

THE ECONOMICS OF COMMERCIAL LOBBYING

by

THOMAS GROLL

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Student: Thomas Groll

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This dissertation has been accepted and approved in partial fulfillment of the requirements for the Doctor of Philosophy degree in the Department of Economics by:

Dr. Christopher J. Ellis	Chair
Dr. Shankha Chakraborty	Member
Dr. Nicholas Sly	Member
Dr. Daniel Tichenor	Outside Member

and

Kimberly Andrews Espy	Vice President for Research & Innovation/ Dean of the Graduate School
-----------------------	--

Original approval signatures are on file with the University of Oregon Graduate School.

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DISSERTATION ABSTRACT

Thomas Groll

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Title: The Economics of Commercial Lobbying

This dissertation addresses the economic behavior and political influence activities by lobbyists today by examining the existence, mechanisms, and welfare implications of commercial lobbying activities and their optimal regulation.

In the second chapter of this dissertation, a novel model of lobbying is presented that explains the behavior of commercial lobbying firms (such as the so-called K-Street lobbyists of Washington, D.C.). In contrast to classical special interest groups, commercial lobbying firms represent a variety of clients and are not directly affected by policy outcomes. They are hired by citizens to advocate policy proposals to politicians that are beneficial to the citizens but also have social implications. Using a model with a market for lobbying services and agency relationships between lobbyists and policymakers it can be shown why commercial lobbying firms exist. It can also be shown that self-interested policymakers, who observe lobbying activities, may employ commercial lobbying firms in a socially inefficient manner.

In the third chapter of this dissertation, the analysis examines the effective regulation of commercial lobbying activities and focuses on the endogenous choice of regulatory

institutions. The analysis uses the model of commercial lobbying presented in the second chapter. I derive the institutional conditions under which a market outcome can be first-best as well as the conditions under which a first-best institution will be self-stable. One result is that current regulations may fail to be effective and cannot limit lobbyists' and policymakers' incentives to substitute financial contributions for the socially beneficial acquisition of information. Additional results explain why endogenous reforms may or may not occur.

In the fourth chapter of this dissertation, the analysis uses a dynamic model of commercial lobbying with lobbyists who undertake unobservable investigation efforts and promise financial contributions. It is shown that repeated relationships with lobbyists simplify a policymaker's information and contracting problem and help policymakers to escape a "cheap talk" lobbying game. The welfare implications of these interactions depend on whether the policymakers' information or contracting problem predominates. Further, the policymaker's information problem may actually improve welfare outcomes. Similarly, financial contributions may also improve welfare outcomes.

This dissertation includes unpublished co-authored material.

CURRICULUM VITAE

NAME OF AUTHOR: Thomas Groll

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene, OR

University of Konstanz, Konstanz, Germany

DEGREES AWARDED:

Doctor of Philosophy in Economics, 2012, University of Oregon

Diplom/Master of Science in Economics, 2008, University of Konstanz

Master of Science in Economics, 2006, University of Oregon

AREAS OF SPECIAL INTEREST:

Public Economics

Industrial Organization

Applied Microeconomics

PROFESSIONAL EXPERIENCE:

Graduate Teaching Fellow, Department of Economics, University of Oregon, 2007-2012

GRANTS, AWARDS AND HONORS:

Charles A. Reed Graduate Fellowship 2011/12, College of Arts & Sciences

Outstanding GTF Teaching Award, Economics, 2011

Best Ph.D. Field Paper, Economics, 2010

Kleinsorge Summer Research Fellowship, Economics, 2010, 2011

Dale Underwood Outstanding Graduate Student Scholarship, Economics, 2008

Graduate Teaching Fellow, Economics, 2007-2012

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CHAPTER I

INTRODUCTION

The classical view of rent-seeking and lobbying is one of special interest groups approaching policymakers to achieve desired policies. Examples would be a steel lobby asking for import protection, firms asking for work permissions for immigrant workers, or the National Rifle Association advocating for legal access to weapons. The economic analysis of rent-seeking and lobbying has focused on the activities of such interest groups that are directly affected by the policy outcomes they lobby for and usually neglect the social implications of their actions. However, direct observation reveals that there is a third actor. Most interest groups hire commercial lobbyists to present policy matters to policymakers on their behalf. Commercial lobbying firms – usually law, consulting or public affairs firms – present the political interests for a variety of clients for economic profit and are not directly affected by the policy outcomes they lobby for. Anecdotal evidence suggests that lobbying firms are prevalent in the political process in Washington, D.C., Brussels, London, Paris, and Berlin, but the mechanisms and implications have been ignored in the economic analysis.

This dissertation asks why interest groups, firms, citizens, or public entities hire lobbying firms for political representation, how lobbying firms interact as intermediaries between clients and policymakers, and how their activities affect economic markets and political outcomes. In Chapter II the analysis focuses on the existence and welfare implications of commercial lobbying in a simple general equilibrium framework. In Chapter III the analysis addresses potential market failure and the distributional consequences of commercial lobbying activities and derives the conditions for an optimal regulation of such activities as well as the conditions for endogenous reforms. In Chapter IV a dynamic model of commercial lobbying with unobservable information acquisition and not

contracted financial contributions is presented that seeks to explain the observed repeated personal interactions between lobbyists and policymakers.

Although the activities of commercial lobbying firms have received little or no attention from the economic literature, they are influential and have distinct characteristics. Empirical evidence shows that commercial lobbyists are more and prevalent in the political process of Washington, D.C.¹ Among the top 10 U.S. lobbying firms in 2010 were five law firms and five government affairs consulting firms. The total reported revenues for all lobbying activities at the federal level were \$3.47 billion. The top 25 commercial lobbying contracts in 2010 were between \$1 and \$10 million.² These expenditures were related to the political representation of lobbying firms' clients and exclude their clients' political campaign contributions. Numerous commercial lobbying firms possess their own Political Action Committees (PAC), and commercial lobbyists make campaign contributions to politicians with whom they share engagements in political issues.³ Commercial lobbying firms advertise their political experience, expertise in specific political and legal areas, and political contacts.⁴ That they advertise their experience and contacts suggests that most relationships between lobbyists and policymakers are personal and based on repeated interactions. The analysis in Chapter II addresses the existence of commercial lobbying firms, incorporates the observed expertise of commercial lobbying firms, and explains the simultaneous provision of information and financial contributions by commercial lobbyists.

¹Using the lobbying reports filed by lobbyists under the Lobbying Disclosure Act (1995) for their activities at the federal level, Bertrand, Bombardini, and Trebbi (2011) show that the share of commercial lobbyists amongst all lobbyists is increasing and that the growth in lobbying expenditures can be attributed to commercial lobbying firms.

²The identities and revenues are from www.opensecret.org; a website from the Center for Responsive Politics. Their data are collected from the individual lobbying registrations and reports filed under the Lobbying Disclosure Act (1995) and provided by the US Senate Office of Public Records.

³See the website of the Center for Responsive Politics for the identities of lobbying firms with PACs and Bertrand, Bombardini, and Trebbi (2011) for an analysis of lobbyists' campaign contributions.

⁴Many lobbying firms advertise on their websites the number of employees with Congress or House staff experience or the number of years their employees held public offices.

In Chapter IV the analysis remains these elements but can also show how repeated personal interactions between lobbyists and policymakers can arise endogenously.

The conventional wisdom of lobbying is that citizens or special interest groups may have valuable information that an imperfectly informed policymakers wishes to learn. As society we care about the quality of policy decisions and benefit from this information. For example,

*“[t]he practice of lobbying in order to influence political decisions is a legitimate and necessary part of the democratic process. Individuals and organizations reasonably want to influence decisions that may affect them, and their environment. Government in turn needs access to the knowledge and views that lobbying can bring.”*⁵

Unfortunately, private incentives to misrepresent information, policy contingent campaign contributions, or political capture by special interests may limit the benefits of lobbying activities and in turn may be even socially undesirable. In the last several years, there has been more public awareness of about the influence of lobbying on the political process. During that period, the influence has been discussed in public and legislation has addressed the phenomenon and public concern. Exemplary is Tony Wright’s MP, Chairman of the Public Administration Select Committee (PASC) of the British parliament in 2009, statement regarding a parliamentary report on lobbying:

*“Lobbying enhances democracy, but it can also subvert it. Government has accepted that it should be more open to outside interests and ideas, and this has brought benefits. But there are risks around influence and public mistrust of government, and these risks have not been managed closely enough. [...] Transparency is key here. There is a public interest in knowing who is lobbying whom about what.”*⁶

⁵See part 1. of the Public Administration Select Committee’s report “Lobbying: Access and influence in Whitehall” (2009) ordered by the British House of Commons.

⁶Tony Wright’s MP statement is taken from a press notice by the Public Administration Select Committee (2009).

One initial reason for the PASC's report was the development of commercial lobbying activities described as "lobbyists for hire" in the United Kingdom.⁷ The analysis in Chapter II, III, and IV provides insights for these discussions by examining the mechanisms of commercial lobbying activities and their welfare implications. Further, Chapter II and IV address political capture by lobbyists; Chapter III addresses public concern about commercial lobbying activities and the importance of transparency about information and financial transfers from lobbyists to policymakers.

Another reason for the PASC's report were previous regulatory changes in the United States, the Lobbying Disclosure Act (1995) and the Honest Leadership and Open Government Act (2007), and the European Union.⁸ The regulation of professional lobbying activities differs widely across democratic countries and even within countries at the state level.⁹ Countries with a higher degree of formal lobbying regulation, are, for example, the United States, Canada, and recently Australia. For example, the U.S. Lobbying Disclosure Act (1995) is intended

*"[...] for the disclosure of efforts by paid lobbyists to influence the decision-making process and actions of the Federal legislative and executive branch officials while protecting the constitutional right of the people to petition the government for a redress of their grievances."*¹⁰

However, most Western democracies have only limited forms of regulation or no regulation at all. The cross-national differences in the regulation of lobbying activities affects the availability of data and the lack of regulation reduces our knowledge to anecdotal evidence about lobbying activities and the activities by commercial lobbying firms in many countries. This dissertation is a starting point to examine the activities by commercial

⁷See part 10. of the PASC's report "Lobbying: Access and influence in Whitehall" (2009).

⁸See part 7. of the PASC's report "Lobbying: Access and influence in Whitehall" (2009).

⁹See Chari, Hogan, and Murphy (2010) for an extensive overview of lobbying regulation across countries.

¹⁰The Lobbying Disclosure Act (1995) – "Purpose and Summary".

lobbying firms, which have been widely ignored in the economic literature, and their welfare implications. The intention is to provide theoretical insights that guide the public and policymakers in their discussions about the need for regulation and publicly available data. Especially the analysis in Chapter III focuses on the potential need for regulation and examines the endogenous choice institutions regulating commercial lobbying activities.

In Chapter II a novel general equilibrium model of lobbying is presented that seeks to explain some behavior of commercial lobbying firms and their implications for social welfare. It is argued that commercial lobbying firms possess an expertise that allows them to make predictions about the social desirability of policy proposals. This expertise gives policymakers an incentive to allocate political access to lobbyists. Citizens with policy proposals, which if enacted yield them private benefits, hire commercial lobbyists with political access to increase the likelihood of realizing these private benefits from policy proposals. In contrast to the previous literature of lobbying activities with information acquisition and financial contributions (Bennedsen and Feldmann 2006, Dahm and Porteiro 2008a), the model can explain a simultaneous provision of information and financial contributions when multiple agents compete for political access and decisions. Further, it is shown that the policymakers' relatively powerful position and ability to monitor lobbyists' verification efforts perfectly allow them to announce access rules that request their desired mix of verification efforts and financial contributions. The socially optimal mix will typically not be achieved as a market outcome because of market power and externality effects. By focusing on the welfare effects, the analysis provides unique insights that contribute to the lobbying literature.

The analysis of Chapter III addresses the optimal regulation of commercial lobbying activities and focuses on a potential political conflict between citizens and policymakers. The potential market failure presented in Chapter II provides the normative rationale for deriving the institutional conditions for the optimal regulation of commercial lobbying activities. Given the socially optimal institutions the analysis provides the conditions

under which a first-best institution is self-stable. Further, it is shown that there is private rent dissipation in the unregulated market equilibrium presented in Chapter II. This provides the positive rationale for explaining a potential political conflict between citizens and policymakers arising from commercial lobbying activities. The analysis provides the conditions for endogenous political reforms because of distributional consequences and provides some arguments for the political stability of unregulated lobbying activities. The focus on optimal regulation and endogenous institutions regulating lobbying activities provides unique insights that contribute to both the lobbying literature and the literature of endogenous political institutions.

In Chapter IV the analysis provides explanations for repeated personal interactions between commercial lobbyists and policymakers and examines the welfare implications of these relationships. The analysis provides a dynamic general equilibrium model of lobbying in which lobbyists provide verification efforts and financial contributions to policymakers in exchange for political access. Citizens hire commercial lobbyists to increase the likelihood of realizing private benefits. In contrast to the static model of commercial lobbying presented in Chapter II, policymakers can only imperfectly monitor lobbyists' information acquisition and are unable to contract with lobbyists. The analysis shows that repeated personal interactions solve a policymaker's information and contracting problem if policymakers can promise barriers to entry into the political access market, which essentially generate positive rents for lobbyists. The welfare implications depend on whether policymakers solve an information or contracting problem when they engage in such relationships. By explaining repeated personal interactions, the analysis provides unique insights that contribute to the lobbying literature.

Chapter II and IV include material co-authored with Christopher J. Ellis.

CHAPTER II

A SIMPLE MODEL OF THE COMMERCIAL LOBBYING INDUSTRY

This chapter is co-authored with Christopher J. Ellis, who contributed through analytical insights, feedback for the development of the theoretical model, and provided editorial assistance. I was the primary contributor to the development and analysis of the theoretical model.

II.1. Introduction

Direct observation reveals that there are two types of professional lobbyist engaged in the business of political influence activities. The first type are the representatives of classical special interest groups, such as trade associations, unions, and other organizations that take political actions on behalf of their members. These lobbyists are directly motivated, either ideologically or via financial gain, by the policy outcomes they lobby for. Their focus is usually only on a subset of policies that are relevant to the interest group's organizing principle. Understanding the problems and activities of lobbyists representing special interest groups has been the primary focus of most of the economic literature in this area. However, there is clearly a second type of lobbyist, those employed by commercial lobbying firms. These lobbyists are increasingly prevalent in lobbying activities and are attracting significant public attention.¹ In contrast to classical special interest groups, commercial lobbying firms are typically not directly affected by the policies they lobby over, nor do they have ideological preferences over policy outcomes. Commercial lobbying firms act as intermediaries between citizens or special interest groups and policymakers; they seek to make profits by selling intermediation services to their clients. These intermediation

¹Bertrand, Bombardini, and Trebbi (2011) show that there has been a rapid growth of commercial lobbying. The share of commercial lobbyists amongst all lobbyists has increased from 40 percent in 1999 to 60 percent in 2009. Indeed, the growth in overall lobbying expenses in that time period can be attributed to commercial lobbying.

services include direct advocacy to branches of government, legal and political consulting, advice about the political feasibility of clients' objectives, facilitating the formation of coalitions and grass root organizations, legislative drafting, legislative witness hearing preparation, and public relations. Until now the behavior of commercial lobbying firms and their economic implications has not been analyzed in the theoretical economics literature, and it is the intent of this dissertation to provide a simple general equilibrium model of commercial lobbying.

Although the activities of commercial lobbying firms has received little or no attention from the economic literature, they are influential and have distinct characteristics. Among the top 10 U.S. lobbying firms in 2010 were five law firms and five government affairs consulting firms. Their reported revenues from lobbying services at the federal level were cumulatively around \$252 million in 2010. The total reported revenues for all lobbying activities at the federal level were \$3.47 billion. The top 25 commercial lobbying contracts in 2010 ranged between \$1 and \$10 million.² These expenditures were related to the political representation of lobbying firms' clients and exclude their clients' political campaign contributions. Commercial lobbying firms advertise their political experience, expertise in specific political and legal areas, and political contacts.³ That they advertise their experience and contacts suggests that most relationships between lobbyists and policymakers are personal and based on repeated interactions.⁴ These features are incorporated into this analysis.⁵

²The identities and revenues are from www.opensecret.org; a website from the Center for Responsive Politics. Their data are collected from the individual lobbying registrations and reports provided by the US Senate Office of Public Records. The Lobbying Disclosure Act (1995) requires professional lobbyists to register and report their activities at the federal level.

³Many lobbying firms advertise on their websites the number of employees with Congress or House staff experience or the number of years their employees held public offices.

⁴This observation was confirmed by University of Oregon Associate Vice President for Public & Government Affairs Betsy Boyd, who is in charge of the university's political representation and registered as a lobbyist under the Lobbying Disclosure Act (1995).

⁵The nature of the repeated agency relationship will not be crucial for the model in this chapter. A dynamic version of the model will be presented in chapter 3.

That lobbying is an important phenomenon is reflected in the increase in public awareness and concern over the influence of special interests on the political process. Pressure to regulate lobbying activities has grown in most democratic countries. The regulation of professional lobbying activities has taken the form of public registers, codes of conduct, and activity reports, such as those adopted recently in the United States, Canada, and Australia.⁶ However, most Western democracies have limited or no regulation.⁷ Also, policy contingent payments to policymakers are widely illegal and the amounts of campaign contributions are frequently limited. Additionally, there is a recent trend towards increased transparency over policymakers' personal income and other financial records. This increased transparency is intended to provide the public with valuable information about policymakers' behavior. The public has also expressed concerns that professional lobbying might not be transparent and may crowd citizens out of the political process.

The conventional wisdom of lobbying is that special interest groups or citizens may have valuable information that an imperfectly informed policymaker wishes to learn. As a society we care about the quality of policy decisions and benefit from this provision of information. Unfortunately, private incentives to misrepresent information may limit what a policymaker may learn from the signals sent by citizens or special interest groups, and the quality of their policy decisions may suffer. Special interest groups and citizens also make financial contributions to policymakers. These financial contributions might be contingent on policy choices and affect negatively the political decision making process. In sum, lobbying performs a socially desirable function by transmitting information to policymakers but the concomitant campaign contributions may adversely distort policy

⁶The Lobbying Disclosure Act (1995) regulates lobbying activities on the federal level in the United States. The regulation includes registration, frequent reports, and penalties for potential violations. In Canada, the Lobbying Act (2008) extended the previous regulation and requires a registration of activities, provides a code of conduct, and limits post-employment opportunities. In 2008, the Australian government introduced a code of conduct and a public register to regulate lobbying activities.

⁷See Chari, Hogan, and Murphy (2010) for an extensive overview of lobbying regulations across countries. The Center for Ethics in Government at the National Congress of State Legislators provides an annual overview of lobbying regulations for U.S. states on its website.

decisions. In this analysis it is argued that the existence of commercial lobbying firms who specialize partially in information verification may serve to, at least partially, circumvent this problem. Commercial lobbying firms maximize their discounted profit streams like any other conventional business, and trade off potential profit increases today from information misrepresentation against the decreases this will imply for future profits. These market incentives, which shall be formalized as an agency relationship between policymakers and lobby firms, allow for the credible transmission of information.

The introduction of commercial lobbyists as intermediaries between citizens and policymakers introduces several new elements of interest, which are not present in the analysis of lobbying by special interest groups. First, commercial lobbyists act as the agents of citizens or special interest groups in presenting their policy proposals to policymakers. Hence a market for intermediation services is introduced. Second, there are agency relationships between the commercial lobbyists and policymakers. Here the policymakers are principals who use access rules to motivate lobbyists to learn and transmit valuable information in exchange for political access. In order to focus on the implications of commercial lobbying a simple general equilibrium structure is provided with three types of agents: Citizens, lobbying firms, and policymakers. All three agent types are assumed to be rational and self-interested.⁸ The number of policymakers will be determined by a constitution. Those not chosen as policymakers may decide to be citizens or lobbyists, and this choice will satisfy a simple arbitrage condition. The model will be constructed such that there is no rationale for the formation of classical special interest groups. Singleton citizens pursuing their own private interests via the political process could in principle decline the intermediation services of lobbying firms and make direct representations to policymakers, that is be their own special interest group. However, it is shown that this is typically not an equilibrium outcome in our model, and frequently it is not socially desirable. Policy

⁸There is no benevolent social planner except a fictitious one used to generate a benchmark for making welfare comparisons.

decisions will be assumed to have private benefits to the citizens that propose them, but will also have spillover effects for the other agents in the model. These spillovers may be socially desirable or undesirable and are not perfectly observed ex ante.⁹ The role of commercial lobbying firms is to observe a signal correlated with the social desirability of any proposal that they “verify”; they thus have the potential to pass along to policymakers a portfolio of proposals some of which have been verified and some not, and amongst those that have been verified a mix of proposals that they observed to be associated with positive and negative signals. That is they may pass along a portfolio of a given expected quality in the sense of the associated expected value of spillovers. Generally in this model more policy proposals is a good thing, but more verification is also desirable. For a given number of agents in the economy there will be an optimal mix of citizens, lobbyists and policymakers. This optimal mix will typically not be achieved as a market outcome, which may involve too much or too little lobbying, furthermore given that resource allocations are market driven the second best constitution (number of policymakers) may be greater or less than at the first-best optimum.

II.1.1. Related Literature

The analysis of special interest groups and lobbying activities has a long tradition. Olson’s (1965) seminal work provides some fundamental insights about special interest groups and their formation. The classical literature on rent-seeking focuses on special groups’ activities to demand or influence political decisions in their favor. The idea of “rent-seeking” - approaching policymakers for favorable policies at the cost of welfare losses - goes back to Tullock (1967), Krueger (1974), and Buchanan (1980).¹⁰ A recent extensive

⁹This echos Buchanan (1980), who noted that profit seeking and rent seeking may be the same activity and similarly motivated, but either can have socially desirable or socially undesirable consequences.

¹⁰Tullock (1967) was the first scholar describing the phenomenon of rent-seeking. The term “rent-seeking” was introduced by Krueger (1974) who was not aware of Tullock’s work. Buchanan (1980) provides a more detailed discussion about the definition and extent of rent seeking activities and their consequences.

survey by Congleton, Hillman, and Konrad (2008) summarizes the different approaches and directions in this field. For a long time, the “black-box” of rent-seeking was modeled with a simple Tullock (1980) contest function, where the relative amount of rent-seeking expenditures determines the likelihood for realizing private rents.

In response to the ad hoc nature of Tullock contest functions, two strands of literature have emerged. One strand of literature focuses on campaign contributions to influence policymakers, whereas another strand addresses the strategic use of information. Persson and Tabellini (2000) as well as Grossman and Helpman (2001) provide surveys of both strands. More recent contributions seek to combine these strands of the literature. Some more recent empirical work focuses on the observed personal relationships between lobbyists and politicians and provide further insights into lobbying activities. The next sections provide some exemplary studies for each strand of the lobbying literature. The survey of the literature reveals that to the best of my knowledge, no theoretical work has focused on the features of commercial lobbying.

II.1.1.1. Financial Contributions

There is an extensive literature that examines the influence of campaign contributions on policy outcomes. Starting with the seminal contribution of Bernheim and Whinston (1986) these menu auction models assume that well-informed agents bid to have a less informed policymaker adopt their preferred policies. Their model predicts that the policymaker’s payoff is increasing in the level of conflict between interest groups.

Grossman and Helpman (1994) employ the menu auction approach to investigate a model of endogenous formation of trade protection. In their common agency model principals, special interest groups seeking trade policies, make contingent contribution offers for desired policies and the government chooses policies to maximize its own outcome. The government’s outcome depends on political contributions from special interest groups for chosen trade policies, and reelection concerns determined by average voter welfare. It is

argued that political contributions are made to influence policymakers' decisions rather than to affect electoral outcomes but that electoral outcomes constrain policymakers. The degree of trade protection for special interest groups increases with the government's desire for campaign contributions relative to voter welfare.

Besley and Coate (2001) also consider a lobbying model with contingent contributions, they combine a citizen-candidate model of representative democracy, as studied in Besley and Coate (1997) and Osborne and Slivinski (1996), with the analysis of Grossman and Helpman (1994). Besley and Coate (2001) present the following results: Competition for political office and the associated lobbying rents leads candidates to choose identical policy choices; however, voters can offset the influence of lobbies if they elect candidates whose interests differ from those of the lobbies'. In their model, not all political equilibria predict complete dissipation of rents.

II.1.1.2. Information Transmission

The other strand of literature assesses the role of lobbying as information revelation. Two issues arise: First, special interest groups may desire to reveal their information truthfully to the policymaker but may only do so imprecisely. Second, special interest groups may misrepresent their information to strategically manipulate policymakers' choices.

Crawford and Sobel (1982) provide an example of a model where agents may only provide information imprecisely. An agent with private information can send a signal to a less informed principal who has the authority to implement a policy that determines the welfare of both. They show that in equilibrium the more informed agent informs the principal that the true state lies within a given partition of the appropriate space. The principal believes that the true state lies at the midpoint of the partition. The agent cannot be more precise in their information revelation as the partitioning of the space causes the principal's beliefs to jump discontinuously punishing the agent for any attempts

to strategically manipulate those beliefs, thus making the imprecise signal credible. The closer the individuals' preferences are the more precise is the signal that may be credibly sent.

Potters and van Winden (1992) extend the analysis of strategic information with “cheap talk” and focus on costly lobbying. An interest group has private information that is relevant for the policymaker. The interest group has to bear some costs if it decides to lobby the policymaker. A message from an interest group can provide a policymaker with valuable information even in the presence of conflict, information independent costs, or unsubstantial messages. Lobbying is more likely if the costs are lower and the benefits are higher; the informational quality increases with the proximity of parties' interests. Overall, lobbying can increase parties' welfare or be socially wasteful.

An alternative model with greater emphasis on the strategic manipulation of information is provided by Krishna and Morgan (2001). They describe an environment with two perfectly informed experts who can advise a decision maker. The experts are biased and may misrepresent their information to the decision maker and achieve more favorable outcomes. The decision maker has to decide who and how many experts shall provide the desired information. Experts' messages are sent sequentially and publicly. If experts have similar preferences, then a second expert does not improve the decision quality; if experts have opposing preferences, then it is beneficial to consult both experts. For both cases, full revelation does not occur. Full revelation may occur if experts engage in a back-and-forth debate.

II.1.1.3. Interaction of Political Contributions and Information Transmission

Other studies have focused on the interactions of political contributions and information revelation as a means by which lobbyists influence policymakers. Early models have modeled campaign contributions as means to gain political access to policymakers and the gained political access as a channel for the transmission of the interest group's private

information. Austen-Smith (1995) develops a two-stage model where an interest group's contributions buy access to the policymaker in the first stage. In the second stage, the access is used to present costless information. In one scenario, the policymaker is informed about the interest group's preferences. The analysis predicts a positive relationship between the amount of contributions and the difference between the policymaker's and interest groups' preferences. In the alternative scenario the interest groups' preferences are unknown to the policymaker. The policymaker can observe the value of political access and forms beliefs about the interest group's objectives. The beliefs are imprecise and there is incomplete revelation of the interest group's type.

Lohmann (1995) considers several heterogeneous interest groups seeking to influence policy. The decisions about buying political access and providing information are simultaneous. The information provided by an interest group to the policymaker is a public good. The interest groups' incentives to free ride decrease the contributions and lead to incomplete rent dissipation. Interest groups with objectives close to the policymaker's obtain access at no cost, whereas extreme interest groups have to make positive payments. Since there are several interest groups competing for influence individual contributions are less effective. There is full revelation of information for cases with high dimensional message spaces and where the information received by each interest group is independent.

More recent models focus on special interest groups' strategic choice of information transmission and financial contributions. For example, Bennesen and Feldmann (2006) argue that an information externality arises when competing special interest groups attempt to influence a policymaker with policy relevant information about a single policy. This information externality reduces an interest group's incentive to provide information and results in a specialization of interest groups in providing information or financial contributions depending on the interest group's information technology. In the current analysis citizens have policy proposals with unknown spillovers that may be investigated by lobbyists. The lobbyists' findings are specific for each policy proposal so that there

is an externality from an enacted policy but no informational externality. Dahm and Porteiro (2008a) focus on the observed simultaneity of information acquisition and financial contributions. In their model a single interest group's gathered information may benefit or harm its aspirations. So financial contributions may avoid a negative information effect or complement information transfers depending on the lobbying game.

II.1.1.4. Empirical Literature

Recent empirical work by Blanes i Vidal, Draca, and Fons-Rosen (2011) focuses on the “revolving door” phenomenon. Former staff employees of Congress members may offer their former work contacts and earn economic rents as lobbyists. Blanes i Vidal, Draca, and Fons-Rosen (2011) find empirical support for the hypothesis that the work experience as a staffer is a source for lobbying revenues and that these revenues are increasing in the political contacts' seniority and power of committee assignments. They show that the lobbyists' revenues decrease immediately and permanently when their former employer loses political office. Eggers (2010) focuses on partisan lobbying and the revolving door phenomenon. He uses the party affiliation of lobbyists with staff experience and politicians in power as indicator for networks. The results show that former staff members' lobbying revenues are more affected by their own party membership and the current party in power; whereas former politicians are more likely to earn lobbying rents because of their personal relationships rather than party affiliation. Bertrand, Bombardini, and Trebbi (2011) focus on the overall lobbying industry and try to disentangle whether lobbyists provide issue expertise or contacts to policymakers. They find evidence that personal contacts as well as lobbyists' expertise matter. Their empirical findings support many of the assumptions made in the presented model of commercial lobbying.

