

Inside the revolving door: Campaign finance, lobbying meetings and public contracts: An investigation for Argentina

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Abstract

This paper explores the relationship between political influence actions and benefits obtained from public procurement. We develop a theoretical model of electoral competition where interest groups can engage in both ex-ante campaign contributions and ex-post lobbying contributions. We derive the optimal distribution of ex-ante and ex-post contributions by interest groups to candidates. If the preference of the interest groups are aligned, political contributions to both candidates are increasing in their respective announced expenditures. Ex-ante and ex-post contributions are imperfect substitutes and the higher the announced expenditure, the more biased the distribution is towards (ex-post) lobbying. Using previously unavailable individual-level data, we test empirically the predictions of the model and to model the probability of obtaining a public contract as a function of both ex-ante and ex-post efforts by interest groups.

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1 Background and motivation

“A great noble craved office to enrich himself by a war, an embassy a governorship. An Italian farmer craved the franchise more humbly to fatten on the favors handed to him for electing the great noble to office. The results were almost inevitable”.

William Stearn Davis, “The Influence of Wealth in Imperial Rome”, pp. 12

The principle “one person, one vote” represents one of the essential bedrocks of democratic systems all over the world. However, in modern and complex democracies where multiple actors and interest groups mix in the political-economic process, this principle has to be reconsidered. While strictly it is true that the principle is supported in the voting process, it may not be the case when considering other aspects of the political process. Individual actors, both organized and unorganized, are likely to affect political and economic outcomes through different channels. Some of these channels include donations to political campaigns, bribes and side payments to candidates and politicians, preferential access to elected politicians and legislators, business associations, public endorsements for candidates and politicians, and even direct actions such as strikes and mass protests. Although different in nature, these are all aimed at shifting the policy away from the median voter outcome and towards their preferred policy position. In this paper, we propose to focus on two of these channels, namely, contributions to political campaigns and lobbying meetings¹

¹The selection of these channels is not arbitrary when considering the Argentine case. Based on [Schneider and Wolfson \(2005\)](#), [Stein \(2006\)](#) identify and measure the intensity of five types of political investments in Latin America: business associations, lobbying, campaign contributions, networks and corruption. Aside from corruption, both lobbying and campaign contributions are

Although these practices can be traced as far back as the the early western empires, it is with the establishment of representative democracies and the separation of powers that these phenomena come to the surface as part of the daily trade of the political-economic process. Lobbying was already present in the very first Congress of the United States. According to [Holyoke \(2014\)](#), agents representing banking interests pressured Treasury secretary Alexander Hamilton to shape fiscal policy and against the creation of a Bank of United States. During the 1850s, several famous lobbyists came under scrutiny due to alleged bribes paid to members of Congress in exchange for votes on trade tariff levels. This launched the first real investigation of undue corporate influence. Stories like these proliferate throughout the ascent and consolidation of democracies.

Yet, in recent times, there appears to be growing voter dissatisfaction with the extent these practices and more importantly with the influence of such actions on economic and political outcomes. In a 2015 survey by the Pew Research Center, 75% of respondents thought money's influence on politics is greater today than ever before regardless of a respondent being Republican or Democrat². Outside candidates have tackled this issue to some extent in their campaign platforms. During the 2016 USA Presidential Election campaign, both Trump and Sanders advocated for the reduction of legal (private) money in politics, albeit for different reasons and motives. This was in stark contrast with the stance adopted by less extreme, pro-establishment candidates such as Clinton, Bush and Rubio³.

Even if many of these activities are legal and regulated, some argue that that extent of these and the fact that there remains channels of ilegal influence may be taking a toll on several democracies and will continue to do so. The phenomenal corruption scheme uncovered by the Lava Jato investigation in Brazil and with ramifications all over the world, shows that these problems extend far beyond rightful donations and contributions to political parties. In fact, after the scandal, the legislation allowing for corporate donations to political parties was declared unconstitutional. In Argentina, an ongoing judicial investigation has unearthed links between the financing of the 2007 Presidential campaign and the drug trafficking business and the so-called "mafia de los laboratorios". The two main parties competing in the election have had their accounting challenged. Only a few months ago, Mariano Rajoy was ousted as Spain's

considered relatively intense as compared with influence through business associations and networks. Although corruption could be formally incorporated in the model, we were unable to obtain raw data on corruption at the individual level data.

²Pew Research Org, "As more money flows into campaigns, Americans worry about its influence". Available at: <http://www.pewresearch.org/fact-tank/2015/12/07/as-more-money-flows-into-campaigns-americans-worry-about-its-influence/>

³Indeed, several observers and analysts believe that Clinton's electoral chances were hampered by relying on the corporate establishment.

Prime Minister on the back of a vote of no confidence from the Parliament over a corruption scandal that involved kickbacks-for-contracts between businessmen and the People's party between 1999 and 2006.

The relationship between money and politics –and more generally, the relationship between private interests and public policy- has long attracted the attention of scholars in political science and political economy. Theoretical work in the late 80's and early 90's in the field of political economy fueled a surge in research in this field. The interest is not merely academic since in recent decades, the spread of democratic conditions through the developing world has brought along various concerns regarding the effective functioning of political institutions. One such concern is related with the role of money in politics, or more specifically, the effects of political and electoral finance on various political and economic outcomes. This concern is of particular relevance for most Latin American countries which have sustained democratic conditions for several decades and have evolved into increasingly complex democracies with multiple political and economic actors. Another aspect that has been tackled at the theoretical level is related with the effects of political connections on political and economic performance.

At the empirical level, however, progress has been much slower. There are essentially two reasons for this. Firstly, the nature of political influence activities makes it often impossible to identify and measure it. Secondly, even when data which allows us to identify and measure these activities are available, it is often not disaggregated at the individual-level, which is essentially the most basic level at which individuals exert differing power. In this paper, we provide an initial exploration of the linkages between influence activities by individuals and interest groups and benefits received by them using individual-level data available from unrelated and unstructured administrative records. To the best of our knowledge, this is the first empirical work studying the relationship between political influence activities and economic and political outcomes for Argentina.

This issue is all the more important considering the recent debate in the Latin America region concerning accountability and transparency and the efforts aimed at improving the institutional design and its implementation. A recent study conducted by IDEA International (2012) shows that 23% of democratic countries do not have any regulation on political finance. As the recent wave of democratization sweeps across much of the globe, more democratic countries are likely to introduce regulations on political finance. Traditionally in Latin America, political parties relied heavily upon public funding for running their campaigns. Indeed, there existed strict limits to the amount of contribution allowed to both individual and firms. But in the last two decades most countries have introduced institutional reforms aiming to strengthen

transparency and to regulate the activities involving money and politics. Uruguay restricted private donations in 2009 while Chile eliminated the reserved contributions (“aportes reservados”) to political parties.

Argentina is no outsider to this regional trend. There is evidence that money into politics has become ever more important in Argentina. In the last decade, official registered private contributions to all political parties increased from 77 million pesos in 2005 to 226 million pesos in 2015 in constant terms⁴. However, this is in only a partial account since some electoral analysts and experts suggest that it would take around 1000 million pesos for a major party to hold a competitive election in 2015⁵. Nota that this estimate is four times as much money than what all the parties officially reported for the 2015 election⁶.

Despite this mismatch between official reporting and the real costs involved in campaign finance, it is hardly arguable that money has been playing an increasingly active role in electoral politics in Argentina. The structure of parties total funding is also important. The ratio of private to total contributions for all parties during the 2005-2015 periods is around 50%. Since recorded public funding is equivalent to actual public funding, it is likely that this ratio is even larger (if we include total (official and unofficial) private contributions).

In a similar vein, and aimed at improving transparency, several Latin American countries have provisions on keeping public records of meetings (“audiencias”) between politicians and public officials and individuals. There is a lobbying registry in both Chile and México where citizens can keep track of who is registered as a lobbyist and the audiences she holds with politicians and public official. Lobbying in Argentina is currently not formally recognized although there are several draft bills aiming at regulating it. As part of a 2003 Decree on Access to Public Information, Argentina created a National Registry of Interest Hearings (“Registro Nacional de Audiencias de Interés”). This is a public registry recording all the audiences solicited and held to politicians and public officials from the range of Director upwards. However, the regulation is lacking and incomplete. Although the public records are available from a web, the quality and consistency of the information included is mediocre. It falls short of extending the transparency requirement to many politicians: the Decree only holds accountable politicians, public officials and members of the Executive power.

Despite the official discourse, these institutional reforms and policy changes may

⁴Note that we used private inflation estimates to deflate. Using official inflation measures, money in politics increases as many as 5 times.

⁵“¿Cuánto cuestan las campañas electorales?”, online newspaper available at <https://www.lanacion.com.ar/1781894-cuanto-cuestan-las-campanas-electorales>

⁶In fact, the legal spending limit for any party for the 2015 Presidential election was 250 million pesos

not always have the intended effect. Prohibiting private contributions has the same effect as limiting them? Is it better in terms of fostering transparency to formally recognize and regulate lobbying activity? While not answering these questions directly, our paper aims at providing a theoretical framework for modeling influence of interest groups during the pre-electoral and post-electoral stages and to provide novel empirical evidence of the channels linking interest groups with politics and the outcomes in terms of reaping the benefits of those actions. While this evidence is clearly not capturing all the possible channels of influence, we believe we are considering two of the three most important channels of political investments by interest groups in the context of Argentina (corruption, being the third).

Our proposed research seeks to provide a theoretical explanation, an empirical estimation and a detailed interpretation of how both private campaign contributions and lobbying meetings (“audiencias de intereses”) affect a specific outcome: the probability of obtaining public contracts and the money awarded in public contracts. More specifically, we propose that campaign contributions and lobbying meetings are both part of a wider menu of “political investments” by special interest groups . These two investments are different in both nature and effects. Our model seeks to capture these differences and derive implications for the empirical analysis. We propose three original contributions. Firstly, we provide a way for separating two alternative channels of political influence, both theoretically and empirically, and to explore its interactions, if any. Secondly, to the best of our knowledge, we provide the first empirical investigation of the political-economy effects of political investments using micro-level data for Argentina. Thirdly, we derive some implications for institutional design and particularly for specific reforms aimed at limiting the impact of corporate interests in public policy outcomes. Finally, the assembling of the data itself in a unique merged dataset represents a significant contribution which may help encourage further empirical studies in this area.

The paper is organized as follows. Section 2 presents a review of the relevant literature. Section 3 introduces our theoretical framework. Section 6 discusses the data and the methods we used to match individuals and firms between three different databases. Section 7 describes the empirical strategy and section 8 presents the results. Section 9 presents some preliminary implications for policy and mechanism design. Finally, section 10 concludes.

2 Literature

The literature on the relationship between interest groups, politics and economic and political outcomes has been growing steadily over the last 30 years. Early studies

looked into the effect of campaign contributions on legislator voting and other electoral outcomes. Empirical work in this area gives mixed results. Some studies find that electoral returns to private campaign contributions are much higher for the challenger than for the incumbent, given the incumbent's campaign spending [[[Jacobson \(1978, 1985\)](#), [Abramowitz \(1988\)](#), [Chappell \(1982\)](#), and [Palda and Palda \(1998\)](#)]; other find similar electoral returns for both incumbent and challenger; others find that neither contribution to incumbent/challenger is significantly related with electoral results [[Green and Krasno \(1988\)](#), [Gerber \(1998\)](#), [Levitt \(1994\)](#)]⁷

Theoretical work during the 90s made significant progress towards embedding the incentives and activities of special interest groups in political-economy models. Most of these frameworks involve models of electoral competition with special interest groups (SIGs). The two classic references here are [Baron \(1994\)](#) and the works by Grossman and Helpman [[Grossman and Helpman \(1996\)](#), [Grossman and Helpman \(1999\)](#), and [Grossman and Helpman \(2001\)](#)]. [Baron \(1994\)](#) provides a model of electoral competition where candidates vie with each other to attract monetary contributions from special interest groups. Candidates use these donations to increase their campaign spending targeted to uninformed voters. Informed voters, on the other hand, are not swayed by campaign spending so a trade-off between attracting uninformed voters (through campaign spending) and attracting informed voters (through policy) appears. Campaign contributions in his model have a productive role since candidates compete for the uninformed voters. Monetary contributions depend on the policy announced by the competing candidates. In the end, candidates face both centrifugal and centripetal incentives in announcing their proposed policies and the fraction of informed and uninformed voters are key parameters.

