. This constitutes the *NGO-level triadic gravity equation*, which is the main theoretical result of our paper:

$$n^S_{ijk}(\xi) = \delta \; \xi^{\frac{\gamma}{\sigma-1}} \; \Delta_{ijk}. \tag{17}$$

The total measure of NGO-level campaigns increases in NGO efficiency ξ. All triadic gravity elements affecting all NGOs alike are summarized in the triadic gravity term Δ_{ijk}, defined in equation (13). The elements in Δ_{ijk} look familiar from standard dyadic gravity equations: a constant term, economic country sizes, bilateral trade costs and terms representing multilateral trade resistance of the countries involved. The striking difference to dyadic gravity equations is that gravity forces shaping both the export and the sourcing decisions of firms are combined. The term $\mathcal{C}$ collects constants and $w_i L_i$, as well as $w_j L_j$, represent economic country sizes. The remaining determinants can be grouped into the terms G_{ki} and G_{ij}. These terms summarize factors shaping sourcing of inputs between k and i as well as trade in final goods between i and j, respectively. The following subsections provide detailed discussions of the different elements shaping the triadic NGO-level gravity equation.

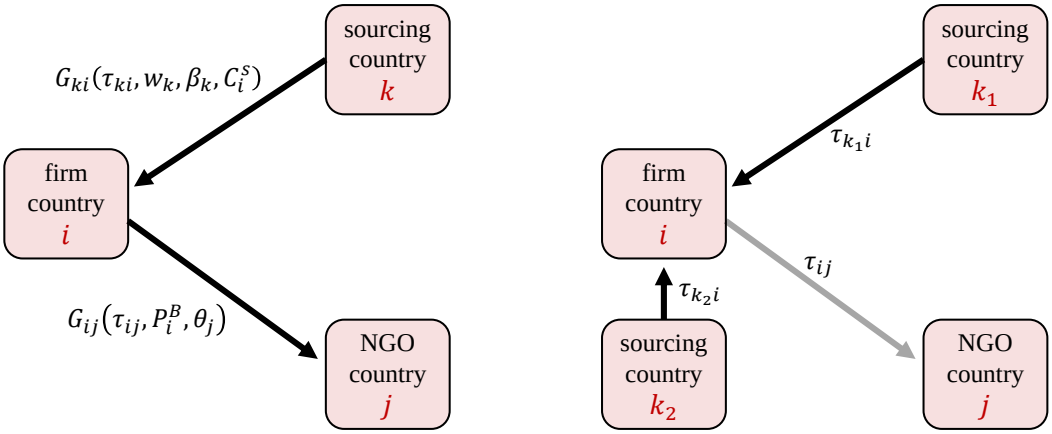


Figure 1: Panel (a) illustrates firm country i, NGO country j and sourcing country k, along with the respective elements of the triadic gravity equation (17) that shape their bilateral relationships, which determine NGO campaigns in country j. Panel (b) illustrates the role of the sourcing trade costs τ_{ki} for the infringements NGOs from j criticize in their campaigns against firms in i. Due to lower sourcing trade costs, the inputs from country k_2 feature more prominently in the input bundle used by firms in i than the inputs from country k_1. This implies better funding opportunities for NGOs in j to campaign against firms in i for infringements in country k_2 as compared to infringements in country k_1.

2.5.2. Gravity for Value Chain Campaigns: Bilateral Trade Costs

The triadic gravity equation (17) pins down all determinants of the number of i-j-k observations at the NGO level. Our main variables of interest in this equation are the trade costs that are relevant for value chain campaigns. They enter through their effect on the triadic gravity term Δ_{ijk}, defined in equation (13). The sourcing trade costs τ_{ki} affect the relative factor content of the country-k intermediate in final products of country i and τ_{ij} shapes the quantity of a final product exported from country i to the NGO country j.

Proposition 2 (Bilateral Trade Costs)**.** *The measure of campaigns $n_{ijk}^S(\xi)$ conducted by a "small" NGO with efficiency $\xi < \bar{\xi}_{ijk}$ in country j targeting firms in country i for infringements in country k is characterized by the triadic gravity equation (17). This measure of campaigns decreases in the bilateral trade costs τ_{ki} and τ_{ij}.*

Proof. This follows directly from inspection of equation (17) and equation (13). □

Figure 1a illustrates the triadic structure shaping NGO campaigns. Let us consider the impact of τ_{ij} in equation (17), which enters through the triadic gravity term Δ_{ijk} defined in equation (13). It is part of the term G_{ij} in equation (13), which collects components affecting NGO campaigns through trade between the firm country i and the NGO country j. The effect of the bilateral trade costs τ_{ij} is straightforward: lower trade costs imply lower prices, which increases the quantities of each good exported from i to j. This implies that the goods from country i feature more prominently in the consumption basket in country j, leading to a higher salience (see equation (1)) and therefore better funding opportunities of NGOs when suggesting a campaign against a firm from country i.

The effect of the internationalization of production is represented by the sourcing trade costs between country k and country i, τ_{ki}, as well as the other components in G_{ki} discussed below. The firm in i optimally chooses an input portfolio of all available inputs. Not observable to the firm, some of these inputs may have been produced under unethical conditions and have the potential to trigger an NGO campaign. Equation (4) implies that the different inputs available do not enter the optimal input bundle in equal shares: lower sourcing costs between k and i imply that inputs from k feature more prominently in the input portfolio of firms in country i. When goods from country i are then exported to the NGO country j, infringements in the sourcing country k are more likely to trigger an NGO campaign as the relative factor content of the criticized input is high. Figure 1b illustrates how the sourcing decision of the firm in i affects NGO campaigns in j that address infringements in country k: due to the proximity of country k_2 (compared to country k_1) to the firm country i and its inputs embodied in the exports from i, we expect ceteris paribus more NGO campaigns in j criticizing actions in k_2 than in k_1. This effect is unrelated to trade costs between the NGO country j and country k_1 or k_2.

We consider this effect of the sourcing trade costs τ_{ki} a non-trivial implication of our model. It stems from our explicit modeling of the sourcing activity of the final goods producer. As outlined in the introduction, this modeling is motivated by the shift of NGOs towards value chain campaigns (Baron 2016): campaigns where NGOs attack firms for infringements along their global value chains. We argue that this implication distinguishes our model from other conceivable gravity models of NGO activity where gravity patterns simply emerge from imposing some distance cost of the actual NGO activity. We discuss such approaches in section 2.6. These may well produce – at least in terms of implications for the empirical estimation – predictions similar to the ones on the bilateral trade costs τ_{ij}. They remain, however, silent on the role of the components in G_{ki}, especially the sourcing friction τ_{ki}. Our model, in contrast, allows us to make a prediction on the effect of the k–i trade costs. A prediction which – as we will see in section 3 – finds support in the data.

We now turn to the effects of the other elements of G_{ij} and G_{ki} in equation (13) that affect NGO campaigns in equation (17) through their impact on Δ_{ijk}. These are country-level variables like the economic country size and multilateral trade resistance terms. The following corollary to proposition Proposition 2 summarizes our results.

Corollary 1 (Country Size and Multilateral Trade Resistance)**.** *The measure of campaigns in the NGO-level triadic gravity equation (17)*

(i) increases in the economic country sizes of the NGO country, $w_j L_j$, and of the firm country, $w_i L_i$;
(ii) decreases in country i's multilateral upstream trade resistance, P_i^B;
(iii) increases in country j's multilateral consumption trade resistance, θ_j;
(iv) increases in country i's multilateral sourcing trade resistance, $\mathcal{C}_i^s$.

