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# Competitive lobbying in the influence production process and the use of spatial econometrics in lobbying research [1]

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Abstract

Much of the lobbying process is inherently competitive: When lobbyists with opposing goals attempt to move outcomes in their preferred direction, successful lobbying by one actor will disadvantage opposing actors. This article theorizes and quantifies the *indirect* form of influence that competing lobbying actors exert on each other. While existing theories of competitive lobbying have focused on legislation, we argue that all stages of the lobbying process involve competition. Our findings make two contributions to the study of lobbying influence. First, using spatial econometrics, we present the first estimates of how the success of one lobbying actor is shaped by the lobbying activities of opposing actors. Second, we study competition in three diverse empirical settings that capture three different stages of the lobbying process: (1) lobbying camps favoring opposite legislative outcomes in five European countries, (2) US lobbying firms competing over client resources, and (3) corporations competing for administrative trade barriers in 19 World Trade Organization member countries. The results reveal important insights about how interdependence among lobbyists conditions their effectiveness. Our application of spatial techniques to model interdependence between actors is useful for all scholars who want to take competitive or collaborative diffusion mechanisms into account in studies of lobbying and public policy.

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## 1. Introduction

Seminal theories of lobbying conceptualize the activities of pressure groups as competitive endeavors, in which groups compete for members, resources, survival and influence (e.g., Austen-Smith and Wright 1992; Haider-Markel 1997; Gray and Lowery 1996; Grossman and Helpman 2001). Theories of rent seeking (Krueger 1974; Tullock 1967) characterize interest groups' activities as *zero-sum* interactions, such that successful rent extraction by some actors will subtract from the rents allocated to other groups. For instance, Becker's (1983) theory of competitive lobbying stresses that the characteristics and strategies of a lobbying group affect the lobbying success of its *opponent*.

Despite the prominence of theories addressing competitive forces in lobbying, little empirical research exists on the topic. While many researchers agree that interest groups' influence-seeking activities entail competitive relationships, we know next to nothing about the empirical consequences of such competition. For instance, we know little about *the degree to which lobbying firms' activities influence their opponents' success indirectly*. We address that broad research question in three diverse contexts to help us better understand the indirect influence exerted by opponents at different stages of the lobbying process.

We make two contributions to the study of lobbying influence (cf. Baumgartner et al. 2009; Grossman and Helpman 2001; Leech 2010; Lowery 2013; Klüver 2013a, b). First, we advance extant theories of competitive lobbying, most of which focus on the legislative context, by arguing that important competitive dynamics between opponents can be expected at *all* stages of the influence production process – not just activities targeting legislators. Lobbying is a multi-faceted process that first requires organizations to decide whether (and how) to distribute the resources they devote to lobbying. They must then choose to try to influence legislation and/or administrative decisions. We hypothesize that each step in that process involves the competitive distribution of the rents that accrue from a change in policy. In a second contribution, using techniques from spatial econometrics (cf. LeSage and

Dominguez 2012) we provide the first estimates of how competition between opposing interests on a political issue shapes outcomes before, during and after the passage of legislation. By exploring the dynamics in very different contexts, we shed light on both (1) the general applicability of our main argument – that lobbying entails important diffusion mechanisms between competing actors and (2) variations in the strength of the relationship among lobbying firms, which depends, for example, on the number of competitors.

We analyze data from three cases, each of which describes competitive lobbying behavior at a different stage of the lobbying process. Table 1 provides an overview of the three cases that we study to provide insights on competitive lobbying throughout the policy-making process.

[Insert Table 1 here]

In case 1, we start by examining the most widely studied aspect of interest group behavior – the legislation phase. That also is where most theory of competitive lobbying is developed. To do so, we leverage data on policy outcomes for 50 issues in five European countries to demonstrate how 'camps' of diametrically opposed advocates compete to shape policy. In case 2, to investigate the *mobilization phase* where organized interests choose whether to become politically active and which lobbyists to hire. We do so by analyzing data on the earnings of US lobbying firms. We demonstrate that when those firms compete for their clients' resources, they generate spillovers: when one firm receives more revenue, other firms that work for the same client receive less. In case 3, to capture competitive lobbying for favorable administrative decisions in the legislative implementation period (*implementation phase*), we replicate a recent study of the determinants of punitive antidumping duties in 19 countries (Egerod and Justesen 2021). We find that competition arises because decision-makers are willing to grant only limited trade protection, because of the economic costs of doing so.

Our results demonstrate that competitive dynamics strongly shape outcomes in these three diverse cases. We find strong support for Becker's (1983) prediction that competitive lobbying has wide-ranging implications: Characteristics that make one side, firm or lobbyist more successful *indirectly* reduce the success of its opponents. While Becker's theory considered legislative lobbying only, we show that the same competitive dynamics apply to the other two stages of the lobbying process. Our findings represent a first step towards investigating the *indirect influence* of competitive forces in both legislative and non-legislative lobbying processes.

## 2. Theory: Competitive lobbying revisited

Since organized interests compete for scarce resources through their political activities, theories of lobbying nearly always take competitive forces into account, for instance in the literatures on population ecology (e.g.. Gray and Lowery 1998; Berkhout et al. 2015), lobbying influence (e.g., Baumgartner et al. 2009; Grossman and Helpman 1994, 2001; Leech 2010, Klüver 2013b; Lowery 2013), and lobbying coalitions (e.g., Heaney 2014; Holyoke 2009, 2011; Godwin, Ainsworth and Godwin 2013). Yet prior studies have largely overlooked the theoretical and empirical implications of the competitive dynamics of lobbying.

We identify two important gaps in the literature. First, studies with an explicit focus on 'competitive lobbying' or 'rent seeking' often emphasize the legislative phase (e.g., Austen-Smith and Wright 1992, 1994; Becker 1983; Baron 2006; Duggan and Gao 2020; Laffont and Tirole 1991; Grossman and Helpman 1994, 2001). However, we argue that competitive dynamics influence all three stages of the lobbying process (Table 2).[4] In the *legislation phase* (case 1), we analyze two camps lobbying for opposite outcomes. The camps each comprise several like-minded interest groups. Second, when considering the *mobilization phase* (case 2), we explore the decisions of groups to contract with one

[4] For more on the additional phases of the lobbying and policy-making processes, see Godwin et al. (2013).

or more professional lobbying firms, and how their expenditures are shared between firms. Finally, in the *implementation phase* (case 3), we examine how firms seek to influence bureaucrats' enforcement decisions.

[Insert Table 2 here]

Addressing a second research gap, prior studies have failed comprehensively to model the empirical implications of competition. To understand its effects on lobbying influence, we apply theories of competitive lobbying (Becker 1983; Baron 2006) and competitive rent seeking (Tullock 1967; Krueger 1974) to various stages of the policy-making process.

### *2.1 A theory of competitive lobbying revisited*

Becker's (1983) model focuses on lobbyists competing over the distribution of taxes and subsidies affecting two competing pressure groups, in which a subsidy paid to group A will be financed by taxing group B. His simple political budget equation implies that the 'influence functions cannot be independent' and that 'increased influence of some groups decreases the influence of others' (Becker 1983, p. 367). An important insight from the model is that, given the competitive dynamics of lobbying, political success will be determined by *relative* advantages *compared to opponents* (Becker 1983, p. 380). The idea of relative advantages suggests that if a lobbying actor's characteristics increase its odds of winning a lobbying contest, they will reduce the odds of opposing actor(s) *indirectly*. When the actor's response to its opponent is 'small' (inelastic), the indirect effects should be substantial because the actor whose response is inelastic will be put at a disadvantage that cannot be overcome because it is unable to invest more lobbying resources.