On the other hand, [Grossman and Helpman \(2001\)](#) examine the process of trading monetary contributions for political favours. Campaign contributions are endogenous in their framework. They analyze the conditions under which special interest groups can exert influence through a variety of actions. One such action is related to providing information for legislators through lobbying audiences⁸. According to the authors, monetary campaign contributions can work in several ways in the influence-peddling

⁷A small number of studies find that campaign spending has a negative effect on incumbents election chances in legislative elections [[Feldman and Jondrow \(1984\)](#) and [Ragsdale and Cook \(1987\)](#)]. More recently, it has been suggested [[Green and Krasno \(1988\)](#), [Gerber \(1998\)](#), [Moon \(2002\)](#)] that the independent variable –campaign spending– is likely to be influenced by the dependent variable –some measure of electoral returns; taking this into account, these authors find that there are no significant differences between the electoral returns of campaign spending for incumbents and challengers. These results are somewhat puzzling against the evidence that politicians seem to invest a lot of effort in raising funds and in light of the popular belief that money wins elections.

⁸Although not as common, special interest groups also engage in alternative actions such as strikes and mass protests.

process. They can be seen as means of buying “access” to politicians. In other words, they are buying privileged access to meetings and audiences. They can also be a means of buying “credibility” since large contributions signal commitment and the stakes involved. Finally, they speculate that campaign contributions may be a way of buying “influence”.

While there are several studies of the relationship between campaign contributions and electoral outcomes for established democracies, very little theoretical and empirical research has been conducted for Latin American countries and specifically for Argentina. The relationship between campaign contributions and election results has been widely studied in the United States. However, studies of this type for Latin America are scarce; in the case of Argentina, aside from [Ferreira Rubio \(1997\)](#) and [Rubio \(2004\)](#) and a few other studies analyzing the political financing system, there are no empirical studies that deal with this issue. In fact, we find that the studies around political contributions and the effects of this in the political game applied in Argentina is almost inexistent; the only study that tries to provide an analysis of this phenomenon we find it in [Samuels \(2001\)](#) in which the author analyses the role of contributions and the relationship of this and the electoral results in a particular field around incumbents and challengers, and finally compares this structure with the system of United States. But as we noted earlier this concern is particularly relevant for Argentina where sustained democratic conditions for three decades have shaped an increasingly complex multi-party democracy with multiple political and economic actors.

More recently, the literature has shifted the attention to studying influence processes beyond the realm of campaign finance. This literature has produced work studying the process of lobbying, its channels and impacts. Lobbying has been addressed profusely in the US literature. [Heinz \(1993\)](#), [Nownes and Freeman \(1998\)](#), [Hedrick \(1988\)](#) and [Birnbaum \(1992\)](#) have produced studies on lobbying focusing on legislative power in the United States. More recently, [Baumgartner et al. \(2009\)](#) addressed lobbying influence in public policies. Similar work was done by [Bouwen \(2002\)](#), which addresses the influence of corporate governance and interest groups through lobbying in the European Union in a multilevel setting. They analyze the access mechanisms of the private interests to the European Commission, the European Parliament and the Council of Ministers of Europe, and how this influences the process of *policy-making*. [Berry \(2015\)](#) examines how interest groups select the topics in those who focus their activities, the way they allocated resources to these influence activities and the strategies they use to influence government. Lastly, another area which has been very actively researched in recent times and which is indirectly related to our work is that of the value and effects of political connections [[Acemoglu et al.](#)

(2016), Wu et al. (2012), Claessens et al. (2008)].

One interesting paper that addresses lobbying activity in a different light is You (2017) where she proposes to systematically analyze the actions of influence (lobbying) on Congressional votes. She distinguishes between two different lobbying activities: ex-ante and ex-post lobbying. In previous studies, lobbying was approached as an activity that happened before the vote. However the author argues that the ex-post moment opens the game for the intervention of the actors in a new scenario, especially if it deals with laws that need specific regulations after being voted.

In the Latin American region, this phenomenon has been studied mainly in Mexico, by authors such as Gómez Valle (2008), Estefan and Sosa (2005), and Astié-Burgos (2011). Until recent years, the study of lobbying activity by individuals and interest groups in Argentina was largely absent from the research agendas of both economists and political scientists. This may be due to the fact that lobbying activity is currently unregulated and not accounted for. Another possible reason is that lobbying is just not that important in the political process as in other countries. Finally, it is also possible that lobbying activity takes different forms from what happens elsewhere. Whatever the reasons, there are only a few selected accounts of the nature, characteristics and effects of lobbying activity in Argentina.

Molinelli (1996) provides a characterization of lobbying activity in Argentina for the 1983-1995 period. He notes that lobbying activity has been systemic in Argentina gradually becoming an active part of political and business life. He also suggests that interest groups are evolving all the time; new groups are formed and traditional groups lose power. In a similar vein, Malamud (2001) stresses that organized interest groups evolved from what is called “corporatism” to a pluralist system of oligopolistic lobbying. Both authors note that lobbying in Argentina is aimed primarily at the executive power, unlike the US and Europe where most lobbying activity gets channeled through Congress.

Unlike most of the referenced works, in the work that we develop here, the lobbying actions are not studied about the legislative power, as most of literature, but on the officials of the Executive Branch. This decision is based on studies of the 90s where, such as it holds Jones (2001) many academics have preferred to qualify the Argentine democracy as a system with strong dominance of executive power, a “delegative democracy”, in where the legislative power is important but not decisive in the policy decision process. The central point of these criticisms of the democratic institutions of Argentina is a vision underlying that the Argentine Congress lacks a real capacity to control the president and, for all intents and purposes, it’s irrelevant for the political process [Jones (2001)].

In this paper, our focus is the study of two separate (albeit related) channels of political influence: campaign contributions (ex-ante) and lobbying meetings (ex-ante and ex-post). In other words, we are interested in exploring whether actions exerted *before* and/or *after* the election has any impact on benefits that may be allocated to donors (ex-ante campaign contributors) and visitors (ex-post hearings attendees).

3 The Model

Consider an election game between two candidates, A and B , with a unique source of randomness: the outcome of the election. With probability P candidate A wins the election and with probability $1 - P$ candidate B does it.

Candidates differ in their positions with respect to a one-dimensional set of government policy options, which entail a total expenditure $V^k > 0$ on public contracts for the winning candidate k , $k = A, B$. Candidates' campaigns are based on these policy positions, so they are publicly announced at the beginning of the campaign period.

The economy is composed of voters and Interest Groups (IGs). A priori, voters are indifferent between both candidates. However, their preferences can be influenced by additional information developed during the campaign period. The *IGs*, instead, are not indifferent to candidates, since their government policies affect their interests differently. Therefore, during the campaign period, each will try to skew the outcome of the election in favor of its interests. To this end, each *IG* i makes monetary campaign contributions $C_i > 0$ to inform voters on its preferred candidate and, ultimately, induce them to vote for him.

After elections - and regardless of the winning candidate- the *IGs* compete against each other for the highest share $\alpha^k \in [0, 1]$ of the committed spending V^k . In this competition, the ex-ante campaign contributions are relevant, but also any ex-post lobby contributions $L_i > 0$. The higher the total own contribution for the candidate in office related to that of rivals, the higher the share α^k obtained.

For the rest of the paper, and in favor of simplicity, the number of *IG* is limited to two, $i = 1, 2$ ⁹.

⁹This simplifying assumption is in line with the coexistence of multiple interest groups merged into two strong coalitions with opposite political interests.

The probability of winning elections

A priori, both candidates have an equal probability of winning the election. However, through campaign contributions C_1 and C_2 , the *IGs* can bias this likelihood in favor of one of them.

Whiting this context, two alternative scenarios should be considered: an scenario of *aligned-preferences*, where both *IGs* share their preferences for the same candidate, and another of *opposite preferences*, where the *IGs*' campaign contributions go to rival candidacies.

Given $P(C_1, C_2)$ the probability that candidate A wins elections, through the paper it is considered:

- under *aligned-preferences*: $\frac{\partial P(\cdot)}{\partial C_i} > 0$, $\frac{\partial^2 P(\cdot)}{\partial C_i^2} < 0$, for $i = 1, 2$, if candidate A is preferred over B , or $\frac{\partial P(\cdot)}{\partial C_i} < 0$, $\frac{\partial^2 P(\cdot)}{\partial C_i^2} > 0$, the other way around.
- under *opposite preferences*: $\frac{\partial P(\cdot)}{\partial C_i} > 0$, $\frac{\partial P(\cdot)}{\partial C_j} < 0$, $\frac{\partial^2 P(\cdot)}{\partial C_i^2} < 0$, $\frac{\partial^2 P(\cdot)}{\partial C_j^2} > 0$ for $i \neq j$, if i supports candidate A , while j supports B .

In any case, it is assumed that all political contributions are handled with equal efficiency across the *IGs* and regardless of the candidate to whom they are driven. That is: $\left| \frac{\partial P(\cdot)}{\partial C_i} \right| = \left| \frac{\partial P(\cdot)}{\partial C_j} \right|$, for $i \neq j$.

Timing

The timing of the game is as follows. At stage 0, the *IGs* observe the candidate's policy options and privately and simultaneously decide on their campaign contributions. That is, whether to contribute to some candidacy and, if so, on the size of such a contribution. At stage 1, campaign contributions are executed and observed by rivals. Also, at the end of this stage, the election process takes place. At stage 2, the elected candidate takes office and the *IGs* make private decisions on their lobby contributions. If applicable, these are executed immediately.

Finally, at stage 3, the in-office-candidate executes his promised campaign policy conditioned on having received some political contribution. Otherwise, this is not implemented¹⁰. Also at this time, policy payoffs are executed, if hold.

¹⁰For political purposes, this non-implementation clause constitutes a trigger strategy to induce the *IGs* to participate in the financing of politics. For modeling purposes, it simplifies the game by reducing to zero the outside payoff of an *IG* that does not involve in politics. In any case it is not restrictive for the main results of the paper.

Timing of the game

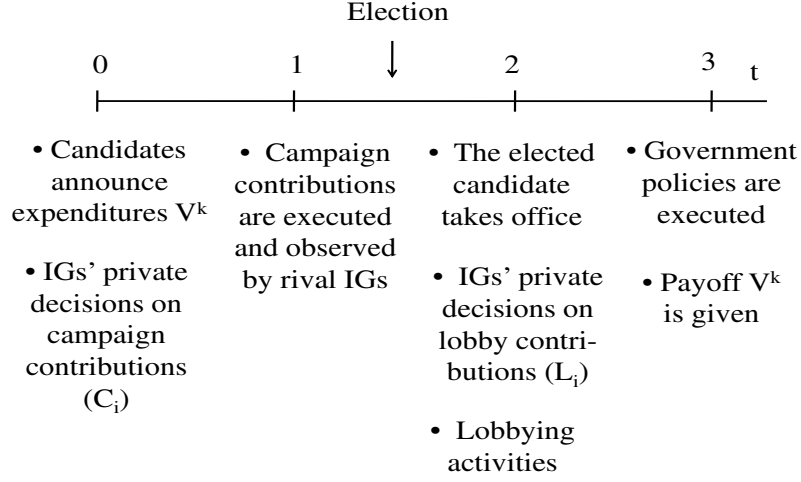


Figure 1: Time-structure of the model

IG payoff function

In this game, the utility function of an *IG* is given by its expected monetary payoff from exerting political contributions C_i and L_i :

$$U_i = P(C_i, C_j) (\alpha^A V^A - L_i^A) + (1 - P(C_i, C_j)) (\alpha^B V^B - L_i^B) - C_i \quad , \quad i \neq j \quad (1)$$

Where any campaign contribution C_i goes to the candidate who announces the highest spending V^k , $k = A, B$ ¹¹, and shares α^k depend on the own and the rival's contributions following the allocation rule described in Table 1¹²:

From this allocation rule, three things should be remarked. First, the own contribution to the campaign of a winning candidate constitutes a positive externality after elections, $\frac{\partial \alpha^A}{\partial C_i} > 0$. That of the rival, instead, constitutes a negative externality, $\frac{\partial \alpha^A}{\partial C_j} < 0$. Second, the own ex-ante and ex-post contributions to a winning candidate are substitutes intertemporally, $\frac{\partial^2 \alpha^k}{\partial C_i \partial L_i^k} < 0$ ¹³.