II.1.2. Outline of the Chapter

The remainder of the chapter is organized as follows. Section 2 introduces the basic model that incorporates the idea of commercial lobbying firms that sell their intermediation services to their clients and interact with policymakers on their behalf. Section 3 presents the social welfare optimum and the socially efficient constitution as a benchmark. Individual incentives to oppose or support socially optimal institutions are considered. Section 4 derives the market equilibrium with self-interested policymakers who are informed about lobbyists' verification efforts. The results are contrasted to the socially optimal outcomes. Potential regulatory actions to achieve first-best or second-best outcomes are discussed. Section 5 concludes with a brief summary.

II.2. The Basic Model

In the basic model of commercial lobbying the analysis examines the interactions between citizens, lobbyists, and policymakers and characterize and compare the market and socially optimal allocations.

Consider a society of population T . Each society member is potentially a citizen, c , lobbyist, l , or policymaker, p . Each citizen receives a single policy proposal which if enacted yields a private benefit and generates a social spillover which might be positive or negative. The citizens may either attempt to present their policy proposals directly to policymakers or indirectly via the services of a commercial lobbying firm. Any proposal that is heard by a policymaker is automatically enacted and its payoffs realized. If a proposal is presented via a commercial lobbying firm that lobby has the ability to investigate the potential social spillover and reported its findings to the policymaker.

II.2.1. Citizens

There are C citizens and each of whom has a policy proposal for policymakers which if approved will yield a private benefit of $\pi^c > 0$. Additionally, every realized policy proposal has a spillover for society of e^c . A spillover can be positive, with $e^c > 0$, which would be socially desirable, or negative, with $e^c < 0$ and it is assumed that $\pi^c + e^c < 0$, which would be socially undesirable. The exogenous probability of a positive spillover is $\rho(e^+)$. With the complementary probability, $\rho(e^-) = 1 - \rho(e^+)$, that a randomly drawn proposal has a negative spillover. Overall, the expected social value of a randomly drawn proposal is positive. This expected social value ensures potential progress through political decisions.

Citizens realize, if their own policy proposal is approved, the private benefit of the proposal π^c and additionally a share of aggregate spillovers from all policy proposals approved by policymakers, A . Citizens may present their proposals directly to a policymaker at no cost or hire for a fee of k a commercial lobbyist to present the proposal on their behalf.¹¹ A citizen can hire only one lobbyist, and the payoff for citizen c is

$$\Pi^c = \begin{cases} \pi^c + \frac{1}{T} \sum_{c=1}^A e^c & \text{if } c \text{ gains access directly,} \\ \frac{1}{T} \sum_{c=1}^A e^c & \text{if } c \text{ gains no access,} \\ \pi^c - k + \frac{1}{T} \sum_{c=1}^A e^c & \text{if lobbyist } l \text{ presents } c\text{'s proposal, or} \\ -k + \frac{1}{T} \sum_{c=1}^A e^c & \text{if lobbyist } l \text{ does not present } c\text{'s proposal.} \end{cases} \quad (\text{II.2.1})$$

¹¹It is assumed that lobbyists are compensated for their overall services they provide to clients and not just rewarded for success. The use of “lobbying success fees” - where the lobbyist’s compensation from the client depends on the lobbyist’s success - is sensitive, since such fees are often illegal or restricted. Lobbying success fees are illegal in connection to U.S. federal government contracts - see 10 U.S.C. 2306(b) - but exceptions apply for lobbying Congress members - see the Lobbying Disclosure Act Guidance (2010) for further details. Also, 43 U.S. states prohibit the use of lobbying success fees and 3 states restrict them - see the Center for Ethics in Government’s (2010) “50 State Chart: Contingency Fees” for an overview.

II.2.2. Lobbying Firms

There are L commercial lobbyists and each lobbyist represents a different lobbying firm. Each lobbying firm accepts proposals from n^l clients and charges a lobbying service fee of k per proposal. Each lobbyist l receives political access of \tilde{a}^{lp} from policymaker p . Overall, the lobbyist l receives political access of $\tilde{a}^l = \sum_{p=1}^{p^l} \tilde{a}^{lp}$ from his p^l political contacts. The lobbying firm sells his political access to citizens. Besides policy proposals from clients, a lobbyist may also provide financial contributions of f^{lp} to each political contact.^{12,13} It is assumed that lobbying firms have expertise which allows them to investigate the potential spillovers of a policy proposal.¹⁴ This expertise takes the form of a verification technology that returns a signal x , $x \in \{x^+, x^-\}$, and improves the quality of the lobbying firm's information about a proposal's expected spillover. If the signal is positive, x^+ , then the exogenous probability of a positive spillover is higher than without investigative effort, $\rho(e^+|x^+) > \rho(e^+)$; a negative signal, x^- , increases the likelihood of a negative spillover, $\rho(e^-|x^-) > \rho(e^-)$. Investigated proposals with a positive signal have a greater expected social value than unverified proposals; verified proposals with a negative signal have a negative expected social value. The expected social value of a policy proposal can be

¹²Financial contributions are not linked to policy outcomes here, they exist as part of the price of access paid by commercial lobbyists; for the implications of policy contingent financial contributions see Bernheim and Whinston (1986), Grossman and Helpman (1994), and Besley and Coate (2001).

¹³The assumption that only commercial lobbyists make financial contributions is a simplification. However, Bertrand, Bombardini, and Trebbi (2011) provide empirical evidence that lobbyists make larger campaign contributions than their clients and that out-of-house lobbyists make larger ones than in-house lobbyists. They also show that lobbyists' campaign contributions are a standard practice and can be linked to politicians with whom they overlap in lobbying and political issues.

¹⁴This assumption was confirmed in an interview with a professional lobbyist. Further, Bertrand, Bombardini, and Trebbi (2011) construct a measure of lobbyists' concentration in specific issues. They distinguish between "specialists" who focus on a few issues and "generalists" who are involved with a larger range of issues. They find that out-of-house lobbyists are more likely to be specialized than in-house lobbyists and are less likely to be generalists.

summarized as to the following:

$$\begin{aligned} \rho(e^+|x^+) (\pi^c + s) + \rho(e^-|x^+) (\pi^c - s) &> \rho(e^+) (\pi^c + s) + \rho(e^-) (\pi^c - s) \\ &> 0 > \rho(e^+|x^-) (\pi^c + s) + \rho(e^-|x^-) (\pi^c - s) \end{aligned} \quad (\text{II.2.2})$$

where $\pm s$ is the magnitude of the spillover e^c .

Verification is costly, and is represented by the increasing convex cost function $F(m^l)$, where m^l is the number of proposals verified. In addition each proposal, whether verified or not, incurs the lobbyist a processing cost, represented by the increasing convex cost function $G(n^l)$, where n^l is the number of proposals processed. Additionally, the verification and processing costs have the property $F'(0) = G'(0) = 0$.

Lobbying firms also enjoy a share of aggregate spillovers, hence their payoffs are

$$\Pi^l = kn^l - G(n^l) - F(m^l) - \sum_{p=1}^{p^l} f^{lp} + \frac{1}{T} \sum_{c=1}^A e^c. \quad (\text{II.2.3})$$

II.2.3. Policymakers

Each of the P policymakers has a given endowment of time that allows them to approve a maximum of A^p proposals. Given that there are P policymakers, they can approve $A \leq PA^p$ proposals. The number of approved proposals is finite, and each policymaker has to decide how to allocate political access across citizens and lobbyists. Policymakers do not have an independent verification technology and cannot investigate presented policy proposals. Nevertheless, each policymaker p can design rules $\tilde{a}^{cp}(\cdot)$ and $\tilde{a}^{lp}(\cdot)$ that determine access for citizens and lobbyists. Financial contributions by lobbyists may be a part of these access rules. The allocation of access must satisfy $A^p \geq \sum_{c=1}^{c^p} \tilde{a}^{cp} + \sum_{l=1}^{l^p} \tilde{a}^{lp}$. All presented proposals are implemented by policymakers.

Policymakers receive an ego rent from holding office, θ , potentially receive financial contributions, f^{lp} , from their l^p lobbying contacts, and enjoy a share of aggregate spillovers.

The valuation of financial contributions is parameterized by α with $\alpha \in [0, 1]$, which may be interpreted as the degree of dishonesty of a policymaker. The payoff for policymaker p is then

$$\Pi^p = \theta + \alpha \sum_{l=1}^{lp} f^{lp} + \frac{1}{T} \sum_{c=1}^A e^c. \quad (\text{II.2.4})$$

II.3. Social Welfare Optimum

The analysis begins with a characterization of the social welfare optimum, which acts as the benchmark for our analysis. The social planner maximizes ex ante social welfare by choosing the allocation of all resources in society; this includes choosing the number of policymakers and level of lobbying activities. There are two potential social welfare optima, with either a positive or a zero level of commercial lobbying.

II.3.1. Description of Social Welfare

Let a social planner care about the sum of individual payoffs.¹⁵ This can be described by

$$\begin{aligned} \Pi^s &= \sum_{c=1}^C \Pi^c + \sum_{l=1}^L \Pi^l + \sum_{P=1}^P \Pi^P \\ &= A^l \left[\pi^c - k + \frac{1}{T} \sum_{c=1}^A e^c \right] + (N - A^l) \left[-k + \frac{1}{T} \sum_{c=1}^A e^c \right] \\ &\quad + A^c \left[\pi^c + \frac{1}{T} \sum_{c=1}^A e^c \right] + (C - N - A^c) \left[\frac{1}{T} \sum_{c=1}^A e^c \right] \\ &\quad + Nk - \sum_{l=1}^L F(m^l) - \sum_{l=1}^L G(n^l) - \sum_{l=1}^L f^l + \frac{L}{T} \sum_{c=1}^A e^c \\ &\quad + P\theta + \alpha \sum_{p=1}^P f^p + \frac{P}{T} \sum_{c=1}^A e^c, \end{aligned} \quad (\text{II.3.1})$$

¹⁵The description of social welfare follows a utilitarian welfare function with identical weights and payoffs describing individual utilities. A social planner is concerned about efficiency with respect to the largest possible sum of payoffs.

where N is the total number of proposals passed to lobbying firms for potential political representation; A^l is the number of policy proposals presented by lobbyists; the remaining $N - A^l$ proposals are passed to lobbying firms but are not presented to policymakers. Citizens may access policymakers directly. There are A^c proposals presented by citizens; the remaining proposals are neither presented directly or indirectly by citizens. The financial contributions f^l are transfers from lobbyists to policymakers.

In expected terms, (II.3.1) can be reduced to

$$E[\Pi^s] = A\pi^c - \sum_{l=1}^L F(m^l) - \sum_{l=1}^L G(n^l) + P\theta + (\alpha - 1) \sum_{l=1}^L f^l + E \left[\sum_{c=1}^A e^c \right]. \quad (\text{II.3.2})$$

A social planner, who wants to maximize social welfare as given by the sum of individual payoffs, discards proposals with negative verification signals and accepts all other policy proposals. To summarize, the expected spillovers are

$$E \left[\sum_{c=1}^A e^c \right] = \left(A^c + \sum_{l=1}^L u^l \right) s [\rho(e^+) - \rho(e^-)] \\ + \rho(x^+) \sum_{l=1}^L m^l s [\rho(e^+|x^+) - \rho(e^-|x^+)], \quad (\text{II.3.3})$$

where u^l is the number of proposals presented by lobbyist l that have not been verified.

II.3.2. Optimal Verification and Financial Contributions

First, the social planner identifies the optimal distribution of political access across citizens and lobbyists, the optimal portfolio of policy proposals consisting of verified and unverified proposals, and the optimal amount of financial contributions from lobbyists to policymakers.

The social planner employs all political resources to approve policy proposals, $A = PA^p$, because of the positive expected value of a marginal approved policy proposal. The maximization problem consists of the objective function from (II.3.2), the choice of

verification efforts and financial contributions undertaken by lobbyists, m^l and f^l , as well as the allocation of political access given a number of citizens, lobbyists, and policymakers.

The problem is to

$$\begin{aligned}
\max_{n^l, m^l, u^l, r^l, f^l, A^c} E[\Pi^s] &= PA^p \pi^c - \sum_{l=1}^L F(m^l) - \sum_{l=1}^L G(n^l) + P\theta + (\alpha - 1) \sum_{l=1}^L f^l \\
&+ \left(PA^p - \rho(x^+) \sum_{l=1}^L m^l \right) s [\rho(e^+) - \rho(e^-)] \\
&+ \rho(x^+) \sum_{l=1}^L m^l s [\rho(e^+ | x^+) - \rho(e^- | x^+)] \tag{II.3.4}
\end{aligned}$$

s.t.

$$n^l = m^l + u^l + r^l, \tag{II.3.5}$$

where n^l is the number of clients' proposals, m^l the number of verified proposals, u^l the number of unverified but presented proposals, and r^l the number of proposals that disappear in a lobbying firm. (At the social welfare optimum, $u^l = r^l = 0$.)

The first-order conditions are

$$\begin{aligned}
\frac{\partial E[\Pi^s]}{\partial m^l} &= -\frac{\partial F(m^l)}{\partial m^l} - \frac{\partial G(m^l + u^l + r^l)}{\partial n^l} \\
&+ \rho(x^+) s [\rho(e^+ | x^+) - \rho(e^- | x^+) - \rho(e^+) + \rho(e^-)] \quad \forall l \tag{II.3.6}
\end{aligned}$$

with $m^l > 0$ because of $F'(0) = G'(0) = 0$,

$$\frac{\partial E[\Pi^s]}{\partial u^l} = -\frac{\partial G(m^l + u^l + r^l)}{\partial n^l} + s [\rho(e^+) - \rho(e^-)] \leq 0 \quad \forall l, \tag{II.3.7}$$

$$\frac{\partial E[\Pi^s]}{\partial r^l} = -\frac{\partial G(m^l + u^l + r^l)}{\partial n^l} \leq 0 \quad \forall l \tag{II.3.8}$$

with $r^l = 0$ because of $m^l > 0$ and $G'(\cdot) > 0$,

$$\frac{\partial E [\Pi^s]}{\partial f^l} = \alpha - 1 \leq 0 \quad \forall l, \quad (\text{II.3.9})$$

$$\frac{\partial E [\Pi^s]}{\partial A^c} = s [\rho(e^+) - \rho(e^-)] > 0 \quad \forall c. \quad (\text{II.3.10})$$

The second-order conditions with respect to verification are

$$\frac{\partial^2 E [\Pi^s]}{\partial m^{l^2}} = -\frac{\partial^2 F(m^l)}{\partial m^{l^2}} - \frac{\partial^2 G(n^l)}{\partial n^{l^2}} < 0 \quad \forall l. \quad (\text{II.3.11})$$

and are satisfied because $F(\cdot)$ and $G(\cdot)$ are increasing and convex.

Given the described optimization problem and first-order conditions, the following can be stated.

Proposition 1. *If there is a corner solution for (II.3.4), then all proposals shall be verified by lobbyists and all access is granted to lobbyists, who present only those proposals with positive verification signals. Each lobbyist presents $m^{l*} = \frac{PA^p}{\rho(x^+)L}$ proposals.*

If there is an interior solution, then lobbyists verify m^ proposals and present those with positive verification signals. The remaining political resources are employed to approve unverified proposals presented by citizens.*

Potentially the optimization problem for the social planner has two different solutions with respect to verification. If the number of policymakers is rather small and policymakers can approve only a relatively small number of proposals, then the social optimum is at a corner and only those proposals that were verified and received a positive verification signal are enacted. All political access is allocated to commercial lobbying firms. If the number of policymakers is rather large and relatively many proposals can be approved, then the social optimum is interior and the verification of proposals is determined by the marginal trade-off between the costs and benefits of verification costs. The policymakers' remaining resources are employed to approve unverified proposals presented by citizens.

Since unverified proposals have the same expected benefit whether they are presented by lobbyists or citizens but lobbyists have to bear processing costs.¹⁶ The political capture of policymakers by lobbyists occurs only for a corner solution with a relatively fewer policymakers.

If there is an interior solution, then the optimal number of verified proposals, m^* , is a function of the spillovers' magnitudes, the quality of the verification technology, as given by the improvement in information about spillovers, and the costs of commercial lobbying. If the magnitude of spillovers, s , increases, then information becomes more valuable to distinguish between proposals with positive and negative spillovers and it is optimal to invest more resources in verification. The same holds for the verification technology. If the technology is more effective at distinguishing between proposals, then it is more valuable to invest resources in verification. The comparative statics for an interior solution can be summarized by

$$m^* = m \left(\underbrace{s}_{(+)}, \underbrace{\rho(x^+)}_{(+)}, \underbrace{\rho(e^+|x^+)}_{(+)}, \underbrace{\rho(e^-|x^+)}_{(-)}, \underbrace{\rho(e^+)}_{(-)}, \underbrace{\rho(e^-)}_{(+)} \right). \quad (\text{II.3.12})$$

The optimal investigation efforts m^* for an interior solution are invariant to the number of lobbyists, L , and policymakers, P . This does not hold at a corner solution, where the number of policymakers and lobbyists determine the amount of verification. The amount of verification at a corner solution depends positively on the number of policymakers, P , and individual political resources A^P . It is decreasing in the number of lobbyists, L , and the likelihood for a positive verification signal $\rho(x^+)$.

Using proposition 1 and (II.3.9), the following can be stated.

Lemma 1. *If $\alpha < 1$, then financial contributions from lobbying firms to policymakers are welfare decreasing and the optimal amount would be $f^* = 0$. However, if $\alpha = 1$, then*

¹⁶For all unverified proposals it is true that $\frac{\partial E[\Pi^s]}{\partial u^l} < \frac{\partial E[\Pi^s]}{\partial A^c}$.

financial contributions are pure transfers from lobbying firms to policymakers and do not affect the choice of verification efforts and the allocation of political access.

If policymakers discount financial contributions, then these payments are not pure transfers and are therefore socially wasteful.¹⁷ However, if financial contributions are pure transfers, then these payments are lump sum transfers and do not affect the social optimum.

II.3.3. Optimal Number of Policymakers and Size of Political Establishment

It has been shown that the solution to the social planner's problem could be constrained by the number of policymakers and lobbyists. To extend the analysis, the social planner may choose the number of lobbyists, citizens, and policymakers. In a sense this describes the design of a socially optimal constitution, and it identifies whether commercial lobbying is socially desirable.

The costs of assigning a citizen to be a lobbyist or policymaker are the foregone private benefits π^c and spillovers e^c from the citizen's proposal. The benefits from increasing the number of policymakers are A^p more approved proposals and the compensation for holding office. The social planner only wants citizens to become lobbyists if they are going to verify all of their clients' proposals. If the expected social benefit of an additional citizen, $\pi^c + E[e^c]$, outweighs the social benefits from investigations, which is then true for all lobbyists and verification effort levels, it follows that the social optimum involves zero lobbyists. If, conversely, the verification benefits from commercial lobbying outweigh the benefits of an additional citizen, then the number of citizens must be equal to the number of proposals that lobbyists can verify. The proportion of proposals verified that received positive signals must then equal total access to policymakers.

¹⁷The financial contributions are discounted by the degree of dishonesty. A policymaker with a lower degree of dishonesty, low α , discounts financial contributions more than a more dishonest policymaker.

II.3.3.1. Social Optimum without Commercial Lobbying

First, suppose that the marginal benefit of an additional lobbyist is less than the marginal cost. This has to be true for all lobbyists and therefore commercial lobbying does not take place. The expected social value of an unverified policy proposal is positive. To maximize social welfare, a social planner employs all political resources to approve proposals. Expected social welfare is then

$$E[\Pi^s] = \min \{PA^p, C\} \pi^c + P\theta + E \left[\sum_{c=1}^{\min\{PA^p, C\}} e^c \right], \quad (\text{II.3.13})$$

where society consists of citizens and policymakers. Solving the social planner's problem to maximize the sum of payoffs, the following can be stated.

Proposition 2. *The socially optimal solution in the absence of commercial lobbying requires that the political resources equal the number of available policy proposals and citizens – i.e., $PA^p = A$ and $PA^p = C$. All policy proposals are approved.*

Proof. See the Appendix. □

To realize its social value each proposal must have a proposer, a citizen, and a policymaker to enact the proposal. It follows that at the social welfare optimum the number of citizens must equal the total political access.¹⁸

Given $T = C + P$ and proposition 2, the socially optimal number of policymakers in the absence of commercial lobbying is

$$P^* = \frac{T}{A^p + 1} \quad (\text{II.3.14})$$

and the number of citizens is

$$C^* = \frac{TA^p}{A^p + 1}. \quad (\text{II.3.15})$$

¹⁸It is assumed that the citizen's social contribution is larger than a policymaker's. Otherwise it would be optimal to have only policymakers in the population.

The optimal expected social welfare in the absence of commercial lobbying is

$$E[\Pi^{s*}] = \frac{T(A^p(\pi^c + E[e^c]) + \theta)}{A^p + 1} \quad (\text{II.3.16})$$

with an expected spillover of $E[e^c] = s[\rho(e^+) - \rho(e^-)]$.

II.3.3.2. Social Optimum with Commercial Lobbying

Now suppose that the marginal benefit of an additional lobbyist outweighs the losses from a marginal policy proposal. This implies that commercial lobbying is socially beneficial and the following can be stated.

Proposition 3. *In the case of welfare enhancing commercial lobbying, the optimum requires that all political resources are employed to approve proposals, $PA^p = A$. Lobbying firms verify all policy proposals from citizens, $m^{l*}L = C$. Only policy proposals with a positive verification signal are passed and approved by policymakers, $\rho(x^+)m^* = \frac{PA^p}{L}$.*

Proof. See the Appendix. □

If commercial lobbying is welfare enhancing, then the social planner requires that all policy proposals are verified. The selection of the potentially best policy proposals maximizes in expected terms the quality of political decisions. This “cherry-picking” process excludes citizens from political access and reduces their political role to the provision of policy proposals.

Given $T = C + L + P$ and proposition 3, the socially optimal number of policymakers in the presence of commercial lobbying is

$$P^{**} = \frac{\rho(x^+)Tm^*}{\rho(x^+)m^* + A^p + A^pm^*}, \quad (\text{II.3.17})$$

the number of lobbyists is

$$L^{**} = \frac{TA^p}{\rho(x^+)m^* + A^p + A^pm^*}, \quad (\text{II.3.18})$$

and the number of citizens is

$$C^{**} = \frac{TA^pm^*}{\rho(x^+)m^* + A^p + A^pm^*}. \quad (\text{II.3.19})$$

Optimal expected social welfare with commercial lobbying is

$$E[\Pi^{s^{**}}] = \frac{T(\rho(x^+)m^*(\theta + A^p(\pi^c + E[e^c|x^+])) - A^p(F(m^*) + G(m^*)))}{\rho(x^+)m^* + A^p + A^pm^*} \quad (\text{II.3.20})$$

with an expected spillover of $E[e^c|x^+] = s[\rho(e^+|x^+) - \rho(e^-|x^+)]$.

II.3.4. Comparison of Potential Social Optima

The previous results identified potential social optima with or without commercial lobbying. Which of these is the social optimum depends on the deep parameters of the model. Here the analysis characterizes the differences between the two potential outcomes.

Comparing the number of policymakers, the following can be stated.

Proposition 4. *The optimal number of policymakers is greater in the absence of commercial lobbying than in the presence of commercial lobbying – i.e., $P^* > P^{**}$.*

Proof. See the Appendix. □

In the absence of commercial lobbying policymakers approve all available proposals, and there is no policy proposal filtered by the lobbying industry. More approved policy proposals require more political resources and therefore more policymakers. Whereas in the presence of commercial lobbying there are less policy proposals passed to policymakers

because of a verification filtering effect by lobbyists. As a consequence, less policy proposals are presented and approved, which can be done with fewer policymakers.

If we define the political establishment as the sum of policymakers and lobbyists (Washington insiders), the following can be stated.

Lemma 2. *Iff $A^p > \rho(x^-)m^*$, then the optimal size of the political establishment is smaller in the absence of commercial lobbying – i.e., $P^* < P^{**} + L^{**}$.*

Proof. See the Appendix. □

Given the optimal number of citizens, lobbyists, and policymakers, the analysis characterizes the socially efficient outcome. The comparison of $E[\Pi^{s*}] \stackrel{\geq}{\leq} E[\Pi^{s^{**}}]$ can be summarized by

$$\underbrace{(P^* - P^{**})(\theta + A^p \pi^c)}_{(+)} + A^p \underbrace{(P^* E[e^c] - P^{**} E[e^c | x^+])}_{(?)} + \underbrace{L^{**} (F(m^*) + G(m^*))}_{(+)} \stackrel{\geq}{\leq} 0, \quad (\text{II.3.21})$$

which can be broken down into the three terms indicated in equation (II.3.21). The first term is the pure private gains from additional policymakers, that is the ego rents earned by the policymakers themselves, and the additional private benefits realized because more policymakers can approve more proposals. The second term gives the benefits from improved information when lobbyists exist, but these are moderated by the fact that more lobbyists imply fewer policymakers. The third term simply recognizes that commercial lobbying is costly. It can be concluded that if the second term is absolutely larger than the sum of the first and the third, that is if lobbying improves information sufficiently, then commercial lobbying is socially desirable.

II.4. Market Outcome

In the previous section the analysis characterized the social optimum. Here, the analysis characterizes the market equilibrium and ask if the market outcome is socially

efficient, that is whether or not it yields the same allocation as the social optimum. The basic structure of preferences and technologies is the same as in the previous section. However, resource allocations are now determined by market mechanisms. The market outcome consists of a perfectly competitive lobbying market, in which citizens demand and lobbyists supply lobbying services, a market for political access governed by agency relationships between lobbyists and policymakers, and the market for allocating labor between lobbyists and citizens which is perfectly arbitrated. Policymakers grant political access to lobbyists in exchange for informational and financial resources, and lobbyists sell this political access to their clients.

The information structure as follows, *ex ante* no agent observes the spillovers. However, all society's members know the exogenous probabilities of $\rho(e^+)$, $\rho(e^-)$, $\rho(e^+|x^+)$, $\rho(e^-|x^+)$, $\rho(e^+|x^-)$, and $\rho(e^-|x^-)$. Citizens do not observe the lobbyists' actions or interactions between lobbyists and policymakers. However, they can observe realized political access \tilde{a}^l and the number of clients n^l of each lobbying firm l . Policymakers can observe both the verification efforts of lobbyists and the signals generated. The number of policymakers is determined by a constitution and is common knowledge.

Policymakers do not have independent verification technologies, but perfectly observe and correctly interpret the verification signals generated by lobbyists. This has the interpretation that policymakers are competent and ask lobbyists for "hard facts," which consist of research reports, from which they may deduce lobbyists' verification activities. Policymakers may then demand a level of verification by each lobbyist, possibly together with a financial contribution, in exchange for political access.¹⁹

The analysis describes the incentives to form a commercial lobbying market, and how self-interested policymakers employ commercial lobbying firms both to improve the quality of information and as a means of extracting rents from society.

¹⁹Bennedsen and Feldmann (2006) adopt a set up in which a policymaker asks interest groups to provide independent information from a reputable third-party. They cite in its support Milgrom and Roberts (1986), Laffont and Tirole (1990), and Bennedsen and Feldmann (2002a, b).

II.4.1. Citizens

Each citizen takes the distribution of political access as given and decides whether or not to participate in the political process. A citizen can approach a policymaker directly at no cost. If access is granted, then the attempt was successful and the proposal is approved. However, some approaches may be unsuccessful, hence the citizens must calculate the probability of gaining access in computing their expected payoffs which may be defined by

$$\frac{\tilde{A}^c}{C - N} \left[\pi^c + \frac{E[e^c]}{T} \right] \geq 0, \quad (\text{II.4.1})$$

where \tilde{A}^c is the total access granted to citizens by all policymakers and N is the number of all lobbying clients, and $C - N$ is the number of citizens competing for the granted available access.

As an alternative citizens may hire commercial lobbying firms to present their policy proposals. These citizens cannot observe the lobbying activities and have to form expectations about the likelihood that their proposals will be presented. The expected payoff from hiring a lobbyist would be

$$\frac{\tilde{a}^l}{n^l} \left[\pi^c + \frac{E[e^c]}{T} \right] - k \geq 0 \text{ for every } l. \quad (\text{II.4.2})$$

A citizen can always decide to be politically inactive, in which case the policy proposal would expire, and the citizen realize a private benefit of zero and a share of all policy spillovers. If all political resources are employed to approve policy proposals and if citizens must make their choices of whether to present their proposals prior to lobbying firms engaging in any verification activity, then citizens enjoy the same share of expected spillovers independent of their choices.