Proof. This follows directly from inspection of equation (17) and equation (13). □

These factors are not at the core of our analysis (and only affect the empirical analysis through the choice of appropriate fixed effects). We therefore only highlight some interesting features of corollary 1 at this point and provide a more detailed analysis in appendix B.1. The effects of economic country sizes of the exporter and importer of final goods as well as the importer's multilateral trade resistance term are well known from standard gravity models. More interesting are country i's multilateral upstream trade resistance, P_i^B, and its multilateral sourcing trade resistance, $\mathcal{C}_i^s$. The former summarizes the ease (or difficulty) with which producers in country i source from abroad and therefore affects production costs: a low value of P_i^B implies that producers in i produce at a low cost, which increases their exports. The latter shapes the relative factor content of a given input in the final product, as it provides the reference point determining to which degree e.g. low $i-k$ trade costs translate into a high factor content of k-inputs in i-products.[23]

We have now analyzed all components of our triadic gravity equation (17). Note that for completeness, in appendix B.2 we also consider the second determinant of $n_{ijk}(\xi)$ in equation (16): $n_{ijk}^L(\xi)$ for "hyper-efficient" NGOs. We show that all results from proposition 2 and corollary 1 are qualitatively unchanged, as long as there are at least some NGOs not conducting the entirety of all possible campaigns (i.e., NGOs with $\xi < \bar{\xi}_{ijk}$).

2.5.3. *Local* Global Watchdogs

In this section, we highlight how an expansion of international trade, both in intermediates as well as in final goods, can draw NGOs from their intrinsically domestic activity to the global stage: even if NGOs exclusively cater to their domestic donor base and only address issues with a strong relation to the consumption basket of these domestic donors, the internationalization of the firms delivering these consumption goods internationalizes NGO activity. We analyze how this being drawn into international activity by the internationalization of firms shapes the patterns of domestic and international components of NGO campaigns.

For this, we define "internal trade" as NGO/consumer and firm being in the same country ($i=j$); "internal sourcing" as the supplier and the firm being in the same country ($i=k$) and "internal action" as the NGO and the supplier with the criticized action/infringement being in the same country ($j=k$). This allows us to distinguish three types of campaigns (from the perspective of the NGO): (1) "all-internal", where internal trade, internal sourcing and internal action are combined ($i=j=k$), (2) "all-international", with neither internal trade nor internal action ($i \neq j$ and $j \neq k$); and (3) "mixed" campaigns with either internal trade *or* internal action ($i=j$ and $j \neq k$ or $i \neq j$ and $j=k$).

The following proposition summarizes the implications of our model regarding the local vs. global elements of NGO campaigns:

[23] Note that a term similar to $\mathcal{C}_i^s$ can be found in equation (8) of Antràs et al. (2017), where they also compute the share of intermediate input purchases sourced from a given country.

Proposition 3 (Local Global Watchdogs)**.** *NGO campaigns have a home bias but are "globalized" by the economic globalization of firms.*

(i) With international trade costs larger than domestic trade costs, there is a home bias in final goods trade and therefore in NGO activity: more campaigns occur for internal trade ($i = j$). There also is a home bias in sourcing implying that more campaigns occur for internal sourcing ($i = k$). The two home biases taken together also imply that there are more all-internal ($i = j = k$) campaigns. When trade costs go to infinity, there is a complete home bias and only all-internal campaigns occur.

(ii) With finite trade costs, there will always be a combination of all-internal campaigns ($i = j = k$), "all-international" campaigns ($i \neq j$ and $j \neq k$) and "mixed" campaigns ($i = j$ and $j \neq k$ or $i \neq j$ and $j = k$). When either of the two bilateral trade costs τ_{ki} or τ_{ij} falls, the fraction of i-j-k campaigns with at least one foreign component increases.

Proof. See appendix B.3.

Part (*i*) of the above proposition establishes the home bias of NGOs implied by our model, which stems from higher trade costs impeding the internationalization of sourcing and exporting decisions of firms. Part (*ii*) complements this finding by highlighting that in our model also the home bias in sourcing increases the number of campaigns. Finally, part (*iii*) establishes that falling trade costs spur the economic internationalization of firms and thereby internationalize NGO campaigns: increased international trade in inputs and final goods increases the number of campaigns with an international dimension. This implies that the activity of local NGOs is globalized by the globalization of production and trade – NGOs become "local global watchdogs."

The result that all-internal, all-international and mixed campaigns always coexist in our model may seem trivial at first sight. It has, however an interesting implication for the way one should (or should not) look for evidence of the home bias or internationalization of NGO activity in the data. While the fraction of the all-internal campaigns may be taken as a measure for the home bias in NGO activity and the fraction of all-international campaigns may be taken as a measure for internationalization, the fraction of mixed campaigns could be interpreted either way: they constitute campaigns with a strong domestic dimension; at the same time, they can be counted as international campaigns. When the fraction of mixed campaigns is high, the interpretation of the data will therefore strongly depend on the way the researcher looks for evidence of home bias or internationalization.

2.6. Discussion and Extensions

Before we bring the main predictions of our model to the data in section 3, it is worth pausing to reflect on possible extensions and alternative modeling strategies. We first highlight results at the country level, which are reported in the Online Appendix. We then contrast our value chain based modeling to a 'naive' approach to campaign gravity and highlight the key differences in implications and how they are expected to affect empirical patterns. Finally,

we discuss how NGO networks with a central planner allocating campaign activity across a set of subsidiaries may be added to our model, keeping the main mechanisms intact.

2.6.1. Country-Level Analysis

The model can be used to derive gravity predictions on the country level by aggregating across NGOs. We derive these equations in the Online Appendix, section OA-1. While the resulting expressions are more cumbersome than the NGO-level results, we show that the qualitative gravity predictions from the NGO-level analysis continue to hold at the country level.

These results can be thought of as a theoretical foundation for estimating country-level triadic gravity equations. In a country-level regression, data are aggregated across NGOs at the country level. Given that our data used in section 3 does contain NGO-level information, we run these much more demanding regressions in our analysis presented in section 3. As a robustness check, we present the results of the corresponding country-level regressions in the Online Appendix, section OA-2. We find that our main results from the NGO-level analysis in section 3 are confirmed.

2.6.2. Value Chain Forces vs. 'Naive' Campaign Gravity

Do we need the complex underlying structure with a fully-fledged model of international trade and international sourcing by firms in order to construct a gravity model for NGO campaigns? One could think of a 'naive' model of NGO campaigns where some distance (gravity) related cost (e.g., less information) arises between the NGO country and the two other countries involved. In such a 'naive' model, figure 1a above would look different: two arrows would connect the NGO country with the other two countries, but no arrow would connect the sourcing country k and the firm country i.

The key distinctive feature of our model of value chain campaigns is that we draw the attention to the country pair that *does not* involve the NGO country, the k–i connection. The relevance of sourcing frictions, τ_{ki}, for NGO campaigns seems difficult to explain in a model without a sourcing relationship along a value chain (especially so, as value chain campaigns have become a key strategy of NGOs (Baron 2016)). The impact of this sourcing friction therefore constitutes the key distinguishing element of our model. Accounting for it in the theory calls for a model of international trade and international sourcing of the type we provide in this paper. We therefore pay special attention to the effects of our proxies for the sourcing frictions τ_{ki} in the empirical analysis in section 3.

2.6.3. Coordination within international NGO networks

Many NGOs are associated to international networks. This fact in and of itself could affect the geography of NGO campaigns. Consider the case of Greenpeace, which consists of its national branches (Greenpeace USA, Greenpeace Canada, etc.) that operate independently from Greenpeace International, which has no formal control over the branches' actions.

It may, however, be the case that Greenpeace International enables national branches to coordinate. In our model, there would be no reason for this, as there is no cannibalization between branches of the same NGO in different countries. The success of a national branch in raising sufficient funds for their campaigns from their domestic donors is independent of the fundraising success of a branch in a different country. In our model, if both branches succeed in fundraising, Greenpeace USA would run a campaign on the same issue as Greenpeace Canada. But one could think of a setting where it is optimal for a central planner in an NGO network to assign only the branch closest to the action country and the branch closest to the firm country to launch a campaign, while the others remain inactive.

In our view, such an approach can be viewed as an extension of the 'naive' modeling approach discussed above. Some gravity friction between the NGO and the firm or the NGO and the source country makes it efficient to have only the closest branches of the NGO network to engage. This would strengthen the gravity implications compared to the 'naive' approach, as being the second closest branch does not only lower the probability to run a campaign but reduces it to 0.

Our argument on the key distinction of our model to the 'naive' model, however, remains unaffected by this modeling variation. Such a model would not feature any predictions concerning the sourcing frictions τ_{ki}, which are the key distinctive prediction of our theory.