We argue that the logic above applies to a variety of settings in the realm of lobbying competition and has far-reaching empirical implications beyond the distribution of subsidies in a two-actor

scenario (cf. Becker 1983, pp. 388ff). We maintain that the insights from Becker's model are applicable under three conditions: (1) when two opposing lobbying camps compete over policy (*H1*), (2) when many lobbying firms compete over clients (*H2*), and (3) when the dynamics of competition for administrative outcomes become more complex owing to positive (*H3a)* and negative (*H3b)* spillovers between actors. We explain each of the extensions to the theory of competitive lobbying in turn.

### *2.2 Competition as legislative lobbying between two sides (H1)*

The payoff structure in Becker's original model applies quite straightforwardly in a setting with two camps comprising several interest groups that lobby simultaneously for and against change on a policy issue (e.g., Baumgartner et al. 2009; Klüver 2013a; Junk and Rasmussen 2019; Lorenz 2020; Mahoney and Baumgartner 2015). If one camp successfully moves public policy in its preferred direction, the other one will lose out. Thus, the probability of success is increased either because (1) an actor's own camp improves its odds of winning or (2) the opposing camp's chances of winning decline. The two camps favoring and opposing policy change will expend time, energy and resources to maximize their expected gains. Camp A will exert pressure to lobby for a policy change and camp B simultaneously will pressure to oppose the policy change.

Becker's model assumes that the equilibrium lobbying effort will be reached as groups maximize their gains by deploying optimal political pressure, given the productivity of their expenditures and *the behavior of other groups*.[5] Figure 1 illustrates our interpretation of the argument for the example of two camps (A and B) characterized by reaction curves $a_0$ and $b_0$; equilibrium lobbying pressure is denoted $e_0$.

[5] We do not reproduce Becker's full model here. Rather, we rely on the comparative statics he derives to show how his model predicts that changes in camp characteristics will affect competition (Becker 1983, pp. 378–380).

[Insert Figure 1 here]

The intercept of each response curve is determined by how effective the camp is in producing pressure. The slope is determined by the allocative inefficiency created by the camp's cause (e.g., smaller deadweight losses produce steeper curves) and how easily the group can increase its pressure in the short term. When camp A becomes more effective at exerting pressure, for instance because it mobilizes more (or a more diverse set of) active groups, its reaction curve shifts up (to $a_1$) and its optimal lobbying pressure increases. If camp B can react to that change (along the reaction curve $b_0$), it would likewise increase its pressure; the new equilibrium would move to e1, where the relative pressure of the two camps has changed little.

However, if camp B cannot react to camp A, the analysis looks very different. If we imagine that the reaction curve of camp B is vertical (i.e., the dashed line in Figure 1), for instance because it has exhausted its resources or cannot adjust its behavior, the equilibrium moves to $p_1$, where camp A has secured a competitive advantage over camp B.

Put differently, the more *inelastic the response* of a lobbying actor is to the opponent's pressure, the more we should see that changes in the lobbying characteristics of one camp put the other camp at a disadvantage. That conclusion will hold in the presence of informational asymmetries (cf. Baron 2006) or time lags in reacting to the opponents' strategies and strengths (cf. Austen-Smith and Wright 1992, 1994), or organizational characteristics that are hard to adjust (in the short term). Such relative inelasticity characterizes many common predictors in models of lobbying influence in the literature. Examples include the group type of individual actors, the sizes and compositions of lobbying camps, or their available resources, such as staff size (cf. Baumgartner et al. 2009; Binderkrantz, Christiansen and Pedersen 2014; Dür, Bernhagen and Marshall 2015; Lorenz 2020; Mahoney and Baumgartner 2015; Klüver 2013a; McKay 2012).

H1 applies the same reasoning to competition between lobbying camps. If camp A becomes more efficient in exerting pressure, it will become more successful. As a best response, camp B will exert more pressure to partially offset camp B's greater chances of success, but it will not be able to fully offset it; as a result, its own success will decline. We therefore expect considerable interdependence between camps, such that a change in any characteristic, such as camp size or diversity (Klüver 2013a; Lorenz 2020; Mahoney and Baumgartner 2015), that makes camp A more successful will have an indirect negative effect on the opposing camp:

*Hypothesis 1: Where two lobbying camps compete for influence over policy outcomes, an increase in camp A's (1) size or (2) diversity significantly reduces camp B's lobbying success.*

We expect very similar dynamics when many groups compete simultaneously (cf. Becker 1983, pp. 388ff) and at different stages of the lobbying process.

### *2.3 Competition at early stages of the lobbying process (H2)*

Previous studies of competitive lobbying tend to focus on how competition shapes legislative influence (e.g., Austen-Smith and Wright 1992, 1994; Becker 1983; Baron 2006; Duggan and Gao 2020; Laffont and Tirole 1991; Grossman and Helpman 2001, 1994). However, we expect the competitive dynamics outlined above to apply in all situations when lobbying actors seek to extract rents from a common pool of finite resources (Krueger 1974; Tullock 1967). Similar to theories that consider lobbying throughout the policy process (Godwin, Ainsworth and Godwin 2013), we argue that much lobbying behavior does not concern itself with legislation; various actors compete to distribute the spoils both *before* and *after* a new policy is enacted. We argue that competition is inherent in all rent-seeking aspects of lobbying, not just when it aims to shape legislation.

For instance, contract[6] lobbying firms compete over their clients' limited resources, often before both in-house and hired lobbyists try to affect concrete legislation (cf. LaPira, Thomas and Baumgartner 2014). A key way in which (future) rents from lobbying are distributed is by interest groups outsourcing lobbying effort (Ban, Palmer and Schneer 2019; McCrain 2018). The contract lobbying firm agrees to seek influence on behalf of its clients in return for a retainer, which can be seen as the lobbyist's share of the interest group's rents. Since lobbyists' clients typically have a fixed lobbying budget, lobbying firms compete with one another directly. The allocation of resources to one lobby firm likely depends on their proven effectiveness and their fields of expertise. However, since the client has a ceiling on how much it is willing to spend on its lobbying campaign, when one lobbying firm increases its share of the client's resources, other lobbying firms will receive smaller shares.

The setting described above is well suited to studying rent seeking between *many* competing actors with clear zero-sum characteristics. We expect that the characteristics that make one firm more appealing to clients, such as a high level of connectedness and past success (cf. Furnas, Heaney and LaPira 2019), will affect all other competing firms indirectly. As in our previous setting, we expect the response curves to opponents' characteristics to be *relatively inelastic*, given that lobbying firms' abilities to adjust to the competitive advantages of other firms are constrained (especially in the short term). Still, given that *many* firms compete against one another at the same time, we expect the indirect effects to be smaller than in the previous example of bilateral competition between camps.

*Hypothesis 2: Where lobbying firms compete for client contracts directly, one firm's increases in (1) connectedness or (2) past revenue indirectly make other firms less likely to secure contracts.*

[6] The distinction between contract and in-house lobbying is important. In the former, the interest group hires one or more professional lobbying firms to act on its behalf. In the latter, the group hires one or more lobbyists to work in a dedicated public affairs division of the group. We focus on the former because competition is more clearly observable.

Finally, we expect the competitive dynamics described above to be applicable *after* the legislative process ends, for example when corporations compete to shape administrative rulings, and even when the patterns of competition become more complex.