The citizen's decision reduces to

$$\Delta E[\Pi^c] = \begin{cases} \frac{\tilde{A}^c}{C-N} \pi^c & \text{if } c \text{ chooses the direct approach,} \\ \frac{\tilde{a}^l}{n^l} \pi^c - k & \text{if } c \text{ passes the proposal to lobbyist } l, \\ 0 & \text{if } c \text{ decides to be politically disenfranchised,} \end{cases} \quad (\text{II.4.3})$$

and if citizens expect political capture by lobbyists, then the choice alternatives reduce to hiring a lobbying firm or being politically disenfranchised. As a result, the individual demand for commercial lobbying would reduce to

$$\frac{\tilde{a}^l}{n^l} \pi^c - k \geq 0 \text{ for all } l. \quad (\text{II.4.4})$$

Given the market structure for commercial lobbying, each citizen has the opportunity to become a lobbyist. The decision, whether to enter the industry or not, depends on the citizens' and lobbyists' expected payoffs. More specific whether $E[\Pi^c] \gtrless E[\Pi^l]$. It is assumed that this market is perfectly arbitrated.

II.4.2. Lobbyists

Policymakers device access rules to divide their time between lobbying firms and citizens. The access rules define a portfolio of verified and unverified proposals to be presented by any given lobbying firm to any given policymaker, and also any required financial contributions. Since policymakers can observe lobbyists' actions, they can enforce access rules by denying political access when necessary.

Given the access rules, each lobbying firm determines its optimal size and whether to remain in or leave the industry. It is assumed that there are sufficient lobbyists such that each may neglect the effects of their own entry-exit decision on aggregate spillovers. The opportunity of exit is the outside option for each lobbying firm. The firm's problem

is characterized by

$$\max_{n^l} E[\Pi^l] = kn^l - G(n^l) - F(\bar{m}^l) - \bar{f}^l \quad (\text{II.4.5})$$

with $E[\Pi^l] \geq E[\Pi^c]$ and identical spillover shares as its participation condition. Each firm l must provide verification effort of $\bar{m}^l = \sum_{p=1}^{p^l} \bar{m}^{lp}$ and financial contributions of $\bar{f}^l = \sum_{p=1}^{p^l} \bar{f}^{lp}$ to its p^l political contacts. The first-order condition with respect to the number of clients is

$$k = \frac{\partial G(n^l)}{\partial n^l} \quad (\text{II.4.6})$$

with $n^l > 0$ because of $G'(0) = 0$. The first-order condition determines the number of clients a firm is willing to accept.

II.4.3. Policymakers

Each policymaker takes the lobbying service fee, k , the size of each firm, n^l , and the number of lobbyists, L , as given and determines the distribution of his political resources, A^p , and the access rule for lobbyists. The access rule consists of a required level of verification effort, m^{lp} , the number policy proposals to be presented, and a given financial contribution, f^{lp} , for each lobbying firm.

A policymaker has to respect the lobbyist's participation condition and cannot force his l^p lobbying contacts to realize economic losses. Further, the policymakers play a Nash game between themselves. Each takes the actions of others as given, and does not request more or less resources to influence the behavior of other policymakers. It is assumed that policymakers have some degree of dishonesty, and so $\alpha \in (0, 1]$.²⁰ Perfectly honest policymakers, with $\alpha = 0$, are discussed as a special case later. The expected payoff for a

²⁰The assumption was made for technical reasons. The behavior of perfectly honest policymakers is discussed in the Appendix A.1.

policy maker is

$$E[\Pi^p] = \theta + \alpha \sum_{l=1}^{lp} f^{lp} + \frac{1}{T} E \left[\sum_{c \in A^{-p}} e^c \right] + \frac{1}{T} E \left[\sum_{c \in A^p} e^c \right]. \quad (\text{II.4.7})$$

Given that all the policy proposals that will be presented have a positive expected spillover effect, then each policymaker always exhausts political access.²¹ Any unverified or positively verified proposal increases his share of expected spillovers. All proposals with negative verification signals are ignored. Further, each policymaker may ignore some unverified proposals, r^{lp} , because of time constraints. Political access is granted by each policymaker as long as lobbying firms provide the requested verification efforts, financial contributions, and policy proposals.²² A policymaker knows that a citizen would provide only a single unverified proposal, but a lobbyist could provide verification efforts and financial contributions. Therefore, a policymaker has no incentive to allocate access to citizens as long as lobbyists provide enough proposals.

The policymaker's optimization problem is characterized by

$$\begin{aligned} \max_{m^{lp}, f^{lp}, \tilde{a}^{lp}, r^{lp}} E[\Pi^p] &= \theta + \alpha \sum_{l=1}^{lp} f^{lp} + \frac{1}{T} E \left[\sum_{c \in A^{-p}} e^c \right] \\ &+ \frac{1}{T} \left[\rho(x^+) \sum_{l=1}^{lp} m^{lp} \right] s [\rho(e^+ | x^+) - \rho(e^- | x^+)] \\ &+ \frac{1}{T} \left[\sum_{l=1}^{lp} (\tilde{a}^{lp} - \rho(x^+) m^{lp}) \right] s [\rho(e^+) - \rho(e^-)] \end{aligned} \quad (\text{II.4.8})$$

subject to lobbying firms' proposal constraint with Lagrange multiplier ω^{lp}

$$n^l = \tilde{a}^{lp} + \rho(x^-) m^{lp} + r^{lp} + \sum_{h \neq p} m^{lh} + \sum_{h \neq p} u^{lh} + \sum_{h \neq p} r^{lh} \quad (\text{II.4.9})$$

²¹If there is political capture by lobbyists, then $A^p = \sum_{l=1}^{lp} \tilde{a}^{lp}$.

²²The number of unverified presented proposals can be written as $u^{lp} = \tilde{a}^{lp} - \rho(x^+) m^{lp}$.

and the lobbying firms' participation condition with multiplier λ^{lp}

$$n^l k - f^{lp} - \sum_{h \neq p} f^{lh} - F(m^{lp} + \sum_{h \neq p} m^{lh}) - G(n^l) \geq E[\Pi^c | \text{private ben.}] \text{ for every } l^p. \quad (\text{II.4.10})$$

The first-order conditions and associated complementary slackness conditions are

$$\begin{aligned} \frac{\partial E[\Pi^p]}{\partial m^{lp}} &= \rho(x^+) \frac{s}{T} [\rho(e^+ | x^+) - \rho(e^- | x^+) - \rho(e^+) + \rho(e^-)] \\ &\quad - \lambda^{lp} \frac{\partial F(\cdot)}{\partial m^{lp}} - \rho(x^-) \omega^{lp} \leq 0, \end{aligned} \quad (\text{II.4.11})$$

$$\frac{\partial E[\Pi^p]}{\partial m^{lp}} m^{lp} = 0, \text{ and } m^{lp} \geq 0 \quad \forall l^p,$$

$$\frac{\partial E[\Pi^p]}{\partial f^{lp}} = \alpha - \lambda^{lp} \leq 0, \quad (\text{II.4.12})$$

$$\frac{\partial E[\Pi^p]}{\partial f^{lp}} f^{lp} = 0, \text{ and } f^{lp} \geq 0 \quad \forall l^p,$$

$$\frac{\partial E[\Pi^p]}{\partial \tilde{a}^{lp}} = \frac{s}{T} [\rho(e^+) - \rho(e^-)] + \frac{s}{T} \frac{\partial \sum_{h \neq l} \tilde{a}^{hp}}{\partial \tilde{a}^{lp}} [\rho(e^+) - \rho(e^-)] - \omega^{lp} \leq 0, \quad (\text{II.4.13})$$

$$\frac{\partial E[\Pi^p]}{\partial \tilde{a}^{lp}} \tilde{a}^{lp} = 0, \text{ and } \tilde{a}^{lp}, \text{ and}$$

$$\frac{\partial E[\Pi^p]}{\partial r^{lp}} = -\omega^{lp} \leq 0, \quad (\text{II.4.14})$$

$$\frac{\partial E[\Pi^p]}{\partial r^{lp}} r^{lp} = 0, \text{ and } r^{lp} \geq 0 \quad \forall l^p.$$

Lemma 3. *Each policymaker with $\alpha \neq 0$ extracts all potential resources up to the point that each lobbyist with whom he has contact is indifferent between staying in and leaving the industry.*

Proof. See the Appendix. □

²³Citizens and lobbyists realize the same expected share of spillovers independent of their choices, and therefore take only private benefits into account.

A lobbyist can provide valuable information improvement and financial contributions to a policymaker who has the means to extract resources. This result is standard in the classical principal-agent literature, the only twist being that the policymakers do not compensate their agents directly but rather transfer to them an asset, access, which they sell to their clients, citizens.²⁴

Proposition 5. *If there is a corner solution to (II.4.8) with respect to verified proposals, then all approved policy proposals received a positive verification signal. Policymakers extract all remaining rents from lobbyists via financial contributions.*

If there is a corner solution to (II.4.8) with respect to verified and unverified proposals, then the solution to the policymaker's problem involves lobbyists verifying m^{co} proposals to exhaust a lobbyist's financial resources, and presenting those proposals which received a positive verification signal together with sufficient unverified proposals to exhaust access. No rents are extracted via financial contributions because of a sufficiently small α . The amount of verification at the firm-level is determined by

$$F \left(m^{co} + \sum_{h \neq p} m^{lh} \right) = n^l k - \sum_{h \neq p} f^{lh} - G(n^l) - E[\Pi^c | \text{private ben.}]. \quad (\text{II.4.15})$$

If there is an interior solution to (II.4.8) with respect to verified and unverified proposals as well as financial contributions, then the solution to the policymaker's problem involves lobbyists verifying $m^\#$ proposals, and presenting those proposals which received a positive verification signal together with sufficient unverified proposals to exhaust access. All remaining rents are again extracted by policymakers via financial contributions. The amount of verification at the firm-level is determined by

$$\frac{\partial F(m^l)}{\partial m^{lp}} = \rho(x^+) \frac{s}{\alpha T} [\rho(e^+ | x^+) - \rho(e^- | x^+) - \rho(e^+) + \rho(e^-)]. \quad (\text{II.4.16})$$

²⁴The principal-agent problem with moral hazard has its origins in the work by Mirrlees (1974, 1976), Holmstrom (1979), and Grossman and Hart (1983). For an extensive review of the principal-agent literature see Laffont and Martimort (2002) and Bolton and Dewatriport (2005).

If there is a corner solution with respect to (II.4.8) and all approved proposals are unverified. All rents from lobbying firms are extracted via financial contributions.

Proof. See the Appendix. □

When each of the potential solutions to the policymaker's problem arises depends primarily on the degree of the dishonesty α . If a policymaker has a higher degree of dishonesty and therefore values financial contributions more, then he requests less verification efforts but higher financial contributions. Less verification efforts imply a substitution of unverified proposals for proposals with positive verification signals since the number of approved proposals does not change. As a consequence, the quality of political decisions, as measured by spillover effects, decreases.

A policymaker's incentive to improve political decisions depends also on his share of expected spillovers. The share depends on the population size and is decreasing in the number of people. An increasing population moves a policymaker's trade-off towards financial contributions. On the other hand, if the magnitude of spillovers increases or the verification technology improves, then policy choices become more valuable to the policymaker and move his trade-off towards verification efforts.

How the optimal level of verification responds to changes in the exogenous parameters of the model depends on the nature of the solution to the policymaker's problem.

Providing that the market for lobbying services between citizens and lobbyists clears and the solution to the policymaker's problem is interior, then the optimal level of verification is independent of this market outcome. The comparative statics for an interior solution can be summarized as

$$m^\# = m \left(\underbrace{\alpha}_{(-)}, \underbrace{T}_{(-)}, \underbrace{s}_{(+)}, \underbrace{\rho(x^+)}_{(+)}, \underbrace{\rho(e^+|x^+)}_{(+)}, \underbrace{\rho(e^-|x^+)}_{(-)}, \underbrace{\rho(e^+)}_{(-)}, \underbrace{\rho(e^-)}_{(+)} \right). \quad (\text{II.4.17})$$

When there is a corner solution with respect to verified (and unverified proposals), then the policymaker's optimal verification requests depend on the market outcome for lobbying services (first and second statement of proposition 5). The greater the rents lobbyists earn from this market the greater will be the level of verification policymakers can request.

Finally, when there is a corner solution with respect to financial contributions, then the policymaker requests zero verification and this is locally invariant with respect to endogenous parameters of the model.

II.4.4. Comparison of Socially Optimal and Market Levels of Verification and Financial Contributions

Comparing the requests for verification and financial contributions made by a policymaker in a market environment with the socially optimal level of these variables allows us to identify the distortions caused by self-interested policymakers. A social planner takes all costs and benefits of commercial lobbying into account, but each policymaker in a market environment neglects the value of spillovers to others, and all costs that do not impose direct constraints on their choices. Further, the value placed on financial contributions by a policymaker provides him with an incentive to substitute financial contributions for information quality. The verification efforts at the firm level for an interior solution are characterized by

$$\frac{\partial F(m^l)}{\partial m^l p} = \rho(x^+) \frac{s}{\alpha T} [\rho(e^+ | x^+) - \rho(e^- | x^+) - \rho(e^+) + \rho(e^-)]. \quad (\text{II.4.18})$$

Using (II.3.6) and (II.4.18), the verification effort levels determined by the social planner and the verification efforts requested by policymakers relate such that

$$\frac{\partial F(m^l)}{\partial m^l} = \frac{1}{\alpha T} \left(\frac{\partial F(m^l)}{\partial m^l} \Big|_{m^l=m^*} + \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=m^*} \right). \quad (\text{II.4.19})$$

As a result, the following can be stated.

Proposition 6. *Comparing the verification effort levels for the full information social welfare optimum and the requests by policymakers under the full information market outcome, we have*

- If $\left. \frac{\partial F(m^l)}{\partial m^l} \right|_{m^l=m^*} > \frac{1}{\alpha T-1} \left. \frac{\partial G(n^l)}{\partial n^l} \right|_{n^l=m^*}$, then $m^\# < m^*$. Policymakers request less verification per firm than socially optimal.
- If $\left. \frac{\partial F(m^l)}{\partial m^l} \right|_{m^l=m^*} = \frac{1}{\alpha T-1} \left. \frac{\partial G(n^l)}{\partial n^l} \right|_{n^l=m^*}$, then $m^\# = m^*$. Policymakers request socially optimal verification per firm.
- If $\left. \frac{\partial F(m^l)}{\partial m^l} \right|_{m^l=m^*} < \frac{1}{\alpha T-1} \left. \frac{\partial G(n^l)}{\partial n^l} \right|_{n^l=m^*}$, then $m^\# > m^*$. Policymakers request more verification per firm than socially optimal.

Proof. See the Appendix. □

There are several distortions in operation. First, each policymaker receives only a share of aggregate spillovers and therefore does not fully internalize all benefits from improved political decisions. The larger the policymaker's share of expected aggregate spillovers, through a smaller population T , the more likely is oververification at the firm level. Second, a policymaker recognizes and responds to a trade-off between verification efforts and financial contributions constrained by lobbying firms' participation constraints. In contrast, a social planner does not respect this trade-off, and indeed when $\alpha < 1$ financial contributions are banned. The higher the degree of dishonesty the more likely is underverification at the firm-level. Finally, a policymaker ignores processing costs which are taken into account by a social planner. As a consequence, higher marginal processing costs increase the likelihood of oververification at the firm level.

Using lemma 3 and proposition 5, the following can be stated.

Lemma 4. *If $\alpha < 1$, then policymakers may request financial contributions that are socially inefficient.*

Even if the various distortions are offsetting such that the levels of verification are as at the social optimum, it is still the case that financial contributions are socially wasteful, simply because a policymaker does not value a dollar as highly as a lobbying firm. In the extreme case there are corner solutions, where policymakers' dishonesty is sufficiently high such that they request zero verification so as to maximize to financial contributions.²⁵

II.4.5. Equilibrium

The market equilibrium is characterized by supply equals demand in the lobbying service market, a Nash equilibrium between policymakers in selecting agency contracts to offer lobbyists, and perfect arbitrage in the market for allocating labor between lobbyists and citizens. This equilibrium is attained under the assumption of a given constitution which specifies the number of policymakers, \bar{P} .

II.4.5.1. The Commercial Lobbying and Labor Markets

The citizens' demands for commercial lobbying with political capture by lobbyists follows from (II.4.4). Assuming symmetric lobbying firms, the market demand can be written as a function of n^l such that

$$k(n^l) = \frac{\bar{P}A^p}{Ln^l}\pi^c \text{ for every } l. \quad (\text{II.4.20})$$

Each lobbying firm takes the lobbying service fee, k , and requests by policymakers as given and determines its profit-maximizing size with respect to clients. The supply of commercial lobbying services is

$$k(n^l) = \frac{\partial G(n^l)}{\partial n^l} \text{ for every } l. \quad (\text{II.4.21})$$

²⁵This holds if the fourth statement of proposition 5 holds.

Using the demand (II.4.20) and supply of commercial lobbying (II.4.21) with perfect competition, the symmetric equilibrium number of clients per firm can be described such that

$$\frac{\bar{P}A^p}{Ln^l}\pi^c = k(n^l) = \frac{\partial G(n^l)}{\partial n^l} \text{ for every } l. \quad (\text{II.4.22})$$

The market clearing lobbying service fee depends on the number of clients, lobbyists, political resources, private benefits from an approved proposal, and technology for processing proposals.

Lemma 5. *In an equilibrium with a perfectly competitive lobbying market and nonsatiated policymakers, all citizens are clients of commercial lobbying firms – i.e., $C = n^l L$.*

Proof. See the Appendix. □

This is an immediate implication from the assumption that the market for lobbying services is perfectly contestable. If a citizen exists who is not a client of a lobbying firm, then he realizes no expected private benefits. Given that the costs of lobbying activities are increasing and convex that citizen can always enter the lobbying industry at a lower cost per client than pre-existing firms, hence all citizens must either be clients of lobbying firms or become lobbyists themselves.

II.4.5.2. The Market for Political Access

It has been shown that with political capture all political access goes to lobbyists, in the symmetric case this can be written as

$$\tilde{a}^l = \frac{\bar{P}A^p}{L} \text{ for every } l \quad (\text{II.4.23})$$

and $\tilde{a}^c = 0$ for all c .

The number of clients per lobbying firm is given by

$$n^l = m^l + u^l + r^l \text{ for every } l. \quad (\text{II.4.24})$$

However, not all clients' proposals may be presented to policymakers, the number presented is given by

$$\tilde{a}^l = a^l = \rho(x^+)m^l + u^l \text{ for every } l. \quad (\text{II.4.25})$$

The requested verification efforts at the firm-level for an interior solution follow from (II.4.18). The total financial contributions paid by a single lobbying firm to its political contacts follows from lemma 3 such that

$$\bar{f}^l = n^l k^l - F(\bar{m}^l) - G(n^l) \geq 0 \text{ for all } l. \quad (\text{II.4.26})$$

II.4.5.3. Full Equilibrium

The full market equilibrium is characterized by the market equilibrium conditions discussed above and the population constraint

$$T = C + L + \bar{P} \quad (\text{II.4.27})$$

where \bar{P} is the constitutionally determined number of policymakers.

First, using the full political participation result of lemma 5 and (II.4.27), the equilibrium number of lobbyists depending on the number of clients per firm can be derived.

The equilibrium number of lobbyists is

$$L = \frac{T - \bar{P}}{1 + n^l}. \quad (\text{II.4.28})$$

In the symmetric lobbying market equilibrium characterized by (II.4.22) with the equilibrium number of lobbyists from (II.4.28), the equilibrium number of clients per firm is such that

$$\frac{n^\#}{1+n^\#} \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=n^\#} = \frac{\bar{P} A^p \pi^c}{T - \bar{P}}. \quad (\text{II.4.29})$$

The equilibrium number of clients per firm is positive and unique.²⁶

Using (II.4.28) and (II.4.24), the symmetric equilibrium number of lobbyists can be obtained such that

$$L^\# = \frac{T - \bar{P}}{1 + n^\#}. \quad (\text{II.4.30})$$

The equilibrium number of citizens follows from full political participation and (II.4.30) such that

$$C^\# = n^\# L^\#. \quad (\text{II.4.31})$$

The equilibrium lobbying service fee is

$$k^\# = \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=n^\#} \quad (\text{II.4.32})$$

and each lobbying firm receives political access of

$$\tilde{a}^\# = \frac{\bar{P} A^p}{L^\#}. \quad (\text{II.4.33})$$

Political access is granted by policymakers in exchange for the presentation of portfolios of proposals with the requisite expected social value and financial contributions. For the interior solution, the presented proposals consist of verified proposals with a positive verification signal, $\rho(x^+)m^\#$, such that

$$\frac{\partial F(m^l)}{\partial m^l} \Big|_{m^l=m^\#} = \rho(x^+) \frac{s}{\alpha T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] \quad (\text{II.4.34})$$

²⁶See the Appendix A.2.9.

and unverified proposals described by

$$u^\# = \tilde{a}^\# - \rho(x^+)m^\# \geq 0.^{27} \quad (\text{II.4.35})$$

The equilibrium number of unverified and unrepresented proposals, proposals that disappear, is given by

$$r^\# = n^\# - m^\# - u^\# \geq 0. \quad (\text{II.4.36})$$

The equilibrium amount of financial contributions per firm is

$$f^\# = n^\#k^\# - F(m^\#) - G(n^\#) \geq 0. \quad (\text{II.4.37})$$

II.4.6. Comparative Statics of Market Equilibrium

In the following the analysis focuses on the comparative statics of the market equilibrium to identify how exogenous parameter changes affect the market equilibrium.

The full equilibrium is described by a list of endogenous variables ($L, C, n^l, k, m^l, u^l, r^l, f^l$) and determined by eight equilibrium conditions as supplied above. Using these equilibrium conditions, the Jacobian²⁸ is derived and thereafter the determinant of the Jacobian, which is negative.²⁹

Given that all equilibrium equations are differentiable with respect to all endogenous and exogenous variables and the determinant of the Jacobian is nonzero, the derivation applies the *Implicit Function Theorem* and calculates the comparative statics for the system

²⁷If there is a corner solution to the policymaker's problem with respect to verified proposals, then the equilibrium verification at the firm-level is $m^\# = \frac{\tilde{a}^\#}{\rho(x^+)}$ and $u^\# = 0$. Alternatively, if there is a corner solution to the policymaker's problem with respect to verified and unverified proposals, then $u^\# = \tilde{a}^\# - \rho(x^+)\bar{P}m^{co}$ with $F(\bar{P}m^{co}) = n^\#k^\# - G(n^\#)$. Finally, if there is a corner solution with respect to financial contributions, then $m^\# = 0$ and $u^\# = \tilde{a}^\#$.

²⁸See the Appendix A.3.1.

²⁹See the Appendix A.3.2.

of equilibrium equations by *Cramer's rule*.³⁰ The comparative statics for the system of equilibrium equations with an interior solution for verification efforts and financial contributions are summarized in table II.1. In the following, the analysis discusses some comparative statics of greatest interest.

$\frac{\partial y}{\partial x}$	$m^\#$	$L^\#$	$C^\#$	$n^\#$	$k^\#$	$u^\#$	$f^\#$
\bar{P}	0	(-)	(?)	(+)	(+)	(+)	(+)
α	(-)	0	0	0	0	(+)	(+)
s	(+)	0	0	0	0	(-)	(-)
π^c	0	(-)	(+)	(+)	(+)	(+)	(+)
T	(-)	(+)	(+)	(-)	(-)	(?)	(?)
A^p	0	(-)	(+)	(+)	(+)	(+)	(+)

TABLE II.1. Summary of Comparative Statics for Market Equilibrium

II.4.6.1. The Number of Policymakers

Increasing the number of policymakers affects the commercial lobbying service market as well as the market for political access between lobbyists and policymakers. In the lobbying service market, citizens form expectations about the likelihood that proposals are presented by lobbyists to one their political contacts. The citizens' expectations depend on each firm's political access and number of clients. Increasing the number of policymakers increases available political access lobbying firms compete for, and increases the probability that any given citizen's proposal will be presented to a policymaker, hence this increases citizens' willingness to pay for lobbying services. This increased willingness to pay for

³⁰See the Appendix A.3.3.

lobbying services causes higher lobbying expenditures and higher resources for lobbying firms. Lobbying firms with political access become larger, and this increases concentration in the lobbying industry.

The interactions between lobbyists and policymakers are affected in the following ways: The lobbying industry becomes more concentrated with fewer lobbying firms each of whom presents an unchanged number of verified proposals, hence the number of unverified proposals increases both on the firm level and in aggregate. As lobbying firms have unchanged verification costs and higher revenues, policymakers can extract more rents via increased financial contributions. The additional unverified proposals decrease the average quality of political decisions, furthermore aggregate financial contributions increase.

II.4.6.2. The Degree of Dishonesty

Increasing the degree of policymakers' dishonesty does not affect the lobbying service market. The lobbying service market outcome depends on the distribution of political access, competition for access, and the benefits and costs of commercial lobbying. None of which change. However, increasing the degree of dishonesty changes the policymaker's relative weights attached to information quality and financial contributions. A policymaker substitutes unverified proposals for verified proposals and requests higher financial contributions.

II.4.6.3. The Magnitude of Spillovers

Since spillovers are external to the citizens' and lobbyists' decisions on the lobbying service market, there is no direct effect on this market from a change of the magnitude of spillovers. As noted above, each policymaker's optimal verification requests depend on the share of expected spillovers from policy proposals. If the magnitude of spillovers increases, then the expected gain from verifying policy proposals increases. Each policymaker substitutes verified proposals for unverified proposals and requests less

financial contributions. This spillover magnitude effect has the opposite effect to a marginal change in the degree of dishonesty.

II.4.6.4. Private Benefits

Increasing the private benefit from an approved policy proposal, all else equal, increases the citizens' willingness to pay for lobbying services. This in turn causes a reallocation of labor away from the lobbying services industry into private citizenry. The higher willingness to pay and more and more lobbyists becoming citizens it follows that the lobbying industry becomes more concentrated. Overall, lobbying expenditures increase.

A policymaker's optimal verification requests at the firm level are unaffected by an increase of private benefits. However, fewer lobbyists mean that each receives more political access, presents more unverified proposals, and makes larger financial contributions. The overall amount of financial contributions depends on the opposite effects of fewer lobbyists and higher payments per firm. Further, the overall quality of political decisions decreases since fewer lobbyists provide the same amount of verification per firm.

II.4.6.5. Population

Given that the number of policymakers is determined by the constitution, an increase in the population must increase the number of citizens and lobbyists. It immediately follows that then the number of proposals enacted cannot change and the likelihood of realizing private benefits from policy proposals must decline. As a consequence, the citizens' willingness to pay for lobbying services decreases. The decreased willingness to pay and more competing firms decrease the number of clients per firm and the lobbying service fee.

Each policymaker receives a smaller share of expected spillovers and benefits less from improved policy information. This changes this relative weights attached to information quality and financial contributions towards higher financial contributions. This change causes a substitution of unverified proposals for verified proposals. As a consequence, the

average quality of political decisions declines. Further, there are two opposite effects for the equilibrium number of unverified proposals and financial contributions per firm; on the one hand all policymakers approve more unverified proposals and request higher aggregate financial contributions. On the other hand there more lobbyists providing lobbying services. As a result, the comparative statics for the equilibrium number of unverified proposals per firm and equilibrium amount of financial contributions depend on parameter values.

An increasing population decreases the share of expected spillovers for citizens, lobbyists, and policymakers. It also increases the number of citizens and lobbyists. Citizens and lobbyists do not take the share of expected spillovers into account but there are more citizens and lobbyists competing for political access.

II.4.6.6. Political Resources

Increasing the number of policy proposals that each policymaker can potentially enact increases the likelihood that a citizen's proposal is enacted. This increased likelihood raises the citizens' willingness to pay for lobbying services and raises the opportunity costs of being a lobbyist. Hence the number of lobbyists declines and each remaining lobbyist has more access and lobbying rents. A policymaker's optimal verification requests are unaffected, hence policymakers use their additional resources to approve more unverified proposals, and extract the additional lobbying rents from lobbyists via higher financial contributions. The additional unverified proposals and fewer lobbyists verifying the same number of proposals per firm decrease the average quality of political decisions. The overall amount of financial contributions increases.

II.4.7. Normative Analysis and Potential Regulation

In this section the analysis first compares the market equilibrium to the social optimum. Then potential efficiency enhancing regulatory actions are analyzed. To facilitate

this analysis it is first assumes that the constitution fixes the number of policymakers at their first-best optimal level.

Our regulatory analysis is confined to examining the comparative statics of the effects of changes in the number of policymakers and the policymakers' degree of dishonesty, which may be interpreted as the standard of policymakers, on social welfare evaluated at the market allocation. The analysis provides predictions as to whether these changes are welfare improving, not whether or not the allocation is welfare optimal.

II.4.7.1. Market Equilibrium and Social Welfare Optima

Population and Commercial Lobbying Industry In a first step, the analysis evaluates the distribution of citizens and lobbyists and the concentration of the commercial lobbying industry. Following proposition 6 and lemma 4, self-interested policymakers cause a socially inefficient over- or underverification and may request socially inefficient financial contributions. Analyzing the case of oververification first, the following can be stated.