3. Empirics

We summarized the three main testable implications of the theory in propositions 1 to 3. We now bring these predictions to the data. We describe the data in section 3.1 and present the estimation approach for triadic gravity equations in section 3.2. We apply this approach to test proposition 2 (Bilateral Trade Costs) and proposition 3 (Local Global Watchdogs) in sections 3.3 and 3.4, respectively. We then use the NGO fixed effects from our preferred specification in section 3.2 to test proposition 1 (Two-Sided Heterogeneity).

3.1. Data Description

The data we use is collected by Sigwatch, a for-profit consultancy firm providing multinational companies with daily information regarding the dynamics of global NGO campaign activity. Sigwatch gathers communications by NGOs worldwide, in which they criticize target firms. Each observation in our data contains the following elements: the year; the name, headquarter country (i) and sector of the targeted company; the name and headquarter country (j) of the NGO; the country in which the criticized action took place (k); and up to three keywords describing the type of incriminating behavior. In the rest of the paper, we refer to these observations as *campaigns*. Our sample spans from 2010–2019 and contains 102 532 campaigns by 4 343 NGOs from 118 countries. These NGOs target 11 429 firms headquartered in 145 countries, for actions in 172 countries. To stay close to our model of value chain campaigns, we focus our analysis on non-service sectors. This leaves us with 75 % of all campaigns; see table A.1 in appendix A for the list of sectors.

In our analysis, we exploit the fact that each campaign contains *i*-*j*-*k* information on the location of the agents involved. Vietnam is, for example, the action country (country k) in the database when in January 2017, the US-based (country j) NGO *PETA* defending animal rights criticized the French (country i) luxury firm *Louis Vuitton* for inflicting cruel treatment on crocodiles in Vietnam used in the production of leather bags. A different context presents the US (country i) confectionery manufacturer *Mars*, criticized in October 2017 for buying cocoa from illegal and unsustainable sources linked to deforestation in Ivory Coast (country k) by the German (country j) NGO *Rainforest Rescue*.[24]

3.2. NGO-Level Triadic Gravity

We now describe our estimation equation, which we then apply to test the implications of proposition 2 and proposition 3 in section 3.3 and section 3.4, respectively. Guided by the NGO-level gravity equation (17), we estimate variations of the following equation

$$\ln(n_{ijkz}) = \hat{\tau}_{ij}\ \beta_1 + \hat{\tau}_{ki}\ \beta_2 + \hat{\tau}_{kj}\ \beta_3 + FE_i + FE_k + FE_z + u_{ijkz}, \tag{18}$$

in which our dependent variable is (the log of) the number of *i*-*j*-*k* campaigns by NGO z.[25] The matrix $\hat{\tau}_{lm}$ ($lm \in \{ij,\ ki,\ kj\}$) contains our proxies for bilateral trade costs:

$$\hat{\tau}_{lm} = (\ln(\text{distance}_{lm}) \mid \text{Contiguity}_{lm} \mid \text{Language}_{lm} \mid \text{Colonial History}_{lm})\,. \tag{19}$$

This is our central independent variable of interest, as it allows us to test the prediction in proposition 2. We employ standard controls from the literature (see, e.g., Head & Mayer (2014)), provided by the CEPII (see footnote 31). We use the log of bilateral geographic distance, $\ln(distance_{lm})$, as well as the following indicator variables: The dummy *Colonial History*$_{ij}$ equals 1 for pairs of countries i and j having ever shared a colonial relationship (and equivalently for the country pairs k–i as well as k–j). The *Language* dummy variable is 1 for country pairs that share the common official language and the *Contiguity* dummy is 1 if the respective countries share a border. Our main interest is in the effect of the three bilateral distances, the key measure of trade costs in the gravity literature. Geographical distance is a continuous variable with observations for all country pairs, which differentiates it from the dummy variables.

We control for the country sizes and trade resistance terms from corollary 1 using three sets of fixed effects. We control for all time-invariant characteristics of the firm country

[24] While these two examples from our data nicely illustrate how value chain campaigns enter our data, we cannot be sure that in all observations there is an actual sourcing relationship between the "action country" (k) and the "firm country" (i). It is a limitation of our data set that the action in k may be linked to the firm in i for a reason different from an actual sourcing relationship. Different from Hatte & Koenig (2020), we drop service sectors. We expect this to reduce this concern, as it excludes, for example, campaigns against financial institutions that finance questionable investment projects in developing countries, which is unrelated to value chain campaigns.

[25] In the data, each NGO z is assigned to *one* NGO country j. Technically, this makes the j index obsolete. For expositional convenience, however, we keep the NGO country index j. This allows us to highlight the triadic structure in the clearest possible way, denoting trade costs between firm and NGO as τ_{ij} instead of τ_{iz} and equivalently τ_{kj} instead of τ_{kz} for trade costs with country k.

i, including its economic size (corollary 1 (i)), its multilateral upstream trade resistance (corollary 1 (ii)) and its multilateral sourcing trade resistance (corollary 1 (iv)), with a country i fixed effect (FE_i). By the same token, we include an action country fixed effect (FE_k), which controls for all time-invariant characteristics of country k. As we estimate the triadic gravity equation at the *NGO level*, we include an NGO fixed effect (FE_z). This controls for all time-invariant NGO characteristics, including the NGO's efficiency ξ. At the same time, the NGO fixed effect also controls for all time-invariant country characteristics of the NGO country j, as each NGO is – by definition – observed only in *one* NGO country j (see also footnote 25). This controls for economic size of country j (corollary 1 (i)) and multilateral consumption trade resistance of country j (corollary 1 (iii)). It therefore makes a country j fixed effect obsolete.

3.3. Value Chain Trade Costs

Proposition 2 summarizes one of our main theoretical results: the measure of campaigns at the NGO level conducted by an NGO in country j targeting firms in country i for infringements in country k *decreases* in τ_{ki} and τ_{ij} (and is *independent* of τ_{kj}). That is, for the country pairs k–i and i–j, we expect negative distance effects and positive effects for the dummy variables in equation (19) (as these are measures of trade facilitation) as well as no effect of these variables along the kj dimension.

To test the implications on bilateral trade costs, we use a sample of campaigns where three different countries are involved ($i \neq j \neq k$). This allows to abstract from any domestic dimensions of NGO campaigns and provides the right framework to analyze the effect of bilateral distances in a triadic gravity setting. In the next section, we include domestic components of campaigns and sourcing to analyze home bias in NGO activity.

We first take a purely *dyadic* perspective on our data, in line with traditional gravity estimations: We aggregate our observations across action countries k such that our dependent variable, (the log of) n_{ijz}, is the total number of campaigns in which NGO z from country j targets firms from country i, irrespective of the action country. We use this approach as a reference point because without knowledge of our theory – which adds a *triadic* dimension to the campaign activity – simply considering campaigns from j NGOs targeting i firms and controlling for ij-specific variables ($\hat{\tau}_{ij}$) would be a natural starting point.

We estimate the adjusted versions of equation (18) using OLS and its exponentiated form using Poisson Pseudo Maximum Likelihood (PPML) to account for heteroskedasticity, as promoted by Silva & Tenreyro (2006). Regression results for OLS and PPML are presented in table 1, columns (1) and (2), respectively. Our key measure of bilateral trade costs, distance between country i and j, is negative and highly significant in both specifications.

While the negative effect of trade frictions between the country of the firm, i, and the country of the NGO, j, is a direct implication of our model, we discussed in sections 2.6.2 and 2.6.3 that other conceivable models could predict such an effect as long as trade frictions (or their proxies) impede NGO activity in some way (e.g., informational frictions increasing in distance or a central planner within an NGO network assigning campaigns to NGOs

Table 1: NGO-level dyadic and triadic gravity regressions. Dependent variable: Campaigns by NGO z from country j directed at firms in i with action in k. The sample only contains "all-international" campaigns where the three countries involved differ ($i \neq j \neq k$).