### *2.4 Complex dynamics of competition between corporations in administrative rulings (H3)*

To address the competitive dynamics that take place *after* the legislative process ends, we focus on lobbying before administrative agencies (cf. Furlong and Kerwin 2005; Yackee 2005; You 2017). The patterns of competition in that phase might increasingly become complex given that specific rulings entail multifaceted structures of costs and benefits to sectors, individual actors within a sector, or both. To illustrate such complex modes of competition that entail important indirect effects between competing actors, we focus on the example of corporate lobbying over antidumping duties.

Antidumping duties are punitive tariffs that decision-makers (e.g., the International Trade Commission) impose on foreign products if they deem the prices to be artificially low. They are imposed administratively: they do not require legislation, but are levied discretionarily after a bureaucratic investigation. Such duties are designed to shield domestic companies from 'unfair' competition. In practice, however, they represent a potent tool that can improve the competitive positions of specific firms (Blonigen and Prusa 2003). When two domestic companies that produce the same good compete with different foreign firms, decision-makers can impose antidumping duties on specific products produced and exported by a named foreign firm and thus protect only one of the domestic firms.

As in previous examples, we expect competition over the strictly limited amounts[7] of antidumping duties that decision-makers impose. Every time a firm successfully lobbies for antidumping protection, less protection remains available for other domestic firms. Thus, any characteristic that makes a corporation more effective at securing any dumping duties has an additional indirect effect on other domestic firms. We focus on revenue as the main characteristic, given that prior research has shown it to be an important factor in corporate lobbying success (Oliver and Holzinger 2008). We expect inelastic response curves to characterize this case.

However, administrative decisions tend to have complex implications for competitive relationships. Because corporate protection seekers operate within industries, we can expect rivalry on two levels: within and between corporations that produce the same product. Thus, we can expect distinct forms of indirect effects between connected protection-seeking firms, which we define as all direct competitors within a country that produce the same goods.

On the one hand, since imposing duties is costly for society (Egerod and Justesen 2021), decision-makers are not willing to grant unlimited protection. That constraint triggers competition *within* groups of same-good producers, given that antidumping duties can protect individual firms. Therefore, paralleling our predicted effects in H1 and H2, we expect that *within groups of same-good producers,* any characteristic that makes one firm more successful at placing duties on its foreign competition indirectly reduces the protection provided to competitors (Egerod and Justesen 2021). H3a summarizes that expectation with a focus on past revenue as a predictor (cf. Oliver and Holzinger 2008) .

[7] Note that the practice is sanctioned by the World Trade Organization and, as previous research has shown, antidumping duties have large negative effects on competition and the volume of international trade (Blonigen and Prusa 2003; Bown and Crowley 2007).

*Hypothesis 3a: In direct competition between same-good producers for antidumping duties, an increase in one corporation's revenue indirectly reduces the success of other same-good producers in securing antidumping duties.*

On the other hand, when duties are imposed to protect one good, a *precedent* is created, which means that other firms producing the same good are more likely than firms producing *different products* to gain protection as well. Antidumping duties therefore will be concentrated on certain goods; vigorous competition for duties largely will take place *between products*. Consequently, we predict that looking *across all firms*, when one firm becomes more effective at lobbying and gains antidumping protection, other same-good producers will have an *easier tim*e doing so as well by appealing to the precedent. Those considerations lead us to H3b, which predicts an additional *positive* indirect effect, again with revenue as a predictor.

*Hypothesis 3b: In direct competition between all corporations for antidumping duties, an increase in one corporation's revenue indirectly increases the success of other same-good producers in securing antidumping duties.*

Below, we use spatial econometrics methods to estimate the indirect effects.

**3. Method: Estimating lobbying competition with spatial econometrics**

Our argument implies that when one actor is successful in its lobbying endeavors, its opponent's success will be affected indirectly. We use spatial autoregressive (SAR) models (also called spatial-lag-of-*y* models) to test that conjecture. Such models seek to estimate spatial diffusion: how one actor's outcome spreads to other actors with which it is connected (for a well-known example, see LeSage et al. 2011). Connection does not need to be geographic; actors can be connected through their activities on the same issue, in the same sector, or if their activities have the same targets, for

example. Spatial econometrics techniques allow us to account for and quantify the association between group characteristics and lobbying success across related units.

Figure 2 illustrates the two theoretical quantities of interest in our SAR model: the *indirect effect* and *diffusion parameter* – the effects our hypotheses predict. The model includes the standard quantity of interest from a non-spatial regression model: any characteristic that is conducive to the success of a lobbying actor A affects its own success directly. The SAR model also allows us to estimate the effects of competition in two ways. First, the successes of the two opposing actors, A and B, inherently are linked when they compete over a preferred outcome: A's success will diminish the success of B (a relationship known as "diffusion" or the "diffusion parameter" in spatial econometrics). Second, because of the competitive dynamics, any factor that would make a group more successful always will have an additional indirect effect because one group's success will make its opponents less successful (cf. our discussion of Becker 1983). Thus, if actor A improves its chances of lobbying success, that improvement *indirectly* reduces actor B's odds of winning.

[Insert Figure 2 here]

### *3.1 Defining competitors with the weights matrix*

When adopting spatial techniques to estimate the relationship between lobbying competitors, the first step is to define which units are connected. In case 1 (lobbying camps competing to shape a policy issue), the opposing camps are linked by the issue over which they are lobbying. Here, we would expect a negative spillover effect on the other camp because the competitive dynamics induce a contemporaneous autocorrelation in outcomes between camps that are active on the same issue. In case 2 (lobbying firms competing over client resources), firms working for the same clients are connected. In case 3 (antidumping duties) we analyze actors within and across groups of same-good producers.

The next step is to create a weights matrix to map the network structure between actors in a dataset to account for the extent of interdependence (and thus the importance of the relationship) between them (here, competitors) (Moran 1948). In a dataset with N observations, the N x N weights matrix (we call it $w_{ij}$) will specify, for each unit of observation, the relationship to each other unit. The ($i$, $j$)$^{th}$ element of the matrix describes the relationship between units $i$ and $j$. If $w_{ij} \neq 0$ ($w_{ij} = 0$), $i$ and $j$ are related (not related), for instance as competing lobbyists on a policy issue (cf. Kelejian and Piras 2017). Thus, the dependent variable $y$ for unit $i$ can be estimated as a function of the relevant characteristics of unit $i$ itself as well as those of related units, $j$. We enter the variables in a SAR model of the following form:

$$y = \rho(wy) + X\beta + \epsilon \quad (1)$$

For case 1, we model how camp A's lobbying success depends on $X$ (the independent variable, *Camp size*). What is more important, competitive lobbying is modeled by entering a spatially lagged $y$, which is computed by weighting the dependent variable by means of the spatial connectivity matrix. This captures how camp A influences the outcome of connected camp B. Hence, the strength of spatial interdependence is captured by ρ (diffusion parameter), which can be interpreted as a correlation coefficient because we row-normalize the weights matrix. Appendix B contains a more detailed discussion of SAR models.

Appendix A provides further details on the empirical context, our datasets and relevant controls for all three cases. The next three sections introduce the variables for the three cases considered.

### *3.2 Dependent variables: Lobbying success*

For each of the cases we study, Table 3 provides an overview of the variables, contexts and data sources.