¹¹The possibility of contributing to both candidacies, while possible, is left aside from the analysis since contributing to the favorite candidate is always a dominant strategy. This is true since: (i) the assumption of $\left| \frac{\partial P(\cdot)}{\partial C_i} \right| = \left| \frac{\partial P(\cdot)}{\partial C_j} \right|$, $i \neq j$, implies that opposite contributions cancel each other and what finally matters to bias the likelihood of the election outcome are net contributions, and (ii) for someone who did not contribute ex-ante to the winning candidate, lobbying is always a useful ex-post strategy to fight for V .

¹²In equation (1), coefficients α^k are defined in terms of i 's shares of V^k . The analogous coefficients for the rival *IG* are $1 - \alpha^k$.

¹³One way to interpret this is by considering that C_i finance the acquisition of information useful

Share α^k allocation rule given that candidate A wins elections

	C_i supports A	C_i supports B
C_j supports A	$\alpha^A = \frac{L_i^k + C_i}{L_i^k + L_j^k + C_i + C_j}$	$\alpha^B = \frac{L_i^k}{L_i^k + L_j^k + C_j}$
C_j supports B	$\alpha^A = \frac{L_i^k + C_i}{L_i^k + L_j^k + C_i}$	$\alpha^B = \frac{L_i^k}{L_i^k + L_j^k}$

Table 1: Columns state i 's alternative strategies with respect to support the candidacy of A or B . Rows state the analogous for the rival IG . Each element in the matrix identifies the value of i 's share of V from combining these alternative scenarios.

Finally, What if the supported candidate loses elections? Specifically: How the campaign contributions to a non-winning candidate affect the IGs ' ex-post lobbying behavior? Following the above described rule, the campaign contributions to a non-winning candidate do not affect lobbying decisions. Hence, it is ruled out from the political system the possibility of retaliation against an IG for the simple fact of having contributed to the campaign of the rival candidate.

Clarified these issues, i 's two-periods problem yields:

$$\left\{ \begin{array}{l} \max_{C_i} U_i^{EA} = P(C_i, C_j) (\alpha^A V^A - L_i^A) + (1 - P(C_i, C_j)) (\alpha^B V^B - L_i^B) - C_i \\ st : L_i^k \in \arg \max_{L_i^k} \{ U_i^{EP} = (\alpha^A(\bar{C}_i, \bar{C}_j) V^A - L_i^A) I + (\alpha^B(\bar{C}_i, \bar{C}_j) V^B - L_i^B) (1 - I) \} \end{array} \right. \quad (2)$$

for $k \in \{A, B\}$

Where $P(\cdot)$ behaves as described in subsection (1.1), α^k follows the allocation rule shown in Table 1 for $k \in \{A, B\}$, and I is an identity variable that takes the value 1 (one) if candidate A takes office, or 0 (zero) if candidate B does it.

4 The game under *aligned-preferences*

The IGs ' preferences are aligned in favor of candidate A when $V^A > V^B$, and in favor of B if $V^A < V^B$. Without loss of generality it is assumed the first case; so that any contribution C_i goes to A 's campaign and $\frac{\partial P(\cdot)}{\partial C_i} > 0$, $\frac{\partial^2 P(\cdot)}{\partial C_i^2} < 0$, $i = 1, 2$.

4.1 The Ex-post election problem

Solving (2) by backward induction, at $t = 1$ the problem of each IG is to choose how much lobby to exert after elections given a rival that also lobbies and ex-ante in the after-election competition for V . From a less legal point of view, this can be interpreted as political favors, in the sense that to allocate V the 'political system' favors the IG that contributed the most to the campaign of the in-office candidate.

contributions C_i and C_j to candidate A . That is:

$$\left\{ \begin{array}{l} \max_{L_i^k} U_i^{EP} = (\alpha^A V^A - L_i^A) I + (\alpha^B V^B - L_i^B) (1 - I) \quad , \quad k \in \{A, B\} \\ st : \alpha^A = \frac{L_i^A + \bar{C}_i}{L_i^A + \bar{C}_i + L_j^A + \bar{C}_j} \quad , \quad \text{if A won elections } (I = 1) \\ \alpha^B = \frac{L_i^B}{L_i^B + L_j^B} \quad , \quad \text{if B won elections } (I = 0) \end{array} \right.$$

Taking first partial derivatives with respect to L_i^k , the optimal lobbying strategy of i in terms of j 's lobbying behavior is referenced by equation (3) and illustrated in Figure (2).

$$L_i^k(L_j^k) = \begin{cases} L_i^A = \sqrt{(L_j^A + C_j) V^A} - L_j^A - (C_i + C_j) & \text{if: } I = 1 \\ L_i^B = \sqrt{L_j^B V^B} - L_j^B & \text{if: } I = 0 \end{cases} \quad (3)$$

Lobby Reaction functions

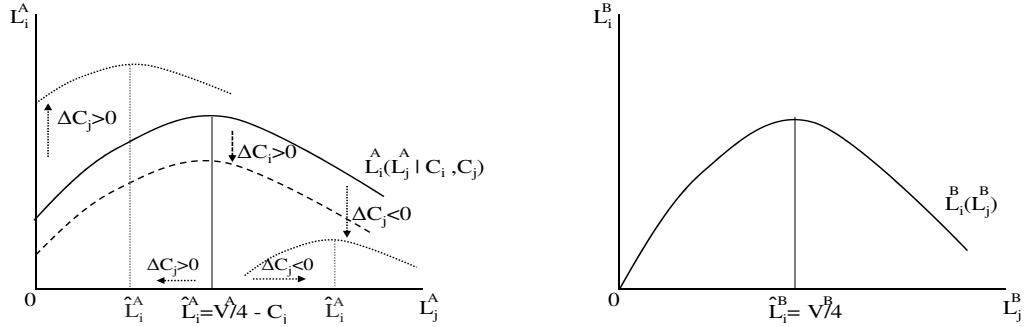


Figure 2: IG i 's lobbying contribution L_i^k in terms of the rival's lobby L_j^k if the winning candidate was supported ex-ante (Left) and if it was not the case (Right). In both, the i 's optimal lobby response to j 's lobby behavior is to play aggressively each time that j lobbies less than some threshold \hat{L}_i^k , and to 'accommodate' the other way around. Threshold \hat{L}_i^k crucially depends on the political outcome V^k and also on the ex-ante contribution C_j in the winning candidate was the supported ex-ante.

Given candidate A in office, lobby contributions L_i^A and L_j^A relate differently depending on some threshold \hat{L}_i^A . Faced to a rival that makes little lobby ($L_j^A < \hat{L}_i^A$), the best strategy for i is to play aggressively, i.e. to increase its lobby contributions each time that j increases his. The opposite holds for a rival that lobbies a lot ($L_j^A > \hat{L}_i^A$): each time that j increases its lobby contributions, i 'accommodates' by reducing the owns.

Also, i 's lobby contribution depends on the campaign contributions C_i and C_j . This is consistent with a distribution rule for the payoff V^k that considers all contributions. Regarding the own contribution: C_i and L_i^A are perfect substitutes and each additional unit of ex-ante campaign contribution implies an equal reduction in ex-post lobby. Regarding the rival's contribution: an increase in C_j induces i to lobby more or less depending on whether i is competing aggressively for the highest fraction of V^A or playing an 'accommodative'-strategy, respectively. (Figure 2–left)

The analogous analysis holds for the case in which candidate B takes office, but for the fact that there is no role for C_j in determining the threshold \hat{L}_i^B ¹⁴. (Figure 2–right)

Proposition 1 summarizes these results:

Proposition 1 *In the aligned preferences game, ex-post lobbying is increasing in the total expenditure V^k , and if the ex-ante supported candidate:*

(i) *takes office: ex-ante and ex-post contributions are perfect substitutes according to: $L_i^A + C_i^A = \frac{1}{4}V^A$, for: $i = 1, 2$.*

(ii) *does not takes office: $L_i^B = \frac{1}{4}V^B$, for: $i = 1, 2$.*

In both cases, competition for V leads to equal shares, $\alpha^A = \alpha^B = \frac{1}{2}$.

Notice that the result of equal shares arises from *IGs* with equal preferences for the payoffs V^k . Otherwise, if, for example, i 's preferences were closer to the preferences of the winning candidate than those of j , i would had higher incentives to contribute to the in-office candidate than j . In this context $\alpha > 1/2$ for this candidate¹⁵.

¹⁴This result arises directly from the no-retaliation assumption described in Section 1.3 with respect to contributions to a non-winning candidate.

¹⁵Assuming $I = 1$, a simple way to see this is by considering $U_i^{EP} = \alpha^A \theta V^A - L_i^A$, with $\theta > 1$, in the above described problem. In this context: $\alpha^A = \frac{\theta}{1+\theta} > 1/2$. Further details on the role and implications of this preference parameter θ are developed in Section 3.

4.2 The Ex-ante election problem

Given the ex-post optimal behavior described in Proposition (1), at $t = 0$ the *IG* i 's problem is reduced to¹⁶:

$$\begin{cases} \max_{C_i} U_i^{EA} = P(C_i, C_j) U_i^{EP}(I = 1) + (1 - P(C_i, C_j)) U_i^{EP}(I = 0) - C_i \\ st : U_i^{EP} = \left(\frac{1}{2}V^A - L_i^A\right) I + \left(\frac{1}{4}V^B\right) (1 - I) \\ L_i^A = \frac{1}{4}V^A - C_i \end{cases}$$

Taking first partial derivative with respect to the own campaign contribution, the interior solution for C_i is characterized by:

$$\frac{\partial P}{\partial C_i} [U_i^{EP}(I = 1) - U_i^{EP}(I = 0)] + P \frac{\partial U_i^{EP}(I = 1)}{\partial L_i^A} \frac{\partial L_i^A}{\partial C_i} = 1 \quad (4)$$

The LHS states i 's marginal gains from increasing its campaign contribution due to: (i) the possibility of biasing the likelihood that candidate A (its favorite) takes office, and (ii) lower future lobby requirements. The first effect implies a net gain of utility of $U_i^{EP}(I = 1) - U_i^{EP}(I = 0)$ for each additional point of P . The second one captures the substitution relationship between C_i and L_i observed in Proposition (1). Finally, the RHS of equation (4) states the marginal cost of C_i .

At this point in the analysis, it is very useful to establish a specification for the probability function $P(C_i, C_j)$ to illustrate the equilibrium with maximum detail. To this end, through the rest of this section it is supposed $P(C_i, C_j) = 1 - \frac{1}{2}e^{-2(C_i+C_j)}$. This probability function not only fulfill the basic requirements for aligned-preferences - particularly in favor of candidate A -, but also states that rival's contributions C_i and C_j are substitutes, i.e., increasing the own campaign contribution discourages the rival from contributing more.

Taking into account this probability distribution in equation (4), Proposition 2 describes the optimal behavior with respect to campaign contributions. Figure 3 illustrates it.