Lemma 6. *If there is oververification on the firm level, then the lobbying industry is larger and more concentrated than is socially efficient.*

Proof. See the Appendix. □

If policymakers request more verification per firm than is socially optimal, then each lobbyist receives more political access than is socially optimal. More political access per firm increases the willingness to pay for a firm's lobbying services and increases the firm's number of clients. More clients per firm and verification efforts increase processing and verification costs. A lobbyist with more political access crowds out other lobbyists, and therefore the industry is more concentrated than at the socially efficient level.

Proceeding with the case of underverification at the firm level, the following can be stated.

Lemma 7. *If there is underverification at the firm level, then relative to the social welfare optimum this leads to*

- *a smaller and less concentrated lobbying industry if $\rho(x^+)m^* > \rho(x^+)m^\# + u^\#$,*
- *or a larger and more concentrated lobbying industry if $\rho(x^+)m^* < \rho(x^+)m^\# + u^\#$.*

Proof. See the Appendix. □

The first case occurs when the policymakers' requests for verification efforts cause lower firm verification efforts and each lobbyist receives less political access than is socially efficient, then citizens are willing to pay less for a firm's lobbying services and the number of clients per firm decreases. Fewer clients per firm decrease verification and processing costs. As a consequence, the lobbying service fee is lower and there are more lobbyists and fewer citizens than is socially efficient. The other case involves an underverification at the firm level, but each lobbyist receives more political access. This circumstance leads to fewer lobbyists but larger firms than is socially efficient.

Social Welfare at the Market Equilibrium Expected social welfare evaluated at the market equilibrium with self-interested policymakers and a perfectly competitive commercial lobbying market is

$$E[\Pi^{s\#}] = \bar{P} \left(\theta + \alpha f^{p\#} \right) + \bar{P} E[e^c | \alpha], \quad (\text{II.4.38})$$

where the quality of expected spillovers, $E[e^c | \alpha]$, depends on the policymakers' degree of dishonesty, α .

The social welfare optimum, when commercial lobbying is socially desirable, is

$$E[\Pi^{s**}] = P^{**} (\theta + A^p \pi^c) - L^{**} (F(m^*) + G(m^*)) + P^{**} E[e^c | x^+], \quad (\text{II.4.39})$$

where all proposals are verified and only those with positive verification signals are enacted, $E[e^c | x^+]$.

Suppose $\bar{P} = P^{**}$. This implies that the number of policymakers follows from the socially optimal structure discussed in II.3.3.2 when commercial lobbying is welfare enhancing. The comparison of $E[\Pi^{s**}] \geq E[\Pi^{s\#}]$ can be summarized by

$$\underbrace{\bar{P}A^p\pi^c - L^{**}(F(m^*) + G(m^*))}_{(?) } - \underbrace{\alpha\bar{P}f^{p\#}}_{(+)} + \underbrace{\bar{P}(E[e^c|x^+] - E[e^c|\alpha])}_{(\geq 0)} \geq 0, \quad (\text{II.4.40})$$

which can be broken down into the three terms indicated. The first term is the potential pure private gains for citizens and lobbyists in the social welfare optimum with commercial lobbying. The second term gives the private benefits for self-interested policymakers from financial contributions in a market environment. Such financial contributions are socially wasteful when $\alpha \neq 1$. The third term identifies the quality difference of political decisions with respect to expected spillovers. Self-interested policymakers may substitute unverified proposals with verified proposals to realize higher financial contributions. This substitution decreases the expected quality of spillover effects. If self-interested policymakers are sufficiently dishonest, then they approve unverified proposals and distort the political decision-making process.

II.4.7.2. Market Equilibrium and Political Structure

The final part of the analysis focuses on how the political structure, in terms of the number of policymakers and their degree of dishonesty, can be adjusted to achieve welfare improvements when the actions of self-interested policymakers cause welfare distortions. Social welfare evaluated at the full market equilibrium given \bar{P} policymakers can be written as

$$\begin{aligned} E[\Pi^{s\#}] &= \bar{P}(\theta + A^p s(\rho(e^+) - \rho(e^-))) + \alpha L^\# f^\# \\ &\quad + \rho(x^+)L^\# m^\# s(\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)), \quad (\text{II.4.41}) \end{aligned}$$

where policymakers realize private benefits from ego rents and financial contributions. The remaining social benefits are aggregate expected spillovers from approved policy proposals.

The Number of Policymakers First, the analysis determines the effect on social welfare when there is a marginal increase for the number of policymakers. It has been shown that verification efforts at the firm level are independent to the number of policymakers, but there are more unverified proposals approved because of more political access for fewer lobbyists. The comparative statics for social welfare for an increase of the number of policymakers at the full market equilibrium is given by

$$\frac{\partial E[\Pi^{s\#}]}{\partial \bar{P}} = \underbrace{\theta + A^p s (\rho(e^+) - \rho(e^-))}_{(+)} + \underbrace{\alpha L^\# \frac{\partial f^\#}{\partial \bar{P}}}_{(+)} + \underbrace{\frac{\partial L^\#}{\partial \bar{P}}}_{(-)} \underbrace{(\alpha f^\# + \rho(x^+) m^\# s \psi)}_{(+)}, \quad (\text{II.4.42})$$

where $\psi = \rho(e^+ | x^+) - \rho(e^- | x^+) - \rho(e^+) + \rho(e^-)$ and $s\psi$ measures the additional expected benefit from verifying an additional policy proposal.

If the number of policymakers increases, then there are also additional ego rents and more approved proposals. However, a larger number of policymakers would decrease the social benefits from commercial lobbying because of fewer lobbyists verifying the same number of proposals per firm. From a citizen's perspective, an increased number of policymakers and fewer lobbyists increases the chances for political access and willingness to pay for lobbying services. However, in equilibrium all citizens' private rents are dissipated and they don't benefit directly from the increase in political access. There are opposing effects with respect to financial contributions. On the one hand, financial contributions per firm are increasing; on the other hand, there are fewer lobbyists.

Policymaker Standards Finally, the analysis asks how a change of the policymakers' quality, measured by the degree of dishonesty α , would affect social welfare at the full market equilibrium. The quality of policymakers, α , may be thought of as associated with the ability of voters to monitor their actions, or with social norms. The parameter α shall

be made endogenous at a later juncture. Differentiating of (II.4.41) with respect to α , gives

$$\frac{\partial E[\Pi^{s\#}]}{\partial \alpha} = L^\# \left(f^\# + \underbrace{\alpha \frac{\partial f^\#}{\partial \alpha}}_{(+)} + \rho(x^+) s\psi \underbrace{\frac{\partial m^\#}{\partial \alpha}}_{(-)} \right), \quad (\text{II.4.43})$$

which can be re-written as

$$\frac{\partial E[\Pi^{s\#}]}{\partial \alpha} = L^\# \left(f^\# - (T-1)\rho(x^+) \frac{s\psi}{\alpha T} \frac{\frac{\partial F(m^\#)}{\partial m^{lp}}}{\frac{\partial^2 F(m^\#)}{\partial m^{lp^2}}} \right). \quad (\text{II.4.44})$$

As described above, a policymaker's degree of dishonesty does not affect the commercial lobbying service market, but affects the trade-off between verification efforts and financial contributions. Greater dishonesty leads to more financial contributions and the substitution of unverified proposals for verified policy proposals. This substitution effect has negative welfare consequences.³¹ However, policymakers gain because financial contributions are substituted for verification efforts. The overall effect on social welfare is ambiguous; if α is very low, then there may be oververification and increase in α would increase social welfare, if α is high, then there is underverification and would lower social welfare. This suggests that there is a socially optimal level of α which is nonzero, some dishonesty may be a good thing.

II.5. Conclusion

This chapter has introduced a novel model of commercial lobbying. It both explains the existence of the commercial lobbying industry and the impact commercial lobbying has on welfare via its influence on policy-making. Policymakers request information transmission and financial contributions from lobbyists in exchange for political access.

³¹See the Appendix for calculations for the two effects. The result of the comparison is $\alpha \frac{\partial f^\#}{\partial \alpha} < \rho(x^+) s\psi \frac{\partial m^\#}{\partial \alpha}$.

The political access enables lobbyists to sell their lobbying services to their clients for profit.

The introduction of commercial lobbyists as intermediaries between citizens and policymakers provides several new insights into lobbying and political influence. First, it has been shown that commercial lobbying is welfare enhancing if the benefits from implied improvements in policy information outweigh the foregone private benefits from direct political access for citizens plus the costs of commercial lobbying. Thus, the analysis has identified the political structure that would facilitate socially efficient outcomes.

Second, it has been demonstrated how commercial lobbying arises endogenously in a perfectly competitive market, and identified the potential sources for inefficiencies. Self-interested policymakers' preferences for financial contributions and positive externalities from policy choices can distort market outcomes even with potentially welfare enhancing lobbying. Finally, our analysis highlights the interactions of political institutions and policymakers' characteristics.

Many aspects of commercial lobbying remain unexplained and left for future research. The analysis has assumed that policymakers are informed about lobbying activities and can observe the verification efforts of lobbyists. It is important to understand how policy choices would change if lobbyists were able to hide information. It was assumed that the number of policymakers is given by a constitution and that the degree of dishonesty is exogenous. An extension with political competition among heterogeneous policymakers could provide some further interesting results.

This chapter has focused on questions of efficiency given commercial lobbying firms exist. In the next chapter the analysis shall take a closer look at distributional issues and their political economic consequences.

CHAPTER III

COMMERCIAL LOBBYING, OPTIMAL INSTITUTIONS AND POLITICAL REFORMS

III.1. Introduction

The conventional wisdom of lobbying is that citizens or special interest groups may have policy relevant information that an imperfectly informed policymaker wishes to learn to the benefit of society. However, lobbying and other activities may influence policymakers in socially undesirable ways. Exemplary lobbying and influential activities include the strategic provision of information and policy contingent, or candidate specific, campaign contributions.¹ Such activities are usually undertaken or organized by representatives of traditional special interest groups or employees of commercial lobbying firms. The difference between the two types of professional lobbyist being that special interest groups are directly affected by the policy outcomes they lobby for whereas lobbying firms provide intermediation services for profit to various clients.² The analysis of special interest group activities and the regulation of their activities has been a primary focus of economic analysis.³ However, as argued in the previous chapter, commercial lobbyists are increasingly predominant. This chapter intends to explain the implications of commercial lobbying for the optimal regulation of lobbying activities and to provide empirically relevant

¹Further activities include the formation of coalitions, candidate endorsements, media campaigns, and corruption.

²The wide engagement in lobbying activities and the presence of commercial lobbying firms can be confirmed by the disclosures by professional lobbyists under the Lobbying Disclosure Act (1995) which are electronically available on through the Senate's Office of Public Records. The data reveal that commercial lobbyists represent the interests of a variety of companies, unions, trade groups, counties, cities, universities, and individual citizens.

³See Olson's (1965) seminal work for the formation of special interest groups. Persson and Tabellini (2000) and Grossman and Helpman (2001) provide a detailed review for special interest groups' political influence activities. See Dahm and Porteiro (2008b) for an overview of the campaign finance reform literature.

arguments for why some societies choose to regulate professional lobbying activities and others do not.

The influence of special interests on the political process has produced plenty of public scandals and started many public discussions about the benefits and risks of professional lobbying activities. A few of these scandals and discussions lead to gradual reforms in the regulation of professional lobbying activities. The history of lobbying regulation in the United States goes back to the 1930s when the influence of specific industries or foreign governments on domestic policies became of public concern.⁴ But the first comprehensive regulation of lobbying activities at the federal level did not come into place until the Lobbying Disclosure Act of 1995. Additional public scandals revealed loopholes and public pressure resulted in the Honest Leadership and Open Government Act of 2007, enacted as amendments to the existing rules.⁵ The current regulations require lobbyists to disclose their lobbying activities, limit policymakers' "revolving door" career ambitions,⁶ and increase the transparency of policymakers' discretionary spending. Nonetheless, the current regulations do not provide transparency about lobbyist-policymaker interactions,⁷ strategic

⁴The Public Utilities Holding Company Act of 1935 required representatives of holding companies to report their activities to the Securities and Exchange Commission before lobbying Congress, the Securities and Exchange Commission or the Federal Power Commission. The Merchant Marine Act of 1936 required representatives of ship owning companies or shipyards that received government subsidies to disclose their income, expenses and interests. The Foreign Agents Registration Act of 1938 required individuals who represented foreign entities to register. The first general law to regulate lobbying activities at the federal level was enacted in 1938 and applied only to the legislative branch, namely Congress. See Chari, Hogan, Murphy (2010) for a more detailed discussion of the history of lobbying regulation in the United States.

⁵Jack Abramoff was one of the more enigmatic professional lobbyists, working for several lobbying firms over time, and also well known for lucrative lobbying contracts. He was the center of a public corruption scandal and pleaded guilty to charges of fraud, tax evasion, and bribery of Congress members. The investigations led to several investigations and convictions against policymakers, staffers, and lobbyists. See Schmidt and Grimaldi (2005, 2006).

⁶The revolving door is the phenomenon of former public officials who become lobbyists and provide their political networks and expertise to potential clients. For an empirical analysis of this phenomenon and the networks of lobbyists and policymakers see Blanes i Vidal, Draca, and Fons-Rosen (2011) as well as Eggers (2010).

⁷The Lobbying Disclosure Act (LDA) requires lobbyists to disclose their lobbying revenues, names of clients, and institutions of their administrative contacts but not the names of the policymakers they interact with. Current empirical analysis uses various proxies for lobbyist-policymaker networks. Blanes i Vidal, Draca and Fonsen (2011) use past work experience of lobbyists and policymakers, Eggers (2010) uses party affiliation of lobbyists, and Bertrand, Bombardini and Trebbi (2011) employ campaign contributions to

information transfers from lobbyists to policymakers,⁸ or the potential substitution of financial transfers for desirable policy information to influence self-interested policymakers.

In addition to the observed gradual reforms, a comparison reveals that the institutions that regulate lobbying activities differ widely both across countries and within countries at the state level. Countries with a higher degree of formal lobbying regulation, such as public registers, code of conducts, and activity reports, are, for example, the United States, Canada, and recently Australia. Most Western democracies have only limited forms of regulation or no regulation at all.⁹ Even in the absence of regulations, public dissatisfaction with professional lobbying activities is present in most countries. This can be seen in the case of the European Union: The European Parliament has a mandatory register for lobbyists; the European Commission changed in 2008 from self-regulation to a voluntary register for lobbyists;¹⁰ but the European Council has no rules in place.

The current analysis addresses two questions: What are the political institutions that can achieve first-best lobbying outcomes in a market environment, and why do we observe unregulated lobbying activities as well as gradual reforms? To answer both questions the analysis uses the model of commercial lobbying presented in section II.2. of the previous chapter and defines a set of institutional elements that provides a more complete picture for an effective regulation of lobbying with respect to the distribution of political access, the provision of policy relevant information, as well as financial contributions. In the commercial lobbying model, lobbyists provide lobbying services for profit to many clients and possess an expertise that allows them to make predictions about the social desirability

politicians by lobbyists as measure. The current analysis may shed some light why policymakers may hesitate to disclose their interactions with lobbyists.

⁸The *New York Times* obtained emails in 2009 that showed how lobbyists employed by the same law firm and lobbying on behalf of a biotechnology company provided House members from both parties ghost-written statements and printed in the Congressional Records.

⁹See Chari, Hogan and Murphy (2010) for a detailed comparison of lobbying regulation across countries.

¹⁰The Interinstitutional Agreement on the Establishment of a Transparency Register (2011) combines both the Parliament and the Commission registers for enhanced transparency.

of policy proposals, which they can share with policymakers. The policymakers' powerful position to allocate political access between competing citizens and lobbyists allows them to request their preferred combination of information acquisition and financial contributions, which in turn may not be socially efficient.

For the first question of the current analysis, it is shown that if commercial lobbying is socially desirable, then institutional rules and transparency about both financial transfers and informational transfers from lobbyists to policymakers can limit potential welfare distortions in a market environment.¹¹ These distortions may arise if lobbyists and policymakers substitute financial contributions for socially beneficial information. The exclusive focus of current regulations on campaign contributions and other financial benefits, which ignores informational transfers, may fail to limit these distortionary substitutions.

The current analysis highlights that private rent dissipation and the quality of political decisions in a market equilibrium may cause political conflict between citizens and policymakers. This political conflict addresses the second question and determines the conditions under which a first-best institution is or is not self-stable – i.e., under which conditions a first-best institution can be or cannot be implemented via democratic reforms. The current analysis also shows that the observed political stability of unregulated lobbying activities can be explained by self-interested policymakers who do not distort the positive welfare effects from commercial lobbying too much, or by citizens who do not have sufficient political power to initiate political reforms.

¹¹In this chapter, the analysis focuses on all policymakers with some discretionary power such as politicians, staff members, or public servants and proposes optimal institutional constraints for accountability. The specific case of politicians and political competitions as means for accountability is discussed in chapter 5.

III.1.1. Related Literature

The current study is related to the lobbying literature that focuses on a special interest group's strategic choice of providing information and making campaign contributions as a means to influence policymakers.¹² Early models examined campaign contributions as a means to gain political access to policymakers and the gained political access as a channel for the transmission of the interest group's private information.¹³ More recent models focus on a special interest group's strategic choice of information acquisition and financial contributions.¹⁴ A more detailed review of the rent-seeking and lobbying literature can be found in section II.1.1 of the previous chapter.

The implications of lobbying activities and the specific regulation of campaign finances have been studied by Dahm and Porteiro (2008b). They focus on the implications of legal campaign contribution limits on the provision of information by a special interest group. In their lobbying model, a special interest group that is directly affected by the policy can provide both policy relevant information and campaign contributions to induce a favorable political outcome. However, the gathered and observable information may counteract the interest group's ambition. The authors show that limits on campaign contributions make

¹²There is an extensive literature that examines the influence of campaign contributions on policy outcomes. In particular, see Bernheim and Whinston (1986), Grossman and Helpman (1994), and Besley and Coate (2001). Common for these models is that special interest groups provide financial resources to policymakers in exchange for preferred policies. Another strand of literature assesses the role of lobbying as information revelation. See Crawford and Sobel (1982), Potters and van Winden (1992), Austen-Smith (1994), and Krishna and Morgan (2001) for exemplary studies. Issues in these models are the special interest group's ability to reveal credibly their private information to the policymaker, and the special interest group's incentive to misrepresent private information to induce desired policy choices.

¹³Austen-Smith (1995) argues that a special interest group acquires political access to a legislator that enables the group to transmit policy relevant information. The legislator can use the interest group's willingness to buy access as a signal to form a belief about the group's credibility. Lohmann (1995) shows that competing special interest groups provide policy relevant information to a policymaker and only those with interests that conflict with the policymaker's interests pay a positive amount to gain access and enhance their credibility.

¹⁴Bennedsen and Feldmann (2006) argue that an information externality arises when competing special interest groups attempt to influence a policymaker with policy relevant information about a single policy. This information externality reduces an interest group's incentive to provide information and results in a specialization of interest groups in providing information or financial contributions depending on the interest group's information technology. Dahm and Porteiro (2008a) focus on the observed simultaneity of information acquisition and financial contributions.

contributions as “damage control” less effective and decrease an interest group’s incentive to gather risky information. In this analysis, commercial lobbyists compete for political access and are less concerned about the information related to the policies they lobby for.

Finally, the current study also relates to the recent literature that models political institutions as endogenous choices by rational agents. One strand of the literature focuses on the endogeneity of the political enfranchisement of agents.¹⁵ Another strand focuses on the endogeneity of electoral rules, social choice functions, and the delegation of power.¹⁶ Barbera and Jackson (2001), for example, focus on self-stable constitutions consisting of a voting rule for ordinary affairs and one for constitutional changes, and Aghion, Alesina and Trebbi (2004) analyze the delegation of power and its optimal checks and balances.¹⁷ In contrast, Mulligan, Gil and Sala-i-Martin (2004) argue that the political decision-making process might be more affected by interest groups’ influence activities than by electoral rules. The current analysis focuses on the conditions under which a first-best institution that regulates commercial lobbying activities is or is not self-stable, and it shows how unregulated commercial lobbying activities may cause endogenous political reforms.

III.1.2. Outline of the Chapter

The structure of this chapter is as follows: Section III.2. summarizes the economic model. Section III.3. discusses two characteristics of the unregulated market equilibrium. Section III.4. derives the first-best institution that regulates commercial lobbying activities in a market environment. Section III.5. derives the conditions under which a first-best

¹⁵In particular, see Acemoglu and Robinson (2000, 2006) who argue that political elites transferred political power to disenfranchised citizens to prevent social unrest. Other models provide explanations for a voluntary extension of the franchise such as Lizzeri and Persico (2004) and Jack and Lagunoff (2006).

¹⁶See Koray (2000) for the endogeneity of social choice functions.

¹⁷More recent work by Messner and Polborn (2004) studies self-stable voting rules in an overlapping generations framework in which young and old vote on policies that realize delayed costs and benefits. Maggi and Morelli (2006) analyze countries’ voluntary entry decision into international organizations and the stability of such agreements with respect to voting rules. Trebbi, Aghion and Alesina (2008) focus on the choice of voting rules when some electorates are part of minorities.

institution is self-stable, and provides arguments for the empirically relevant case of unregulated lobbying activities despite a public dissatisfaction. Section III.6. concludes.

III.2. The Economic Model

The economic model follows the commercial lobbying model presented in section II.2. of the previous chapter. Here a brief summary is provided. A society consists of a population T with citizens, c , lobbyists, l , and policymakers, p , such that $T = C + L + P$. Each citizen has a single policy proposal that if enacted will yield a private benefit of $\pi^c > 0$ and create a social spillover of e^c , $e^c \in \{s, -s\}$ with $s > 0$. A policy proposal with a positive spillover would be socially desirable whereas one with a negative spillover would be socially undesirable – i.e., $\pi^c - s < 0$. A policy proposal’s social desirability is unknown to society ex ante but each society member knows the exogenous probability of a positive spillover, $\rho(e^+)$, and the complimentary probability of a negative spillover, $\rho(e^-) = 1 - \rho(e^+)$. Overall, the expected social value of any policy proposal is positive and each society member receives an identical share of all realized spillovers.¹⁸ A policy proposal can be presented to a policymaker either directly by a citizen or indirectly for a fee of k by a lobbying firm, which operates for profit and is represented by one lobbyist. Lobbyists have a verification technology that allows them to investigate the social desirability of policy proposals, m^{lp} , the ability to provide financial contributions, f^{lp} , and the ability depending on access to present verified and unverified proposals, u^{lp} , to the p^l policymakers they interact with. Each lobbyist bears costs for processing n^l clients’ proposals, $G(n^l)$, and costs for verifying proposals, $F(m^l)$.¹⁹ Policymakers announce political access rules to citizens and lobbyists and enact all presented proposals, A . Each policymaker has a time constraint for enacting policy proposals, A^p , receives an ego rent for holding office, θ , and

¹⁸These spillovers can be interpreted as externalities or impure public goods. Examples for such policies are projects that require a legislative change of current laws or an administrative support such as special permissions or exemptions, which are common in tax, antitrust, and immigration issues.

¹⁹It still holds that $G(\cdot)$ and $F(\cdot)$ are increasing convex and $G'(0) = F'(0) = 0$.

discounts financial contributions by α with $\alpha \in (0, 1]$.²⁰ The appointment and number of policymakers follows from a constitution with $P = \bar{P}$ and is common knowledge.

The actions by lobbyists and the interactions between policymakers and lobbyists are unobservable to citizens. Nevertheless, citizens can observe the amount of political access, \tilde{a}^l , and the number of clients, n^l , for each lobbyist. A policymaker is able to observe both the lobbyists' verification efforts for him, m^{lp} , and returned verification signals, $x \in \{x^+, x^-\}$. All individuals know how the probability that a particular proposal will be socially desirable is updated after the receipt of a given verification signal with $\rho(x)$, $\rho(e^+|x^+)$, $\rho(e^-|x^+)$, $\rho(e^+|x^-)$, and $\rho(e^-|x^-)$.²¹

There are three markets. The lobbying labor market has no barriers to entry and exit. Citizens may hire a lobbyist in a perfectly competitive lobbying market at a market equilibrium fee of k . Lobbyists offer verification efforts and financial contributions to policymakers in exchange for political access. These exchanges have agency characteristics. This framework accounts for commercial lobbying activities with both information acquisition and financial contributions, and it provides a simple general-equilibrium structure. Further details about the economic model are presented in section II.2. of the previous chapter.

The payoff for citizen c is

$$\Pi^c = \begin{cases} \pi^c + \frac{1}{T} \sum_{c=1}^A e^c & \text{if } c \text{ gains access directly,} \\ \frac{1}{T} \sum_{c=1}^A e^c & \text{if } c \text{ gains no access,} \\ \pi^c - k + \frac{1}{T} \sum_{c=1}^A e^c & \text{if lobbyist } l \text{ presents } c\text{'s proposal, or} \\ -k + \frac{1}{T} \sum_{c=1}^A e^c & \text{if lobbyist } l \text{ does not present } c\text{'s proposal.} \end{cases} \quad (\text{III.2.1})$$

²⁰This refers to a policymaker's degree of dishonesty or the effectiveness of in-kind transfers.

²¹It holds that $\rho(e^+|x^+) (\pi^c + s) + \rho(e^-|x^+) (\pi^c - s) > \rho(e^+) (\pi^c + s) + \rho(e^-) (\pi^c - s) > 0 > \rho(e^+|x^-) (\pi^c + s) + \rho(e^-|x^-) (\pi^c - s)$.

as described in (II.2.1) in the previous chapter. The payoff for lobbyist l is

$$\Pi^l = kn^l - G(n^l) - F(m^l) - \sum_{p=1}^{p^l} f^{lp} + \frac{1}{T} \sum_{c=1}^A e^c \quad (\text{III.2.2})$$

as described in (II.2.3). Finally, the payoff for policymaker p follows from (II.2.4) with

$$\Pi^p = \theta + \alpha \sum_{l=1}^{lp} f^{lp} + \frac{1}{T} \sum_{c=1}^A e^c. \quad (\text{III.2.3})$$

III.3. Unregulated Market Equilibrium

The unregulated market equilibrium is characterized by demand equals supply in the market for commercial lobbying services, perfect arbitrage in the lobbying labor market, and a Nash equilibrium between policymakers in choosing agency contracts for lobbyists. The derivation and complete characterization of the unregulated market outcome can be found in section II.4. of the previous chapter. Here two characteristics of the unregulated market equilibrium are highlighted: The potential market failure and private rent dissipation. These two characteristics motivate the current analysis of the effective regulation of commercial lobbying activities and the endogenous choice of institutions that regulate such activities.

III.3.1. Potential Market Failure and Quality of Political Decisions

The analysis of the previous chapter highlights that the sources for potential market failure can be manifold. The two sources that motivate the current analysis are: Externality problems because policymakers do not internalize all benefits and costs of lobbying activities when they request verification efforts, and distortions because of policymakers' preferences over spillover shares and financial contributions.²² The first externality problem

²²The detailed normative analysis of the market equilibrium can be found in section II.4.4 and section II.4.7 of the previous chapter. It also characterizes additional sources for market failure and discusses each potential market failure in more detail.

arises when policymakers take only their individual spillover shares into account but ignore aggregate spillover effects. Another externality arises when policymakers respect the lobbyists' participation constraints but ignore the costs of processing policy proposals.²³ The former may cause verification efforts at the firm-level that are inefficiently low; the latter may cause verification efforts that are inefficiently high. These effects are shown in proposition 6 of the previous chapter.

The second source for market failure relates to the policymakers' ability to control the allocation of political access. A policymaker's preferences over improved spillover shares and financial contributions determine the quality of political decisions and may distort the social benefits from commercial lobbying activities. The distortion arises when policymakers trade socially beneficial verification efforts for privately beneficial financial contributions. The policymaker's trade-off between verification efforts and financial contributions is characterized in proposition 5 of the previous chapter. A policymaker's request for financial contributions substitutes unverified policy proposals for verified policy proposals with positive signals because of the lobbyist's resource constraint. Since the policymaker's verification effort requests are affected by the degree of dishonesty (or effectiveness of in-kind transfers), α , and the expected quality of spillovers from verified and unverified enacted policy proposals is affected by the extent of verification efforts, the expected quality of spillovers depends on α and can be summarized by $E[e^c|\alpha]$. Following (II.4.17) in the previous chapter, a higher value of α decreases the expected quality of a spillover, and vice versa.

III.3.2. Private Rent Dissipation and Equilibrium Payoffs

In equilibrium, all political access is allocated to lobbyists because of their resource advantages and all citizens become clients of commercial lobbying firms (lemma 5). The

²³The costs of verifying proposals affect the market for commercial lobbying services and lobbyists' participation condition for the political access market. The policymaker's marginal decision how to extract available lobbying rents is unaffected by the commercial lobbying market outcome.

citizen's willingness to pay for commercial lobbying services is equal to the expected benefit of an enacted policy proposal and equals the marginal cost of processing proposals at the firm-level – i.e., $\frac{\bar{P}A^p}{Ln^l}\pi^c = k = \frac{\partial G(n^l)}{\partial n^l}$ for every l .

In equilibrium, free exit and entry into the lobbying industry imply perfect arbitrage with $E[\Pi^c] = E[\Pi^l]$. Using the perfect arbitrage equilibrium condition and lemma 3, we can predict the following.