[Insert Table 3 here]

For *case 1*, we rely on GovLis Project's[8] data on governmental responsiveness in five European countries (Denmark, Germany, the Netherlands, Sweden and the United Kingdom). The dataset comprises a sample of 50 issues on the public policy agenda, which were drawn as a stratified quasi-random sample of issues appearing in high-quality public opinion polls in the respective counties (see Rasmussen, Mäder and Reher 2018). Information on actors active in inside and outside lobbying on those issues was collected for up to four years in several steps (see Appendix A.1). The dataset allows us to collect information on the composition of the opposing lobbying camps active on the specific issues in the sample. We therefore aggregate the dataset to the level of camps active on a particular issue and estimate the effects of camp characteristics on its own lobbying success as well as that of the opposing camp. Thus, our unit of analysis here is the *lobby camp on an issue*. We measure lobbying success as binary preference attainment (for discussions of such a measure, cf. Dür 2008; Rasmussen, Mäder and Reher 2018; Junk 2019), i.e., whether the policy outcome at the end of the observation period was in line with the policy goal of the lobbying camp (1) or its opponent (0).

For *case 2*, we rely on data from the Center for Responsive Politics (CRP) on the earnings of lobbying firms.[9] The US Lobbying Disclosure Act (LDA) requires lobbyists to file reports with the Senate Office of Public Record, which, after "cleaning", the values of individual lobbying contracts is released by the CRP to the public. The unit of analysis here is the *contract lobbying firm*, and the outcome variable is the firm's annual revenue. Following the literature on US lobbying (Furnas, Heaney and LaPira 2019), we aggregate the value of individual lobbying contracts to the firm level to measure lobbying success.

[8] For more information, see: https://govlis.eu/

[9] Link to the CRP bulk data: https://www.opensecrets.org/bulk-data

For *case 3*, we draw on an existing dataset by Egerod and Justesen (2021) and reproduce their findings. The dataset matches all petitions for antidumping duties filed between 2006 and 2016 in 19 World Trade Organization jurisdictions[10] to the finances of the corporations that filed them. For antidumping duties, our analysis relies on the exceptionally granular Bown (2016) database, which identifies domestic firms that seek protection, and for what products. What is important is that the dataset provides a measure of successful firm-level lobbying for trade protection and identifies other domestic firms that lobby to have the same product protected (same-good producers). Thus, our unit of analysis is *corporation filings*. Our measure of lobbying success (the antidumping protection a firm gains), is the size of the duty that a firm was able to impose on its foreign competition (i.e., the percentage of the good's original price that is added to its final sales price). If the company did not succeed in having a duty imposed, the variable is coded 0. Following Egerod and Justesen (2021), we log transform duty size and add 0.5 to deal with zero cases.[11]

### *3.3 Independent variables: Characteristics of lobbying actors*

In all three cases, we focus on established predictors of lobbying success, and estimate the diffusion parameter and indirect effects on connected actors.

In *case 1* (preference attainment by a lobbying camp), we focus on two important predictors of preference attainment: the *size* (number of actors) and *diversity* (types of united interests) of the lobbying camp. We expect increasing either characteristic to boost the camp's lobbying success because broader (stronger or more heterogeneous) support is signaled to policymakers (cf.

[10] The countries are Argentina, Australia, Brazil, Canada, Colombia, the European Union, India, Israel, Japan, Malaysia, Mexico, the Philippines, Russia, South Africa, South Korea, Taiwan, Turkey, Ukraine, and the United States.
[11] We obtain similar results when we enter a binary measure of success and the variable is not log transformed.

Baumgartner et al. 2009; Lorenz 2020; Mahoney and Baumgartner 2015; Klüver 2013a; Junk 2019). To test these effects, *Camp size* is operationalized as the total number of advocates in the camp (i.e., those sharing the position in favor of or against policy change), divided by the total sum of lobbying actors on either side of the issue in the total sample of active advocates. *Camp diversity* is measured as the inverse of the Herfindahl–Hirschman Index (HHI) to account for diversity in terms of different substantial group types included in the camp.[12]

In *case 2* (spillover effects from competing lobbying firms), we focus on two independent variables: *Firm size* and *Betweenness centrality* (a firm's position in the network of firms, or how well it bridges communities). The latter is important because firms that work for the same set of clients are likely to offer the same type of services; those that bridge multiple communities are likely to offer services that attract clients from different communities. Betweenness is centered and standardized. We enter each firm's *2014 revenue* (logged) to capture its past success. Since the dependent variable is *2015 revenue* (logged), our results should be interpreted as within-firm revenue changes from the previous year.

In *case 3* (antidumping protection), we consider the revenue of the corporations lobbying for antidumping protection, relying on data from the commercial Orbis database (Egerod and Justesen 2021).

Since our dataset comes from observational studies, we cannot rule out all threats to causal identification. However, we do note that the spatial lag of *y* effectively deals with omitted variables that cause certain types of clustering on the dependent variable. And since our independent variables

[12] The inverse index (1-HHI) ranges from 0 (most homogenous: only one group type in the camp) to 1 minus 1/number of different group types, which is the most diverse distribution. For more details, see Appendix A.2.

are not amenable to manipulation in the short term, potential bias caused by reverse causality is minimized.

### *3.3 Control variables*

In all three cases, we enter relevant control variables that previous studies have shown to be related to the dependent variables capturing lobbying success and the independent variables on actor or camp characteristics. Appendix A (Sections A.2, A.4 and A.6) describe their choice in more detail.

In *case 1*, we enter the following controls to predict camp preference attainment: camp resources, cooperation in the camp, a status quo preference, public support, and issue salience. We also enter fixed effects for the five countries in the study. In *case 2*, we are interested in betweenness centrality to capture a lobbying firm's bridging capacity. Since that measure is highly correlated with the number of connections, we also enter the latter as a control. In *case 3*, we include the following controls to predict the antidumping protection gained by a firm: ratio of fixed to total assets (asset specificity), total assets, total capital, and taxes paid. All models include country and year fixed effects and use product fixed effects to control for within- and between-product comparisons.

## 4. Results

In this section, we present evidence of the spatial dynamics between competing lobbying actors at three stages of the lobbying process.

### *4.1 Case 1: Legislative lobbying competition by opposing camps*

To estimate the model of camp lobbying success, wherein our weights matrix connects opposing camps on the same issue (see Appendix B.2), we estimate a Bayesian SAR probit specification. That estimator is similar to other SAR techniques but takes the binary nature of our lobbying success

variable into account. We estimate the model by a Markov Chain, Monte Carlo method and a Gibbs sampler, which simulates parameters and marginal effects. That simulation approach allows us to extract a characteristic's direct effect on a camp's lobbying success as well as its additional indirect effect, which arises from the spatial dynamics. We simulate the model 10,000 times and discard every twentieth simulation to deal with autocorrelation in the chain. We adopt the first 3,500 simulations as burn-in.

Figure 3 displays our results on camp-level competitive lobbying, focusing on the two main variables of interest: camp size and camp diversity. The estimates are standardized, so they represent the expected shift in predicted probabilities for a one-standard-deviation change in the independent variable. Appendix C contains tables reporting coefficient estimates and the full models including relevant controls.

[Insert Figure 3 here]

The results show that the *spatial diffusion parameter* is very large. After conditioning on the covariates in our model, it is about -0.65 and statistically significant, which demonstrates that the two camps lobbying to shape each policy issue inherently are interdependent.[13]

We are interested in how the competitive dynamic shapes the impact of the camps' individual characteristics (H1). We expected characteristics like camp size and diversity, which make one camp stronger and more successful, would make its opponent less likely to succeed. That expectation clearly is supported in Figure 3, which displays the direct and indirect average marginal effects associated with changes in the covariates of interest. The figure indicates that increasing relative *camp*

[13] When estimating Moran's I – without conditioning on covariates – diffusion is estimated as -0.98; we cannot reject the possibility that it is exactly -1. The smaller spatial diffusion parameter in the full model indicates that part of the competition between camps is captured by the camp-level characteristics that are included in the model.