¹⁶In favor of simplicity, in the main text it is only referenced in detail the problem under $L_i^A > 0$. Otherwise, under the corner solution $L_i^A = 0$, it would be:

$$\begin{cases} \max_{C_i} U_i^{EA} = P(C_i, C_j) \alpha^A V^A + (1 - P(C_i, C_j)) \frac{1}{4}V^B - C_i \\ st : \alpha^A = \frac{C_i}{(C_i+C_j)} \end{cases}$$

Despite this simplification in the exposition of i 's problem, the statements in Propositions, Corollaries and Lemmas in this Section also cover corner solutions. The reader can find a detailed analysis of these in the Appendix Section.

Proposition 2 *In the aligned preferences game for candidate A, ex-ante campaign contributions exhibit an inverted U-shaped form with respect to the campaign payoff V^A :*

$$C_i^* = \begin{cases} C(V^A) & , \text{ if } : V^A < \check{V}^A \\ \frac{1}{2} - \frac{1}{4} (V^A - V^B) & , \text{ if } : V^A \in (\check{V}^A, \hat{V}^A) \quad , \text{ for } : i = 1, 2 \wedge i \neq j \\ 0 & , \text{ if } : V^A > \hat{V}^A \end{cases}$$

with $\frac{\partial C(V^A)}{\partial V^A} > 0$.

The analogous result holds under aligned preferences for candidate B.

Optimal contributive behavior

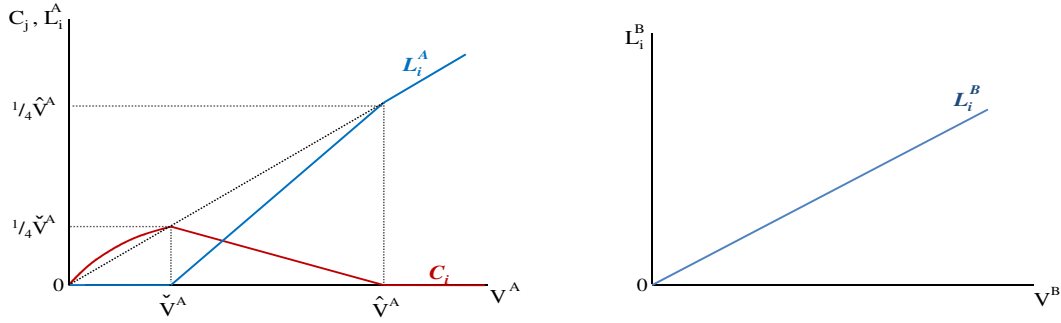


Figure 3: Optimal distribution of campaign and lobby contributions to the favorite candidate A in terms of the announced payoff V^A (LEFT), and optimal lobby contribution for the opposite candidate in terms of the announced payoff V^B (RIGHT).

For low values of V^A ($V^A < \check{V}^A$), candidate A is barely preferred over B. In this context, the IGs find it optimal to devote all their contributory money to A's campaign, since in this way they can increase A's probability of taking office without compromising so much money to it. However, as V^A goes up, the favoritism for candidate A is strengthened, and this will eventually induce the IGs to get into an ex-post fight for the highest share of V^A . This lobbying competition implies an increasing demand for resources in V^A that are partially removed from the campaign contributions. In the extreme case of $V^A > \hat{V}^A$, all contributory money is devoted to lobbying.

Lemma (1) summarizes the main results of this section:

Lemma 1 *In the aligned preferences game for some candidate:*

- (i) political contributions to both candidates are increasing in their respective announced expenditures V^k , $k = A, B$, and
- (ii) for the favorite candidate A there exist $\check{V}^A < \hat{V}^A$ such that: for $V^A < \check{V}^A$ or $V^A > \hat{V}^A$ all money is devoted to a single objective: A 's campaign or lobbying, respectively. However, for $V^A \in (\check{V}^A, \hat{V}^A)$, the money is distributed between campaign and lobbying: the higher the expenditure V^A , the more biased is the distribution towards lobbying.

Corollary 1 *In the aligned preferences game, campaign contributions are a useful instrument to bias the likelihood of winning an election in favor of some candidate. However, lobbying activities are (almost) a total waste of resources.*

The first statement of Corollary (1) trivially follows from a positive allocation of campaign contributions at the optimum, $C_i^* > 0$. The second statement follows from the IGs' impossibility to bias the optimal shares α^k , $k = A, B$, in the own favor, regardless of the total lobby executed. Therefore, within a set-up of costly lobbying, any lobbying above a minimal value is a total waste of resources for the IGs¹⁷.

This result leads to consider the possibility that the IGs find it optimal to coordinate their contributory strategies - especially those related to lobbying -, instead of competing. Corollary 2 illustrates the existence of such incentives to cooperate with a simple example¹⁸:

Corollary 2 *In the aligned preferences game for some candidate, the IGs can achieve better results by committing themselves to reduce their lobbying contributions to some minimum $L^k = \epsilon > 0$, with $\epsilon \rightarrow 0$, rather than competing.*

5 What if preferences are opposite?

When the IGs have opposite preferences with respect to their favorite candidates, their campaign contributions go in opposite directions and, therefore, have opposite effects in each candidate's probability of winning the election. Given A the favorite candidate of i , and B that of j , any campaign contribution of i goes to A 's candidacy,

¹⁷Actually, for the favorite candidate A , it is possible to observe $\alpha^A = 1/2$ with $L_i^A = 0$, $i = 1, 2$, as long as campaign contributions are positive.

¹⁸The nature of a cooperative game of this type, as well as the identification of the associated optimal strategies -including the triggers- are beyond the scope of this work. Therefore, all the related comments introduced in the main text are illustrative and respond, mainly, to the interest of noticing the relevance of the topic for future work.

as well as any of j goes to that of B . Therefore: $\frac{\partial P(\cdot)}{\partial C_i} > 0$, $\frac{\partial^2 P(\cdot)}{\partial C_i^2} < 0$, $\frac{\partial P(\cdot)}{\partial C_j} < 0$, $\frac{\partial^2 P(\cdot)}{\partial C_j^2} > 0$, for $i \neq j$.

In this context, the assumption that contributions are handled with equal efficiency, regardless of the *IG* from which they come from and towards the political party to which they are addressed, implies that $\frac{\partial P(\cdot)}{\partial C_i} = -\frac{\partial P(\cdot)}{\partial C_j}$, $i \neq j$. The political implication of this is that an *IG* can only increase the likelihood that its favorite candidate wins by contributing more than its rival. Otherwise, if both *IGs* make the same level of contribution, their corresponding effects on $P(\cdot)$ cancel each other.

That said, in what follows it is first analyzed the case in which the two political outcomes are relevant for the *IGs*, opening the door to a double-competition game: ex-ante, to bias the election outcome in favor of the favorite candidate, and ex-post, to get the highest share of V . Latter in the analysis, it is considered the case of ‘extreme-opposite preferences’, where each *IG* only finds interesting the campaign promise of a single candidate.

5.1 The two-stage competitive game

Within the basic set-up described in Section 1, a simple way to model opposing preferences is by introducing an individual exogenous parameter $\theta_i \in \mathfrak{R}^+$, $i = 1, 2$, that distorts the relative interest that each *IG* has on the monetary payoffs V^A and V^B . Particularly, in the utility function:

$$U_i = P(C_i, C_j) (\alpha^A V^A - L_i^A) + (1 - P(C_i, C_j)) (\alpha^B \theta_i V^B - L_i^B) - C_i$$

a value of $\theta_i < \frac{V^A}{V^B}$ states that i ’s interests are closer to those of candidate A , and so contributing to his campaign is the most profitable for it. The opposite holds the other way around¹⁹.

Given this general rule, through this section the monetary assumption $V^A > V^B$ is combined with the parameter preferences: $\theta_i = 1$ and $\theta_j > V^A/V^B$. This states that while the *IG* i prefers candidate A ’s policies over those of B , j prefers the opposite.

In terms of the ex-post problem described for the *aligned-preferences* game - Section (2.1)-, this difference in preferences does not modifies the dynamic of the game; neither the associated results. Indeed, it only states that contributions C_i and

¹⁹The reader can consider θ_i as an expertise-parameter that distorts the relative interest that the *IGs* have on the monetary values V^A and V^B according to the specific policy to which they are committed. Indeed, given equal campaign promises V^A and V^B , but associated to different policies: expanding an existing port and building schools, respectively; an *IG* conformed by port construction companies will prefer to support A ’s campaign rather than that of B . The opposite will hold with an *IG* widely experienced in building schools.

C_j serve to opposite campaigns.²⁰ That said, Proposition 3 extends Proposition 1 for the case of non-aligned preferences:

Proposition 3 *In the opposite-preferences game, lobby contributions are increasing in the total expenditure V^k , and:*

- *For the IG whose candidate takes office, ex-ante and ex-post contributions are perfect substitutes. That is: $L_i^A + C_i^A = \frac{1}{4}V^A$ if A takes office, or $L_j^B + C_j^B = \frac{\theta^2}{(1+\theta)^2}V^B$ the other way around.*
- *For the rival IG, however, lobbying is the unique tool to compete ex-post for V . Particularly: $L_i^B = \frac{\theta}{(1+\theta)^2}V^B$ if A takes office, or $L_i^A = \frac{1}{4}V^A$ the other way around.*

Corollary 3 *When both IG value the payoff V equally, competition leads to equal shares. Otherwise, the one with the highest valuation for V , gets the highest share.*

In term of this model, where $\theta_i = 1$ and $\theta_j > 1$, it holds: $\alpha^A = 1/2$ and $\alpha^B = \frac{1}{(1+\theta)} < 1/2$.

Regarding the ex-ante problem, it is also analogous to that under *aligned-preferences* - Section (2.2) -, but for the fact that campaign contributions C_i and C_j have opposite effects in the joint probability $P(C_i, C_j)$. To deal with this novelty, Table 2 illustrate the general features of the joint distribution $P(C_i, C_j)$ and Table 3 exposes the resulting ex-ante payoff matrix of the game. In the matrix, each element indicates the ex-ante payoff of each *IG* under the alternative strategies regarding the own and the rival's campaign contributions.

Following the standard analysis for strategic games, contributing ex-ante constitutes a dominant strategy for both *IGs*. This result goes in line with that obtained

²⁰In the case of opposite-preferences, the reaction function of each *IG* lobby contributions in terms of those of the rival are given by:

$$L_i^k(L_j^k) = \begin{cases} L_i^A = \sqrt{L_j^A V^A} - L_j^A - C_i & \text{if: } I = 1 \\ L_i^B = \sqrt{(L_j^B + C_j) V^B} - L_j^B - C_j & \text{if: } I = 0 \end{cases}$$

$$L_j^k(L_i^k) = \begin{cases} L_j^A = \sqrt{(L_i^A + C_i) V^A} - L_i^A - C_i & \text{if: } I = 1 \\ L_j^B = \sqrt{L_i^B \theta_j V^B} - L_i^B - C_j & \text{if: } I = 0 \end{cases}$$

In their nature, these equations are equal to those observed under aligned-preferences, but for the fact that the *IGs'* campaign contributions go to opposite candidates.

Joint probability distribution $P(C_i, C_j)$

	$C_i = 0$	$C_i > 0$
$C_j = 0$	1/2	P_H
		P_M *
$C_j > 0$	P_L	1/2 **
		P_m ***

Table 2: Where $P_L < 1/2 < P_H$ and $P_m < 1/2 < P_M$. Given $C_i, C_j > 0$, there are three possible cases: (*) $C_j < C_i$, (**) $C_i < C_j$, and (***) $C_i = C_j$.