Proposition 7. *All expected private rents from approved policy proposals are dissipated. However, not all expected rents are dissipated.*

The competition for political access and the resource requests by policymakers extract all expected *private* rents from the rest of the economy. This result is similar to the rent-seeking literature, in which a Tullock (1980) contest function induces individuals competing for a prize to expend resources such that with an increasing number of competitors these political investments equal the prize. It also adds to the discussion of Tullock (1972) and Ansolabehere, de Figueiredo, and Snyder Jr (2003), who observe that campaign contributions fall well short of the public budgets for which they are competing. In this sense they observe incomplete rent dissipation. Generally, the presence of spillovers and competition for private rents, as defined by a government budget, may lead to incomplete social rent dissipation.

The market equilibrium payoff for a citizen and a lobbyist is

$$E[\Pi^{c\#}] = \frac{\bar{P}A^p}{T}E[e^c|\alpha] = E[\Pi^{l\#}] \quad (\text{III.3.1})$$

and for a policymaker

$$E[\Pi^{p\#}] = \theta + \alpha f^{p\#} + \frac{\bar{P}A^p}{T}E[e^c|\alpha] \quad (\text{III.3.2})$$

with $\bar{P}A^p = A$. These equilibrium payoffs emphasize that the benefits from commercial lobbying activities for citizens and lobbyists depend entirely on the expected quality of spillovers from policy proposals enacted by self-interested policymakers, $E[e^c|\alpha]$.

III.4. First-Best Institution

This section takes up the point of a potential market failure and proposes the institutional elements that may achieve efficient market outcomes. The analysis starts by defining the institutional elements of interest and then derives the elements of a first-best institution in a market environment in two steps: First, the results of the social welfare optimum characterize the institutional elements for the socially desirable distribution of political access and level of commercial lobbying; second, the analysis derives additional institutional conditions under which the first-best outcome can be attained as a market equilibrium.

The social optimum depends on the social desirability of commercial lobbying. There are two possibilities. The analysis derives two institutions with either a larger number of policymakers and zero level of commercial lobbying or a smaller number of policymakers and a positive level of commercial lobbying. The current analysis the need for transparency rules that focus on both financial transfers and information transfers from lobbyists to policymakers in order to ensure the potential social benefits from commercial lobbying.

III.4.1. Institution

The institutional elements of interest are the number of policymakers, the availability of political access to citizens and lobbyists, and the legal constraints on lobbying activities within a constitutional framework.²⁴ The constitutional framework could be, but is not

²⁴The current analysis abstracts from a detailed discussion of voting rules and the delegation of power for collective decision-making. The reader is referred to Buchanan and Tullock's (1962) seminal work and Congleton and Swedenborg's (2006) review of democratic constitutional design. In the next section, some more general voting rules are considered.

limited to, a democratic constitution with presidential, parliamentary, or direct democratic voting features, or a bureaucracy with government agencies.

The institution, I , determines the number of policymakers, \bar{P} ; defines potential constraints for each policymaker to allocate political access between citizens and lobbyists, \bar{a}^c and \bar{a}^l ; describes potential responsibilities for each policymaker to request a certain expected quality of policy information from commercial lobbyists, \bar{q} ; and may regulate the ability of policymakers to receive financial contributions from lobbyists, \bar{f} . The expected quality of policy information, which is provided by a lobbyist to a policymaker, q , depends on the share of verified policy proposals with positive signals amongst all presented policy proposals – i.e., $q = \frac{\rho(x^+)m^{lp}}{\bar{a}^{lp}}$. Here, \bar{f} can be interpreted as a financial contribution limit on what a policymaker can receive from a lobbyist. This can be summarized as the following:

Definition 1. *An institution I is a set of elements $(\bar{P}, \bar{a}^c, \bar{a}^l, \bar{q}, \bar{f})$ with $\bar{P} \in [0, T]$, $\bar{a}^c \in [0, A^p]$, $\bar{a}^l \in [0, A^p]$, $\bar{q} \in [0, 1]$, and $\bar{f} \in [0, \infty)$.*

III.4.2. The First-Best Institution

It is shown in section II.3. of the previous chapter that the form of the social optimum depends on the social desirability of commercial lobbying. If commercial lobbying is not welfare enhancing, then the social optimum is described by no commercial lobbying activities and there are only citizens and policymakers; if commercial lobbying is welfare enhancing, then the social optimum is described by a positive level of commercial lobbying and there are citizens, lobbyists, and policymakers. In the first step the characteristics of the social optimum describe the elements of a first-best institution.

III.4.2.1. Commercial Lobbying is Socially Undesirable

If commercial lobbying is socially undesirable, then the socially optimal number of policymakers follows from the notion that all unverified policy proposals are in expected terms welfare increasing and lobbyists contribute more to social welfare as citizens providing

policy proposals. Therefore, sufficient policymakers shall be appointed to office and approve a maximum of policy proposals. Using proposition 2 of the previous chapter and definition 1, the implications for a potential first-best institution when commercial lobbying is socially undesirable can be summarized as to the following:

Proposition 8. *If commercial lobbying is socially undesirable, then institution I^* with $\bar{P} = P^*$, $\bar{a}^c = A^p$, $\bar{a}^l = 0$, $\bar{q} = 0$, and $\bar{f} = 0$ is a first-best institution.*

Policymakers are required to allocate all their time to citizens and enact any policy proposal independent of their private incentives. If all political access is allocated to citizens, then there is no reason for citizens to hire lobbyists, and the institutional elements that regulate the quality of information and amount of financial contributions, \bar{q} and \bar{f} , are not binding. The socially optimal expected payoff for a citizen is

$$E[\Pi^{c*}] = \pi^c + \frac{P^* A^p}{T} E[e^c] \quad (\text{III.4.1})$$

and for a policymaker

$$E[\Pi^{p*}] = \theta + \frac{P^* A^p}{T} E[e^c]. \quad (\text{III.4.2})$$

The expected quality of political decisions is $E[e^c] = s[\rho(e^+) - \rho(e^-)]$ per enacted policy proposal.

III.4.2.2. Commercial Lobbying is Socially Desirable

If commercial lobbying is socially desirable, then the net benefits from commercial lobbying should be maximized. Therefore, policymakers shall allocate their time to lobbyists and ask only for verified proposals with positive signals. Citizens do not receive direct political access and shall pass their proposals to lobbyists, who verify all of them. This can be summarized to $PA^p = \rho(x^+)Lm$, $C = nL$, and $n = m$. The existence of financial transfers depends on the degree of dishonesty or effectiveness. If financial contributions are socially wasteful, $\alpha < 1$, then they should be banned; if financial

contributions are just pure transfers, $\alpha = 1$, then the social optimum would be unaffected and would not require a contribution limit. Using proposition 3 of the previous chapter and definition 1, the implications for a potential first-best institution of socially desirable commercial lobbying can be summarized as to the following:

Proposition 9. *If commercial lobbying is socially desirable, then institution I^{**} with $\bar{P} = P^{**}$, $\bar{a}^c = 0$, $\bar{a}^l = A^p$, $\bar{q} = 1$, and $\bar{f} \begin{cases} = 0 & \text{if } \alpha < 1 \\ \geq 0 & \text{if } \alpha = 1 \end{cases}$ is a first-best institution.*

The institution I^{**} would maximize the net benefits of socially desirable commercial lobbying and result in the best expected quality of enacted policy proposals since all of them were verified and received a positive verification signal, x^+ . The implications for financial contribution limits are two-fold: The limit shall ensure that financial transfers neither affect the distribution of political access nor substitute for policy relevant information, and if they are allowed, then they should be pure transfers rather than socially inefficient in-kind transfers. The socially optimal expected payoff for a citizen is

$$E[\Pi^{c**}] = \rho(x^+) \pi^c - k + \frac{P^{**} A^p}{T} E[e^c | x^+], \quad (\text{III.4.3})$$

for a lobbyist

$$E[\Pi^{l**}] = m^* k - F(m^*) - G(m^*) - f^{l*} + \frac{P^{**} A^p}{T} E[e^c | x^+], \quad (\text{III.4.4})$$

and for a policymaker

$$E[\Pi^{p**}] = \theta + \alpha f^{p*} + \frac{P^{**} A^p}{T} E[e^c | x^+]. \quad (\text{III.4.5})$$

The expected quality of political decisions is $E[e^c | x^+] = s [\rho(e^+ | x^+) - \rho(e^- | x^+)]$ per enacted policy proposal.

III.4.2.3. Choice of a First-Best Institution and the Veil of Ignorance

The selection of a first-best institution by founding fathers could be characterized by the social planner's planner and would depend on the social desirability of commercial lobbying, which follows immediately from the welfare outcomes of $E[\Pi^{s*}]$ and $E[\Pi^{s**}]$ from (II.3.16) and (II.3.20) described in the previous chapter. If the informational gains from commercial lobbying do outweigh the larger private rents from a larger government and the costs of commercial lobbying, then the institution I^{**} is chosen. If not, then I^* is chosen.

An institution can also be proposed by founding fathers to society members who contemplate the proposed institutions "behind a veil of ignorance."²⁵ It is assumed that all individuals are risk-neutral.

If individuals do not know their identities ex ante but know that commercial lobbying is socially undesirable, then they all evaluate their individual expected payoffs from behind a veil of ignorance and expect an individual payoff of

$$E[\Pi^{u*}] = \frac{C^*}{T} E[\Pi^{c*}] + \frac{P^*}{T} E[\Pi^{p*}] = \frac{1}{T} E[\Pi^{s*}], \quad (\text{III.4.6})$$

which is the expected payoff from being either a citizen or a policymaker and is equal to an identical share of the optimal social welfare.

If individuals do not know their roles but know that commercial lobbying is socially desirable, then each individual expects a payoff of

$$E[\Pi^{u**}] = \frac{C^{**}}{T} E[\Pi^{c**}] + \frac{L^{**}}{T} E[\Pi^{l**}] + \frac{P^{**}}{T} E[\Pi^{p**}] = \frac{1}{T} E[\Pi^{s**}], \quad (\text{III.4.7})$$

²⁵This criterion for collective decision-making goes back to Harsanyi (1953) and was named and extended by Rawls (1971). Buchanan and Tullock (1962) discuss the costs of collective decision-making and external costs (costs that an individual bears because of a personal disagreement with a collective decision). The collective decision-making behind a veil of ignorance reduces external costs ex ante and can implement a social choice with unanimity.

which is the expected payoff from being either a citizen, lobbyist or policymaker and equals an identical share of social welfare.

Both can be summarized as to the following:

Lemma 8. *Behind a veil of ignorance no individual has an incentive to oppose a first-best lobbying institution I^* or I^{**} .*

Proof. See the Appendix B.1.1. □

Each individual expects an equal share of social welfare from behind a veil of ignorance. So whenever social welfare is maximized the expected individual payoff is also maximized and no individual has an incentive to oppose a first-best institution.

III.4.3. Individual Compliance with a First-Best Institution

The second step of the current analysis focuses on the individual incentives to deviate from their socially desirable behavior. These incentives help to identify the potential need for additional rules or transparency to achieve a first-best outcome in a market environment. Suppose that founding fathers (or society members who vote behind a veil of ignorance) have implemented an institution I^* or I^{**} but that individuals behave according to their self-interests.

III.4.3.1. Institutional Ban on Commercial Lobbying

Suppose commercial lobbying is not welfare enhancing and the institution I^* with a larger government, P^* , and a ban on commercial lobbying, $\bar{a}^l = 0$, would have been implemented. Further, citizens and policymakers observe their roles and expected payoffs, as described in (III.4.1) and (III.4.2).

A citizen could deviate from this behavior in a market environment in two ways:²⁶ A citizen could attempt to hire another citizen to act as a lobbyist who provides a verified policy proposal to a policymaker,²⁷ or could act as a lobbyist for another citizen. Both potential deviations require that a policymaker has a mutual interest in reallocating political access and grant it to a designated lobbyist.

A policymaker could also deviate from the socially desirable behavior in two ways: A policymaker could require verification efforts in exchange for political access, or could require financial contributions in exchange for political access.²⁸ Both actions imply that a policymaker would reallocate political access from a citizen to a designated lobbyist and violate $A^p = \bar{a}^c$. A citizen would then have the choice between complying with the policymaker's request or being politically inactive.

Proposition 10. *A citizen has no incentive to deviate from the institutional rules of I^* .*

A policymaker has an incentive to deviate from the institutional rules of I^ if*

$$\rho(x^+)E[e^c|x^+] > 2E[e^c] \text{ and } \rho(x^+)\pi^c \geq F(1) + G(1) \quad (\text{III.4.8})$$

and would require verification efforts in exchange for political access or if

$$\alpha > \left(T \left(\frac{\pi^c - G(1)}{E[e^c]} \right) + 2 \right)^{-1} \quad (\text{III.4.9})$$

and would require financial contributions in exchange for political access.

Proof. See the Appendix B.1.2. □

²⁶Every citizen has an incentive to use available political access because of $\pi^c > 0$. This is independent of I^* that specifies whether a citizen is required to present a policy proposal or a policymaker is required to accept all policy proposals presented by citizens.

²⁷Every citizen receives political access and has no incentive to hire a lobbyist just for political representation.

²⁸Every policymaker has a private incentive to employ all political resources because of a share of positive expected spillovers.

If commercial lobbying is socially undesirable, then no citizen has an incentive to privately provide the public good of policy information. Unlike citizens, policymakers do not bear the costs of commercial lobbying directly and possess a powerful position that allows them to offer their scarce time in exchange for resources. If a policymaker sufficiently values the improvements in spillover shares through verification efforts, shown in (III.4.8), or values financial contributions higher than a spillover share from an unverified proposal, shown in (III.4.9), then a policymaker has an incentive to deviate from I^* and to offer political access to citizens via a commercial lobbyist. The policymaker's requests for verification efforts are more likely for larger information improvements and larger private benefits from proposals, π^c . Financial requests are more likely for higher degrees of dishonesty (or the effectiveness of in-kind transfers), α , a larger population, T , and larger private benefits from proposals, π^c .

Proposition 10 implies that potential violations of I^* would be undertaken by policymakers and not by citizens. This may require penalties and additional transparency rules to monitor and constrain policymakers' actions.

III.4.3.2. Institutional Facilitation of Commercial Lobbying

Now suppose commercial lobbying is welfare enhancing and the institution I^{**} with a smaller government and a positive level of commercial lobbying activities, $\bar{a}^l = A^p$, has been implemented. All individuals observe their identities and payoffs, as described in (III.4.3), (III.4.4), and (III.4.5). Citizens shall not receive direct political access to policymakers but shall pass their policy proposals to lobbyists, who receive all available political access, verify all policy proposals from their clients, and present only those with positive verification signals to policymakers.

A citizen could deviate from the socially desired behavior with an attempt to bypass the lobbyists' verification efforts and to approach a policymaker directly.²⁹ This would

²⁹Assume that $\rho(x^+)\pi^c - k \geq 0$ and that a citizen has an incentive to pass the proposal to a lobbyist.

require that a policymaker would have to have an incentive to reallocate political access from a lobbyist to a citizen.

A lobbyist could deviate from the institutional rules of I^{**} in two ways: A lobbyist could offer to make a financial contribution when $\bar{f} = 0$ (because of $\alpha < 1$), or could offer financial contributions to substitute for verification efforts. However, a lobbyist has no incentive to offer financial contributions if it does not affect the amount of political access or terms for political access. Alternatively, a policymaker could violate the institution I^{**} in three ways: A policymaker could reallocate political access to citizens, could demand financial contributions when $\bar{f} = 0$, or could substitute financial contribution requests for verification request, i.e., $q < 1$.³⁰

Proposition 11. *A citizen has no individual incentive to deviate from the institutional rules of I^{**} .*

A lobbyist and a policymaker have a mutual incentive to substitute financial contributions for verification efforts if

$$F'(m^* - 1) > \frac{1 + \alpha}{\alpha} \frac{E[e^c | x^+] - E[e^c]}{T}. \quad (\text{III.4.10})$$

A policymaker has an incentive to extract further financial contributions from lobbyists if

$$k + \frac{E[e^c | x^+] - E[e^c]}{T} > F'(m^* - 1) + G'(m^* - 1). \quad (\text{III.4.11})$$

Proof. See the Appendix B.1.3. □

A citizen may want to bypass the verification efforts of lobbyists to avoid the private costs of commercial lobbying, $\rho(x^-)\pi^c + k$, but cannot persuade a policymaker to reallocate political access because of a potential reduction in the policymaker's share of spillovers, $\frac{E[e^c | x^+] - E[e^c]}{T} > 0$.

³⁰Similarly, every policymaker has a private incentive to employ all political resources because of a share of positive expected spillovers.

If (III.4.10) holds, then lobbyists have an incentive to substitute financial contributions for verification efforts because of cost savings, and policymakers have an incentive to realize higher private gains from financial contributions than from better spillover shares. These incentives can lead to a collusive behavior between lobbyists and policymakers. The substitution of financial contributions for verification efforts is more likely for higher marginal costs of verification, $F'(\cdot)$, higher degrees of dishonesty, α , larger populations, T , and lower spillover improvements through commercial lobbying – i.e., the difference between an enacted policy proposal with a positive verification signal and an unverified proposal with $E[e^c|x^+] - E[e^c]$.

The incentive for collusion is related to Tirole (1986) and Laffont and Tirole (1991). In their agent-supervisor-principal model an agent undertakes an unobservable productive effort and a supervisor is hired by a principal to monitor the agent. The supervisor can share the monitoring findings with the principal or can collude for a side payment with the agent and suppress the information. A collusion reduces the principal's wealth and would require the principal to pay the supervisor a reward for sharing the information. Kessler (2000) shows that if the supervisor's monitoring information can be concealed but not forged, then a principal can prevent collusion at no cost. In the analysis here, the policymaker receives “hard” information about the lobbyist's signals and verification effort if he requests the information. Collusion, in the form of the substitution of financial contributions for verification efforts, could therefore be prevented if additional institutional rules ensure transparency about lobbyists' and policymakers' financial and information transfers. That is, policymakers would have to disclose the amount of policy information they received.

Policymakers have an incentive to use their powerful position and extract economic rents from lobbyists via financial contributions. The threat of losing political access and the lobbyist's value of political access is described in (III.4.11). This mechanism is similar to the unregulated market outcome in which policymakers announce take-it-or-leave-it access

rules to lobbyists. The welfare implications depend on whether such financial contributions are socially wasteful in-kind transfers, $\alpha < 1$, or pure transfers, $\alpha = 1$.

Despite the risk of political influence, a common argument in support of lobbying activities is the provision of socially desirable information to policymakers. This emphasizes the importance of evaluating the effectiveness of such information provision. Here, proposition 11 highlights a potential collusive incentive for lobbyists and policymakers that may require monitoring informational transfers as well as the financial transfers between them. Further, current transparency rules that focus exclusively on financial transfers may fall short in distinguishing between additional financial contributions that do not affect information acquisitions (as pure transfers or additional transfers) and financial contributions that substitute for information acquisitions (as distortions).

III.5. Political Conflict and Institutional Reforms

This section relaxes the assumption of exogenously given institutions and focuses on the distributional consequences arising from commercial lobbying activities. The focus is on a potential political conflict between citizens, lobbyists, and policymakers that may result in endogenous reforms departing from or preventing a first-best institution. The analysis focuses on two questions: Under which conditions is a first-best lobbying institution self-stable and how can the empirically relevant case of unregulated lobbying market outcomes be explained? Rather than using a specific voting rule to initiate institutional reforms, the focus is more general and considers the cases when unanimous support is required, when citizens are decisive, or when policymakers are decisive for institutional reforms.³¹

³¹The current analysis includes all policymakers with discretionary power such as politicians, staff members, or public servants. One may argue that political competition amongst politicians may keep politicians sufficiently accountable and political reforms may not be necessary. However, this special case is left for chapter 5.

III.5.1. Self-Stable First-Best Institutions

Previously we explored when founding fathers implemented or proposed the first-best lobbying institution depending on the social desirability of commercial lobbying activities. In this section individuals observe their individual payoffs in the first-best and articulate their collective demands. These political incentives and some varying pivotal rules for reforms help to explain the stability of first-best institutions in various scenarios. It is assumed that there are no compensating transfers between individuals and their political preferences are entirely determined by their individual payoffs.³² The rationale for an inefficient institutional reform is characterized by the distributional consequences of the first-best outcome and the distribution of political power but not by any kind of market failure. The political implications of market failure are analyzed in section III.5.2.

An institutional reform may lead to a different number of policymakers, \bar{P} , and result in a different distribution of citizens and lobbyists. If individuals would expect a completely new draw of social roles and payoffs, then they would act behind a veil of ignorance and the first-best institution would be always self-stable as shown in section III.4.2.3. To add some insights, it is assumed that individuals' expectations are more detailed.

For example, the analysis does not model how policymakers are appointed to office but derives the optimal number of policymakers for I^* and I^{**} – i.e., $P^* > P^{**}$. Abstracting from appointment rules, the analysis focuses on heterogeneous expectations amongst policymakers. Suppose some policymakers would be more likely than other policymakers to stay in office if there is reduction in the number of policymakers. A reason for such heterogeneity could be influence, seniority, or party affiliation. So the analysis defines “stronger policymakers” who expect to stay in office and “weaker policymakers” who expect to lose office because of a reduction in the number of policymakers.

³²A first-best outcome can be always achieved with compensatory transfers. However, a compensation for individuals who suffer from a single policy is rarely observed and it is not uncommon that individuals are asked to vote on a single policy topic and ignore potentially offsetting policies.

III.5.1.1. First-Best Institution I^*

Suppose commercial lobbying is socially undesirable and the institution I^* has been implemented at the constitutional stage. The question then is whether or not the first-best institution I^* is self-stable or if there is a collective demand for the institution I^{**} (for example, via a referendum) with $P^* > P^{**}$.

If citizens do not expect to be appointed to a political office because of a smaller government or political barriers to entry, then they would find it optimal to be a client or a lobbyist after a reform. A representative citizen compares the expected payoffs of $E[\Pi^{c*}]$ with $E[\Pi^{c^{**}}]$ and $E[\Pi^{l^{**}}]$ as described in (III.4.1), (III.4.3), and (III.4.4).

Proposition 12. *Citizens oppose the first-best institution I^* if the expected improvements in spillover shares outweigh citizens' private benefits from direct political access.*

Proof. See the Appendix B.1.4. □

Citizens desire to deviate from the first-best institution I^* and privately provide the public good of lobbyists' verification efforts if their expected shares of spillover improvements outweigh their foregone private benefits from direct political access, which yields the entire proposal's private benefit.

If some policymakers expect that they would lose political office, then these weaker policymakers would expect to be a client or a lobbyist after an institutional reform. A representative weaker policymaker compares the expected payoffs of $E[\Pi^{p*}]$ as described in (III.4.2) with $E[\Pi^{c^{**}}]$ and $E[\Pi^{l^{**}}]$. The trade-off for a representative stronger policymaker follows from the expected payoffs of $E[\Pi^{p*}]$ and $E[\Pi^{p^{**}}]$ as described in (III.4.5).

Proposition 13. *Weaker policymakers oppose the first-best institution I^* if the expected improvements in spillover shares outweigh their private benefits from holding a political office.*

Stronger policymakers oppose the first-best institution I^ if their expected benefits from commercial lobbying activities are positive – i.e.,*

$$\alpha f^{p^*} + \frac{A^P}{T} (P^{**} E[e^c|x^+] - P^* E[e^c]) > 0 \quad (\text{III.5.1})$$

with $f^{p^} \geq 0$.*

Proof. See the Appendix B.1.5. □

Weaker policymakers face a similar trade-off to citizens. A citizen loses the private benefits from direct political access, whereas a weaker policymaker loses the private benefits, such as ego rents and potential financial contributions for $\alpha = 1$, associated with political office. Stronger policymakers expect to keep their private benefits from office and demand institutional reform of commercial lobbying if their spillover shares from fewer but verified proposals outweigh the spillover shares from more but unverified policy proposals, or if the financial contributions of f^{p^*} are sufficiently large. An institutional reform could improve the quality of enacted policy proposals, if $P^{**} E[e^c|x^+] > P^* E[e^c]$, but this is just a necessary but not sufficient condition for welfare enhancing commercial lobbying.

Using proposition 12, proposition 13, $\rho(x^-)\pi^c + k > 0$, and $f^{p^*} \geq 0$, the following can be concluded:

Corollary 1. *Policymakers are more likely than citizens to oppose the first-best lobbying institution I^* .*

This follows immediately from the distribution of benefits and costs of commercial lobbying. Policymakers do not bear the costs of commercial lobbying and can improve their spillover shares and earn financial contributions, whereas citizens have to bear the costs of commercial lobbying.

III.5.1.2. First-Best Institution I^{**}

Now suppose commercial lobbying is socially desirable and the institution I^{**} has been implemented at the constitutional stage. The question reverses to: Under which conditions is the first-best institution I^{**} with $P^{**} < P^*$ self-stable?

If citizens and lobbyists do not expect to be appointed to political office because they are relatively numerous and there is a potentially relatively small increase in the number of policymakers, then citizens and lobbyists would expect to be a citizen after an institutional reform. A representative citizen or lobbyist would compare the individual expected payoffs of $E[\Pi^{c^{**}}]$ and $E[\Pi^{l^{**}}]$ with $E[\Pi^{c^*}]$. If policymakers expect to stay in office after an institutional reform, then the trade-off is between $E[\Pi^{p^{**}}]$ and $E[\Pi^{p^*}]$.

Proposition 14. *Citizens and lobbyists oppose the first-best institution I^{**} if their private lobbying costs outweigh their shares of spillover improvements through commercial lobbying.*

*Policymakers do not oppose the first-best institution I^{**} .*

Proof. See the Appendix B.1.6. □

Citizens bear the costs of commercial lobbying and the foregone private benefits from direct political access. If citizens' shares in spillovers do not improve sufficiently, then they are not willing to bear these costs and abandon direct political access. Unlike citizens, policymakers do not bear the costs of commercial lobbying and focus entirely on potential spillover improvements. If commercial lobbying is socially desirable, then the spillover improvements through commercial lobbying are positive and policymakers have an incentive to pursue such benefits.

III.5.1.3. Political Power and Reforms

Given the previously described political incentives the analysis proceeds with different voting rules. First, suppose an institutional reform requires unanimity amongst society's members. Corollary 1 predicts that the support by citizens would determine the likelihood

of an institutional reform from institution I^* to institution I^{**} . If policymakers would support a reform because of expected gains, then citizens cannot also expect gains since all potential Pareto-improvements are exhausted whenever I^* would be optimal. This implies that the first-best institution I^* would be self-stable because of a veto by citizens. Proposition 14 implies that the first-best institution I^{**} would be self-stable because of a veto by policymakers to block an institutional reform from I^{**} to I^* .

However, unanimous voting as a collective decision rule for institutional reforms may not be appropriate for all constitutional settings. Now suppose that citizens are decisive for an institutional reform. Examples would be a simple majority or super majority for collective decisions, which are indeed mostly affected by citizens' preferences. Proposition 12 and proposition 14 imply that the citizens' support for a potential reform is entirely determined by the comparison of commercial lobbying fees and benefits from direct political access with the potential improvements in individual spillover shares.

Finally, suppose policymakers are pivotal for institutional reforms. Examples would be a parliament approval that can be delayed, a bureaucratic government agency, or policymakers with limited re-electoral concerns. The support for an institutional reform by policymakers follows from proposition 13. It implies that policymakers favor an institution with commercial lobbying activities as their expected benefits from the provision of information or financial contributions are positive. This is independent of the lobbying costs, which are borne by citizens.

The choice of the lobbying institution via potential reforms can be summarized by the following:

Proposition 15. *The distributional consequences of commercial lobbying activities and the collective decision rule for institutional reforms may lead to an inefficient lobbying institution.*

The analysis assumed that all individuals behave according to their “socially efficient” roles but allowed for endogenous institutional reforms. The rationale for an inefficient institutional reform has been characterized by the distributional consequences in the absence of market failures and political power. In the following, the analysis focuses on the political implications of a market failure.

III.5.2. Stability of the Unregulated Market Outcome

To address the question of the empirically relevant case of unregulated lobbying activities the analysis focuses on the predicted private rent dissipation for citizens in an unregulated market equilibrium. The private rent dissipation for citizens and the political market failure raises the question why unregulated lobbying activities are relatively common despite these predictions. It can be shown that the unregulated market outcome can be explained by self-interested policymakers who do not distort the benefits from commercial lobbying activities too much, or by citizens who are not powerful enough to constrain policymakers via institutional reforms.