*size* by 25% (roughly one standard deviation) is associated with a direct 16 percentage-point increase in the camp's probability of success. More important, because of the very strong competitive dynamic, the increase in the larger camp's win-probability leads to a corresponding decline of approximately 9.5 percentage points in the opponent's likelihood of influencing policy. Likewise, a one-standard-deviation increase in *camp diversity* corresponds to a 12.5 percentage-point rise in the probability of lobbying success, and roughly a 7 percentage-point decrease in the opponent's likelihood of influencing policy.

The evidence thus demonstrates the significance of lobbying competition for understanding policy outcomes. The proposed spatial techniques allow us to directly capture the dynamics proposed in classical theories of rent seeking and competitive lobbying. Below, we demonstrate that the same dynamics hold more broadly, even when many groups compete in much more complex (non-legislative) environments.

### *4.2 Case 2: Competition over client resources among contract lobbying firms*

In our models of competition between contract lobbying firms, our weights matrix captures that firms working for the same client are connected, as they compete for a share of the same finite budget. Our sample contains 1,783 unique lobbying firms. As we document in Appendix A.4, the number of connections (sharing a client) in the sample varies from 0 to over 384. Rather than simply accounting for *whether* two units (in this case firms) are connected, the weight matrix captures the *intensity* of the connection. Using a simple linear weighting scheme, we weight the ties so that firms with more ties between them are connected more strongly.[14] Additionally, we row-normalize the weights matrix

[14] We obtain the same result using the log of inverse distance, a convex functional form, or a binary matrix.

to allow us to interpret the diffusion parameter as the Pearson correlation between the dependent variable of neighbors (LeSage and Pace 2014).

We then estimate a linear SAR model and rely on the LeSage and Pace (2014) parametric bootstrap to decompose the estimates into direct and indirect effects. The results support H2: when one contract lobbying firm increases its (1) level of betweenness and (2) past revenue, earning changes among connected firms should be smaller (Figure 4).

[Insert Figure 4 here]

We estimate a diffusion parameter of -0.026, which is statistically significant and much smaller in magnitude than in the previous test, since the competitive dynamics are more subtle and distributed among more actors in this case. Nevertheless, the finding indicates that a firm's revenue is negatively related to the revenue of other firms with which it has clients in common.

The interdependencies also are reflected in the indirect negative effects of *betweenness* and *past revenue* (right panel of Figure 4). Both factors have strong direct effects (see left panel of Figure 4): We estimate that a one-standard-deviation increase in a firm's bridging capacity is associated with a 30% increase in revenue over the previous year, and that a 1% increase in 2014 revenue is associated with 0.08% more revenue in 2015. The right panel illustrates that both significant positive effects generate simultaneous *negative indirect effects* on connected firms: A one-standard deviation increase in a firm's bridging capacity is associated with a reduction in the revenue of connected lobbying firms of approximately 0.5. As before, this effect happens because the increase in the firm's own revenue associated with betweenness propagates to other firms, which reduces their revenue. Similarly, an increase in 2014 revenue is associated with a small indirect effect on connected firms (Figure 4). Case 2 illustrates that even when more than 300 actors are connected, an actor's lobbying characteristics have significant indirect effects on the opponents' success. In case 3, we show how

complex such effects can become, as they can entail both *negative* and *positive spillovers*, depending on the nature of the competition.

### *4.3 Case 3: Administrative lobbying competition among protection-seeking firms*

Finally, we reproduce the findings in Egerod and Justesen (2021) to look into administrative lobbying for trade protection and explore the dynamics between corporations that lobby to have antidumping duties imposed on their foreign competition. The results support our argument in two ways. First, they show that individual corporations compete over administrative decisions; competition is not limited to the legislative arena or contract lobbying firms. Second, the findings illustrate how competitive dynamics can be extremely complex. As we show below, two competing firms might benefit from a beneficial outcome for one of the parties if it supplies an advantage over other (common) competitors. The indirect effects in networks of lobbyists can both be negative and positive, depending on the nature of competition that is conceptualized and entered into the analysis.

To capture the competitive dynamics, we construct a weights matrix in which firms from the same country that seek protection for the same good in the same year are connected. Recall that we predict that competitive dynamics exist both within and between product groups (H3a and H3b). To simulate those dynamics, we enter fixed effects for products. When doing so, the model is estimated on variation within a group of same-good producers only. In those cases, we would expect *negative* diffusion: same-good producers compete (H3a). When the fixed effects are excluded, all products are compared, and we would expect *positive* diffusion: same-good producers win protection at the expense of other-good producers (H3b).

To estimate the foregoing effects, we rely on linear SAR models. To estimate the marginal direct and indirect effects of the producer's characteristics on the antidumping duties it obtains, we again adopt LeSage and Pace's (2014) parametric bootstrap procedure. Figure 5 displays our results on firm-level

lobbying for antidumping duties, which reproduce the findings from Egerod and Justesen (2021). Central to the purpose of our article, we find statistically significant diffusion parameters – and with the sign change that we expected: We estimate a *negative* and statistically significant parameter of –0.023 in the models with fixed effects (i.e., focusing on competition *within groups of same-good producers*) and a *positive* and statistically significant competition parameter of 0.015 without fixed effects (i.e., focusing on the diffusion between connected firms versus all groups, meaning competition *across groups of same-good producers*).

[Insert Figure 5 here]

This competitive dynamic has important implications for the impact of the firm's economic characteristics (Figure 5). As in the previous cases, we show significant direct effects in Panel A, this time with and without product fixed effects. In both cases, when a company that seeks antidumping protection increases its revenue by 1%, the duty it can expect to have imposed on its foreign competition increases (by 0.59% and 0.45%, respectively). As shown in Panel B, the competitive dynamic induces an additional indirect impact, and its direction depends on the inclusion/exclusion of product fixed effects. In line with H3a, we observe *competition between same-good producers*: when a firm increases its revenue by 1%, the duty other domestic same-good producers can expect to have imposed on their foreign competition declines significantly (by 0.11%, first row of Figure 5).

In addition, as H3b predicts, (more) powerful competitive dynamics emerge *between* product groups, which means that same-good producers *benefit* when one of them secures antidumping duties on their foreign competition. More important, as Panel B (row 2) shows, the indirect effect of revenue on other same-product producers seeking protection is large and positive when compared across all companies. Thus, if a company increases its revenue by 1%, the protection afforded to their same-good producers will *increase* by 0.59% when we look across all companies (no product fixed effects).

The evidence thus illustrates the complex dynamics of competition within and across product groups, sectors or countries, which future research should take into account when utilizing the spatial econometrics theory and techniques explored here.

## 5. Conclusion

This article examines the importance of *indirect effects* on the opponent's lobbying success in the influence production process (cf. Dahl 1961; Lowery and Gray 2004; Lowery and Brasher 2004). While existing theories of competitive lobbying have tended to focus on legislation, we examined the effects of competition in three stages of the lobbying process: (1) legislative lobbying by opposing lobbying camps attempting to shape public policy, (2) the distribution of rents when lobbying firms compete for the resources of their (shared) clients, and (3) lobbying on administrative decisions when producers compete to impose duties on their foreign competitors. We showed that the *magnitude* of spatial diffusion varies strongly between those contexts. Such variation is consistent with the different situations in which the number of competitors (on an issue, about a set of clients, or about duties on foreign competition) varies, which generates very different degrees of interdependence. More important, however, is that in all three situations the spatial diffusion parameters were significant, showing that connected actors generated significant indirect effects on each other's outcomes. Estimating such competitive dynamics allowed us to decompose the effect of the characteristics of lobbying actors on lobbying success into a direct effect on an actor's own lobbying success and an *indirect effect* on the opponent's success. Our examples in three highly diverse settings illustrate how long-standing theories of lobbying and competitive rent extraction (Becker 1983; Krueger 1974; Tullock 1967) can be modelled empirically by decomposing the effect of the characteristics of lobbying actors into direct and indirect effects.