Ex-ante payoff matrix under opposite preferences

		\tilde{U}_i^{EA}			
		$C_i = 0$		$C_i > 0$	
	$C_j = 0$	1/2 H_j	1/2 H_i	$P_H H_j$	$P_H H_i - (1 - P_H)C_i$
\tilde{U}_j^{EA}				$P_M H_j - P_M C_j$	$P_M H_i - (1 - P_M)C_i$ *
	$C_j > 0$	$P_L H_j - P_L C_j$	$P_L H_i$	$P_m H_j - P_m C_j$	$P_m H_i - (1 - P_m)C_i$ **
				1/2 $H_j - 1/2 C_j$	1/2 $H_i - 1/2 C_i$ ***

For expository reasons, notation has been simplified in two ways. First: $U_i^{EA} = \tilde{U}_i^{EA} + \frac{1}{(1+\theta)^2}V^B$ and $U_j^{EA} = \tilde{U}_j^{EA} + \frac{\theta^3}{(1+\theta)^2}V^B$. Second: $H_i = \frac{1}{4}V^A - \frac{1}{(1+\theta)^2}V^B$ and $H_j = \frac{1}{4}V^A - \frac{\theta^3}{(1+\theta)^2}V^B$. (*) case in which $0 < C_j < C_i$. (**) case in which $0 < C_i < C_j$. (***) case in which $0 < C_i = C_j$.

Table 3: Interest Groups i and j 's ex-ante payoffs under alternative strategies for the own and the rival's campaign contributions.

under *aligned-preferences*, since the feature of opposing preferences does not invalidate the *IGs'* interest on competing ex-post for the monetary payoff V , regardless of the policy that finally finances.

However - and in contrast to previous results -, a priori it can not be assured equal campaign contributions. Indeed, without further specifications on the functional form of the joint distribution $P(C_i, C_j)$, any combination (C_i, C_j) such that $C_i, C_j > 0$ and that follows the behavior rule described in Proposition (3) constitutes a candidate for an equilibrium. A strong reason for not imposing any specific distribution for $P(C_i, C_j)$ lies in that different specifications for this distribution will only modify the particular result for (C_i, C_j) , without distorting the general result that both *IGs* find it optimal to contribute ex-ante.

Lemma 2 *In the game with opposite preferences, there exists a Nash Equilibria in pure strategies with both IGs contributing ex-ante to rival candidates and:*

- (i) *for the IG whose favorite candidate takes office: such a contribution offset ex-*

post lobbying, even completely,

(ii) for the IG whose favorite candidate loses elections: lobbying is mandatory.

Corollary 4 *In the opposite-preferences game, campaign contributions are a useful instrument to bias the likelihood of winning an election in favor of a candidate as long as they differ in magnitude. Otherwise, it remains fixed at 1/2.*

5.2 IGs with extreme-opposite preferences

Under extreme-opposite preferences there is no competition for V after elections. Therefore, if candidate A takes office, the IG i gets the total payoff V^A conditional to having contributed to A 's political cycle - in any way, during the campaign or after it through lobbying. If, instead, candidate B is the one who takes office, the analogous rule applies but with respect to j 's political contributions²¹.

The direct consequence of this is that the IGs do not have incentives to make costly lobbying if they have already contributed during the campaign period. In the case that they haven't done so, it leads them to make the minimum level of lobbying that ensures the execution of the campaign promise.

Proposition 4 *In the game with extreme opposite preferences, political contributions are allocated to a single objective, either the campaign or lobbying, according to the following rule:*

Given i 's favorite candidate - candidate A - taking office:

(i) *if $C_i > 0$: there is no ex-post lobbying and ex-post utilities are given by $(U_i^{EP}, U_j^{EP}) = (V^A, 0)$,*

(ii) *if $C_i = 0$: the IG i is the only one that lobbies, particularly $L_i^A = \epsilon > 0$, $\epsilon \rightarrow 0$, and ex-post utilities are given by $(U_i^{EP}, U_j^{EP}) = (V^A - \epsilon, 0)$.*

The analogous rule holds in the case in which j 's favorite candidate (B) takes office.

Given Proposition (4), Table 2 describes the ex-ante payoff matrix of the game. Following standard notation, each element in the matrix indicates the ex-ante payoff of each IG under alternative strategies with respect to the own and the rival's campaign contributions. Following it, Lemma 3 summarizes the equilibrium.

²¹The reader must remember that the fulfillment of the campaign promises is conditioned to at least one IG showing interest in it, which in the model is manifested through political contributions - ex ante, ex post or both. Otherwise, the campaign promises are not executed.

Ex-ante payoff matrix under extreme-opposite preferences

		U_i^{EA}			
		$C_i = 0$		$C_i > 0$	
U_j^{EA}	$C_j = 0$	$(V^B - \epsilon)/2$	$(V^A - \epsilon)/2$	$(1 - P_H)(V^B - \epsilon)$	$P_H V^A - C_i$
	$C_j > 0$	$(1 - P_L)V^B - C_j$	$P_L(V^A - \epsilon)$	$(1 - P_M)V^B - C_j$	$P_M V^A - C_i$ *
				$(1 - P_m)V^B - C_j$	$P_m V^A - C_i$ **
				$1/2 V^B - C_j$	$1/2 V^A - C_i$ ***

where: $P(C_i = 0|C_j > 0) = P_L < \frac{1}{2} < P_H = P(C_i > 0|C_j = 0)$ and $P(C_i > 0|0 < C_i < C_j) = P_m < \frac{1}{2} < P_M = P(C_i > 0|0 < C_j < C_i)$. (*) case in which $0 < C_j < C_i$. (**) case in which $0 < C_i < C_j$. (***) case in which $0 < C_i = C_j$.

Table 4: Interest Groups i and j 's ex-ante payoffs under alternative strategies for the own and the rival's campaign contributions.

Lemma 3 *In the game with extreme-opposite preferences, there is a unique Nash Equilibrium (NE) in pure strategies in which both IGs reduce their political contributions to a minimum ex-post lobbying conditioned to a favorable election outcome for their respective favorite candidates. That is: $C_i = C_j = 0$ and the IG $i(j)$ is the only one that lobbies with $L_{i(j)}^{A(B)} = \epsilon > 0$ and $\epsilon \rightarrow 0$, if candidate A(B) takes office.*

The intuition behind Lemma 3 goes as follows. Since by increasing the own campaign contribution each IG induces the rival to increase its own even more, there is no equilibrium with both IGs contributing differently ex-ante²². This, in addition with the assumption that equal campaign contributions constitutes a total waste of money for both IGs, yields to a single candidate strategy for an equilibrium: not to contribute ex-ante and to wait for the outcome of the election to see whether to lobby or not. Finally, optimal lobbying as little as possible ($\epsilon \rightarrow 0$, in Proposition 4) assures that this strategy constitutes a Nash Equilibrium²³.

6 Data collection and description

The empirical analysis will be carried out using as the main sources of information three datasets which were specially constructed for this research. Each of the three datasets provide information about one of the three variables for which we are intending to look if there exist a relationship among them: campaign contributions and lobby efforts, which we expect influence the results of procurement contracts of the National Public Sector, more specifically the Executive branch and some agencies

²²Otherwise, the IG contributing the least, would face a total waste of money.

²³Please refer to the Appendix Section for the formal proof.

which are under its jurisdiction. The three datasets cover the period 2003 to 2015, but depending on the difficulties we face with merging the datasets, we might work with some sub-periods.

6.1 Data on campaign contributions

The collection of data on campaign contributions we rely on the information generated by the research team “Money and Politics in Argentina: Party Financing, Election Results, and Policy Choice in the Period 2003-2013”. These data are compiled from three main sources: 1) National Electoral Chamber: campaign contributions to political parties were obtained from individuals and legal entities; 2) Money and Politics Project run by the NGO Poder Ciudadano; 3) Electoral Route Project: an open-source development, carried out by an interdisciplinary team of journalists, scholarship holders, programmers and think tanks in the field. In this case the data were obtained from the National Electoral Chamber.

The dataset contains information on the name of the individual contributor, the national ID of the contributor, the political party to which the contribution was made, the amount of the contribution and several other variables identifying election type, office and date.

6.2 Data on hearings of interest (“Audiencias de interés”)

The collection of data aimed at reflect lobbying actions, we rely on data coming from the official registry of audiences of interest with officials of the National Executive Branch. This registry is one of the main mechanisms for access to public information and citizen participation, in accordance with Decree 1171/03. According to this Decree, an interest management hearing is a meeting with a regulated entity requested by individuals or legal entities, public or private, in which the applicant seeks to influence the functions and/or decisions of any agency or official under the jurisdiction of the National Executive Branch. This database contains information at the individual level about the person who requests the meeting with the regulated entity, with the latter been obliged to register their Interest Management Hearings (all public officials whose category is equivalent to or higher than Director General: President; Vice President; Head of Cabinet of Ministers; Ministers; Secretaries and Undersecretaries; General and National Directors; Federal Comptrollers; and Authorities of organisms, entities, companies, societies, dependencies and any other entity that functions under the jurisdiction of the National Executive branch; Public agents with executive function whose category is equivalent or superior to General Director).

This dataset contains information on the date, place and summary of the purpose of the hearing, the name and position of the public official, the name, position and ID number of the applicant, and details on the subject (individual or corporate) the applicant attends on behalf of.

6.3 Data on National public sector procurement contracts

Since there are no structured data containing records of public sector procurement contracts, the database had to be compiled from scratch. There are two primary sources of information on national public procurement. The “Oficina Nacional de Contrataciones” (National Procurement Office)²⁴ and the “Boletín Oficial Nacional” (National Official Bulletin). Collecting data from either source is a painstaking affair. We decided not to use data from the “Oficina Nacional de Contrataciones” since it only allowed us to make individual queries for each public contract and even then, the information contained in each record was very limited. We opted instead to use the “National Official Bulletin”²⁵

In order to build a database including the award of bids and contracts by the National public sector, we collected information from the third section of the National Official Bulletin. Firstly, we wrote a simple script to perform URL-looping and to download all the PDFs records corresponding to the period under study and then we extracted all the awards and bids granted between 25/05/2003 and 10/12/2015. Secondly, we scraped all the information from the third section of the National Official Bulletin containing calls for bids and public tenders and notification of awards of public contracts. We structured this information into a datasheet comprising several fields (see below for variables we collected). Finally, we refined these data eliminating rows wich did not belong to public procurement.

This information was reviewed taking into account the provisions of Decree 1023/01, which specifies the “National Administration Procurement System”, which applies to procurement procedures involving the following jurisdictions and entities:

²⁴Website: www.argentinacompra.gov.ar

²⁵The National Official Bulletin is the national government gazette of the Argentine Republic. It represents the single most important official media outlet of the National government where all the legal norms –laws, decrees, and regulations- and other public administrative acts from the executive, legislative and judiciary are published. It is published daily and is divided into four sections. The first section publishes new laws, decrees and resolutions. The second section publishes information on business affairs, such as registrations, liquidations, closures, auctions and other commercial matters. The third section announces calls for bids and for public tender offers and also communicated the awards of bids and contracts. Finally, the fourth section publishes communications concerning Internet domain registration.

1. National Administration, including the Central Administration and Decentralized Organisms, including Social Security Institutions.
2. State companies and corporations, including public companies, public limited companies with a majority State holding, mixed-economy companies and all other business organizations in which the State has a majority stake in the capital or in the formation of corporate decisions.
3. Public entities expressly excluded from the National Administration, which includes any non-business state organization, with financial autonomy, legal personality and its own assets, where the National Government has majority control over the assets or the formation of decisions, including those non-state public entities where the National Government has control of decisions.
4. Trust funds made up entirely or mainly of assets and/or funds of the National Government.

According to Art. 4 of the Decree 1023/2001, the following bids and contracts are included: 1) Purchases, supplies, services, rentals, consultancy, leases with purchase options, swaps, concessions for the use of public and private property of the National Government, entered into by the jurisdictions and entities within its scope of application and all those contracts not expressly excluded; 2) Public works, public works concessions, public service concessions and licenses.

In regards to the type of acts collected, we included public selection procedures (public tender, public tender, public auction) and non-public or private selection procedures (short tender or abbreviated tender), excluding direct contracting/purchases. The variables collected for each act were the following:

- Date of the administrative act.
- Official Bulletin Number.
- Subsection.
- Contracting authority.
- Type of contracting act.
- Identification number of the act of procurement.
- File number.
- Evaluation opinion number (if applicable/available).