Citizens support commercial lobbying in the first-best if their shares of expected spillover improvements outweigh their private lobbying costs – i.e.,

$$\frac{A^p}{T} (P^{**} E[e^c | x^+] - P^* E[e^c]) \geq \rho(x^-) \pi^c + k. \quad (\text{III.5.2})$$

Suppose this holds but the institution I^{**} may not be feasible. Citizens who observe the unregulated market outcome with a given number of policymakers \bar{P} support a complete ban on commercial lobbying if

$$\frac{\bar{P} A^p}{T} (E[e^c | \alpha] - E[e^c]) < \frac{\bar{P} A^p}{T - \bar{P}} \pi^c, \quad (\text{III.5.3})$$

which is the difference between the shares of expected spillover improvements from commercial lobbying and the expected private benefits from direct political access. The

share of expected spillovers depends on the quality of political decisions made by self-interested policymakers - i.e., $E[e^c|\alpha]$. For the citizens' political incentives for the unregulated market setting, the following can be stated:

Lemma 9. *If citizens have a political incentive to oppose commercial lobbying activities in a market environment, then they demand a constitutional change with a ban on commercial lobbying and an increase in the number of policymakers.*

Proof. See the Appendix B.1.7. □

If citizens demand a ban on commercial lobbying because of relatively low spillover improvements compared to the expected gains from direct political access, then citizens also demand a ban on commercial lobbying in order to receive direct political access. If the number of policymakers would not change, then direct political access would be uncertain and citizens would be better off reducing the competition for political access. Therefore the citizens' decision to accept or oppose the current unregulated commercial lobbying market depends on

$$\frac{A^p}{T} (\bar{P}E[e^c|\alpha] - P^*E[e^c]) \gtrless \pi^c. \quad (\text{III.5.4})$$

Consequentially, the following can be stated:

Proposition 16. *If the policymakers' degree of dishonesty, α , is too large, then citizens have an incentive to demand a second-best institution that bans commercial lobbying. Even when citizens support commercial lobbying in the first-best.*

Proof. See the Appendix B.1.8. □

Despite the fact that citizens would be willing to forfeit political access for improved political decisions through commercial lobbying activities at the constitutional stage, (III.5.2) holds, citizens may have an incentive to implement an inefficient institution that bans commercial lobbying activities and constrains self-interested policymakers. As the

policymakers' degree of dishonesty, α , increases policymakers request less verification efforts for higher financial contributions and distort social benefits. The citizens' collective demand is independent of the actual commercial lobbying costs. Their collective demand is entirely characterized by the improvements in political decisions and the citizen's private benefit from direct political access.

Proposition 16 implies that unregulated commercial lobbying activities can be explained by self-interested policymakers who do not distort the social benefits from commercial lobbying too much, or by citizens who do not have sufficient political power to constrain policymakers. Which of these two hypotheses is correct is an empirical question.

III.6. Conclusion

This chapter provides an analysis of the effective regulation of commercial lobbying activities, and it analyzes the endogeneity of institutions that regulate such activities. The current analysis emphasizes the need of transparency rules about both financial transfers and information transfers from lobbyists to policymakers. It also argues that the observed institutional differences can be explained by a political conflict between citizens and policymakers that is rooted in the distribution of costs and benefits from commercial lobbying.

The current analysis uses a model of commercial lobbying that explains the observed simultaneity of information acquisition and financial contributions in a simple general-equilibrium framework. Imperfectly informed policymakers can announce take-it-or-leave-it political access rules to citizens and lobbyists who compete for political access by providing resources to policymakers. The analysis provides several new insights that are not present in the analysis of lobbying activities and regulatory institutions. First, the effective regulation of commercial lobbying activities may require additional transparency rules that limit lobbyists' and policymakers' collusive incentives to substitute financial contributions for information provisions. Current transparency rules that focus exclusively on financial

benefits may fail to prevent this. Second, the analysis shows how the distribution of costs and benefits from commercial lobbying activities may cause a political conflict between citizens and policymakers. This potential conflict provides the conditions under which a first-best institution is or is not self-stable. It also argues that the observed political stability of unregulated lobbying activities can be explained by self-interested policymakers who do not distort political decisions too much or by citizens who do not have sufficient political power to initiate reforms.

CHAPTER IV

INCOMPLETE INFORMATION AND REPEATED COMMERCIAL LOBBYING

This chapter is co-authored with Christopher J. Ellis, who contributed through analytical insights. I was the primary contributor to the development and analysis of the theoretical model.

IV.1. Introduction

In recent policy debates much attention has been devoted to the activities, personal relationships and influence of lobbyists on the political process.¹ It is argued in the previous chapters that most of these lobbying activities are undertaken by individual lobbyists and lobbying firms that are, in contrast to special interest groups, not directly affected by policy outcomes. Commercial lobbyists have usually some form of expertise in legal, public, or political affairs and provide financial resources to policymakers in form of campaign contributions, networking events, gifts, and potential future employment. This type of lobbyist works on behalf of clients for economic profit rather than ideological motives, and the commercial lobbyist's proprietary asset is political access to policymakers. Chapter II provides a rationale for commercial lobbying activities and analyze the welfare implications in a static environment. This chapter intends to focus on repeated commercial lobbying activities in the presence of private policy information and in the absence of legally binding contracts. It is shown that repeated lobbying relationships simplify a policymaker's

¹For example, The New York Times reported in 2009 how the same lobbyists, employed by the same law firm and lobbying on behalf of a biotechnology company, provided House members from both parties with statements about the health care reform. Some of these statements were printed in the Congressional Records (Pear 2009). The extensive Dodd-Frank Wall Street Reform Act and the process of its drafting caused a windfall of lobbying revenues, especially for lobbyists with expertise in financial products and regulation (Becker 2010). The New York Times's online service "Topics" has a special archive for articles related to lobbying and lobbyists. The Washingtonian magazine listed in 2007 the top 50 "hired guns" - a list of professional lobbyists working for law or government affairs firms (Eisler 2007). Jack Abramoff was one of the more enigmatic lobbyists, working for several lobbying firms over time, and well known for lucrative lobbying deals (Schmidt and Grimaldi 2005). He pleaded guilty to charges of fraud, tax evasion, and bribery of Congress members (Schmidt and Grimaldi 2006).

information and contracting problem. To the best of my knowledge the repeated personal interactions between lobbyists and policymakers have not been analyzed in the theoretical economics literature, and it is the intent of this chapter to provide a dynamic model of commercial lobbying that explains how these interactions arise endogenously and analyzes their welfare implications.

The empirical lobbying literature provides evidence for repeated personal relationships between lobbyists and policymakers. For example, Kroszner and Stratmann (1998) argue that the committee system of Congress provides an environment that facilitates repeated interactions and reputation building between special interest groups and politicians. The committee structure and the repeated interactions ease agreements of legislative support for campaign contributions in the absence of legal contracts. Recent empirical work by Blanes i Vidal, Draca, and Fons-Rosen (2011) and Eggers (2010) focuses on the importance of personal relationships between lobbyists and politicians. The former concentrates on the “revolving door” phenomenon in which political staff members become lobbyists and attempt to earn lobbying rents by offering their previous political contacts to special interest groups. They find empirical support for the revolving door hypothesis and show that those lobbyists with previous staff experience realize immediate, discontinuous, and permanent losses in lobbying revenues after their previous employer leaves office. Eggers (2010) focuses on lobbyists’ and politicians’ party affiliation and the revolving door phenomenon. His results show that the revenues of those lobbyists with staff experience are more affected by their party membership and the party in power; whereas former politicians generate lobbying income by offering personal contacts rather than ideological proximity to political incumbents. Other recent empirical work by Bertrand, Bombardini, and Trebbi (2011) tries to disentangle whether lobbyists provide issue expertise to policymakers or offer political access to potential clients. Amongst their results, they show that lobbyists, measured by campaign donations and reported policy issues, follow their political contacts and change

their political issues when those politicians change offices or committee assignments and political issues.

The basic model of commercial lobbying, which is presented in Chapter II, focuses on the existence and welfare implications of commercial lobbying activities in a market environment. The basic model assumes that policymakers can observe both the lobbyists' information acquisition and information. This allows policymakers to request their desired levels of verification efforts and financial contributions directly, which results in private rent dissipation for lobbyists and citizens. However, the assumption of observable verification efforts might be too restrictive for all commercial lobbying games. If policy information is private knowledge to lobbyists, then they may not be able to credibly transmit information to policymakers or may have an incentive to misrepresent information. Imperfect information about a lobbyist's verification efforts causes a moral hazard problem: A lobbyist may misrepresent the information about costly verification. The policymakers' information problem decreases their ability to request verification efforts directly and may require them to share rents.

This chapter introduces a dynamic version of the commercial lobbying model that builds on unobservable lobbying efforts and promised, rather than contractible, financial contributions. Commercial lobbying firms have the capability to investigate the social desirability of citizens' policy proposals and can transfer financial benefits to policymakers. It is argued that if policymakers cannot observe lobbyists' investigation efforts and financial contributions cannot be contracted, then repeated personal relationships between a policymaker and a lobbyist facilitate a solution to a policymaker's information and contracting problem. Policymakers have an incentive to announce political access rules that induce current information acquisition and financial contributions in exchange for political access. The intertemporal interactions enable policymakers to escape a static "cheap talk" game with no lobbying efforts that actually allows them to monitor the quality of exchanges with lobbyists. The motivation for lobbyists to engage in such repeated interactions arises

when policymakers create political barriers to entry and promise lobbyists, as “political insiders”, positive profits. These information rents reduce the verification efforts by each lobbyist, and the welfare implications of repeated personal interactions depend on whether the policymakers’ information or contracting problem predominates. However, the policymaker’s information problem may actually improve welfare outcomes. Similar to the results in Chapter II, financial contributions may also improve welfare outcomes.

The commercial lobbying model characterizes the actions of commercial lobbyists with expertise who act as intermediaries between citizens and policymakers. Commercial lobbyist differ from “experts” and “advocates” who have been discussed in the economic literature.² Their characteristics share specific features of each of these types. Experts are characterized as agents who possess some form of expertise and private information that is valued by a decision-maker. In contrast to a commercial lobbyist who competes for political access, which is offered to clients, an expert is directly affected and compensated by the decision-maker’s choice. An advocate is expected to achieve the best outcome for another agent. Dewatriport and Tirole (1999) study the behavior of advocates and show that informational benefits are maximized when each advocate argues for a specific cause. They point out that we observe two compensation schemes for advocates: Decision-based rewards and information-based rewards. Decision-based rewards are based on the advocates’ achievements for their clients; information-based rewards are based on how advocates achieves outcomes. Dewatriport and Tirole (1999) focus their analysis on decision-based rewards and ignore information-based rewards. Commercial lobbyists represent many clients and are dependent on political access to policymakers. Commercial lobbyists have to balance policymakers’ demands with clients’ objectives in order to be successful. The former is closer to information-based rewards, whereas the latter is closer

²For example, Crawford and Sobel (1982), Gilligan and Krehbiel (1989), Austen-Smith (1994), and Krishna and Morgan (2001) study the behavior of a single or multiple experts with private information who advise an imperfectly decision-maker. A biased expert has an incentive to misrepresent information, and a decision-maker may want to consult competing experts to improve decision-making. Krishna and Morgan (2001) provides a review of this literature.

to decision-based rewards. It is argued that the competition for scarce political access allows relatively powerful policymakers to shift the lobbyists' compensation scheme more towards indirect information-based rewards.

IV.1.1. Other Related Literature

The current study is related to the rent-seeking and lobbying literature that focuses on campaign contributions, information acquisition, or both simultaneously.³ The closest two literature strands are lobbying models with unobservable information and the simultaneity of information acquisition and financial contributions. Crawford and Sobel (1982) and Krishna and Morgan (2001) focus on static lobbying games with imperfect information. An imperfectly informed decision-maker anticipates a sender's incentive to misrepresent information and, as a result, one or multiple senders may be unable to communicate their private information credibly.⁴ Bennedsen and Feldmann (2006) and Dahm and Porteiro (2008a) focus on the interdependency and the trade-off between information acquisition and financial contributions. However, similar to the basic model presented in Chapter II, both assume that a lobby's information is verifiable for a policymaker. To the best of my knowledge no economic analysis has focused on repeated lobbying.

The current study is also related to the extensive literature that focuses on incomplete information, repeated interactions, and barriers to entry. The notion that current actions can generate future information is introduced by Kreps and Wilson (1982), as well as Milgrom and Roberts (1982). Both address Selten's (1978) Chain Store Paradox and analyze incumbents' and entrants' actions in a repeated game with asymmetric information. Market incumbents undertake current investments to create a reputation that deters future

³A detailed review of the two literature strands is provided in section 1.1 of Chapter II.

⁴Section 1.1 of Chapter II provides a survey for costly lobbying activities. In such models lobbying expenditures serve the decision-maker as a signal for an interest group's credibility. Here, costly lobbying activities improve the information about policies or serve as a private benefit for a policymaker.

entry.⁵ Diamond (1991) focuses on the reputation of borrowers and monitoring by lenders. The borrower's current repayments improve the borrower's credit rating and allow the borrower to borrow at lower interest rates in the future. Here, commercial lobbyists undertake current verification efforts, which are positively correlated with quality signals policymakers receive, to establish a reputation that is rewarded with political access. These reputations and the policymakers' rewards create barriers to entry in the political access market and deter entry into the market for commercial lobbying services.

The interactions between commercial lobbyists and policymakers who grant political access in exchange for unobservable efforts is also related to the principal-agent literature. However, as Holmstrom (1981) points out, principal-agent models with asymmetric information may require complex sharing rules that may entail serious limitations with respect to legal enforcement. Simple fixed-wage contracts may perform better whenever the complex contracts cannot be enforced.⁶ Such contracts with prohibitively costly bonding have been addressed in the economic literature of efficiency wages with shirking. This literature addresses the relationship between a worker's productivity and compensation. For example, Shapiro and Stiglitz (1984) show that employers have an incentive to offer higher wages that increase a worker's opportunity cost of shirking and being fired. The resulting higher equilibrium wages imply a higher level of unemployment that serves as a discipline device. The authors assume that the likelihood of detecting shirking is exogenous and that a worker's effort choice is dichotomous. Sparks (1986) allows for continuous effort and employer's can observe with some positive probability an employee's effort level. As a result, an employer announces a minimum effort level and dismisses shirking workers. In equilibrium, workers undertake the required minimum effort and receive efficiency wages. In

⁵Kreps and Wilson (1982) assume that entrants do not know the incumbent's predatory payoff and that there is positive chance that predatory actions yield better payoffs for an incumbent in any stage. Milgrom and Roberts (1982) assume that predation is costly for the incumbent and that there is some uncertainty for entrants' about their alternatives. The qualitative implications are similar for both though the latter has a strong uniqueness result.

⁶For an extensive survey of the economic literature of moral hazard and dynamic moral hazard problems see Bolton and Dewatriport (2005).

Esfahani and Salehi-Isfahani (1989) as well as Black and Garen (1991), an employer receives a signal about a worker's performance that is positively correlated with the worker's effort. The worker's choice of effort is continuous, and the employer announces a performance standard for a continued work relationship.⁷ In both models, some unlucky non-shirking workers are in equilibrium dismissed, creating vacancies for entry.

The current analysis models the principal's problem similarly to Esfahani and Salehi-Isfahani (1989) as well as Black and Garen (1991). However, it provides some additional insights. First, a policymaker, as the principal, does not bear any explicit cost when rewarding a lobbyist's performance. A policymaker allocates scarce time that is valued by citizens and lobbyists and this causes an implicit cost for the policymaker. The political access, as indirect compensation for a lobbyist in this market, can be sold to potential clients in the market for lobbying services and creates an incentive to undertake effort. Second, both a lobbyist's verification effort and financial contribution is continuous but the degree of monitoring differs. Verification effort can only be imperfectly monitored whereas financial contributions can be perfectly monitored. The former reflects the policymaker's information problem and the latter the policymaker's contracting problem in the presence of asymmetric information and in the absence of binding contracts.

IV.1.2. Outline

The structure of this chapter is as follows: Section IV.2. presents the dynamic model and characterizes a simple political access rule. Section IV.3. characterizes the steady state with a simultaneous equilibrium in the lobbying labor market, the market for commercial lobbying services, and the market for political access. Section IV.4. concludes and discusses the findings.

⁷Esfhani and Salehi-Isfahani (1989) focus on the observed dualism, the coexistence of formal and informal sectors, and the wage gaps and unemployment rates across both sectors. They argue that workers' effort is less observable in the formal sector because of complexity. Black and Garen (1991) focus on industry wage differentials and argue that observed wage gaps result from differences in labor performance standards or observability of workers' efforts.

IV.2. The Dynamic Model

The economic model is a dynamic version of the commercial lobbying model presented in section 2 of Chapter II. The lobbying model is in discrete time and characterized by unobservable information acquisitions and promised financial contributions. A society consists of citizens, c , lobbyists, l , and policymakers, p . All agents are risk-neutral and infinitely lived. Each citizen has a single policy proposal in any period t that if enacted will yield a private benefit of $\pi^c > 0$ and create a social spillover of e_t^c with $e_t^c \in \{s, -s\}$ and $s > 0$. A policy proposal with a positive spillover would be socially desirable whereas one with a negative spillover would be socially undesirable – i.e., $\pi^c - s < 0$. The social value of any policy proposal is unknown to society in t and each society member will only know in $t + 1$ whether the proposal has been or has not been socially desirable. However, each society member knows the exogenous probability for a positive spillover, $\rho(e^+)$, and the complimentary probability for a negative spillover, $\rho(e^-) = 1 - \rho(e^+)$. Overall, the expected social value of any policy proposal is positive, and each individual receives an identical share from all realized spillovers.

A policy proposal can be presented to a policymaker either directly by the citizen or indirectly by a lobbyist, who operates for profit. Lobbyists have two capabilities: 1) they have a verification technology that allows them to investigate the welfare effects of policy proposals, and 2) they can make financial contributions to policymakers. Each policymaker has a time constraint for enacting policy proposals but no independent verification technology. Every policymaker announces political access rules to citizens and lobbyists, $\tilde{a}^{cp}(\cdot)$ and $\tilde{a}^{lp}(\cdot)$, that allocate time between citizens and lobbyists for the presentation of policy proposals. The total number of enacted policy proposals is A_t .

The timing of the model for each time period t is the following: First, all policymakers simultaneously announce individual access rules to citizens and lobbyists. Second, citizens choose to become a lobbyist or continue as citizen with a policy proposal. Third, lobbyists

accept a certain number of proposals from clients and may investigate some of them. Finally, lobbyists promise financial contributions and present a portfolio of policy proposals to policymakers, which are immediately enacted.

The actions by lobbyists and the interactions between lobbyists and policymakers are unobservable to citizens. However, citizens can observe the amount of political access, \tilde{a}_t^{lp} , and the number of clients, n_t^l , for each lobbyist. Policymakers know the characteristics of the lobbyists' verification technology but the lobbyists' verification efforts, their received verification signals, and financial contributions are unobservable in t . Notwithstanding, each policymaker observes in $t + 1$ the financial contributions made by lobbyists and their delivered quality of policy proposals in period t . All individuals know the distribution of society's members in the population, T , in t - i.e., $T = P_t + C_t + L_t$. The appointment and number of policymakers follows from some commonly known constitutional rule with $P_t = \bar{P}$.

There are three markets in the economy. Citizens have free access to the verification technology and may enter the lobbying labor market. The remaining citizens may hire a lobbyist in a competitive lobbying market at a market fee of k_t or attempt to approach a policymaker directly. Policymakers announce political access rules to lobbyists that demand verification efforts and financial contributions in exchange for future political access. These exchanges have agency characteristics but are not contractible. Further details about the dynamic model are presented in the following.

IV.2.1. Citizens

There are C_t citizens and each has a policy proposal. If a policy proposal will not be enacted by the end of t , then the proposal expires and each citizen will have a new policy proposal in $t + 1$. A citizen realizes the private benefit of the enacted policy proposal, π^c , and additionally a share of aggregate spillovers from all enacted policy proposals, A_t , at the end of t . Citizens may present their proposals directly to a policymaker at no cost or

hire a commercial lobbyist to present the proposal on their behalf for a fee of k_t . A citizen can hire only one lobbyist in t .

The payoff for citizen c in t is:

$$\Pi_t^c = \begin{cases} \pi^c + \frac{1}{T} \sum_{c=1}^{A_t} e_t^c & \text{if } c \text{ gains access directly in } t, \\ \frac{1}{T} \sum_{c=1}^{A_t} e_t^c & \text{if } c \text{ gains no access in } t, \\ \pi^c - k_t + \frac{1}{T} \sum_{c=1}^{A_t} e_t^c & \text{if lobbyist } l \text{ presents } c\text{'s proposal in } t, \text{ or} \\ -k_t + \frac{1}{T} \sum_{c=1}^{A_t} e_t^c & \text{if lobbyist } l \text{ does not present } c\text{'s proposal in } t. \end{cases} \quad (\text{IV.2.1})$$

If all policymakers exhaust their time constraints and citizens are not strategic about spillover effects and the contribution of each citizen to total spillovers is sufficiently small, then citizens do not take spillover shares into account since they realize ex ante the same shares of expected spillovers.

IV.2.1.1. Citizens' Lobbying Labor Supply

Each citizen takes the political access rules by policymakers as given. Given the free access to the verification technology, the citizen's entry decision depends on the payoffs for citizens, Π_t^c , and lobbyists, Π_t^l , in t , as well as the expected lifetime payoffs for citizens and lobbyists. More important for the entry decision for citizens is whether or not there is political access available to entrants, which they could then offer to potential clients – i.e., $\sum_{p=1}^{\bar{P}} \tilde{a}_t^{lp} \geq 0$, where \tilde{a}_t^{lp} is lobbyist l 's political access.

IV.2.1.2. Citizens' Demand for Commercial Lobbying Services

A citizen can try to approach a policymaker directly at no cost. If direct access is granted, then the proposal is presented and enacted. However, political access is uncertain and citizens have to form an expectation about the likelihood for direct political access.

The citizens' expected trade-off for direct political access may be characterized by

$$\frac{\sum_{p=1}^{\bar{P}} \tilde{a}_t^{cp}}{C_t - N_t} \pi^c \geq 0 \text{ for all } t, \quad (\text{IV.2.2})$$

where $\tilde{a}_t^{cp} \in \{0, 1\}$, N_t is the number of all lobbying industry clients, and $C_t - N_t$ is the number of citizens competing for direct political access. Another alternative is to hire a lobbyist to present the policy proposal. A potential client cannot observe lobbyists' actions behind closed doors and therefore has to form expectations about the likelihood for a presentation by a lobbyist. A citizen uses the lobbyist's political access, \tilde{a}_t^{lp} , and the number of its clients, n_t^l , to form an expectation about a successful mandate by l . The expected payoff from hiring a lobbyist depends on the likelihood of a successful mandate, the private benefit of the policy proposal, and the lobbying service fee. Finally, a citizen has the alternative of being politically inactive, which yields a certain private benefit of zero.

If citizens expect no direct political access to policymakers – i.e., $\sum_{p=1}^{\bar{P}} \tilde{a}_t^{cp} = 0$ – then the alternatives are reduced to hiring a lobbyist or being politically inactive. As a result, the individual demand for commercial lobbying can be reduced to

$$\frac{\tilde{a}_t^{lp}}{n_t^l} \pi^c - k_t \geq 0 \text{ for all } l \text{ and } t. \quad (\text{IV.2.3})$$

IV.2.2. Lobbying Firms

There are L_t lobbyists and each represents one lobbying firm. A lobbyist accepts proposals from n_t^l clients for a lobbying service fee of k_t per proposal. Lobbyists have some sort of expertise that allows them to investigate the potential spillovers of policy proposals. This verification technology returns a private signal x , $x \in \{x^+, x^-\}$, and improves the lobbyist's information about a proposal's expected spillover. If the signal is positive, x^+ , then the exogenous probability for a positive spillover is higher than without investigation,

$\rho(e^+|x^+) > \rho(e^+)$; a negative signal, x^- , increases the likelihood for a negative spillover, $\rho(e^-|x^-) > \rho(e^-)$. Investigated proposals with a positive signal have a greater expected social value than unverified proposals; verified proposals with a negative signal have a negative expected social value. The expected social value of a policy proposal can be summarized as to the following:

$$\begin{aligned} \rho(e^+|x^+) (\pi^c + s) + \rho(e^-|x^+) (\pi^c - s) &> \rho(e^+) (\pi^c + s) + \rho(e^-) (\pi^c - s) \\ &> 0 > \rho(e^+|x^-) (\pi^c + s) + \rho(e^-|x^-) (\pi^c - s). \end{aligned} \quad (\text{IV.2.4})$$

The verification of proposals causes costs that are expressed by $F(m_t^{lp})$, where m_t^{lp} is the number of proposals that are investigated for the lobbyist's only political contact, p_t^{lp} . Another source of lobbying costs arises with each client and proposal. Each proposal causes processing costs for a lobbyist, and these processing costs are expressed by $G(n_t^l)$. It is assumed that both $F(\cdot)$ and $G(\cdot)$ are increasing and convex.⁸ Depending on the political access rule, $\tilde{a}^{lp}(\cdot)$, a lobbyist may present verified proposals as well as some unverified proposals to the policymaker, u_t^{lp} . The potential remaining proposals disappear in the firm, r_t^l - i.e., $n_t^l = m_t^{lp} + u_t^{lp} + r_t^l$. Finally, depending on the policymaker's political access rule a lobbyist may also make a financial contribution to the policymaker, f_t^{lp} . Both the verification effort and the financial contribution are private information in t .

The payoff for lobbyist l in t is

$$\Pi_t^l = k_t n_t^l - G(n_t^l) - F(m_t^{lp}) - f_t^{lp} + \frac{1}{T} \sum_{c=1}^{A_t} e_t^c. \quad (\text{IV.2.5})$$

IV.2.3. Policymakers

Each of the \bar{P} policymakers can approve a maximum of A^p proposals in t , and all policymakers together enact A_t proposals with $A_t = \bar{P}A_t^p \leq \bar{P}A^p$. In each period, a

⁸It is also assumed that $F'(0) = G'(0) = 0$ and $F'''(\cdot) \geq 0$.

policymaker receives an ego rent for holding office, θ , may receive financial contributions, f_t^{lp} , from l_t^p lobbying contacts, and enjoys a share of spillovers from all enacted policy proposals.⁹ A policymaker may discount financial contributions by α with $\alpha \in [0, 1]$. This can be interpreted as the policymaker's degree of dishonesty or the effectiveness of in-kind transfers.

Policymakers do not have an independent verification technology for policy proposals and enact all presented proposals. However, each policymaker p can announce access rules to citizens and lobbyists, $\tilde{a}^{cp}(\cdot)$ and $\tilde{a}^{lp}(\cdot)$, that allocate the policymaker's time and specify implicit conditions. These access rules may be influenced by lobbyists' verification efforts and financial contributions. Naturally, the allocation of access is restricted by the policymaker's time constraint – i.e., $A_t^p \geq \sum_{c=1}^{c_t^p} \tilde{a}_t^{cp} + \sum_{l=1}^{l_t^p} \tilde{a}_t^{lp}$. Note that there is no explicit cost for the policymaker to enact policy proposals or to compensate citizens or lobbyists for the presentation of policy proposals. However, there is an implicit cost for the policymaker because of his finite time endowment.

The payoff for policymaker p in t is

$$\Pi_t^p = \theta + \alpha \sum_{l=1}^{l_t^p} f_t^{lp} + \frac{1}{T} \sum_{c=1}^{A_t} e_t^c, \quad (\text{IV.2.6})$$

where the aggregate spillovers depends on presented policy proposals. The expected quality of spillovers from enacted policy proposals, $E \left[\sum_{c=1}^{A_t} e_t^c \right]$, depends on the number of unverified proposals presented by citizens or lobbyists and verified policy proposals with their received verification signals presented by lobbyists.

⁹The only purpose of the ego rent is to provide some form of benefit to the policymaker that is independent of his actions and provides some compensation for foregoing private benefits he may would enjoy as if he were a citizen. Whether $\theta > 0$ or $\theta = 0$ has no effect on the qualitative results of this analysis.

IV.2.4. Political Access Rules

Each policymaker faces a trade-off in the allocation of political access: Citizens can provide policy proposals but lobbyists can provide multiple policy proposals and verification efforts. Further, a political access rule for a citizen, $\tilde{a}^{cp}(\cdot)$, can only specify whether a citizen can or cannot present a policy proposal. Whereas a policymaker's access rule for a lobbyist, $\tilde{a}^{lp}(\cdot)$, can specify the desired quality of presented policy proposals, financial contributions, and the number of policy proposals in exchange for political access. In order to grant political access to lobbyists conditionally on their unobservable efforts, policymakers have to take legal constraints as well as the monitoring of lobbyists into account.

It is assumed that policymakers and lobbyists cannot write legally binding contracts about the quality of presented portfolios and financial contributions.¹⁰ However, it is reasonable to assume that there are some “insider rules” or loose agreements that serve as implicit contracts and common sense amongst “political insiders.” These insider rules imply the conditions under which policymakers grant political access to lobbyists in exchange for their provided efforts. For the design of such insider rules, a policymaker realizes that lobbyists are not directly affected by policy proposals but care about political access for economic profit, which creates a means to induce costly lobbying efforts. A relatively simple and legally unobjectionable incentive device for a policymaker is the implicit threat of terminating a personal relationship.¹¹ With the end of a personal relationship, and the implied loss of political access, a lobbyist can no longer offer this access to clients. So a lobbyist would have to approach another policymaker to replace the lost access or go out of business. The policymaker's advantage is that the policymaker can replace a lobbyist by offering a citizen the opportunity to become a lobbyist.