We chose our three cases to illustrate how the concepts of interdependence and diffusion between actors (and thereby the constructed weights matrixes) depend on specific circumstances, especially theoretical considerations about how actors are 'connected'. A weights matrix might connect few actors in a binary fashion (camp example) or relate many actors and include their proximity or intensity of connection (lobbying firm example). Moreover, depending on the specific focus and points of comparison, a weights matrix may be adopted to assess both positive and negative spillovers (dumping duty example).

We hope that our application of spatial econometrics to competitive lobbying will inspire the use of spatial models in lobbying research in the future. We believe that spatial techniques are well suited to estimate different forms of 'diffusion' between actors, which are prominent in theories of lobbying, such as competition for members, organizational survival, or decision-makers; time and attention (e.g., Austen-Smith and Wright 1992; Haider-Markel 1997; Gray and Lowery 1996); as well as positive spillovers between cooperating lobbyists (Hojnacki 1997; Junk 2019; Holyoke 2009; Hanegraaff and Pritoni 2019; Heaney and Leifeld 2018). In addition to the interdependencies of outcomes, spatial models likewise could help account for the likely interdependence of lobbyists' strategy choices (Dür and Mateo 2013, p. 678) – both between partner organizations, which might be sharing labor, and between opponents that might engage in counter-lobbying, as we discussed in Section 2 (see Figure 1). We rely on spatial econometrics tools to address such dynamics empirically, for instance to evaluate how *elastic* lobbying actors' responses are to their opponent's strategies.

The results also have implications for how policy-makers design lobby regulations. If certain group types have limited influence (Grossman and Helpman 2001), regulation's effects go beyond constraining that group's influence. Because of indirect effects, regulation – particularly if it imposes unequal burdens across group types – simultaneously could increase opposing groups' influence on

policy outcomes, giving the newly regulated group even less influence than originally envisioned with the reform. While that consideration does not make such regulation impossible, it highlights a set of unintended consequences that make it difficult.

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**Table 1: Overview of cases in the study**

| Case | Hypothesis | Phase of lobbying process | Unit of analysis | Competitive dynamic | Dependent variable | Setting | Data source |
|---|---|---|---|---|---|---|---|
| 1 | H1 | Legislation phase | Lobby camp on an issue | Lobbying camps competing to shape a policy issue | Preference attainment (binary: 1 = outcome in line with policy goal; 0 = outcome counter to policy goal) | Five European countries | GovLis Project data on gov't responsiveness (policy outcomes for 50 issues) |
| 2 | H2 | Mobilization phase, pre-legislative passage | Contract lobbying firm | Lobbying firms competing over client resources | Firm's annual revenue | US | Senate Office of Public Record/ Center for Responsive Politics |
| 3 | H3 | Implementation phase, after legislation is passed). | Corporation filings | Corporations competing over imposition of antidumping duties on foreign products | Duty size (percent of foreign good's original price added to final sales price) | All petitions for antidumping duties filed 2006-2016 in 19 WTO countries | Egerod and Justesen 2021 |

**Table 2: A stylized influence production process**

| Mobilization phase (case 2) | Legislation phase (case 1) | Implementation phase (case 3) |
|---|---|---|
| • Firm/group/camp decides on lobbying activity.<br>• Contract lobbying firms are hired.<br>• Agreements made with coalition partners. | • Pressure exerted on legislators to influence bill content.<br>• Counter-pressure exerted.<br>• Lobbying success determined.<br>• Bill passes or fails. | • Bureaucrats implement and enforce rules.<br>• Firm/group/camp attempts to influence enforcement. |

*Note: While the mobilization phase is before the legislation phase in the influence production process, we study legislative lobbying as our case 1. This is because most prominent theories about competitive lobbying concerns the legislative phase. It is therefore more natural to study first, before showing how similar dynamics are present in other phases.*

**Table 3: Overview of Variables and Data Sources for Each Case**

| Case | Dependent | Independent | Controls | Unit of Analysis | Setting | Data Source |
|---|---|---|---|---|---|---|
| 1 | Preference attainment | • Camp size<br>• Camp diversity | • Camp resources<br>• Cooperation in the camp<br>• Status quo preference<br>• Public support<br>• Issue salience | Lobby camp on an issue | Five European countries | GovLis Project data on gov't responsiveness (policy outcomes for 50 issues) |
| 2 | Firm's revenue | • Betweenness centrality<br>• 2014 revenue | Lobbying firm's total number of ties | Contract lobbying firm | US in 2015 | Senate Office of Public Record/ Center for Responsive Politics |
| 3 | Duty size | Revenue of the corporations lobbying for antidumping protection | • Ratio of fixed to total assets<br>• Total assets<br>• Total capital<br>• Taxes paid | Corporation Filings | All petitions for antidumping duties filed 2006-2016 in 19 WTO countries | Egerod and Justesen (2021) |