	(1)	(2)	(3)	(4)	(5)	(6)
Database	Dyadic		Triadic			
Method	OLS	PPML	OLS	PPML	OLS	PPML
Dep. var.	$\ln n_{ijz}$	n_{ijz}	$\ln n_{ijkz}$	n_{ijkz}	$\ln n_{ijkz}$	n_{ijkz}
ln distance$_{ij}$	-0.097^{a}	-0.130^{a}	-0.061^{a}	-0.088^{a}	-0.061^{a}	-0.088^{a}
	(0.025)	(0.039)	(0.016)	(0.023)	(0.016)	(0.023)
Contiguity$_{ij}$	-0.024	0.097	0.026	0.063	0.028	0.066
	(0.063)	(0.103)	(0.041)	(0.069)	(0.041)	(0.068)
Colonial history$_{ij}$	0.097^{c}	0.158	0.095^{b}	0.139^{b}	0.096^{b}	0.139^{b}
	(0.055)	(0.099)	(0.039)	(0.071)	(0.039)	(0.071)
Language$_{ij}$	0.037	-0.049	-0.016	-0.056	-0.016	-0.058
	(0.048)	(0.087)	(0.035)	(0.067)	(0.035)	(0.067)
ln distance$_{ki}$			-0.033^{a}	-0.068^{a}	-0.033^{a}	-0.069^{a}
			(0.011)	(0.020)	(0.011)	(0.020)
Contiguity$_{ki}$			0.009	-0.013	0.010	-0.011
			(0.031)	(0.054)	(0.031)	(0.054)
Colonial history$_{ki}$			0.061^{a}	0.109^{a}	0.061^{a}	0.108^{a}
			(0.022)	(0.036)	(0.022)	(0.035)
Language$_{ki}$			-0.034^{b}	-0.053^{c}	-0.034^{b}	-0.054^{c}
			(0.017)	(0.028)	(0.017)	(0.028)
ln distance$_{kj}$					-0.003	-0.014
					(0.014)	(0.023)
Contiguity$_{kj}$					0.015	0.025
					(0.034)	(0.064)
Colonial history$_{kj}$					0.011	0.014
					(0.026)	(0.051)
Language$_{kj}$					-0.004	-0.037
					(0.024)	(0.041)
Observations	3981	3981	10346	10346	10346	10346
R^2	0.485		0.292		0.293	
NGO FE	yes	yes	yes	yes	yes	yes
Firm country FE	yes	yes	yes	yes	yes	yes
Action country FE	—	—	yes	yes	yes	yes

Note: n_{ijkz} is the number of campaigns by NGO z from country j targeting firms in i for actions in k. For columns (1) and (2), n_{ijz} is computed as the sum of n_{ijkz} over all k. Data is pooled over 2010–2019 and restricted to the 17 non-service sectors. Robust standard errors clustered at the NGO level in parentheses. ^{c} p<0.1, ^{b} p<0.05, ^{a} p<0.01

located in vicinity to a target firm or an infringement country). The key distinctive feature of our model is that we draw the attention to a country pair that *does not involve the NGO country*: the country of the firm, i, and the country where the infringement occurs, k. This sets our model apart from any model with some gravity friction between the country of the NGO and the country of the firm (or the country of the infringement). The negative impact of $\hat{\tau}_{ki}$ on triadic NGO campaigns predicted in proposition 2 is therefore central to our empirical analysis.

In order to test this implication of the model, we now use (the log of) n_{ijkz} – i.e., NGO-level campaigns in a given i-j-k triad – as dependent variable. We keep our ij trade cost measure, $\hat{\tau}_{ij}$, and include our main variable of interest: the trade cost measure between countries i and k, $\hat{\tau}_{ki}$. This is our preferred specification, because it is closest to our theoretical NGO-level triadic gravity equation for NGO campaigns (17). We present the regression results in columns (3) and (4) of table 1. Our key measure of international trade costs, bilateral distance, remains highly significant for the i–j distance and also comes out highly significant for our main variable of interest, the k–i distance. Both geographical distances exhibit the negative effect on triadic NGO campaigns predicted in proposition 2.

While this constitutes our main empirical result, we provide a natural robustness check in our triadic setting by additionally controlling for trade costs between the action country and the NGO country, $\hat{\tau}_{kj}$. Taking our model with value chain campaigns at face value, we would not expect any effect of trade frictions along the kj dimension (proposition 2).[26] Results are reported in columns (5) and (6) of table 1. Most importantly, the inclusion of $\hat{\tau}_{kj}$ leaves our main findings from our preferred specifications virtually unaffected. Moreover, nicely in line with our model's prediction, not a single coefficient of trade costs along the "third" dimension is statistically significant.

Overall, we take the results reported in table 1 as strong support for the predictions of proposition 2. We now turn to the home bias in NGO campaigns predicted in proposition 3.

3.4. International and Domestic Campaigns

In line with most of the gravity literature on international trade in goods, our preferred specification outlined above is based on campaigns where the three countries involved are different and therefore distance effects are identified by international bilateral distances only. Proposition 3 (*i*), however, highlights two sources of *home bias* in NGO campaigns: due to lower trade costs within countries, our model implies that one should ceteris paribus observe more campaigns with a domestic component or campaigns that are entirely domestic. Proposition 3 (*ii*) highlights the co-existence of "all-international", "all-internal" and "mixed" campaigns.

Table 2 shows to which extent these different types of campaigns are present in our

[26] While the explicit focus of our model on value chain campaigns assigns no role to trade frictions between counties j and k, there are conceivable arguments why these frictions may matter for NGO campaigns independently of our main mechanism. In an earlier version of this paper (Koenig et al. 2021), we discuss possible reasons why trade frictions between the sourcing country k and the NGO country j may matter for triadic NGO campaigns and show how these may be included into the model.

Table 2: Domestic and international dimension of campaigns, 2010–2019.

Domestic dimension			International dimension	
(1)	(2) all-internal	(3) mixed	(4) all-international	(5)
Firm or action (or both) domestic	Firm *and* action domestic	1 foreign and 1 domestic element	Firm *and* action are foreign	Firm or action (or both) foreign
75 693	41 479	34 214	26 839	61 053
74 %	40 %	34 %	26 %	60 %

Source: Sigwatch campaign data in 17 non-service sectors. The total number of campaigns is 102 532. Note that columns 2, 3 and 4 add up to 100 % of campaigns; columns 2 and 3 add up to column 1; and columns 3 and 4 add up to column 5. Moreover, note that the actual share in column 3 is 33.4 % of campaigns. In the table we round this to 34 % to assure that despite rounding in columns 2 and 4, columns 2, 3 and 4 still add up to the logically required 100 %.

data. Columns (2) to (4) show that 40 % of campaigns are all-internal, 34 % are of the mixed type and 26 % are all-international. This implies that 74 % of campaigns have at least one *domestic* component ("internal trade", $i = j$, and/or "internal action", $k = j$), see column (1). This shows that domestic activity of NGOs looms large in our data. At the same time, column (5) highlights that 60 % of campaigns have an *international* component. Each of these observations taken for itself would either seem to suggest that NGO activity is predominantly domestic (column (1)) or that it is predominantly international (column (5)). Of course, this is explained by the fact that one third of the campaigns are of the "mixed" type. Overall, table 2 shows that all three types of campaigns predicted by proposition 3 (*ii*) have a strong presence in our data. Especially the 34 % of "mixed" campaigns highlight the combination of domestic and international activity characterizing NGOs as "Local Global Watchdogs": a strong home bias combined with significant international activity.

We complement our main regression analysis from above with one that also includes campaigns with domestic elements ($i = j$, $j = k$, or both). To this end, we follow the part of the trade literature that also accounts for domestic trade in gravity regressions (Head & Mayer 2000, Anderson & van Wincoop 2003 and Head & Mayer 2021; with Yotov 2022 providing a recent survey). In order to determine whether being in the same country as the NGO, or whether the firm sourcing domestically, has an impact above and beyond the variables identified in section 3.2, we generate three additional indicator variables: *Internal Trade*$_{i=j}$ is 1 for observations where firm and NGO are located in the same country; *Internal Sourcing*$_{k=i}$ is 1 for campaigns that are related to the domestic sourcing of a firm; and *Internal Action*$_{k=j}$ is 1 for observations where the criticized action took place in the country of the NGO. We add these indicators to the other dummy variables in the trade cost vector $\hat{\tau}_{lm}$ in equation (19).