- Notification number.
- Type and modality of contracting.
- Purpose of the contract.
- Name of the natural or legal person participating in the event, their address and their ID (CUIT).
- Amount of the contract.
- Order of merit in which the bidder was evaluated (if applicable/available).
- Evaluation of the tender (if applicable/available): whether it was evaluated positively or not (in the case of evaluation opinions: whether it was evaluated positively or not, in the case of pre-awards: whether it was pre-awarded or not; in the case of awards: whether it was awarded or not).

Although the regulations that govern the contracting process detailed above indicate as a requirement the publicity and transparency of the acts, many times the Official Bulletin does not reflect the complete contracting process in a detailed manner. Some of the issues noted in this regard are the following:

1. Publication of the results on the basis of lines or on the basis of the complete contracting act. In some cases, the winning bidder is listed line by line; in other cases, the amount obtained by each bidder is consolidated and the corresponding amount is stated, but without specifying how much of the amount corresponds to each one.
2. Publication of offers rejected by line or by full act. In the subsection “Evaluation opinions”, the result of the evaluation of the Evaluation Commission is published for each offer in a specific administrative act. In these cases, information is often presented differently in different situations. Thus, it can be found that rejected companies are published or evaluated negatively in global terms, but it is not published (in most cases) which bidders were rejected for each of the lines. Otherwise, in most cases, the bidders who were the winners of each of the lines are usually published. This does not make it possible to see the “internal” competition of each line, so it is not possible to know (in most cases) which companies submitted bids for which lines in each act of contracting, whether they were rejected or did not submit bids.
3. Publication of lines with consolidated bids presenting the sum the amounts of two or more bidders for the same line. In most cases, when information is

published on the offer of a natural or legal person that is submitted for more than one line, the amounts of the lines are consolidated into a single line item, and only that data is published, without being able to distinguish how much corresponds to each line item.

4. Publication of order of merit. There is a considerable lack of information in a considerable number of cases on the order of merit with which the bids for each contract were evaluated.
5. Publication with names of non-homogenized natural or legal persons. Another problem related to the quality of information relates to the non-systematic and inconsistent recording of bidders' names. This situation led to the need to homogenize the database, with information from outside the Official Bulletin, using the AFIP registry to homogenize and complete the missing data.
6. Publication with incomplete information: especially address and ID number (CUIT) of the bidders. In more than 50% of the cases, the unique tax identification code of the bidders and their domicile are missing. To complete the missing or partial information we used data from the list of natural or legal persons available in the AFIP registry. For further information, see Appendix 12.

6.4 Data description and characterization

Argentina has a mixed system of party financing. As “fundamental institutions of the democratic system”²⁶, political parties finance their activities with both public and private funds. We focus strictly on electoral financing therefore we will not consider the regular funding parties receive for institutional strengthening and development²⁷. Public electoral contributions comprise a fixed amount of money for ballot-printing and a variable amount of money for campaigning. The former is equal for all parties and the latter is a function of past electoral performance²⁸. Parties can also collect private electoral contributions –both from firms and individuals up to 2009 when contributions from firms were prohibited. All political parties are required to keep books on these contributions and to submit two reports –preliminary and final- to the National Electoral Chamber. Parties that fail to do that are fined and/or excluded

²⁶The fundamental provisions for the existence and functioning of parties are laid out in article 38 in the National Constitution. This was introduced by a constitutional reform in 1994.

²⁷Although not intended for electoral campaigning, in recent years parties have often been accused of using the receipts in these funds to spend money during campaign times.

²⁸Parties are required a certain amount of minimum votes to be entitled to this campaigning money so that the total amount allocated to parties in each election year may vary significantly

from the recipients of public electoral contributions in future elections. To date, despite improvements in reporting standards, a significant number of parties do not comply with the regulations.

Table 5 uses the 46531 individual contributions to aggregate the total amount donated to all parties in every election year for both executive and legislative national elections. Total private and public contributions are expressed in millions of constant 2015 Argentine pesos. Private contributions include both corporate and individual donations. In the 2005-2015 period, political parties have been getting ever larger amounts of money: most of it can be explained by the increase in public funding although private funding has also increased from 2005 to 2015 but with sharp up-and-downs in between. In particular, note that total private contributions go up from 2005 through 2009, fall sharply in 2011 and rise again up until 2013/2015. The sharp fall in 2011 may likely be due to the modifications introduced to the political finance regime starting in that year which saw corporate private contributions outlawed. In fact, the number of donors fall from 10536 in 2009 to 6826 in 2011²⁹

Table 5: Private and public campaign contributions, 2005-2015 (All parties)

Concept	2005	2007	2009	2011	2013	2015
Pri (mill 2015 pesos)	77.21	193.54	301.63	95.00	242.08	226.37
Pub (mill 2015 pesos)	55.88	137.14	113.85	637.59	252.35	747.53
Total (mill 2015 pesos)	133.09	330.68	415.48	732.59	494.43	973.90
Pri (%)	58.01	58.53	72.60	12.97	48.96	23.24
Pub (%)	41.99	41.47	27.40	87.03	51.04	76.76
Total (%)	100	100	100	100	100	100

It is worth mentioning that the regime governing political and electoral finance in Argentina has been modified three times in the last 15 years³⁰. The first two reforms were aimed at formalizing the mixed political finance system and improving transparency and accountability by introducing new registration and filing standards. But it was the third amendment in 2009 which introduced one very significant change in the form of prohibiting private corporate contributions (including firms, corporate donors and other institutional investors). Naturally, these changes may have had an effect on the structure, amount and type of contributions that it might be interesting

²⁹Naturally, we are not able to identify a causal effect here and rule out other factors as explanations for this fall such as changes in registration standards, degree of electoral competition and type of election. However, this change in the institutional design may have affected the number and average donation amount of individual (non-corporate) donors.

³⁰The changes were made in 2002 (National Law 25600), 2007 (National Law 26215) and 2009 (National Law 26571). There is currently a draft bill in the Argentine parliament which if passed will represent yet another reform to the regime.

to explore provided we could link individual (non-corporate) donors after the reform to corporate contributors prior to the reform³¹

Table 6: Mean corporate contributions, by type of donor

Tipo	Promedio	Nro aport
Agro, ganaderia, caza	9828	50
Industria Alimentaria	7222	24
Industria Tabacalera	18500	3
Industria Madera, Papel, Impresiones	12089	29
Industria, Acero Metales y Herramientas	5734	36
Industria Automotriz y Transporte	5373	15
Industria Electrica y varios	11375	16
Transporte Energia y Gas	19000	2
Construccion y Edificacion	5925	88
Ventas al por mayor	4197	92
Servicios Transporte y Alm. Datos	11600	32

Table 6 shows corporate contributions for the 2005-2009 period grouped by activity sector, average contribution amount and number of donors in each sector. It can be seen that there is some heterogeneity across the different sectors both in terms of number of donors and size of the contribution. Table 7 shows the top donors during the 2005-2013 period. It can be seen that there are both individual and corporate donors, some of them belonging the medical and pharmaceutical sector which was under suspicion of illegal financing of the 2007 Presidential campaign.

The database on public tender contracts contains over 130000 rows and 41600 public contracts. Due to way the public contracts were scrapped from the *Official Bulletin*, each public contrat often has more than one row. This is the case for example when the public contract has information on the whole process and list the outcomes of several stages of the public procurement process (evaluation assesment, pre-awarded, awarded).

Tables 8 and 9 show the basic structure of the public procurement data. The first table shows the number of contracts awarded per year, the total amount of money awarded and the average amount per contract. The next table shows the the distribution of contracts between firms and the number of firms which have been

³¹One possible way to do this is to match individual donors in the “donors” database to administrative records holding information on individuals linkages to firm, business associations and other institutional actors through several possible roles (members, directors, owner, etc). A database containing these records have been made public recently which may provide us with information for establishing these linkages.

Table 7: Top donors to parties

Name	Party	Type	Amount
Asencio, Eduardo Marcelo	Concertacion UNA	Ind	510000
Sitrack.com Arg. SA	FPV	Emp	400000
Marsans Internacional SA	FPV	Emp	400000
CreaUrban SA	FPV	Emp	400000
ProIdeas SA	MPU	Emp	400000
La Inversora SA	MPU	Emp	390000
Encuentro para la Esperanza	Concertacion UNA	Emp	390000
Multipharma SA	FPV	Emp	380000
Patriti SA	MPU	Emp	380000
Iter Medicina SA	Emp	FPV	360000
Global Pharmacy SER SA	FPV	Emp	310000

Table 8: Distribution of public contracts, by year

Year	Contracts	Total amount (mill)	Avg amount (mill)
2003	954	1112.25	1.17
2004	1914	5840.57	3.05
2005	2385	7732.18	3.24
2006	2544	7953.07	3.13
2007	2722	11519.81	4.23
2008	3972	13631.77	3.43
2009	4368	18509.29	4.24
2010	3871	14626.33	3.78
2011	4891	16622.97	3.40
2012	4866	23759.95	4.88
2013	3267	24559.17	7.52
2014	2582	16213.58	6.28
2015	3264	9106.31	2.79
Total	41600	171187.24	

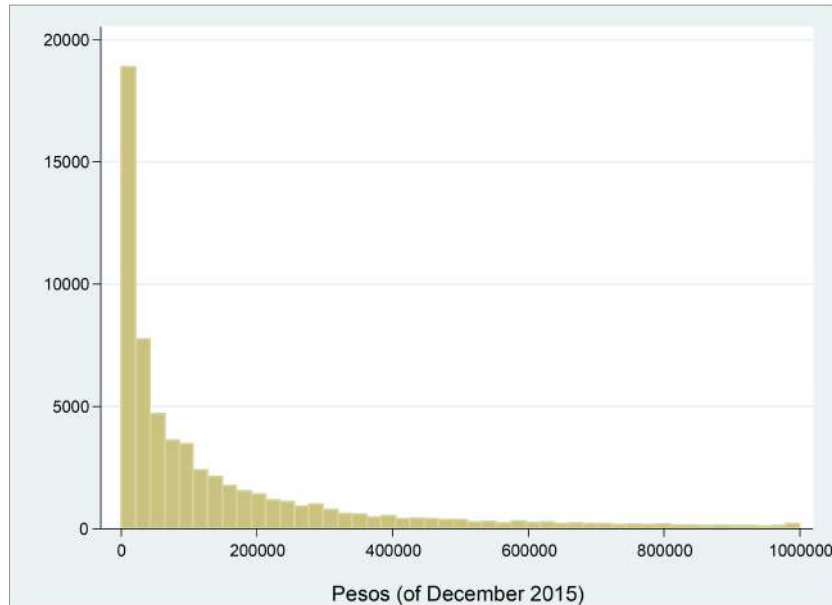
awarded a certain amount of contracts during the whole 2003-2015 period. It can also be seen that there is significant heterogeneity. Many firms have gotten less than 5 contracts (55% of the total number of firms were awarded one contract only during the whole period). On the other hand, around 15% (around 200) of the firms have obtained over 50 contracts; 61 of those have been awarded more than 100 contracts each during this period.

Table 9: Distribution of public tender contracts - By firm/person and of contracts awarded

of contracts	firms/persons	%
1 a 5	11409	0.838650397
6 a 20	1552	0.114084093
21 a 50	450	0.033078506
51 a 100	132	0.009703029
more than 100	61	0.004483975
Total	13604	1

Figure 4 shows the distribution of contracts considering contract amount. This information is consistent with the data shown in the above tables; may firms obtain small amount contract and a much smaller number obtain high amount contracts.

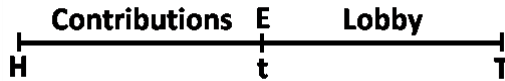
Figure 4: Public tender contracts awarded (up to \$1 million 2015 pesos)



7 Empirical strategy

Let us assume that an election takes place at time t , and that between time H and t , with $H < t$ interested actors can make campaign contributions. After the election takes place interested actors engage in lobby activities in order to increase their chances of winning a particular public procurement contract, which is decided at time T , with $T > t$. This timing is depicted in Diagram 1.