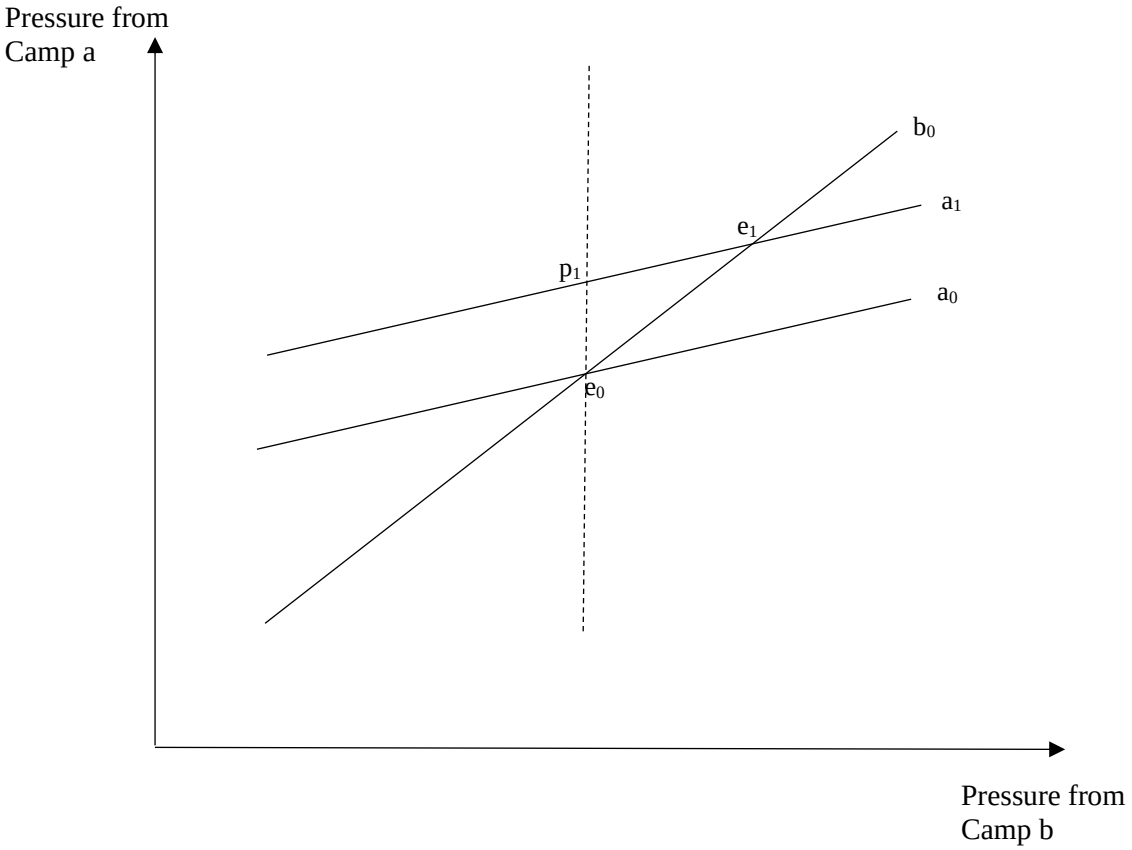


**Figure 1: Reaction curves of camp A and camp B**
(authors' interpretation, cf. Becker 1983: 379)

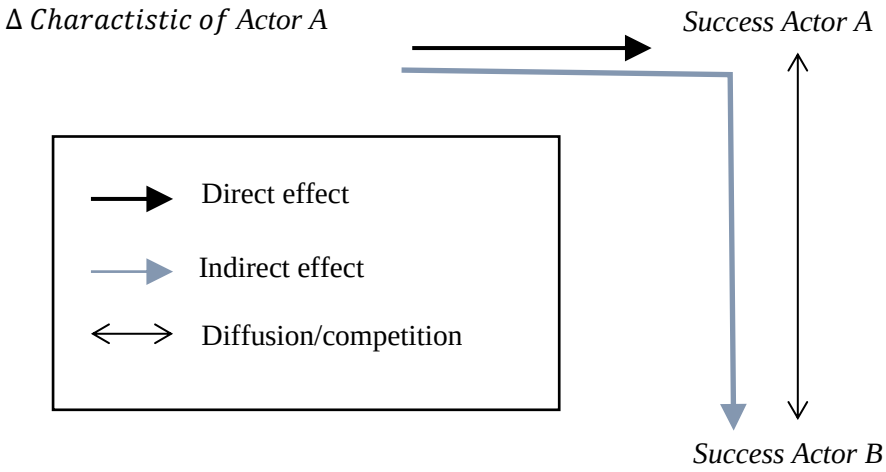


**Figure 2: Conceptualizing direct and indirect effects in lobbying competition**

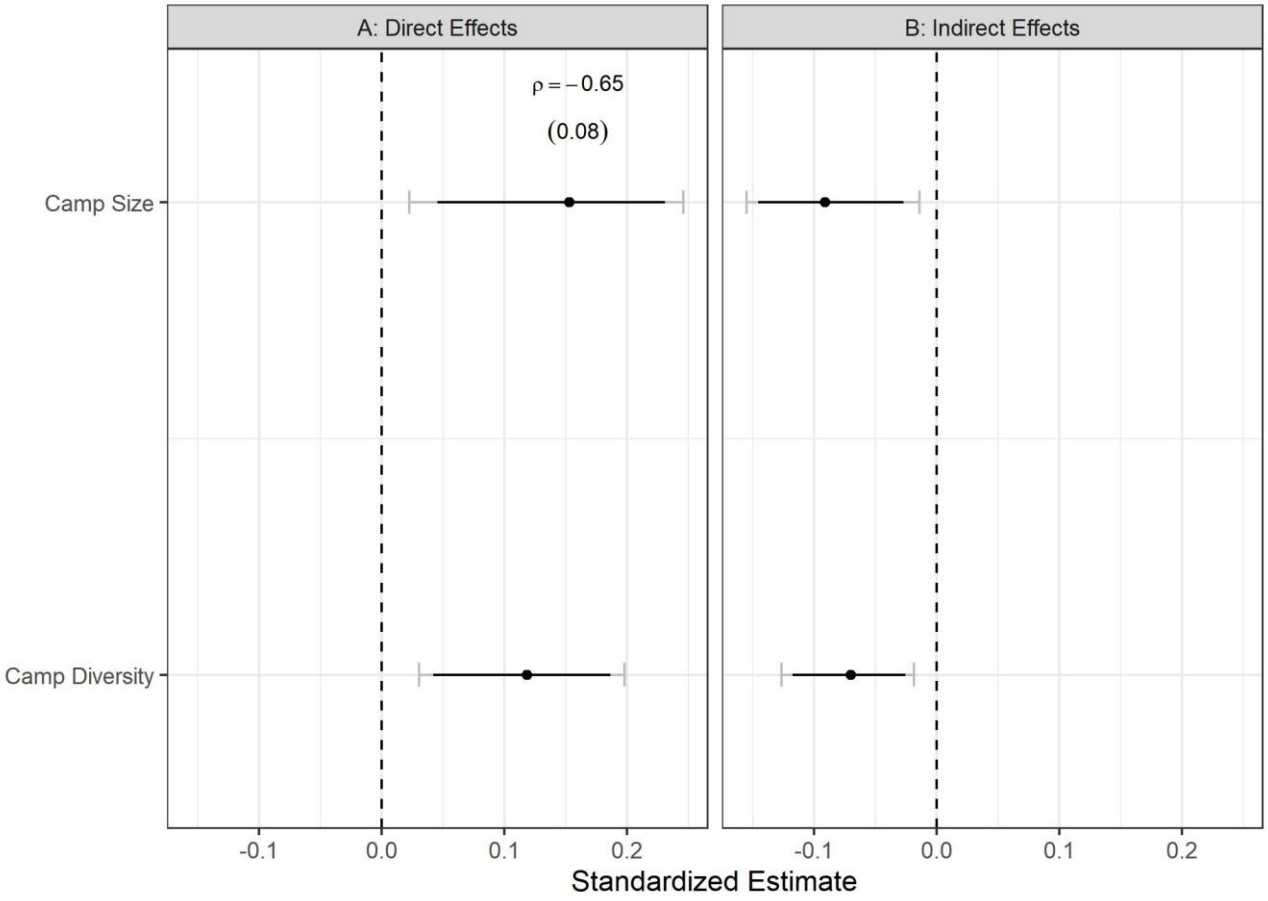


**Figure 3: Direct and indirect effects of camp characteristics on camp preference attainment**

*Note: Estimates are from Bayesian autoregressive probit models. Uncertainty estimates are 90% and 95% credible intervals. N = 96 camps. Estimates standardized. The spatial weights matrix connects camps on opposing sides of a policy issue. Controls: camp resources, cooperation in the camp, status quo defender, public support, issue salience. Covariates held at their observed values when simulating marginal effects.*