To estimate variations of equation (18) that additionally include the *Internal* dummies in the trade cost vector, we need to take a stand on the value the other elements of $\hat{\tau}_{lm}$ should take for the case of an internal campaign. In order not to bias the estimates for

Table 3: NGO-level dyadic and triadic gravity regressions. Dependent variable: Campaigns by NGO z from country j directed at firms in i with action in k. The sample contains both international and domestic elements. To account for a potential special role of domestic campaigns, the dummies "Internal Trade$_{i=j}$", "Internal Sourcing$_{k=i}$" and "Internal Action$_{k=j}$" are included.

	(1)	(2)	(3)	(4)	(5)	(6)
Database	Dyadic		Triadic			
Method	OLS	PPML	OLS	PPML	OLS	PPML
Dep. var.	$\ln n_{ijz}$	n_{ijz}	$\ln n_{ijkz}$	n_{ijkz}	$\ln n_{ijkz}$	n_{ijkz}
ln distance$_{ij}$	-0.084^{a}	-0.144^{a}	-0.053^{a}	-0.093^{a}	-0.053^{a}	-0.112^{a}
	(0.017)	(0.029)	(0.012)	(0.022)	(0.012)	(0.025)
Internal Trade$_{i=j}$	1.261^{a}	1.878^{a}	0.484^{a}	1.099^{a}	0.500^{a}	0.838^{a}
	(0.051)	(0.091)	(0.036)	(0.070)	(0.036)	(0.071)
Contiguity$_{ij}$	0.147^{a}	0.258^{a}	0.057^{c}	0.136^{b}	0.065^{b}	0.117^{b}
	(0.041)	(0.068)	(0.031)	(0.063)	(0.031)	(0.058)
Colonial history$_{ij}$	0.061^{c}	0.176^{a}	0.064^{b}	0.090^{c}	0.068^{b}	0.092^{c}
	(0.037)	(0.061)	(0.028)	(0.055)	(0.027)	(0.055)
Language$_{ij}$	0.158^{a}	0.202^{a}	0.026	0.028	0.030	0.052
	(0.031)	(0.056)	(0.025)	(0.050)	(0.024)	(0.050)
ln distance$_{ki}$			-0.021^{b}	0.003	-0.026^{a}	-0.011
			(0.009)	(0.020)	(0.010)	(0.021)
Internal Sourcing$_{k=i}$			0.471^{a}	1.274^{a}	0.518^{a}	1.215^{a}
			(0.029)	(0.074)	(0.030)	(0.074)
Contiguity$_{ki}$			0.052^{b}	0.157^{a}	0.064^{a}	0.185^{a}
			(0.024)	(0.055)	(0.024)	(0.054)
Colonial history$_{ki}$			0.016	-0.022	0.024	0.061
			(0.019)	(0.038)	(0.019)	(0.038)
Language$_{ki}$			0.015	0.068^{c}	0.006	0.048
			(0.016)	(0.037)	(0.015)	(0.034)
ln distance$_{kj}$					0.016	0.093^{a}
					(0.013)	(0.032)
Internal Action$_{k=j}$					0.703^{a}	1.696^{a}
					(0.039)	(0.112)
Contiguity$_{kj}$					0.033	0.171^{b}
					(0.032)	(0.086)
Colonial history$_{kj}$					-0.037	-0.151^{a}
					(0.024)	(0.058)
Language$_{kj}$					0.078^{a}	0.123^{b}
					(0.021)	(0.050)
Observations	11669	11669	26416	26416	26416	26416
R^2	0.537		0.352		0.420	
NGO FE	yes	yes	yes	yes	yes	yes
Firm country FE	yes	yes	yes	yes	yes	yes
Action country FE	—	—	yes	yes	yes	yes

Note: n_{ijkz} is the number of campaigns by NGO z from country j targeting firms in i for actions in k. For columns (1) and (2), n_{ijz} is computed as the sum of n_{ijkz} over all k. Data is pooled over 2010–2019 and restricted to the 17 non-service sectors. Robust standard errors clustered at the NGO level in parentheses. ^{c} p<0.1, ^{b} p<0.05, ^{a} p<0.01

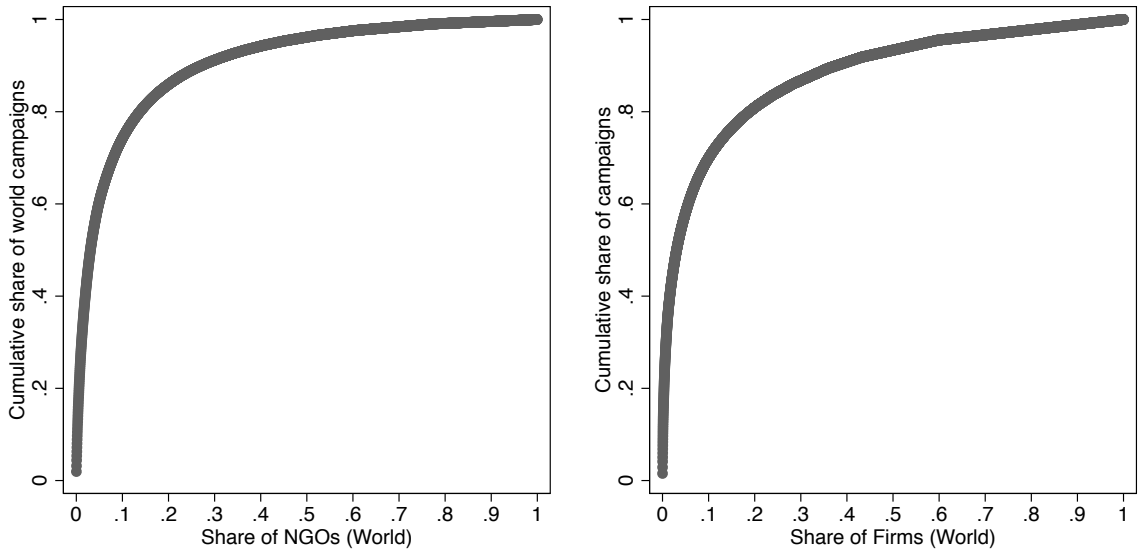
the dummies on bilateral colonial history, common official language and contiguity, which are of interest for international interactions, these are all set to 0 when the two countries involved are actually the same country. For observations that include an internal component, a proxy for the internal (within-county) distance is required. Internal distances are computed by weighting distances between cities with the cities' population shares in the country's population (Mayer & Zignago 2011). This allows us to identify the distance effect also from observations on domestic "flows." The overall effect of being in the same country is then captured by our $Internal_{lm}$ dummies.

The obvious advantage of this approach is that it more than doubles the number of observations. The estimated distance coefficients, however, should be taken with a grain of salt.[27] Since internal distance will on average be short distances, their measurement will impact the overall estimate of the distance effect. Therefore, adding internal flows causes the measurement of internal distance, the estimation of distance effects and the estimation of home dummies to be intertwined. This is particularly true in our case where far more than half of the observations contain a domestic element. However, we will see next, that the point estimates of the distance effect in table 1 do not change substantially when domestic campaigns are accounted for.

For the estimations we proceed in the same order as in section 3.3. Table 3 reports the results. As predicted in proposition 3 (i), the internal trade and the internal sourcing dummies are positive and highly significant. Above and beyond the standard gravity variables, being in the same country as the target firm and/or the target firm sourcing domestically increases the number of campaigns at the NGO level. On the one hand, this is in line with the home bias of NGO target choice in our model. At the same time it is in line with the key prediction concerning the sourcing relationship: greater ease of sourcing inputs increases the number of campaigns against these inputs. In the OLS specifications the effect of the sourcing frictions, τ_{ki}, continues to be negative and highly significant. For the PPML specifications, significance is lost. This does not appear to be a major concern given our argument above and the large number of observations for which the $Internal\ Sourcing_{k=i}$ dummy takes the value of one.

When the internal action dummy is added, it also has a significant positive effect. Our model is silent on the effect of the internal action dummy, as we focus our theory on the implications that stem from international sourcing and trade by firms. The positive significant effect of the internal action dummy suggests that for the NGO, there is some relevance to being in the same country as the infringement that is not captured in our model (but see the argument in footnote 26).