Figure 5: Timeline of the influence activities



In the spirit of the above process, we intend to estimate different specifications aimed at finding if contributions and/or lobby activities influence the chances, as well the amount, of an interested actor of obtaining public procurement contracts.

As a first specification we estimate is the following baseline equation:

$$Y_i = \sum_{h=0}^H y_{i,t+h} = \alpha + \beta C_{i,E} + \gamma \sum_{h=0}^H \omega_{t+h} L_{i,t+h} + \epsilon_i \quad (5)$$

where Y_i is the amount of public procurement contracts granted to the interested actor i between election time t and time T ; $C_{i,E}$ are the contributions made by i ³², while L_i are its lobbying activities. Lobbying efforts are aggregated over period $[t, T)$, where ω are weights allowing to consider for the possibility that lobby efforts which are closer to the time public procurement contract is granted have different incidence than those made further apart in time from it³³. Specification (1) is estimated using only information on actors who obtained a positive amount of public procurement contracts, so that coefficient β and γ will reflect just the existence of correlations with the dependent variable, we expect both coefficients to be positive.

Additionally, for the subsample in which we have both winners and losers of a given public procurement contract, specification (1) can be estimated with variable Y defined in a way that it takes only two possible values, 1 when an interested actor was granted at least one procurement contract, and 0 otherwise. In this case also, β and γ only provide information about correlations of the two explanatory variables with the dependent one.

³² $C_{i,E}$ will be defined in alternative ways, for instance to consider by the fact that a given interested actor could have made contributions to more than just one political party, and not necessarily only to the one that won the election.

³³When available other control variables will be included.

As just mentioned, specification (1) is able to provide us only with correlations among the variables we are interested in, however it fails to provide information on the competition process involved in a specific public procurement contract, in which at least two interested actors are involved. As mentioned before when describing the construction of our datasets, and in despite the regulations governing the contracting process require the publicity and transparency of the all acts, the information available in the Official Bulletin does not reflect the complete contracting process in a detailed manner. Taking into account these considerations, for those bidding process in which we have information on all participants, we propose to estimate an equation as follows:

$$P_{i,j} = \alpha + \beta f(C_{i \in j, E}) + \gamma h(L_{i \in j, t+h}) + \epsilon_i \quad (6)$$

where j identifies a particular bidding process, and $f(\cdot)$ and $h(\cdot)$ are two functions to be defined later aiming at controlling for the relationships between campaign contributions and lobby efforts among all interested actors that participated of the bidding process $j(i \in j)$. The variable $P_{i,j}$ takes the value 1 if interested actor i won the bidding process and 0 otherwise³⁴

8 Results

*** work in process ***

9 Implications

*** work in process ***

10 Conclusion

References

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³⁴Let us remember that as explained in the description of the datasets, those cases in which a given procurement call is further divided into subcategories (“lines”), it can be possible to have more than one winning bidder, not being possible to carry out the analysis at the level of each line.

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11 Appendix-Propositions and proofs

Appendix

◆ Proposition 1:

Recalling the FOC described in (3), for $I = 1$ the IGs' optimal behavior can be characterized by the system:

$$\begin{cases} L_i^A + L_j^A + C_i + C_j = \sqrt{(L_j^A + C_j) V^A} \\ L_j^A + L_i^A + C_i + C_j = \sqrt{(L_i^A + C_i) V^A} \quad \text{for } i \neq j \end{cases} \quad (7)$$

Thus, in the optimum: $L_j^A + C_j = L_i^A + C_i$. Considering this result in (7), it holds: $L_i^A = \frac{1}{4}V^A - C_i$, for $i = 1, 2$. This is the first statement in Proposition 1. For the second statement, regarding L_i^B for $i = 1, 2$, the proof is analogous.

Optimal shares $\alpha^k = 1/2$, for $k = A, B$, follows immediately from $L_j^A + C_j = L_i^A + C_i$ and $L_j^B = L_i^B$.

◆ Proposition 2:

Interior solution: with a little bit of algebra, the interior solution described by (4) can be reduced to:

$$\frac{\partial P}{\partial C_i} \left[\frac{1}{4}(V^A - V^B) + C_i \right] = 1 - P$$

Since P is defined: $P = 1 - \frac{1}{2}e^{-2(C_i+C_j)}$, then: $1 - P = 2\frac{\partial P}{\partial C_i}$; and the above equation yields: $\frac{1}{4}(V^A - V^B) + C_i = \frac{1}{2}$. Solving for C_i : $C_i = \frac{1}{2} - \frac{1}{4}(V^A - V^B) \in (0, \frac{1}{4}V^A)$ for $V^A \in (\check{V}^A, \hat{V}^A) = (1 + \frac{1}{2}V^B, 2 + V^B)$. Notice that: $\frac{\partial C_i}{\partial V^A} < 0$.

Corner solutions: For $V^A > \hat{V}^A$, $C_i = 0$; hence all political contributions are manifested through lobbying. For $V^A < \check{V}^A$, the opposite holds, and $L_i = 0$. In this context the IG i 's problem is given by:

$$\begin{cases} \max_{C_i} U_i^{EA} = P \alpha^A V^A + (1 - P) \frac{1}{4}V^B - C_i \\ st : P = 1 - \frac{1}{2}e^{-2(C_i+C_j)} \\ \alpha^A = \frac{C_i}{(C_i+C_j)} \end{cases}$$

Taking first partial derivative of U_i^{EA} with respect to C_i , $i = 1, 2$, and equating to zero, the equilibrium is characterized by the following system of FOCs:

$$\begin{cases} \frac{\partial P}{\partial C_i} \alpha^A V^A + P \frac{c_j}{(c_i+c_j)^2} V^A = \frac{\partial P}{\partial C_i} \frac{1}{4}V^B + 1 \\ \frac{\partial P}{\partial C_j} (1 - \alpha^A) V^A + P \frac{c_i}{(c_i+c_j)^2} V^A = \frac{\partial P}{\partial C_j} \frac{1}{4}V^B + 1 \end{cases}$$

Given $\frac{\partial P}{\partial C_i} = \frac{\partial P}{\partial C_j}$ and defining $P' = \frac{\partial P}{\partial C_i}$ and $C = C_i + C_j$, the above system yields:

$$\begin{cases} P' \alpha^A V^A + P \frac{(1-\alpha^A)}{C} V^A & = P' \frac{1}{4} V^B + 1 \\ P'(1-\alpha^A) V^A + P \frac{\alpha^A}{C} V^A & = P' \frac{1}{4} V^B + 1 \end{cases}$$

Since the RHS of both equations are equal, the LHS must also be equal:

$$P' \alpha^A V^A + P \frac{(1-\alpha^A)}{C} V^A = P'(1-\alpha^A) V^A + P \frac{\alpha^A}{C} V^A$$

Equivalently:

$$\alpha^A \left(P' - \frac{P}{C} \right) = (1-\alpha^A) \left(P' - \frac{P}{C} \right)$$

which implies that: $\alpha^A = 1 - \alpha^A = \frac{1}{2}$ and, consequently, that $C_i^* = C_j^*$.

Substituting these results in any FOC and remembering that $2(1-P) = P'$:

$$2(1-P^*) \frac{1}{2} V^A + P^* \frac{1}{4C_i^*} V^A = 2(1-P^*) \frac{1}{4} V^B + 1$$

Equivalently:

$$C_i^* = \frac{1/4 P^* V^A}{1 - (1-P^*)(V^A - 1/2 V^B)} \quad , \quad P^* = 1 - \frac{1}{2} e^{-4C_i^*}$$

Applying the standard chain rule for partial derivatives - and after a little bit of algebra-, the reader can prove that:

$$\frac{\partial C_i^*}{\partial V^A} = \frac{P^* [1 + (1-P^*) 1/2 V^B]}{4D^2 + 2(1-P^*)(V^A - 1/2 V^B)(P^* V^A + 1 - P^*) - 2(1-P^*)} \quad (8)$$

where: $D = 1 - (1-P^*)(V^A - 1/2 V^B)$.

The numerator in (8) is trivially positive. The denominator is also positive given: (i) $V^A > V^B$, since candidate A is defined as the "favorite", and (ii) $2D^2 > 1 - P^*$, since $2D^2 \in (1/2, 2)$ and $1 - P^* \in (0, 1/2)$.

Finally, the continuity of C_i^* at the critical value \hat{V}^A is assured by:

$$C_i^-(\hat{V}^A) = C_i^+(\hat{V}^A) \quad \Leftrightarrow \quad \frac{1}{2} - \frac{1}{4}(2 + V^B) + \frac{1}{4} V^B = 0$$

and regarding the continuity at \check{V}^A , it is enough to notice that:

$$(i) \quad C_i^+(\check{V}^A) = \frac{1}{2} - \frac{1}{4} \left(1 + \frac{1}{2} V^B \right) + \frac{1}{4} V^B = \frac{1}{4} \left(1 + \frac{1}{2} V^B \right) = \frac{1}{4} \check{V}^A, \text{ and}$$

$$(ii) \quad \text{the FOC: } P' \alpha^A V^A + P \frac{(1-\alpha^A)}{C^*} V^A = P' \frac{1}{4} V^B + 1 \text{ holds at } (V^A, C_i) = (\check{V}^A, 1/4 \check{V}^A).$$

To demonstrate this last condition it is enough to recall that $\alpha^A = 1/2$, $C^* = 2C_i^* = 2(1/4 \check{V}^A)$ and $2(1-P) = P'$. Hence:

$$P' \frac{1}{2} V^A + P \frac{1/2}{1/2 \check{V}^A} V^A = P' \frac{1}{4} V^B + 1 \quad \Leftrightarrow \quad P' \frac{1}{2} \left(V^A - \frac{1}{2} V^B \right) = 1 - P$$

True for $V^A = 1 + \frac{1}{2} V^B = \check{V}^A$.

◆ **Lemma 1:** Follows from Propositions 1-2.

◆ **Corollary 2:** There are incentives for ex-post collusion if through the coordination of lobbying strategies each *IG* can achieve a higher outcome than under competition. Hence, to prove the existence of such incentives, it is enough to identify an strategy $(\tilde{L}_i^A, \tilde{L}_i^B)$, $i = 1, 2$, that verifies a Pareto improvement with respect to the competitive outcome.

For $V^A > \hat{V}^A$: $c_i^* = 0$ and each *IG* achieves a payoff: $U_i^* = \frac{1}{8}(V^A + V^B)$. In this context, by coordinating an ex-post strategy $\tilde{L}_i^A = \tilde{L}_i^B = \epsilon > 0$ with $\epsilon \rightarrow 0$, $i = 1, 2$, each *IG* achieves an utility: $\tilde{U}_i = \frac{1}{4}(V^A + V^B) - \epsilon$, which is a Pareto improvement with respect to U_i^* for ϵ low enough; that is: $\epsilon < \frac{1}{8}(V^A + V^B)$. Hence, any collusive agreement for which both *IGs* commit themselves to play $\tilde{L}_i^A = \tilde{L}_i^B = \epsilon$ after elections will constitute a Pareto improvement for them.