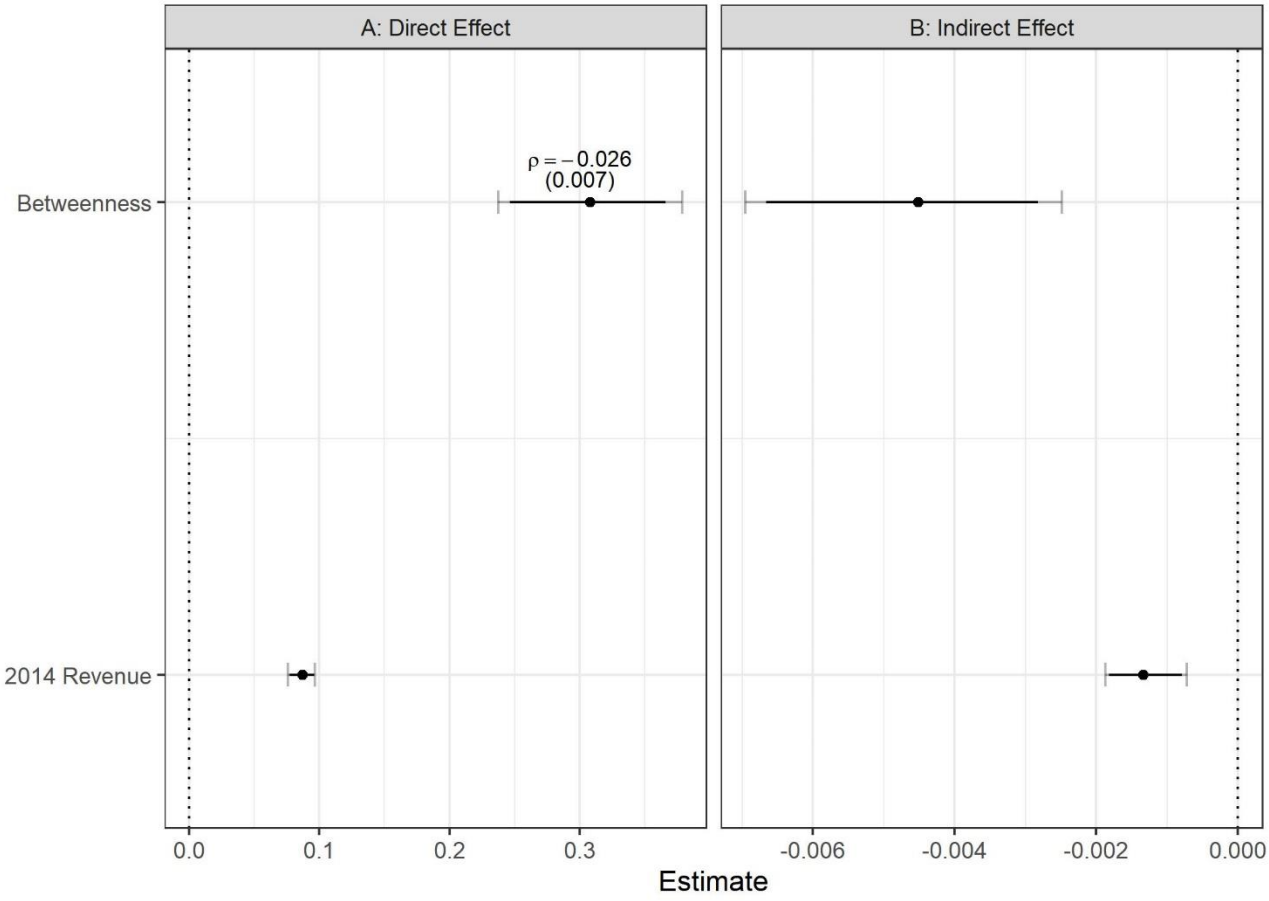


**Figure 4: Lobbying firms and their revenue**

*Note: The dependent variable is 2015 revenue (logged).*[15] *Estimates are from linear SAR models with parametrically bootstrapped uncertainty estimates at the 90% and 95% levels. Lobbying firms are connected if they are hired by the same client. N = 1,783 firms. Total number of ties between firms (logged) included as control.*

[15] Note that we use data published under the LDA from 2015. In Appendix D, we estimate models separately for all years between 2008 through 2016 to show that the estimates are strikingly stable over time.

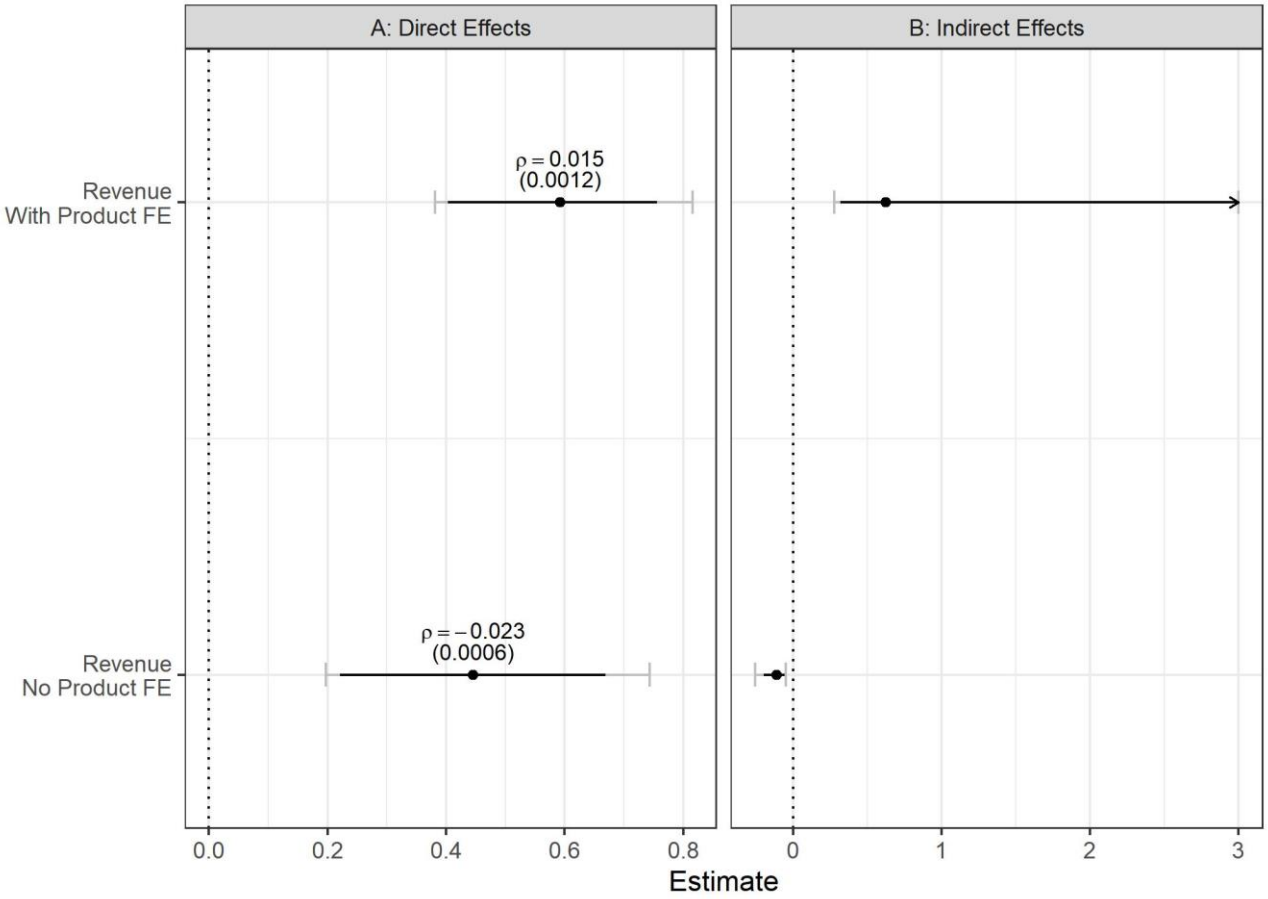


**Figure 5: Firm-level lobbying for duty imposition**

*Note: The model specification is identical to that used in Egerod and Justesen (2021). Estimates are from linear SAR models, with uncertainty estimates at the 90% and 95% levels. Firms (N = 1,030) are connected in the spatial weights matrix when they lobby to have the same product protected by antidumping duties. Controls include asset specificity, total assets, money paid in taxes and total capital (all logged). Fixed effects for country and year, and spatial lags of all covariates included. The vertical axis in Panel B is limited for presentational purposes. The arrow at the upper-limit of the confidence interval illustrates that the uncertainty band continues beyond the graph's limit.*