[27] Geographical distance between two countries is relatively simple to define and differences in more or less elaborate ways of computing them tend to wash out when distance increases (whether the distance between the US and France is computed as the distance between the capitals, or accounts to the distribution of economic activity across the US and France, there is always the Atlantic ocean between them, adding an important common element to the distance measures). Some transactions on a local level will actually have much lower distances, while other transactions take place at much larger distances. See Head & Mayer (2010) for a detailed discussion.



(a) (b)

Source: Sigwatch data, 2010–2019, 102 532 campaigns, 17 non-service sectors.

Figure 2: Cumulative shares of campaigns (panel a) and target firms (panel b).

3.5. Two-sided Heterogeneity

In section 2.4, we highlight the role of two-sided heterogeneity (heterogeneous firms combined with heterogeneous NGOs) for the market for social activism. As we have neither information on firm sales or employment (to proxy for productivity) nor on NGO funds raised or employment (as a measure of NGO efficiency), we use an alternative, model-consistent measure of heterogeneity. According to proposition 1, NGOs with higher efficiency perform a larger measure of campaigns and more productive firms are more attractive targets and therefore receive a larger number of campaigns. This implies that in our model, heterogeneity in productivity and efficiency maps into heterogeneity in the number of campaigns a firm attracts and the number of campaigns an NGO conducts. Both are presented in figure 2 and highlight strong evidence for two-sided heterogeneity in our model. Panel (a) plots the cumulative share of campaigns against the share of NGOs that carry out the campaigns. Panel (b) plots the cumulative share of campaigns against the share of firms that are campaign targets. As for NGOs, the average number of campaigns per NGO over the period is 23; it ranges from 1 to 1 992. Relatively few of the 4 343 NGOs in our sample account for a large fraction of campaigns. The largest 20 % of NGOs account for 80 % of campaigns and the largest 1.5 % of NGOs account for more than 30 % of campaigns. The same holds true for the distribution of firms, which is highly skewed, with roughly 80 % of campaigns going against 20 % of firms and roughly 5 % of firms attracting 25 % of campaigns.

Proposition 1 goes beyond stating two-sided heterogeneity. Equation (12) implies that fundraising success for a campaign depends on NGO efficiency, firm productivity and gravity variables. This implies that NGOs with different efficiency levels differ systematically in their portfolio of target firms. More specifically, more efficient NGOs target firms that are on average smaller (i.e., less productive) and more productive firms are targeted by

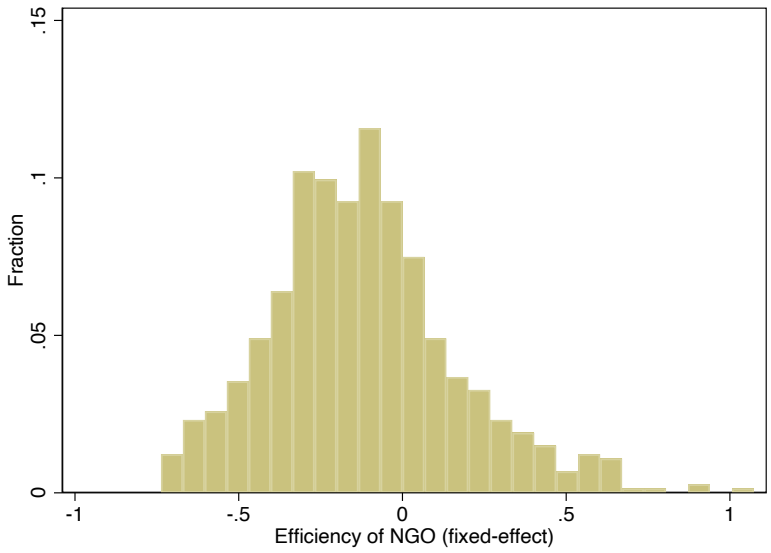


Figure 3: Distribution of NGO efficiency measured as the fixed effect retrieved from the regression in table 1, column (5).

NGOs with lower average efficiency levels. That is, our model predicts negative assortative matching of NGOs and firms. It therefore predicts a negative correlation between NGO efficiency and the average attractiveness of its target firms. This result stems from the combination of two-sided heterogeneity with the fundraising mechanism. Through their effects on salience, NGO efficiency and firm productivity improve funding opportunities for a campaign. Negative assortativity results from the fact that one can substitute for the other.[28]

To test this prediction in our data, we use the number of NGOs targeting a firm as a model-consistent measure of its attractiveness as a target. As for the efficiency, the NGO fixed effects from our NGO-level regression in section 3.3 provide us with estimates of NGO efficiency that account for the effect of gravity forces on target choice.

Figure 3 plots the distribution of the NGO fixed effects obtained from our regression displayed in table 1, column (5). Its distribution is in line with our model in the sense that it is monopolar, which is consistent with our assumption of Pareto distributed efficiencies.[29] As a measure of the degree of heterogeneity, note that an NGO at the 95th percentile has an NGO fixed effect that is 4.6 times higher than the value of the NGO at the 5th percentile.

[28] The implication of negative assortativity therefore sets our model apart from conceivable alternatives with homogeneous NGOs and homogeneous firms or from modeling where targets are randomly assigned to (possibly heterogeneous) NGOs. Considering the firm-to-firm trade network, Herkenhoff, Krautheim & Sauré (2021) show that negative assortativity can arise from the combination of two-sided heterogeneity with several conceivable modeling additions, in our case the fundraising mechanism (see Bernard & Zi 2022 for a related argument). Finding negative assortativity in the data should therefore not be taken as evidence in favor of our specific fundraising mechanism or specific sources of heterogeneity. It would, however, provide evidence in favor of modeling two-sided heterogeneity in combination with a meaningful interaction of the two sides when it comes to an NGO's portfolio of target firms.

[29] Note that a Pareto distribution combined with some additional noise can deliver a monopolar distribution like the one displayed in figure 3. A bipolar distribution, for example, would be clearly at odds with the assumption of Pareto distributed efficiencies.

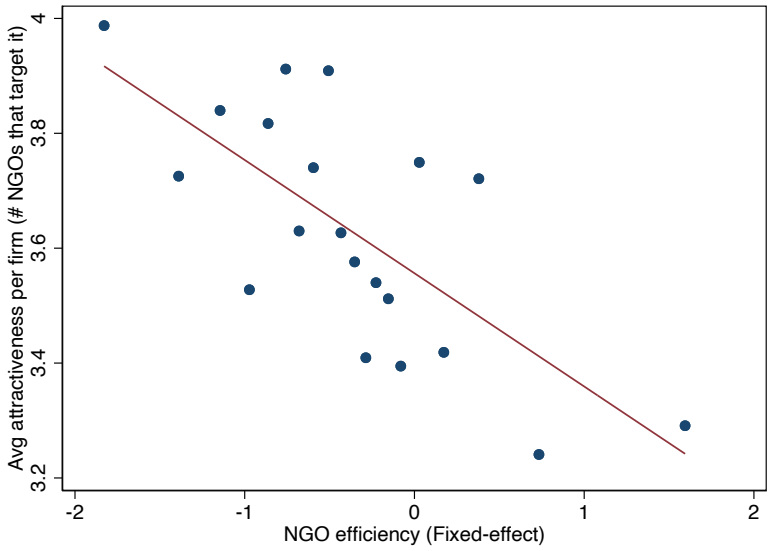


Figure 4: Binscatter plot of firm attractiveness as a target (as measured by the number of NGOs that target the firm) and NGO efficiency measured as the fixed effect retrieved from the regression in table 1, column (5).

Using our measure of firm attractiveness as a target (the number of NGOs targeting a given firm), figure 4 illustrates the negative correlation with the NGO fixed effects. The slope is -0.197 and significant at the 1 % level. This confirms the prediction of negative assortativity in proposition 1: more efficient NGOs campaign against firms that are on average less attractive targets.