Furthermore, for $V^A \in (\check{V}^A, \hat{V}^A)$ the cooperative strategy $(\tilde{C}_i, \tilde{L}_i^k) = (0, \epsilon > 0)$ with $\epsilon \rightarrow 0$, $i = 1, 2$, $k = A, B$, is also a Pareto improvement with respect to the non-cooperative game if and only if $\epsilon < \frac{1}{4}V^B + \min\left\{\frac{1-2\check{P}}{4}, 0\right\}$. While the first inequality assures $\tilde{U}_i(\check{V}^A) > U_i^*(\check{V}^A)$, the latter implies $\tilde{U}_i(\hat{V}^A) > U_i^*(\hat{V}^A)$. In addition with $\frac{\partial \tilde{U}_i}{\partial V^A} > 0$, the inequalities described imply that the payoff by cooperating is higher than that under no-cooperation.

$$\begin{cases} \tilde{U}_i(\check{V}^A) > U_i^*(\check{V}^A) & \Leftrightarrow \frac{1}{4} + \frac{1}{8}V^B + \frac{1}{4}V^B - \epsilon > \frac{1}{2}\check{P} + \frac{1}{8}V^B & \Leftrightarrow \epsilon < \frac{1}{4}(V^B + 1 - 2\check{P}) \\ \tilde{U}_i(\hat{V}^A) > U_i^*(\hat{V}^A) & \Leftrightarrow \frac{1}{2} + \frac{1}{2}V^B - \epsilon > \frac{1}{2} + \frac{1}{4}V^B & \Leftrightarrow \epsilon < \frac{1}{4}V^B \end{cases}$$

◆ **Proposition 3:** Following the preference assumptions $\theta_i = 1$ and $\theta_j = \theta > V^A/V^B$ described in the main text:

- the *IG i*'s ex-post utility is: $U_i^{EP} = (\alpha^A V^A - L_i^A)I + (\alpha^B V^B - L_i^B)(1 - I)$
- and that of *j* is: $U_j^{EP} = ((1 - \alpha^A)V^A - L_j^A)I + ((1 - \alpha^B)\theta V^B - L_j^B)(1 - I)$

with: $\alpha^A = \frac{L_i^A + \bar{C}_i}{L_i^A + \bar{C}_i + L_j^A}$ and $\alpha^B = \frac{L_i^B}{L_i^B + L_j^B + \bar{C}_j}$.

Solving, for L_i^K and L_j^K under each possible outcome (i.e., one in which candidate *A* takes office, $I = 1$, and another in which candidate *B* does it, $I = 0$), the optimal lobbying behavior can be characterized by the system:

$$\begin{aligned} \text{If } I = 1 : & \begin{cases} L_i^A + L_j^A + C_i = \sqrt{L_j^A V^A} \\ L_j^A + L_i^A + C_i = \sqrt{(L_i^A + C_i) V^A} & \text{for } i \neq j \end{cases} \\ \text{If } I = 0 : & \begin{cases} L_i^B + L_j^B + C_j = \sqrt{L_i^B \theta V^B} \\ L_j^B + L_i^B + C_j = \sqrt{(L_j^B + C_j) V^B} & \text{for } i \neq j \end{cases} \end{aligned}$$

Solving, If candidate A takes office: $(L_i^A, L_j^A) = (\frac{1}{4}V^A - C_i, \frac{1}{4}V^A)$; and if candidate B does it: $(L_i^B, L_j^B) = (\frac{\theta}{(1+\theta)^2}V^B, \frac{\theta^2}{(1+\theta)^2}V^B - C_j)$.

◆ **Corollary 3:** Follows immediately from substituting the optimal values for L_i^K , $K = A, B$ and $i = 1, 2$, obtained in Proposition (3) into the share-definition for α^K .

◆ **Lemma 2:** Follows from Proposition 3, Corollary 3 and since for both IGs making some positive, but low, campaign contribution constitutes a dominant strategy. The prove of the last result can be summarized in two steps:

Step 1: Assume first that $C_j = 0$. In this context, player i 's best response is to make some positive but low, campaign contribution, since:

$$U_i^{EA}(C_i = 0|C_j = 0) = 1/2 H_i < P_H K_i - (1 - P_H)C_i = U_i^{EA}(C_i > 0|C_j = 0)$$

for $C_i \in (0, \frac{(P_H - 1/2)H_i}{(1 - P_H)})$. Otherwise, for $C_i > \frac{(P_H - 1/2)H_i}{(1 - P_H)}$, the inequality above states that $U_i^{EA}(C_i = 0|C_j = 0) > U_i^{EA}(C_i > 0|C_j = 0)$, which is a contradiction.

Step 2: Now, assume that $C_j > 0$. In this context, player i 's best response is also to make some positive, but low, campaign contribution, since:

- if $C_i > C_j > 0$:

$$U_i^{EA}(C_i = 0|C_j > 0) = P_L H_i < P_M H_i - (1 - P_M)C_i = U_i^{EA}(C_i > 0|C_j > 0)$$

for $C_i \in (0, \frac{(P_M - P_L)H_i}{(1 - P_M)})$.

- if $C_j > C_i > 0$:

$$U_i^{EA}(C_i = 0|C_j > 0) = P_L H_i < P_m H_i - (1 - P_m)C_i = U_i^{EA}(C_i > 0|C_j > 0)$$

for $C_i \in (0, \frac{(P_m - P_L)H_i}{(1 - P_m)})$.

- if $C_j = C_i = C > 0$:

$$U_i^{EA}(C_i = 0|C_j > 0) = P_L H_i < 1/2 H_i - 1/2 C_i = U_i^{EA}(C_i > 0|C_j > 0)$$

for $C_i \in (0, \frac{(1/2 - P_L)H_i}{1/2})$.

The analogous conclusion is reached by repeating steps 1 and 2 for the rival IG .

Then: making some positive, but low campaign contribution is a dominant strategy for both IG . Therefore, it constitutes a Nash Equilibrium.

◆ **Proposition 4:** In main text.

◆ **Lemma 3:** Given the joint distribution function $P(C_i, C_j)$ described in the main text (Table 2), it holds: $U_i^{EA}(C_i > 0|C_j = 0) = P_H V^A - C_i$ and $\arg \max U_i^{EA}(C_i|C_j > 0) = P_M V^A - C_i$.

The proof of $(C_i, L_i) = (0, \epsilon_i > 0)$, with $\epsilon_i \rightarrow 0$ for $i = 1, 2$ being a Nash Equilibrium in pure strategies, demands for two steps:

Step 1: Assume first that $C_j = 0$. In this context, player i 's best response is not to make any campaign contribution, since:

$$U_i^{EA}(C_i = 0 | C_j = 0) = \frac{1}{2}(V^A - \epsilon_i) > P_H V^A - C_i = U_i^{EA}(C_i > 0 | C_j = 0)$$

for $\epsilon_i < \frac{C_i - (P_H - \frac{1}{2})V^A}{1/2}$, which is true as $\epsilon_i > 0$ with $\epsilon_i \rightarrow 0$ (see Proposition (3)).

Step 2: Now, assume that $C_j > 0$. In this context, player i 's best response is also not to make any campaign contribution, since:

$$U_i^{EA}(C_i = 0 | C_j > 0) = P_L V^A - P_L \epsilon_i > P_M V^A - C_i = U_i^{EA}(C_i > 0 | C_i > C_j > 0)$$

for $\epsilon_i < \frac{C_i - (P_M - P_L)V^A}{P_L}$, which is true as $\epsilon_i > 0$ with $\epsilon_i \rightarrow 0$ (see Proposition (3)).

Hence, not to make any campaign contribution is a dominant strategy for player i and, given the symmetry of the game, so it is for player j . Therefore, $(C_i, L_i) = (0, \epsilon_i > 0)$, with $\epsilon_i \rightarrow 0$ for $i = 1, 2$ is a Nash Equilibrium in pure strategies.

12 Appendix- Matching IDs

As we mentioned in the text, our data come from three different sources. We refer to the three databases as “licitaciones”, “aportes” and “audiencias”. Each source has an independent procedure to produce and record the information at the individual level. Essentially, this means having three unrelated databases with detailed individual-level data but with entirely independent naming and coding system. There are two ID variables in each dataset: **name** (string) and **cuit** (integer). Name is a string variable and records the name of an individual and/or firm. CUIT stands for “Clave Única de Identificación Tributaria” and is an 11-digit unique tax number representing individuals (person/legal person) unequivocally. The CUIT number is typically written as:

Table 10: CUIT structure and correspondence

cuit	2-digit	1-digit	Type	name
30-69325649-2	30	2	Legal Person	Drogueria Kendis SA
20-25756259-0	20	0	Person	Sebastian Freille

If the CUIT number is available for every observation in each database, then joining the three databases is easy by simply performing an exact-matching operation on **cuit**. Unfortunately, this is not possible in our case due to a large proportion of observations with missing CUIT numbers. Due to deficient and arbitrary registration procedures, the CUIT information is missing for many observations in each of the databases. This is particularly a problem for both “licitaciones” and “audiencias”. In the first case, the raw data contained complete CUIT information for only about 15% of the observations. In the second case, the CUIT information is not only missing in many cases but it is also unreliable when it is given.

Given the circumstances, we decided to manually retrieve as many CUIT numbers as possible to complete the missing rows in each of the databases. Thanks to research assistance by several students, we were able to recover the CUIT number for a significant number of rows. Even then, with these improvements, the databases, particularly “licitaciones” and “audiencias” had between 20 and 55% complete CUIT data.

We then decided to follow a mixed procedure consisting of performing both exact- and fuzzy- string matching on all the rows with missing CUIT number string columns. Exact string matching is highly precise but yields very little matches if there are misspelled names in the databases, and/or differences between two strings that corresponded to the same company.

First, we paired each database against a “dictionary” database, namely the Administración Federal de Ingresos Públicos (AFIP) administrative records database. This is a file containing over 4.6 million entries, each row containing both **name** and **cuit** variables and additional variables recording tax conditions for several taxes. For each database, we performed three different merges: 1) merge on both **cuit** and **name**; 2) merge on **cuit** only; and 3) merge **name** only.

We basically followed a rolling case-matching process depending on the quality and consistency of the matching databases. This yielded out the following sub-products:

1. Matching all records with both complete **cuit** and **name** in each of the three databases against our dictionary database of names and cuit. This is merely for confirmation purposes (NOTE: CUIT numbers are unique identifiers).
2. Matching all records with **cuit** in each of the three databases against our dictionary database dictionary of names and cuit. This allows us to confirm an exact **cuit** match and to retrieve the original (string) **name** from the dictionary database.
3. Matching all records without **cuit** but with **name** data against the dictionary database. Matching on strings is complicated due to misspellings, different conventions, errors, spaces, and several similar problems. With the ultimate goal of keeping as many cases as possible in the final dataset, we decided to implement two types of string matching.
 - (a) Exact string matching: Matching all records with **name** information in all three database against the **name** column in the dictionary. This process yield around 10-15% exact matches of the total rows with **name** but without **cuit** in both “audiencias” and “licitaciones” (NOTE: For two strings to match, they have to be exactly equal in terms of spelling, casing, abbreviations, etc. But this has an additional problem: even if there is exact string match, there are both persons and legal persons with identical names in the AFIP dictionary. An illustrative example: “Miguel Angel Alvarez” is matched perfectly from the licitaciones data but matches to 295 identical **name** in AFIP! In these cases, there is simply no way for us to know which of the 295 **cuit** from the dictionary database we should match “Miguel Angel Alvarez” to. Unless we find additional background information on the each of these individuals, we will be forced to drop them from the analysis.
 - (b) Fuzzy (approximate) string matching: Matching all records with **name** information in all three databases against the **name** column in the dictionary. Fuzzy string matching consists of comparing each string from a “client” database to every word of a “server” database and calculated a measure of association (similarity). We adapted an algorithm for performing this operation so that it selects the best possible match (in the “server” database) for every observation in “client” database and records the measure of distance –a distance of “0” is an exact match. Most of these algorithms use what is called “optimal string alignment” through the implementation of the restricted Damerau-Levenshtein distance. We have been able to fuzzy match these databases by chunks –trying to fuzzy match a database of around 10000 observations (“licitaciones”) against a dictionary databae of 4.6 millions is out of the question due to computing and memory issues.

The results of this rolling case-matching process will yield a set of uniquely and unequivocally matched persons and legal persons dataset each with information on **cuit** and **name**. The names of the persons and legal persons will be updated and homogenized from our dictionary database. Once this process is done, we go back to each of the original databases and replace the original information on **cuit** and **name** with the updated and correct information originating from the dictionary dataset. All the databases are ready to be merged on the two ID variables which will yield unequivocally unique cases merged and expanded in the final working dataset.

13 Appendix - Grafs and Tables

Figure 7: Communities of individual and corporate donors to main parties – Years: 2005-2015