¹⁰This follows from the observation that such contracts are usually not legally enforceable or that the enforcement and disclosure of such contracts may have adverse effects for policymakers and lobbyists. Adverse effects could be a loss of credibility or just public envy.

¹¹This is captured by Holmstrom's (1981) analysis that simple fixed-wage contracts may not be generally optimal but might perform better in circumstances when the optimal contract itself would be complex but difficult to enforce because of legal constraints.

The presented political access rule and the issue of monitoring lobbyists' efforts is closely related to the issue of monitoring workers' efforts and rewarding them with fixed wages as studied in Esfahani and Salehi-Isfahani (1989) and Black and Garen (1991). The two key differences are 1) lobbyists' efforts are indirectly compensated (with political access that is valued in the market for lobbying services) and 2) lobbyists' undertake two efforts with different monitoring characteristics: Verification efforts and financial contributions.

IV.2.4.1. Unobservable Effort, Monitoring, and Termination

A lobbyist's current verification effort and financial contributions are private information in t , and this creates an incentive for a lobbyist to promise effort but to actually not undertake effort.¹² A lobbyist only undertakes such costly effort if there is a positive relationship between costly effort and potential rewards. A policymaker can identify perfectly in $t + 1$ a lobbyist's financial contribution that was made in t . So if a policymaker received at least the announced minimum financial contribution of \bar{f}_t^{lp} , then the policymaker does not terminate the relationship and rewards the lobbyist with political access in $t+1$. Therefore, the likelihood for a lobbyist of being dropped given the announced \bar{f}_t^{lp} is therefore either 0 or 1 and depends entirely on the lobbyist's choice of f_t^{lp} . However, a policymaker observes a lobbyist's verification effort neither in t nor in $t+1$. The policymaker only observes the quality of spillovers from policy proposals enacted in t , q_t^{lp} , and has to form an expectation about the lobbyist's verification efforts.¹³ The observed quality can be used by the policymaker as a performance measure that is positively related to the lobbyist's verification effort. This performance measure and conditional future political access can help the policymaker to create a relationship between efforts and rewards.

¹²It is never optimal for a lobbyist with political access to become a citizen in t if $k_t n_t^l - G(n_t^l) \geq \Pi_t^c \geq 0$. If this condition would not hold in equilibrium, then nobody would want to be a lobbyist and there would be no commercial lobbying in equilibrium.

¹³A policymaker knows in $t + 1$ the number of presented proposals, \tilde{a}_t^{lp} , and the number of enacted policy proposals with positive and negative spillovers. This allows the policymaker to observe the quality of presented policy proposals, q_t^{lp} .

The expected quality of presented proposals with positive spillovers can be written, from the lobbyist's perspective in t , as

$$\begin{aligned} E_t \left[q_t^{lp} \right] &= \frac{\rho(x^+) \rho(e^+ | x^+) m_t^{lp} + \rho(e^+) u_t^{lp}}{\tilde{a}_t^{lp}} \\ &= \rho(e^+) + \frac{\rho(x^+) [\rho(e^+ | x^+) - \rho(e^+)] m_t^{lp}}{\tilde{a}_t^{lp}}, \end{aligned} \quad (\text{IV.2.7})$$

where $\tilde{a}_t^{lp} = \rho(x^+) m_t^{lp} + u_t^{lp}$ and \tilde{a}_t^{lp} is parametric for the lobbyist but m_t^{lp} and u_t^{lp} are choices.¹⁴ The expected quality of presented proposals depends on the lobbyist's political access and the expected information improvement through the verification of proposals.

A policymaker can form an expectation in $t+1$ about the lobbyist's verification effort in t with

$$E_{t+1} \left[m_t^{lp} \right] = \frac{q_t^{lp} - \rho(e^+)}{\rho(x^+) [\rho(e^+ | x^+) - \rho(e^+)] \tilde{a}_t^{lp}}, \quad (\text{IV.2.8})$$

where \tilde{a}_t^{lp} and q_t^{lp} are known to the policymaker in $t+1$.

Each policymaker can announce a quality threshold for policy proposals' spillovers, \bar{q}_t^{lp} , that serves as a minimum performance standard and determines whether a policymaker terminates or does not terminate a relationship with a lobbyist in $t+1$. If a policymaker observes $q_t^{lp} \geq \bar{q}_t^{lp}$ in $t+1$, then the relationship continues and the lobbyist receives political access in $t+1$; if a policymaker observes $q_t^{lp} < \bar{q}_t^{lp}$, then the relationship is terminated and the policymakers allocates the lobbyist's political access to another agent.

In Esfahani and Salehi-Isfahani (1989), the principal observes a signal that is equal to the agent's effort plus an unobservable error term, which is characterized with a continuous bell-shaped density function. Since a bell-shaped density function does not guarantee a unique solution to the agent's optimization problem and a continuous best-response

¹⁴The notion that a lobbyist would not present policy proposals with negative verification signals is made precise shortly.

function in a principal-agent framework, they make additional assumptions about the agent's cost of efforts to ensure a solution.¹⁵

The current problem differs because of the information structure of the model. Each policy proposal has either a positive or negative spillover. Further, the lobbyist's verification technology returns either a positive or a negative signal. Given the binary outcomes and exogenous probabilities, the probability of achieving an announced quality threshold follows a hypergeometric probability distribution. The hypergeometric probability distribution is discrete but can be, for specific parameter values, approximated to either a Poisson or a normal probability distribution.¹⁶ Following Jewitt (1988), the Poisson probability distribution fulfills the desired characteristics for the first-order approach of solving principal-agent problems. Unfortunately, the approximation of the hypergeometric probability distribution to a Poisson probability distribution requires that the number of presented proposals with a positive verification signal is relatively small in comparison to the lobbyist's portfolio. So the statistically appropriate approximation would be the normal distribution.

Using (IV.2.7), the observed quality of enacted policy proposals can be approximated by

$$q_t^{lp} = \frac{\rho(x^+) [\rho(e^+|x^+) - \rho(e^+)] m_t^{lp}}{\tilde{a}_t^{lp}} + \epsilon_t^{lp}, \quad (\text{IV.2.9})$$

where ϵ_t has a mean of $\rho(e^+)$ and is normally distributed. The likelihood for a lobbyist of being terminated can be written as

$$\begin{aligned} Pr \left(q_t^{lp} \leq \bar{q}_t^{lp} \right) &= Pr \left(\epsilon_t^{lp} \leq \bar{q}_t^{lp} - \frac{\rho(x^+) [\rho(e^+|x^+) - \rho(e^+)] m_t^{lp}}{\tilde{a}_t^{lp}} \right) \\ &= \delta \left(\bar{q}_t^{lp}, m_t^{lp} \right) \end{aligned} \quad (\text{IV.2.10})$$

¹⁵Similarly, in Black and Garen (1991), the principal observes a similar performance signal but the error term is normally distributed.

¹⁶See Fahrmeir et al. (1997).

with $\frac{\partial \delta(\bar{q}_t^{lp}, m_t^{lp})}{\partial \bar{q}_t^{lp}} > 0$ and $\frac{\partial \delta(\bar{q}_t^{lp}, m_t^{lp})}{\partial m_t^{lp}} < 0$.¹⁷ A lobbyist's verification effort reduces the likelihood of termination and may provide an incentive to undertake unobservable effort to maintain the relationship.¹⁸

IV.2.4.2. The Political Access Rule for Lobbyists

To summarize, the political access rule for a lobbyist, $\tilde{a}^{lp}(\cdot)$, specifies the policymaker's performance expectation, the minimum financial contribution, and the promised future political access – i.e., the access rule is a triple of $\{\bar{q}_t^{lp}, \bar{f}_t^{lp}, \tilde{a}_t^{lp}\}$. The lobbyist takes this access rule as given and forms a best-response of $m_t^* = m(\cdot)$ and $f_t^* = f(\cdot)$ that maximizes the lobbyist's expected lifetime payoff. Further, each lobbyist takes k_t as given and chooses the number of clients, $n_t^* = n(\cdot)$. The policymaker takes m_t^* , f_t^* , n_t^* , and k_t as given and chooses \bar{q}_t^* as well as \bar{f}_t^* to maximize the policymaker's expected lifetime payoff. If a relationship with a lobbyist is terminated by a policymaker, then the lobbyist's political access is allocated to an entering lobbyist who is becoming part of the political establishment.

IV.2.5. The Lobbyist's Optimization Problem

Each lobbyist takes the lobbying service fee, k_t , the citizen's current payoff, Π_t^c , and the political access rules by policymakers, $\tilde{a}^{lp}(\cdot)$, with \bar{a}_t^{lp} , \bar{q}_t^{lp} , and \bar{f}_t^{lp} as given. In each period, a lobbyist determines the number of clients, n_t^l , the number of verified proposals, m_t^{lp} , and the financial contribution, f_t^{lp} , taking into account the impact of these choices on the likelihood of maintaining the relationship with a policymaker.¹⁹ A lobbyist anticipates

¹⁷In the following, $\delta(\bar{q}_t^{lp}, m_t^{lp})$ is written as $\delta(\bar{q}^{lp})$ for notational reasons.

¹⁸It is possible for the policymaker to increase the number of observations by incorporating a lobbyist's performance history. The analysis abstracts from the optimal political access rules and focuses on how repeated personal interactions can solve a policymaker's information and contracting problem.

¹⁹The number of presented but unverified proposals, u_t^{lp} , follows from (IV.2.12) and the choice of m_t^{lp} ; the number of disappearing policy proposals, r_t^l , follows from (IV.2.13), (IV.2.12), and m_t^{lp} .

that the presentation of a proposal with a negative verification signal has a negative effect on the expected quality of the presented portfolio. Because of verification costs the lobbyist's optimal portfolio of policy proposals includes only proposals with positive verification signals and unverified proposals – i.e., $\tilde{a}_t^{lp} = \rho(x^+)m_t^{lp} + u_t^{lp}$.²⁰ The expected lifetime payoff at the beginning of $t + 1$ of a lobbyist is V^l and of a citizen V^c . Both are parametrically given in the lobbyist's optimization problem. The lobbyists' discount rate is r with $r \in [0, 1]$. The lobbyist's optimization problem in t is

$$\max_{n_t^l, m_t^{lp}, f_t^{lp}} E[\Pi^l] = k_t n_t^l - G(n_t^l) - F(m_t^{lp}) - f_t^{lp} + \frac{\delta(\bar{q}^{lp})}{1+r} V^c + \frac{(1-\delta(\bar{q}^{lp}))}{1+r} V^l \quad (\text{IV.2.11})$$

s.t. a current political access constraint of

$$\tilde{a}_t^{lp} = \rho(x^+)m_t^{lp} + u_t^{lp} \text{ for all } t \quad (\text{IV.2.12})$$

with Lagrange parameter λ_t^{lp} and the lobbyist's portfolio of clients' proposals

$$n_t^l = m_t^{lp} + u_t^{lp} + r_t^l \text{ for all } t \quad (\text{IV.2.13})$$

with Lagrange parameter μ_t^{lp} . It is not optimal for a lobbyist with political access to become a citizen in t if $k_t n_t^l - G(n_t^l) \geq \Pi_t^c$. If this would not be true, then the solution is trivial because no society member would want to be a lobbyist and there would be no equilibrium with commercial lobbying.

A lobbyist chooses 1) the number of verified proposals, m_t^{lp} , simultaneously and 2) makes a financial contribution, f_t^{lp} , with the knowledge that the likelihood of dismissal is either 0 or 1.²¹ The first-order condition for the optimal number of clients can be written

²⁰The number of presented proposals is equal to the granted political access. The presentation of policy proposals itself does not cause any costs for lobbyists. So lobbyists with a sufficient number of clients have no incentive to dispose political access.

²¹One may argue that the choice of verification is sequential. That is, a lobbyist observes the verification signal for a proposal and decides whether another proposal should be or should not be verified in order

as

$$\frac{\partial E[\Pi^l]}{\partial n_t^l} = k_t - \frac{\partial G(n_t^l)}{\partial n_t^l} \leq 0 \quad (\text{IV.2.14})$$

and for verification effort

$$\frac{\partial E[\Pi^l]}{\partial m_t^{lp}} = -\frac{\partial F(m_t^{lp})}{\partial m_t^{lp}} - \frac{\partial \delta(\bar{q}^{lp})}{\partial m_t^{lp}} \frac{(V^l - V^c)}{1+r} - \rho(x^+) \lambda_t^{lp} - \mu_t^{lp} \leq 0. \quad (\text{IV.2.15})$$

Note that (IV.2.15) depends on whether $n_t^l \geq m_t^{lp}$. If $u_t^{lp} > 0$, then $\lambda_t^{lp} = 0$ and $\mu_t^{lp} = 0$. Otherwise there would be a corner solution with $\tilde{a}_t^{lp} = \rho(x^+) m_t^{lp}$.

The second-order conditions are

$$\frac{\partial^2 E[\Pi^l]}{\partial n_t^{l2}} = -\frac{\partial^2 G(n_t^l)}{\partial n_t^{l2}} < 0 \quad (\text{IV.2.16})$$

and

$$\frac{\partial^2 E[\Pi^l]}{\partial m_t^{lp2}} = -\frac{\partial^2 F(m_t^{lp})}{\partial m_t^{lp2}} - \frac{\partial^2 \delta(\bar{q}^{lp})}{\partial m_t^{lp2}} \frac{(V^l - V^c)}{1+r} \leq 0.^{22} \quad (\text{IV.2.17})$$

IV.2.5.1. The Supply of Commercial Lobbying Services

The first-order condition (IV.2.14) describes the optimal number of clients with respect to the costs of processing clients' proposals and the current market lobbying service fee. This can be summarized as to the following:

Lemma 10. *The optimal size of the lobbying firm in t , n_t^l , depends on the market lobbying service fee in t with $k_t > 0$ such that*

$$k_t = G'(n_t^l). \quad (\text{IV.2.18})$$

to balance the lobbyist's chances costs. However, one can imagine that a sequential process is much more time-consuming and costly. So in reality, one may observe a mixture of both.

²²In the following the partial derivatives for $\delta(\bar{q}^{lp})$ with respect to m_t^{lp} are written as $\delta_m(\bar{q}^{lp})$ and $\delta_{mm}(\bar{q}^{lp})$.

A lobbyist chooses the number of clients based on the current rewards received in the market of commercial lobbying services. The decision does not depend on the relationship with a policymaker and a potential reward received in the market for political access. The lobbyist's best-response can be described by $n_t^* = n(k_t)$.

IV.2.5.2. The Lobbyist's Financial Contribution

Part of each policymaker's political access rule is the minimum financial contribution of \bar{f}^{lp} . Each lobbyist knows that the policymaker can identify perfectly in $t + 1$ whether or not the lobbyist made the minimum financial contribution in t . If the lobbyist makes a financial contribution less than the minimum, $f_t^{lp} < \bar{f}^{lp}$, then the policymaker terminates the relationship. If a lobbyist made a financial contribution in excess of the the minimum, $f_t^{lp} > \bar{f}^{lp}$, then the policymaker expects, because of the lobbyist's resource constraint, that the lobbyist may not have allocated sufficient resources to the verification of proposals. This would have either an adverse effect on the duration of the relationship or would not maximize a lobbyist's profit. This can be summarized as the following:

$$f_t^* = \begin{cases} 0 & \text{if } V^l < V^c \text{ for a given } \bar{q}_t^{lp} \text{ or} \\ \bar{f}_t^{lp} & \text{if } V^l \geq V^c \text{ for a given } \bar{q}_t^{lp}. \end{cases} \quad (\text{IV.2.19})$$

The lobbyist's stationary participation constraint, $V^l \geq V^c$, follows from (IV.2.11) with $\Pi^l = V^l$ as well as the expected lifetime payoff for a citizen such that:

$$\begin{aligned} \Pi^l = kn^l - G(n^l) - F(m^{lp}) - f^{lp} + \frac{\delta(\bar{q}^{lp})}{1+r}V^c + \frac{(1-\delta(\bar{q}^{lp}))}{1+r}V^l &\geq V^c \\ V^l = \frac{(1+r)(kn^l - G(n^l) - F(m^{lp}) - f^{lp})}{r + \delta(\bar{q}^{lp})} + \frac{\delta(\bar{q}^{lp})}{r + \delta(\bar{q}^{lp})}V^c &\geq V^c \\ (1+r)(kn^l - G(n^l) - F(m^{lp}) - f^{lp}) &\geq rV \end{aligned} \quad (\text{IV.2.20})$$

IV.2.5.3. The Lobbyist's Verification Effort

The first-order condition (IV.2.15) describes the optimal amount of verification efforts given the policymaker's announced quality threshold, \bar{q}_t^{lp} . As long as there is a promised future benefit to being a lobbyist, $V^l - V^c > 0$, and the lobbyist's verification effort decreases the likelihood of being dropped in the future, $\delta_m \left(\bar{q}_t^{lp} \right) < 0$, the lobbyist undertakes a positive level of unobservable verification effort to maintain the relationship with the policymaker.²³ So if a policymaker wants to induce a lobbyist to undertake effort, then the policymaker has to ensure positive future profits and monitor the lobbyist's presented portfolio. This can be summarized as the following:

Proposition 17. *Lobbyists provide positive levels of unobservable verification efforts in t whenever policymakers can promise future benefits and lobbyists' verification efforts decrease the likelihood of being dropped by a policymaker.*

Note that the solution to (IV.2.15) and (IV.2.17) might not be unique with multiple optimal levels of verification efforts.²⁴ This would imply that the lobbyist's best-response, m_t^* , is not a continuous function. However, the important result is that a policymaker can escape a "cheap talk" lobbying game if the policymaker interacts repeatedly with the same commercial lobbyist.²⁵ Each lobbyist has an incentive ex ante to promise verification efforts in exchange for political access but has no incentive ex post to undertake these efforts in an one-shot lobbying game. So if a policymaker is able to promise future rents and can at

²³This follows from $F'(0) = 0$ and that $F(\cdot)$ is increasing convex. Therefore $E[\Pi^l(0)] > 0$ and $E[\Pi^l(\infty)] < 0$ such that $m_t^* > 0$ would be a unique solution to $\frac{\partial E[\Pi^l]}{\partial m_t^{lp}} = 0$.

²⁴See Rogerson (1985) for a general discussion of the multiplicity problem in principal-agent frameworks.

²⁵For example, Crawford and Sobel (1982) show how a better-informed sender partitions strategically the information about the state to influence a decision maker's choice. Krishna and Morgan (2001) focus on circumstances with one lobby or two lobbies, which have similar or opposite bias, have also partitioning equilibria. Austen-Smith (1995) focuses on campaign contributions that increase the likelihood of receiving political access in a first-stage lobbying game and that have reveal some information about the interest group's preference. However, a policymaker has no means to evaluate the credibility of a lobby's speech in the second stage. Here, a commercial lobbyist is not strategic about the information itself but about the verification costs.

least imperfectly monitor verification efforts, then lobbyists have an incentive to provide unobservable verification efforts to gain future profits.²⁶ It is therefore not optimal for a policymaker to meet every period with different lobbyists or to allow free entry into the political establishment, which would diminish a lobbying contacts' profits and verification efforts. Further, a commercial lobbyist represents a variety of clients and is motivated by economic profits. Whereas a citizen or special interest group provides only a few policy proposals and is motivated by a proposal's private benefit. So a policymaker gains a better statistical inference from repeated interactions with commercial lobbyists, and the threat of terminating a relationship is more severe for commercial lobbyists with many clients than for a citizen or special interest group motivated by a single proposal.

Using (IV.2.15) and (IV.2.17), the sufficient condition for a globally optimal level of verification effort, and a continuous best-response function, can be summarized by the following:

Assumption 1. *It holds that*

$$\frac{F''(m_t^{lp})}{F'(m_t^{lp})} > \frac{\delta_{mm}(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})}. \quad (\text{IV.2.21})$$

The assumption ensures a unique optimal verification effort if $n_t^l > m_t^{lp}$. It is assumed for the remaining analysis.²⁷

The best-response function for the lobbyist's verification effort can be described by the exogenous variables of the model, as well as by the lobbyist's parametric values. This

²⁶This result is standard in the efficiency wage literature. In order to induce unobservable costly efforts, employers offer higher wages to employees that increase the employees' opportunity costs of shirking and dismissal.

²⁷As noted earlier, the normal probability distribution does not fulfill Jewitt's (1988) general sufficient conditions for the first-order approach. Since an approximation to a Poisson probability distribution is desirable but not feasible, the analysis faces a trade-off between a problematic statistical approximation and additional assumptions about the lobbyist's cost structure to justify the first-order approach, which keeps the analysis tractable. It seems more reasonable to proceed with an additional assumption. The assumption follows Esfahani and Salehi-Isfahani (1989).

can be summarized, using the parametric values of interest, by the following:

$$m_t^* = m \left(\bar{q}_t^{lp}, \bar{f}_t^{lp}, \bar{a}_t^{lp}, k_t \right). \quad (\text{IV.2.22})$$

The steady state verification effort follows from the notion that the political access rule with its elements does not change from period to period and that $m_t^{lp} = m_{t+1}^{lp}$ for all t . Using $\Pi^l = V^l$, the lobbyist's expected lifetime payoff in the steady state can be written as

$$V^l = \frac{(1+r)(kn^l - G(n^l) - F(m^{lp}) - f^{lp})}{r + \delta(\bar{q}^{lp})} + \frac{\delta(\bar{q}^{lp})V^c}{r + \delta(\bar{q}^{lp})} \quad (\text{IV.2.23})$$

and reduced to

$$V^l - V^c = \frac{(1+r)(kn^l - G(n^l) - F(m^{lp}) - f^{lp}) - rV^c}{r + \delta(\bar{q}^{lp})}. \quad (\text{IV.2.24})$$

The first-order condition (IV.2.15) for an interior solution with $n_t^l > m^{lp}$ can be written as

$$(1+r)F'(m^{lp}) = -\delta_m(\bar{q}^{lp}) \frac{(1+r)(kn^l - G(n^l) - F(m^{lp}) - f^{lp}) - rV^c}{r + \delta(\bar{q}^{lp})} \quad (\text{IV.2.25})$$

and reduced to

$$-F'(m^{lp}) \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} = kn^l - G(n^l) - F(m^{lp}) - f^{lp} - \frac{rV^c}{1+r}. \quad (\text{IV.2.26})$$

The first term on the left-hand side is the marginal cost of verification. The numerator of the second factor expresses the effective discount rate for being a lobbyist in the future; the denominator expresses the marginal change in the likelihood of not being dropped by the policymaker. On the right-hand side of (IV.2.26) is the net benefit of being a lobbyist. Note that in steady state, kn^l is affected by the clients' willingness to pay for lobbying services, which depends on the lobbyist's steady state political access to a policymaker. The interpretation is straightforward: The policymaker has to grant less political access

to the lobbyist in order to induce verification efforts if either the effective discount rate or the effect of verification efforts on the likelihood of not being dropped is relatively small. Using (IV.2.26), the steady verification effort can be written as a function of \tilde{a}^{lp} , \bar{q}^{lp} , \bar{f}^{lp} , and k – i.e., $m^* = m(\tilde{a}^{lp}, \bar{q}^{lp}, \bar{f}^{lp}, k)$. The steady financial contribution is either $f^* = 0$ or $f^* = \bar{f}^{lp}$, and the number of clients follows from $n^* = n(k)$.

IV.2.6. The Policymaker's Optimization Problem

Each policymaker knows the lobbyists' best-responses to $\tilde{a}^{lp}(\cdot)$ and takes the outcomes of the lobbying service market, k_t and n_t^l , as given. A policymaker is also not strategic about the behavior of other policymakers and takes their actions, A_t^{-p} , as given. The policymaker maximizes his expected lifetime payoff by choosing \tilde{a}_t^{lp} , \bar{q}_t^{lp} , and \bar{f}_t^{lp} and taking their effects on the lobbyists' best-responses into account.

Each policymaker has no incentive to allocate time to citizens as long as lobbyists provide sufficient resources in exchange for political access – i.e., $A_t^p = \sum_{l=1}^{l_t^p} \tilde{a}_t^{lp}$. However, a policymaker does not want to enact all policy proposals from lobbyists because some of their proposals may have received negative verification signals and are in expected terms undesirable. A policymaker would like to ignore these proposals and takes this into account by announcing \bar{q}^{lp} . Further, a policymaker does not bear any explicit cost for the allocation of time. The explicit cost of lobbying activities are borne by citizens and lobbyists. The policymaker bears an implicit cost and it is in the policymaker's best interest to maximize lobbyists' efforts in exchange for a minimum of political access.

In steady state, the policymaker's optimization problem can be written as maximizing per period payoffs with

$$\begin{aligned}
\max_{\bar{q}^{lp}, \bar{f}^{lp}, \bar{a}^{lp}, l^p} E[\Pi^p] &= \theta + \alpha \sum_{l=1}^{lp} f^{lp} + \frac{1}{T} E \left[\sum_{c \in A^{-p}} e^c \right] \\
&+ \frac{s}{T} \left(\rho(x^+) \sum_{l=1}^{lp} m^{lp} [\rho(e^+ | x^+) - \rho(e^- | x^+)] \right) \\
&+ \frac{s}{T} \left(\sum_{l=1}^{lp} (\bar{a}^{lp} - \rho(x^+) m^{lp}) [\rho(e^+) - \rho(e^-)] \right) \quad (\text{IV.2.27})
\end{aligned}$$

s.t. the policymaker's time constraint of

$$A^p = \sum_{l=1}^{lp} \bar{a}^{lp}, \quad (\text{IV.2.28})$$

which makes the policymaker's choice of l^p redundant because of the symmetry of firms, the lobbyist's participation condition with $V^l \geq V^c$ from (IV.2.20) of

$$(1+r) \left[kn^l - G(n^l) - F(m^{lp}) - f^{lp} \right] \geq rV^c \text{ for all } l^p, \quad (\text{IV.2.29})$$

which holds with inequality whenever $m^* > 0$ because of the lobbyist's first-order condition described in (IV.2.15), and the lobbyist's incentive compatibility constraint to provide verification efforts from (IV.2.26) for $n^l > m^{lp}$ of

$$-F'(m^{lp}) \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} = kn^l - G(n^l) - F(m^{lp}) - f^{lp} - \frac{rV^c}{1+r}, \quad (\text{IV.2.30})$$

which is binding.

Using (IV.2.30) and substituting for f^{lp} , the policymaker's problem with a non-binding participation constraint and ignoring other policymakers' actions can be reduced to

$$\begin{aligned}
\max_{\bar{q}^{lp}, \bar{f}^{lp}, \tilde{a}^{lp}} E[\Pi^p] &= \theta + \alpha \sum_{l=1}^p \left(kn^l - G(n^l) - F(m^{lp}) - \frac{rV^c}{1+r} + F'(m^{lp}) \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} \right) \\
&+ \frac{s}{T} \left(\rho(x^+) \sum_{l=1}^p m^{lp} [\rho(e^+|x^+) - \rho(e^-|x^+)] \right) \\
&+ \frac{s}{T} \left(\sum_{l=1}^p (\tilde{a}^{lp} - \rho(x^+)m^{lp}) [\rho(e^+) - \rho(e^-)] \right) \quad (IV.2.31)
\end{aligned}$$

The first-order condition with respect to the minimum quality threshold is

$$\begin{aligned}
\frac{\partial E[\Pi^p]}{\partial \bar{q}^{lp}} &= \alpha \left[-F'(m^{lp}) \frac{\partial m^*}{\partial \bar{q}^{lp}} + F''(m^{lp}) \frac{\partial m^*}{\partial \bar{q}^{lp}} \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} \right. \\
&+ F'(m^{lp}) \frac{\delta_m(\bar{q}^{lp})^2 - \delta_{mm}(\bar{q}^{lp})(r + \delta(\bar{q}^{lp}))}{\delta_m(\bar{q}^{lp})^2} \left. \right] \\
&+ \frac{\rho(x^+)s}{T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] \frac{\partial m^*}{\partial \bar{q}^{lp}} \quad (IV.2.32)
\end{aligned}$$

and for the minimum desired financial contribution

$$\begin{aligned}
\frac{\partial E[\Pi^p]}{\partial \bar{f}^{lp}} &= \alpha \left[-F'(m^{lp}) \frac{\partial m^*}{\partial \bar{f}^{lp}} + F''(m^{lp}) \frac{\partial m^*}{\partial \bar{f}^{lp}} \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} \right] \\
&+ \frac{\rho(x^+)s}{T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] \frac{\partial m^*}{\partial \bar{f}^{lp}}. \quad (IV.2.33)
\end{aligned}$$

The granted access follows from the notion that lobbyists represent a certain number of clients and that the policymaker takes the outcomes of the lobbying service market as given. The political access for a lobbyist, \tilde{a}^{lp} , follows from the notion that a policymaker wants to induce verification effort and financial contributions in exchange for lowest possible political access given a lobbyist's resources and clients. Further, the dismissal of shirking or unlucky lobbyists creates vacancies for new lobbyists who are recruited by a policymaker to exhaust the policymaker's time endowment.