One could have considered more ad-hoc measures of NGO efficiency like the number of firms a given NGO targets. This would also be model-consistent. In our view, the NGO fixed effects are the preferred measure of NGO efficiency, as equation (12) implies that the portfolio of targeted firms does not only depend on NGO efficiency, but also on all the gravity forces summarized by the triadic gravity term Δ_{ijk} (as well as firm country-specific variables). Controlling for the gravity elements as well as for the country i fixed effect, the estimated NGO fixed effects constitute a much cleaner measure of NGO efficiency.[30]

4. Conclusion

As a civil society reaction to the absence of binding international regulation in areas like environmental protection or labor rights, advocacy (or watchdog) NGOs are becoming important players in the context of economic globalization, engaging value chain campaigns for infringements along global supply chains. This paper presents a framework to analyze the determinants of the internationalization (or not) of such advocacy NGO activity. Specifically, we consider a model of international trade and global sourcing in which heterogeneous NGOs campaign against heterogeneous firms in response to infringements along international value

[30] In an unreported robustness check we indeed find the expected negative correlation also when using the number of firms a given NGO targets as a measure of NGO efficiency.

chains. We show that this leads to a *triadic* gravity equation for NGO campaigns involving the country of the NGO, the country of the firm as well as the sourcing country. Importantly, our analysis highlights the importance of trade costs along the sourcing relationship between the firm and its suppliers in shaping the "geography" of NGO campaigns, independently from the location of the NGO. Using a recently available data set on NGO campaigns, we test the NGO-level predictions of our theory by estimating triadic gravity equations for campaigns at the NGO level. As predicted by our theory, we find a significant negative effect of the sourcing trade costs on NGO campaigns. The estimations also confirm the predicted negative effect of trade costs along the firm–NGO connection. Our estimations also support two other predictions of our model: home bias of NGO campaigns and negative assortative matching between NGOs and targeted firms.

In the present setup, most of the action on the donation market comes from the supply side of donations and is determined by two main features: the salience of campaigns to donors (affected by trade and sourcing decisions of firms) and the warm glow of donations associated to it. Conversely, the demand side of the donation market is characterized by two exogenous objects: the cost of campaigning and the distribution of heterogeneous efficiency among NGOs to generate salience. In this context, an interesting extension could be to embed the present framework into a model with some explicit pattern of competition between NGOs spending resources to attract the attention of donors, as for instance in Aldashev & Verdier (2009, 2010).

Another extension relates to the fact that NGOs tend to develop interactions with firms that go beyond targeted boycott and information campaigns. As pointed out by a large descriptive business sociology and political science literature, many NGOs, rather than confronting aggressively the corporate sector, prefer to enter into cooperative labeling and regulatory agreements with international firms (Bartley 2007; Falkner 2003; Vogel 2008). Introducing such features into our setup could help characterize the geography of these private international governance agreements that emerge to regulate global production conditions and sourcing decisions in the world.

Another line of research worth pursuing could focus on the role of national policies in the evolution and patterns of international social activism. Indeed, demands for social regulation can be satisfied both through private cooperative or non-cooperative interactions emerging between NGOs and firms. They may, however, also result in the implementation of national policies (trade agreements and regulatory policies) through lobbying or civil society pressure on domestic governments. Incorporating such aspects into our setup of trade, sourcing and NGO campaigning may be fruitful to better understand the relative role of private and public regulatory frameworks in which modern-day international production and trade activities take place.

While these extensions and others are beyond the scope of the present paper, we hope that the framework presented here and its empirical applications can be the stepping stone for future research in this area.

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Appendix A. Data Description

This section provides some additional information on the data we use in our empirical analysis. As outlined in section 3, the data on NGO campaigns has been collected by *Sigwatch*, a for-profit consultancy that keeps its clients informed about recent developments in the NGO nexus. The data collection process is detailed in Hatte & Koenig (2020). For the empirical analysis, we reshape the raw Sigwatch data for the years 2010–2019, such that each observation refers to one campaign by an NGO z (located in country j), criticizing a firm in country i for an action in country k (n_{ijkz}). For the country-level analysis in section OA-2 in the Online Appendix, we aggregate the NGO-level data across NGOs in a given country, such that N_{ijk} is the total number of campaigns in a given triad. Of all campaigns, we keep only those that Sigwatch coded as having a negative "tone", i.e., where the NGO *criticizes* the firm. Moreover, we keep only campaigns targeting firms assigned to the non-service sectors listed in table A.1, leaving us with 75 % of all negative campaigns.

For the gravity analysis in section 3, we complement the Sigwatch campaign data with standard gravity variables provided by the CEPII:[31] bilateral geographic distance, contiguity, colonial history and common language. All variables are defined in section 3.2.

Appendix B. Theory

B.1. Interpretation of Corollary 1: Multilateral Resistance

In this section, we provide a more detailed discussion of the different elements (other than bilateral trade costs) affecting triadic NGO campaigns in equation (17) through the triadic

[31] Available at http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=8; see Head, Mayer & Ries (2010) and Head & Mayer (2014), with data updated on December 18, 2020.

Table A.1: Descriptive Statistics – Non-service sectors.

ISIC	Industry name	# of Firms	# of NGOs	% of Campaigns
4000	Extraction, manuf and distrib of all energies	2573	2435	34.14
1500	Mf of food products and beverages	2309	959	13.65
1300	Mining of metal ores	1026	1064	8.53
5210	Non-specialized retail trade in stores	758	758	7.38
5232	Retail of textiles, clothing, footwear goods	741	452	6.37
3000	Mf of computer and related activities	651	589	5.22
0100	Agriculture, hunting and related	793	751	5.13
2400	Mf of chemicals and chemical products	316	803	4.23
2424	Mf of soap, detergents, perfumes	612	377	3.04
2423	Mf of pharma., medicinal and botanical products	388	578	2.94
2900	Mf of machinery and equipment	255	317	2.32
2100	Mf of paper and paper products	349	314	2.20
3400	Mf of motor vehicles	207	344	1.83
0500	Fishing, aquaculture	211	163	1.10
3694	Mf of games and toys	150	139	.80
1600	Mf of tobacco products	56	120	.64
2500	Mf of plastic products	34	172	.49

Source: Authors' calculations based on Sigwatch data. Sectors are classified according to ISIC Rev. 3.1. Sectors excluded from the analysis are the following: 3700 Recycling; 4100 Water collection, purification and distribution; 4500 Construction; 5500 Hotels and restaurants; 6000 Land transport; 6200 Air transport; 6300 Auxiliary transport activities; 6500 Finance and insurance; 7400 Other business activities; and 9200 Recreation, Media, cultural and sporting activities.

gravity term Δ_{ijk} defined in equation (13). Multilateral upstream trade resistance of country i is given by P_i^B from equation (5). It is defined as the price of one unit of the optimal input bundle in country i. This price depends on all determinants making sourcing from all other countries more or less attractive and therefore summarizes the trade resistance country i faces when trading with its upstream suppliers. The multilateral upstream trade resistance P_i^B affects campaigns through its impact on trade in final goods between countries i and j. With low trade resistance towards the countries supplying intermediates, inputs are cheaper and firms in i produce at lower total cost and charge lower prices. The intuition for the effect of P_i^B is therefore similar to the one for bilateral trade costs τ_{ij}.

The term θ_j, as defined in equation (9), represents the essential features of the consumer price index in country j, P_j. As it reflects (by a constant term) the prices of all goods from all countries that are sold in country j, it also provides a summary of the overall trade resistance country j is facing when importing goods for final consumption from all its trading partners. For given bilateral trade costs τ_{ij}, a higher overall trade resistance θ_j favors exports from i to j and therefore increases the measure of i–j NGO campaigns.

The term $\mathcal{C}_i^s$ reflects multilateral sourcing trade resistance of country i (see equation (6)). It affects triadic campaigns through G_{ki} in equation (13), which shapes the sourcing of

inputs between country k and country i. It has similar components as the multilateral upstream trade resistance P_i^B discussed above, but it enters the triadic gravity equation not through its effect on production costs, but through its effect on the relative factor content of the input sourced from country k, which is given by s_{ki} from equation (6). Multilateral sourcing trade resistance is a key element for the analysis of value chain campaigns. It needs to be compared to the (un)attractiveness of sourcing from a specific country k, which is represented by the other elements of G_{ki}: low bilateral trade costs τ_{ki}, low production costs in k, w_k, and a high technical relevance of k's input in production, β_k, make sourcing from k attractive. This effect is reinforced by a high value of $\mathcal{C}_i^s$, which reflects a low average attractiveness of sourcing inputs from all other countries, driving up the share of inputs from k in the input bundle used by firms from country i.

B.2. Campaigns at the NGO Level – Large NGOs

While proposition 2 constitutes the main result of the theoretical analysis of NGO-level gravity for campaigns, in this appendix we also consider the second determinant of $n_{ijk}(\xi)$ in equation (16): $n_{ijk}^L(\xi)$ for "hyper-efficient" NGOs.

Such NGOs are so efficient that they can cover all possible campaigns. While the existence of these "hyper-efficient" NGOs in the model is the price we pay for analytical tractability, they do not affect the results qualitatively, especially with respect to testable implications of the model. Computing n_{ijk}^L from equation (16), the measure of campaigns by these NGOs is simply given by

$$n_{ijk}^L = \delta \; w_i L_i. \tag{B.1}$$

Equation (B.1) only depends on the economic size of county i, as this determines the measure of possible target firms exporting from i to j, thereby defining the maximum number of possible campaigns. This allows us to state the following corollary:

Corollary B.1. *When also "large" NGOs with efficiencies of $\xi > \bar{\xi}_{ijk}$ are included in the analysis of $n_{ijk}(\xi)$ as defined in equation (16), results from proposition 2 and corollary 1 are qualitatively unchanged, but only hold weakly. The impact of economic size of country i is the only exception, as its effect is the same as in corollary 1.*

Proof. To see this, simply note that the effect of economic size of country i is the same in equations (17) and (B.1). All other variables shaping NGO-level campaigns in equation (17) and presented in proposition 2 and corollary 1 are absent in equation (B.1). □

We argue in footnote 22 that NGOs with an efficiency above the discontinuity threshold are not expected to have any empirical relevance, as they should not arise when the model is mapped from the theoretical continuous distributions to a finite number of NGOs in the data. Corollary B.1 provides a second reason why the fact that in the theory some "hyper-efficient" NGOs carry out all possible campaigns does not affect the empirical analysis in section 3: even in the presence of such NGOs, the testable implications do not change qualitatively.

B.3. Proof of Proposition 3

Part (i): local This follows from the fact that intra-national trade costs are always smaller than international trade costs, combined with proposition 2. When domestic trade costs are fixed at unity and international trade costs going to infinity, this implies that international campaigns go to zero whereas all-internal campaigns are unaffected such that the share of the latter goes to one.

Part (ii): global By proposition 2, the measure of campaigns decreases in both bilateral trade costs. A decrease in bilateral trade costs affects only campaigns with at least one foreign element, because internal trade costs are normalized to unity. Therefore, the measure of all-internal campaigns is unaffected by rising trade costs, whereas the measure of campaigns with at least one foreign element increases when bilateral trade costs fall, which increases the fraction of the latter. □

B.4. Derivation of Aggregate Profits

Denote an i firm's profits from serving j as $\pi_{ij}(\varphi)$. These profits are given by:

$$\pi_{ij}(\varphi) = \frac{\mathcal{C}^x}{\sigma} Y_j \left(\frac{P_i^B \tau_{ij}}{\theta_j} \right)^{1-\sigma} \varphi^{\sigma-1}. \tag{B.2}$$

Recall that π denotes dividends per share of the global mutual fund and that there are $\sum_{n=1}^{N} w_n L_n$ shares in total. Hence, $\pi \sum_{n=1}^{N} w_n L_n$ equals aggregate world profits and can be computed as the sum of all firms' profits in all markets:

$$\pi \sum_{n=1}^{N} w_n L_n = \sum_{n=1}^{N} w_n L_n \int_1^\infty g_\varphi(\varphi) \sum_{l=1}^{N} \pi_{nl}(\varphi) \, \mathrm{d}\varphi. \tag{B.3}$$

Plug in the productivity distribution, equation (B.2) and factor out the integral:

$$= \frac{\mathcal{C}^x}{\sigma} \int_1^\infty \gamma \, \varphi^{\sigma-\gamma-2} \, \mathrm{d}\varphi \sum_{n=1}^{N} w_n L_n \sum_{l=1}^{N} Y_l \left(P_n^B \, \tau_{nl} \right)^{1-\sigma} \theta_l^{\sigma-1};$$

evaluate the integral using $\gamma > (\sigma - 1)$ and cancel using $\mathcal{C}^x$ from equation (10):

$$= \frac{\mu}{\sigma} \sum_{n=1}^{N} w_n L_n \sum_{l=1}^{N} Y_l \left(P_n^B \, \tau_{nl} \right)^{1-\sigma} \theta_l^{\sigma-1};$$

plug in the budget Y_l and change order of summation:

$$= (1+\pi) \, \frac{\mu}{\sigma} \sum_{l=1}^{N} w_l L_l \sum_{n=1}^{N} w_n L_n \, (P_n^B \, \tau_{nl})^{1-\sigma} \, \theta_l^{\sigma-1};$$

plug in the multilateral resistance term from equation (9) and solve for π to get:

$$\pi = \frac{\mu}{\sigma - \mu}. \tag{B.4}$$

B.5. Derivation of Gravity for Intermediate Inputs

Let $\mathfrak{i}_{ijk}(\varphi)$ be the quantity sourced at the firm–destination level, i.e. the quantity of inputs an i firm with productivity φ sources from k to serve market j. As sales in j are $x_{ij}(\varphi)$, the

quantity the i firm has to produce is $\tau_{ij}\ p_{ij}(\varphi)^{-1}x_{ij}(\varphi)$. Each unit of output requires $1/\varphi$ input bundles, whereof each contains b_{ki} units of the intermediate input from k (see equations (3) and (4)). Therefore, an i firm with productivity φ sources $\mathfrak{i}_{ijk}(\varphi) = b_{ki}\ \frac{\tau_{ij}\ p_{ij}(\varphi)^{-1}\ x_{ij}(\varphi)}{\varphi}$ units of intermediate inputs from k in order to serve market j. Using the budget Y_j, equations (4), (8), (10) and (B.4), this gives

$$\mathfrak{i}_{ijk}(\varphi) = \mathcal{C}^x\mathcal{C}^{\mathcal{I}}\ w_jL_j\ \frac{\beta_k\ P_i^B}{w_k\ \tau_{ki}}\ (P_i^B)^{-\sigma}\left(\frac{\tau_{ij}}{\theta_j}\right)^{1-\sigma}\ \varphi^{\sigma-1}, \tag{B.5}$$

where $\mathcal{C}^{\mathcal{I}} \equiv \frac{\sigma-1}{\sigma}(1-\frac{\mu}{\sigma})^{-1}$.

Denote the quantity of country k inputs that are embedded in final products from country i and imported by country j as $\mathcal{I}^X_{ijk} = w_iL_i\int_1^\infty g_\varphi(\varphi)\ \mathfrak{i}_{ijk}(\varphi)\,\mathrm{d}\varphi$. Using the productivity distribution, $\mathcal{C}^x$ from equation (10) and equation (B.5), this equals

$$\mathcal{I}^X_{ijk} = \mu\mathcal{C}^{\mathcal{I}}\ w_iL_i\ w_jL_j\ \left(\frac{w_k\ \tau_{ki}}{\beta_k\ P_i^B}\right)^{-1}\ (P_i^B)^{-\sigma}\left(\frac{\tau_{ij}}{\theta_j}\right)^{1-\sigma}. \tag{B.6}$$

To compute all inputs i firms source from k ($\mathcal{I}_{ki}$), sum over the inputs used to serve all destination markets j, i.e. $\mathcal{I}_{ki} = \sum_{j=1}^N \mathcal{I}^X_{ijk}$. This gives

$$\mathcal{I}_{ki} = \mu\mathcal{C}^{\mathcal{I}}\ w_iL_i\ \left(\frac{w_k\ \tau_{ki}}{\beta_k}\right)^{-1}\ P_i^B\ \Phi_i, \tag{B.7}$$

where $\Phi_i \equiv (P_i^B)^{-\sigma}\sum_{j=1}^N w_jL_j\ \left(\frac{\tau_{ij}}{\theta_j}\right)^{1-\sigma}$.