IV.2.6.1. The Interior Solution: Verification Effort and Financial Contribution

As a first step, suppose the policymaker's problem has an interior solution with $\bar{q}^{lp} > 0$ and $\bar{f}^{lp} > 0$. It follows from (IV.2.33) with $\frac{\partial E[\Pi^p]}{\partial f^{lp}} = 0$ and $\frac{\partial m^*}{\partial f^{lp}} < 0$ from (IV.2.26) that

$$F'(m^{lp}) - F''(m^{lp}) \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} = \frac{\rho(x^+)s}{\alpha T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)]. \quad (\text{IV.2.34})$$

Note that the left-hand side of (IV.2.34) is increasing in m^{lp} and equals for a given \bar{q}^{lp} the right-hand side only once.²⁸ Further, (IV.2.34) is identical to (II.4.16) in Chapter II except for the second the left-hand side that expresses the imperfect monitoring of verification effort This can be summarized as to the following:

Proposition 18. *The desired unobservable verification effort depend on the policymaker's trade-off between improved spillover shares and financial contributions as well as the imperfect monitoring of verification efforts. The desired level of verification efforts per firm is less than in the full information scenario.*

The comparison to the full information scenario follows from proposition 5 of Chapter II. The policymaker's trade-off between a share of increased social spillovers through verification efforts and private benefits from financial contributions is similar in both scenarios. However, because of the imperfect monitoring of verification efforts a policymaker receives less verification efforts from each lobbyist.

Proceeding with (IV.2.32) with $\frac{\partial E[\Pi^p]}{\partial f^{lp}} = 0$ and using (IV.2.34), the optimal quality threshold, \bar{q}^* , follows from

$$F'(m^{lp}) \frac{\delta_m(\bar{q}^{lp})^2 - \delta_{mm}(\bar{q}^{lp})(r + \delta(\bar{q}^{lp}))}{\delta_m(\bar{q}^{lp})^2} = 0 \quad (\text{IV.2.35})$$

²⁸This follows from $F''(\cdot) > 0$ and $F'''(\cdot) \geq 0$.

such that

$$\delta_m \left(\bar{q}^{lp} \right)^2 = \delta_{mm} \left(\bar{q}^{lp} \right) \left(r + \delta \left(\bar{q}^{lp} \right) \right). \quad (\text{IV.2.36})$$

Using (IV.2.34) and (IV.2.36), it can be solved for the optimal verification effort of m^* given \bar{q}^* . Given the outcomes for the commercial lobbying service market, the optimal minimum financial contribution of \bar{f}^* follows from the lobbyist's incentive compatibility condition, described in (IV.2.30), and the pair $\{\bar{q}^*, m^*\}$.

IV.2.6.2. Corner Solution: Verification Effort

Now suppose $\alpha = 0$ implying that a policymaker does not value financial contributions. Therefore, each policymaker sets $\bar{f}_m^{lp} = 0$ to maximize lobbyists' available resources for verification efforts and a lobbyist who would make a financial contribution would be dropped. So a lobbyist's best-response is $f_m^* = 0$. The first-order condition for the quality threshold with $\alpha = 0$ is

$$\frac{\partial E[\Pi^p]}{\partial \bar{q}^{lp}} = \frac{\rho(x^+)s}{T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] \frac{\partial m^*}{\partial \bar{q}^{lp}}. \quad (\text{IV.2.37})$$

It follows that for $\frac{\partial E[\Pi^p]}{\partial \bar{q}^{lp}} = 0$ it has to hold that $\frac{\partial m^*}{\partial \bar{q}^{lp}} = 0$. This is similar to Esfahani and Salehi-Isfahani (1989) with a general bell-shaped distribution, and the derivation is the following: Using the lobbyist's best-response, (IV.2.26), and differentiating with respect to \bar{q}^{lp} , it has to hold for $\frac{\partial m^*}{\partial \bar{q}^{lp}} = 0$ that

$$\frac{r + \delta' \left(\bar{q}^{lp} \right)}{\delta'_m \left(\bar{q}^{lp} \right)} = 0. \quad (\text{IV.2.38})$$

It follows that a policymaker chooses a \bar{q}^{lp} that solves (IV.2.38). A policymaker balances two effects: 1) if the quality threshold is low, then a lobbyist expects that not many proposals have to be verified to reach the announced quality for presented policy proposals, and 2) if the quality threshold is high, then a lobbyist expects that many proposals

have to be verified to reach the threshold but is likely to be dropped. The global maximum for (IV.2.38) depends on the distribution function $\delta(\cdot)$, which is characterized in section IV.2.4.1 as an approximated normal distribution. Given the shape of the normal density function, the maximum is global and unique. Using the unique value of \bar{q}_m^* that solves (IV.2.37) and the lobbyist's stationary first-order condition from (IV.2.26), the corresponding m^* solves

$$F(m^l) + F'(m^l) \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} \Big|_{\bar{q}^{lp}=\bar{q}_m^*} = kn^l - G(n^l) - \frac{rV^c}{1+r} \quad (\text{IV.2.39})$$

and the optimal m^* is unique because of the convexity of $F(\cdot)$ and $F'(\cdot)$.

IV.2.6.3. Corner Solution: Financial Contribution

Finally, suppose policymakers do not value verification efforts sufficiently and desire only financial contributions. A policymaker avoids providing any incentives for costly verification effort as it reduces a lobbyist's resources and they hence choose a quality threshold of $\bar{q}_f^* = 0$. Since a policymaker can monitor perfectly a lobbyist's current financial contribution in $t + 1$, the policymaker takes only the participation constraint into account and tries to extract all available rents. It follows that the participation constraint is binding. The optimal financial contribution minimum follows from (IV.2.29) with

$$\frac{V^l - V^c}{1+r} = f_t^{lp}. \quad (\text{IV.2.40})$$

Using the stationary expected payoff described in (IV.2.24) with $V^l - V^c$, it follows that

$$V^l - V^c = \frac{(1+r)(kn^l - G(n^l) - f^{lp})}{r} - V^c \quad (\text{IV.2.41})$$

and with (IV.2.40) that

$$\frac{(kn^l - G(n^l) - f^{lp})}{r} - \frac{V^c}{1+r} = f^{lp}. \quad (\text{IV.2.42})$$

This can be reduced to

$$kn^l - G(n^l) - \frac{rV^c}{1+r} = (1+r)\bar{f}_f^* \quad (\text{IV.2.43})$$

with $f_f^* = \bar{f}_f^*$.

IV.3. Equilibrium

The equilibrium is characterized by a steady state in the markets for lobbying labor, commercial lobbying services, and political access. The lobbying labor market is in equilibrium if the inflow of citizens into the lobbying industry is equal to the outflow of lobbyists who have lost political access to policymakers. The market for commercial lobbying services is in equilibrium if the demand equals the supply of intermediation services. Finally, the political access market is in equilibrium if there is a Nash equilibrium between policymakers in choosing political access rules, as well as citizens lobbyists respond optimally to these announced rules. In the following, the equilibrium with an interior solution to the policymaker's problem is derived. The equilibrium for each corner solution can be found in the Appendix C.1. and C.2. The presented steady state consists of homogeneous citizens, lobbyists, and policymakers and is solved with symmetry for each group.

IV.3.1. Lobbying Labor Market

The citizen's entry into the lobbying industry depends on the expected payoffs for citizens and lobbyists as well as the availability of political access. The availability of political access is determined by the number of lobbyists who lose political access to policymakers, which can be written as $\delta_t L_t$. The probability of entering the market for

political access and becoming a lobbyist for a citizen, h_t , is

$$h_t = \frac{\delta_t L_t}{C_t + \delta_t L_t} \quad (\text{IV.3.1})$$

and depends on the number of lobbyists losing political access and the number of citizens competing for entry. The value asset equation for a citizen can be written as

$$V^c = h_t \Pi^l + (1 - h_t) \left(\Pi_t^c + \frac{V^c}{1 + r} \right) = h_t \Pi^l + (1 - h_t) \Pi_t^c + \frac{(1 - h_t) V^c}{1 + r} \quad (\text{IV.3.2})$$

with

$$V^c = \frac{(1 + r) (h_t \Pi^l + (1 - h_t) \Pi_t^c)}{r + h_t}. \quad (\text{IV.3.3})$$

The value asset equation for a lobbyist follows from the lobbyist's expected lifetime payoff in the steady state as described in (IV.2.23). Given the opportunity for access, the citizen's entry decision depends on whether $V^l \geq V^c$.

IV.3.2. Market for Lobbying Services

The citizens' demand for commercial lobbying with political capture by lobbyists in t follows from (IV.2.3). Since lobbying firms are identical, the market demand for commercial lobbying services can be written as

$$k_t = k \left(n_t^l \right) = \frac{\tilde{a}_t^{lp}}{n_t^l} \pi^c \text{ for every } l \text{ and } t. \quad (\text{IV.3.4})$$

Each lobbying firms takes the market fee, k_t , as given and determines its optimal size. Using lemma 10, the supply of commercial lobbying services solves

$$k_t = k \left(n_t^l \right) = G' \left(n_t^l \right) \text{ for every } l \text{ and } t. \quad (\text{IV.3.5})$$

Using the market demand (IV.3.4) and the market supply (IV.3.5), the equilibrium condition for the lobbying service market can be written as

$$\frac{\bar{P}A^p}{n_t^l} \pi^c = G' \left(n_t^l \right) \text{ for every } l \text{ and } t. \quad (\text{IV.3.6})$$

The market clearing lobbying service fee depends on the number of clients, lobbyists' political access, the private benefit of an enacted policy proposal, and the cost of processing proposals. Suppose lobbying firms increase the number of clients sequentially and therefore each citizen is a client of a lobbying firm – i.e., $C_t = n_t L_t$.

IV.3.3. Market for Political Access

As shown in the policymaker's problem, policymakers want to employ all political resources and have no incentive to allocate political access to citizens – i.e., $A_t = \bar{P}A^p$ and $\tilde{a}_t^c = 0$. The symmetric political access for each lobbyist can be written as

$$\tilde{a}_t^{lp} = \frac{\bar{P}A^p}{L_t} \text{ for every } t. \quad (\text{IV.3.7})$$

The number of presented unverified proposals and the number of proposals disappearing in the lobbying firm follow from

$$n_t^l = m_t^{lp} + u_t^{lp} + r_t^l \text{ for every } l \text{ and } t \quad (\text{IV.3.8})$$

and the lobbyist's portfolio of presented proposals from

$$\tilde{a}_t^{lp} = \rho(x^+) m_t^{lp} + u_t^{lp} \text{ for every } l \text{ and } t. \quad (\text{IV.3.9})$$

The announced quality threshold, \tilde{q}_t^{lp} , follows from (IV.2.36); the number of verified proposals for $n_t^l > m_t^{lp}$ follows from (IV.2.34). Finally, the required minimum financial

contribution, \bar{f}_t^{lp} , follows from \bar{q}^* , m^* , and the lobbyist's incentive compatibility constraint (IV.2.30). The lobbyist's best-response to \bar{f}^* is $f^* \geq \bar{f}^*$ depending on $V^l \geq V^c$.

IV.3.4. Solution

The full steady state equilibrium with symmetry is characterized by the previously described equilibrium conditions and the population constraint

$$T = C_t + L_t + \bar{P}, \quad (\text{IV.3.10})$$

where \bar{P} follows from the constitution. The number of lobbyists can be written as

$$L_t = \frac{T - \bar{P}}{1 + n_t^l}, \quad (\text{IV.3.11})$$

because of $C_t = L_t n_t^l$ and (IV.3.10).

In the steady state all endogenous variables, X , of the system do not vary over time – i.e., $X_t = X_{t+1}$. First, using (IV.3.6), (IV.3.7), and (IV.3.11), the equilibrium number of clients per firm is

$$\frac{n^*}{1 + n^*} \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=n^*} = \frac{\bar{P} A^p \pi^c}{T - \bar{P}}. \quad (\text{IV.3.12})$$

The equilibrium number of clients is positive and unique.²⁹ The equilibrium lobbying service fee follows immediately such that

$$k^* = \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=n^*}. \quad (\text{IV.3.13})$$

Using (IV.3.11) and (IV.3.12), the equilibrium number of lobbyists and citizens is

$$L^* = \frac{T - \bar{P}}{1 + n^*} \text{ and } C^* = L^* n^*. \quad (\text{IV.3.14})$$

²⁹See the Appendix of Chapter II.

Each lobbying firm receives political access of

$$\tilde{a}^* = \frac{\bar{P}A^p}{L^*} \quad (\text{IV.3.15})$$

in exchange for lobbying efforts. The lobbying efforts are best-responses to the announced political access rule of $\{\tilde{a}^*, \bar{q}^*, \bar{f}^*\}$, where the equilibrium minimum quality threshold follows from (IV.2.36) such that

$$\delta_m \left(\bar{q}^{lp} \right)^2 \Big|_{\bar{q}^{lp}=\bar{q}^*} = \delta_{mm} \left(\bar{q}^{lp} \right) \left(r + \delta \left(\bar{q}^{lp} \right) \right) \Big|_{\bar{q}^{lp}=\bar{q}^*}. \quad (\text{IV.3.16})$$

The corresponding equilibrium best-response for the verification effort follows from (IV.2.34) such that

$$\begin{aligned} & \left(F' \left(m^{lp} \right) - F'' \left(m^{lp} \right) \frac{r + \delta \left(\bar{q}^{lp} \right)}{\delta_m \left(\bar{q}^{lp} \right)} \Big|_{\bar{q}^{lp}=\bar{q}^*} \right) \Big|_{m^{lp}=m^*} \\ &= \frac{\rho(x^+)s}{\alpha T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)]. \end{aligned} \quad (\text{IV.3.17})$$

Using (IV.3.9) and the equilibrium values from (IV.3.15) and (IV.3.17), the equilibrium of unverified presented proposals per firm follows from (IV.3.9) such that

$$u^* = \tilde{a}^* - \rho(x^+)m^*. \quad (\text{IV.3.18})$$

The equilibrium number of proposals that disappear in each lobbying firm follows from (IV.3.8) with (IV.3.12), (IV.3.17), and (IV.3.18) such that

$$r^* = n^* - m^* - u^*. \quad (\text{IV.3.19})$$

The equilibrium inflow of citizens into the lobbying industry follows from (IV.3.1), (IV.3.14), and (IV.3.16) such that

$$h^* = \frac{\delta^*}{n^* + \delta^*}. \quad (\text{IV.3.20})$$

The equilibrium value for the citizen's expected lifetime payoff follows from the notion that there is private rent-dissipation for citizens in equilibrium – i.e., $\Pi_t^c = 0$ – and that a positive expected lifetime payoff is entirely determined by potential entry and positive rents for lobbyists.³⁰ It follows from (IV.3.3) that

$$V^c = \frac{(1+r)h^*\Pi^l}{r+h^*}. \quad (\text{IV.3.21})$$

The steady state values for Π^l , V^l , V^c , \bar{f}^{lp} , and f^{lp} can be solved with $\Pi^l = V^l$, (IV.2.19), (IV.2.23), (IV.2.26), and (IV.3.21). Using (IV.2.23) and (IV.3.21), the following can be obtained

$$V^l = \frac{(1+r)(kn^l - G(n^l) - F(m^{lp}) - f^{lp})(r+h)}{r(r+h+\delta(\bar{q}^{lp})(1-h))}. \quad (\text{IV.3.22})$$

Using (IV.2.26) and (IV.3.21), it follows that

$$f^{lp} = kn^l - G(n^l) - F(m^{lp}) + F'(m^{lp}) \frac{r+\delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} - \frac{rh}{r+h} V^l. \quad (\text{IV.3.23})$$

The equilibrium minimum financial contribution can be derived with (IV.3.22) and (IV.3.23) such that

$$\bar{f}^* = k^*n^* - G(n^*) - F'(m^{lp}) \frac{r+\delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} \frac{r+h^*+\delta(\bar{q}^{lp})r(1-h^*)}{r+\delta(\bar{q}^{lp})(1-h^*)-rh^*} \Big|_{n^l=n^*, m^{lp}=m^*, \bar{q}^{lp}=\bar{q}^*} \quad (\text{IV.3.24})$$

³⁰This follows from the citizen's willingness to pay and the equilibrium service fee described in (IV.3.6).

with the lobbyist's equilibrium best-response of $f^* = \bar{f}^*$. The expected lifetime payoff for a lobbyist in the steady state is

$$V^{l*} = \left(k^* n^* - G(n^l) - F'(m^{lp}) \frac{r + \delta(\bar{q}^{lp})}{\delta_m(\bar{q}^{lp})} - f^* \right) \frac{r + h^*}{rh^*} \Big|_{n^l=n^*, m^{lp}=m^*, \bar{q}^{lp}=\bar{q}^*} \quad (\text{IV.3.25})$$

Finally, the expected lifetime payoff for a citizen in the steady state is

$$V^{c*} = \frac{(1+r)h^*}{r+h^*} V^{l*}. \quad (\text{IV.3.26})$$

If there is a steady state with both a positive level of verification efforts and financial contributions, then it follows from proposition 17 and (IV.3.26) that $V^{l*} > V^{c*} > 0$. Comparing this result to the previous result discussed in proposition 7 of chapter III, it can be stated that both lobbyists and citizens realize expected private benefits and are both better off with respect to private benefits than in the scenario with perfect observability of lobbying efforts. Here, lobbyists realize information rents, which are protected by policymakers' access rules, and citizens realize private rents from limited entry into the political establishment. The dismissal of "unlucky" lobbyists gives policymakers credibility, induces lobbyists to undertake unobservable efforts, and spreads private benefits. However, the quality of political decisions and the implications for social welfare depend on the policymakers' preferences and choice of political access rules. This can be summarized as to the following:

Proposition 19. *The repeated personal interactions between lobbyists and policymakers as well as the resulting barriers to political entry create private benefits for both citizens and lobbyists. The social welfare effects are ambiguous.*

So if commercial lobbying is socially desirable and verification efforts are unobservable, then it would be desirable to have both a political capture by lobbyists and repeated personal interactions between lobbyists and policymakers with barriers to political entry

(proposition 17). However, if verification efforts are unobservable, then verification efforts at the firm-level are less (proposition 18) but the equilibrium number of lobbyists is unaffected. This implies that the social welfare implications can be obtained from proposition 18 and proposition 6 of chapter II. If there is an oververification at the firm-level, then a policymaker's imperfect monitoring may improve social outcomes; if there is an underverification at the firm-level, then imperfect monitoring may worsen social welfare. To summarize, the general welfare implications of repeated personal interactions depend on whether these interactions solve a policymaker's information problem (verification efforts) or a policymaker's contracting problem (financial contributions).

IV.4. Conclusion

This chapter provides an explanation for observed repeated personal interactions between lobbyists and policymakers. In the presence of asymmetric information about lobbyists' information improvements or the absence of binding contracts, policymakers have an incentive to initiate repeated personal interactions with lobbyists to solve their information and contracting problem. Lobbyists undertake current verification efforts and make promised financial contributions if repeated personal relationships promise them positive future profits. These rents arise when policymakers create barriers to entry and restrict the political establishment. If policymakers would not be able to promise future rents and to at least imperfectly monitor verification efforts, then lobbyists have no incentive to provide costly effort and policymakers would be trapped in a repeated "cheap talk" lobbying game. If commercial lobbying is socially desirable, then repeated personal interactions between lobbyists and policymakers improve social welfare outcomes. It has been shown that the welfare implications depend on the policymakers' preferences and the monitoring of verification efforts. Further, the verification efforts are less than in the full information scenario. However, imperfect information may improve welfare outcomes if policymakers cause an oververification at the firm-level otherwise.

The current analysis has focused on policymakers and abstracted from elected representatives. Nevertheless, the analysis can provide some insights for unobservable lobbying efforts and term limits for elected officials. Using the current analysis, a term limit would imply that a lobbyist has no incentive to provide any efforts to a policymaker who is in his last period of office. If politicians use repeated interactions to coordinate campaign contributions, then term limits would improve welfare. However, if repeated interactions solve a policymaker's information problem, then term limits would be socially undesirable.

CHAPTER V

CONCLUSION

The defining feature of this dissertation is its focus on commercial lobbying activities. The analysis presented in Chapter II introduces a novel model of lobbying that examines the behavior commercial lobbying firms as well as the welfare implications of commercial lobbying activities in a general equilibrium framework with simultaneity of information acquisition and financial contributions. In Chapter III the analysis focuses on the optimal regulation of commercial lobbying activities and the endogenous choice of political institutions regulating such activities. In Chapter IV policymakers cannot observe lobbyists' verification efforts and contract with lobbyists about financial contributions. It is shown that repeated personal interactions between a lobbyist and a policymaker solve the policymaker's information and contracting problem.

The economic literature has focused on the political influence activities of classical special interest groups that compete for political ends and are directly affected by the political outcomes they lobby for. However, direct observation reveals that lobbyists are usually either representatives of classical special interest groups or employees of commercial lobbying firms. Empirical evidence suggests that commercial lobbyists are more and more prevalent with respect to their numbers and lobbying revenues (Bertrand, Bombardini, and Trebbi 2011). In contrast to special contrast groups, commercial lobbying firms are not directly affected by policy outcomes and they represent a variety of clients. Further, commercial lobbying firms act as intermediaries between their clients and policymakers who grant them political access. Therefore, they have to balance their clients' interests and policymakers' demands to avoid adverse effects to other clients. In short, commercial lobbying firms compete for political access that they can sell to a variety of clients for economic profit; special interest groups compete for political access that allows them to shape political ends for private benefits.

Lobbying activities are widely observed in democracies today, and understanding their mechanisms and consequences is essential in formulating policies and regulation. This dissertation makes some progress towards this goal by examining the underlying structure and mechanisms of commercial lobbying activities that seem to be more and more prevalent. Most Western democracies have only limited forms of regulation or no regulation at all. This makes it difficult to provide more than just anecdotal evidence for most countries. However, public concern about lobbying and commercial lobbying activities is present in most Western democracies. The dissertation provides some theoretical insights that may help the public and policymakers in addressing these discussions.

The distinct characteristics of commercial lobbying activities in this dissertation have been: The existence of firms that act as intermediaries between many clients and policymakers, an observed expertise by commercial lobbyists, the observed simultaneous provision of information acquisition and financial contributions, as well as observed personal repeated interactions between lobbyists and policymakers. The analysis in Chapter II addressed all but the last characteristic. It has been argued that commercial lobbyists possess an expertise that allows them to make predictions about the social desirability of policy proposals. This expertise gives policymakers an incentive to allocate political access to lobbyists. It is an exchange of political access for the lobbyists' provision of socially desirable information and privately beneficial financial contributions. Citizens with policy proposals, which yield private benefits if enacted, hire commercial lobbyists to increase the likelihood of having a policy proposal enacted. In Chapter IV the analysis extended the baseline model of commercial lobbying and examined the observed personal repeated interactions. It was shown that repeated interactions with lobbyists solve a policymaker's information and contracting problem in the presence of unobservable information acquisition and in the absence of legally binding contracts between policymakers and lobbyists.

The public concern about commercial lobbying activities and the role of transparency about these activities were addressed in Chapter III. The analysis derived the conditions for a socially desirable optimal regulation of commercial lobbying activities and highlighted the importance of transparency about financial transfers as well as information transfers from lobbyists to policymakers. It was shown that policymakers may request a socially undesirable mix of verification efforts and financial contributions and that lobbyists and policymakers may have an incentive to substitute financial contributions for socially desirable information improvements.

It was argued that a cross-national comparison of lobbying activities and commercial lobbying activities is difficult because of the currently limited availability of data. A cross-national comparison of lobbying and its relevance rest on anecdotal evidence for most Western democracies. The analysis in Chapter II and IV abstracted to a large degree from institutional differences and focused on the characteristics of commercial lobbying activities that seem to be common in most Western democracies. The analysis in Chapter III addressed the cross-national differences in the regulation of commercial lobbying activities. It was shown that institutional differences can be explained by efficiency or equity. The observed lack of institutions that regulate lobbying and commercial lobbying activities can be explained by either self-interested policymakers who do not distort the social benefits of commercial lobbying too much or by citizens who do not have sufficient political power to initiate political reforms.

There remain unanswered questions and much research is left for future work. The analysis in this dissertation focused on policymakers in a general sense. It abstracted from political competition amongst politicians who enact policies and compete for offices as well as political campaign resources. Future research could address how policymakers with different degrees of dishonesty compete for political offices and how citizens could keep politicians and their use of commercial lobbying accountable. Further, the models of commercial lobbying presented in this dissertation assumed that spillovers are shared by

all agents in the society and that these spillovers are symmetric. Including distributional differences for spillover shares and heterogeneous spillover magnitudes, the analysis of commercial lobbying could be extended and examine observed issues of partisan polarization or different political agendas of policymakers. Some policy proposals may have spillovers that either affect many people or only a few people severely. These different spillover effects may explain a partisan polarization or the formation of coalition amongst different citizens lobbying for or against policies. Further, different spillovers may also explain personal relationships between lobbyists with a specific issue expertise and policymakers with specific assignments or agendas. A policymaker with a specific political office or political agenda may use commercial lobbyists to provide exactly these proposals that fit the policymaker's office or agenda.

APPENDIX A

CHAPTER II APPENDIX

A.1. Perfectly Honest Policymakers

For the special case of perfectly honest policymakers, $\alpha = 0$, who do not value financial contributions, the following can be stated.

Proposition 20. *If lobbying contacts have sufficient lobbying resources, then each perfectly honest policymaker approves only proposals with positive verification signals.*

Proof. See the Appendix. □

Each perfectly honest policymaker maximizes expected spillovers given firms' resources. But it is not necessarily the case that this is socially efficient. A perfectly honest, but self-interested, policymaker does not internalize the costs of lobbying. Furthermore because other agents in the economy do not fully internalize spillovers, the policymaker may face a resource constraint in terms of resources to finance verification. Notice that these two distortions with respect to verification work in opposite directions creating the possibility that verification will be at the socially optimal level.

Lemma 11. *If there are sufficient financial resources in each lobbying firm to verify all presented proposals, then a perfectly honest policymaker does not dissipate all private economic rents. However, if there are insufficient financial resources to verify all presented proposals, then perfectly honest policymakers' demands for verification exhaust all private rents.*

If revenues earned from lobbying equal or exceed the processing and requested verification costs, $\lambda^{lp} = 0$, and enough citizens hire lobbyists, $\omega^{lp} = 0$, then lobbyists realize a positive economic profit. In comparison to the case of a dishonest policymaker, a perfectly honest policymaker requests exclusively proposals with positive verification signals and does

not request financial contributions to extract remaining economic lobbying rents. However, a perfectly honest policymaker's verification demands may exhaust all lobbying rents and cause that lobbying firms break even.

A.2. Proofs

A.2.1. Proof of Proposition 2

For the first statement, suppose $PA^p > A$. In case of an excess of political resources, decreasing political resources by civilizing a policymaker would increase the number of available proposals, which are in expected terms welfare increasing. This holds iff $\pi^c + E[e^c] > \theta$. If this condition would not hold, then it would be optimal to have a population only consisting of policymakers. Now suppose $PA^p < A$. It is not feasible that the number of approved proposals exceeds the available political resources.

For the second statement, suppose $PA^p > C$. In case of an excess of political resources, decreasing political resources by civilizing a policymaker would increase the number of available proposals, which are accepted because of $PA^p = A$. This holds iff $\pi^c + E[e^c] > \theta$. Now suppose $PA^p < C$. Assigning a disenfranchised citizen, who receives only a common share of aggregate spillovers, to a political office would increase the expected social welfare by $A^p (\pi^c + E[e^c]) + \theta$.

Therefore, $PA^p = A$ and $PA^p = C$.

A.2.2. Proof of Proposition 3

For the first statement, $PA^p = P$, see proof A.2.1.

For the third statement, suppose $\rho(x^+)m^*L < PA^p$. This would describe an excess of political resources and approving proposals with negative verification signal would decrease expected social welfare. Social welfare could be increased by decreasing political resources and increasing the number of verified proposals supplied through more lobbyists.

Now suppose $\rho(x^+)m^*L > PA^p$. This excess of verification is socially wasteful and less verification efforts would increase welfare.

For the second statement, suppose $m^*L < C$. Increasing the number of lobbyists would increase the number of verified policy proposals. By assumption, commercial lobbying is socially efficient and outweighs the costs of citizens now being a lobbyist. Now suppose $m^*L > C$. It is not feasible that there are more clients than citizens.

To summarize, it follows that $PA^p = A$, $m^*L = C$, and $\rho(x^+)m^*L = PA^p$.

A.2.3. Proof of Proposition 4

The first statement relates to the comparison of P^* and P^{**} . It follows that

$$\begin{aligned}
P^* &\stackrel{\geq}{\leq} P^{**} \\
\frac{T}{A^p + 1} &\stackrel{\geq}{\leq} \frac{\rho(x^+)m^*T}{\rho(x^+)m^* + A^p + A^pm^*} \\
\rho(x^+)m^* + A^p + A^pm^* &\stackrel{\geq}{\leq} A^p\rho(x^+)m^* + \rho(x^+)m^* \\
1 + m^* &\stackrel{\geq}{\leq} \rho(x^+)m^* \\
1 &\stackrel{\geq}{\leq} (\rho(x^+) - 1)m^* \tag{A.2.1}
\end{aligned}$$

where $\rho(x^+) \leq 1$ and $m^* > 0$.

A.2.4. Proof of Lemma 2

The second statement relates to the comparison of P^* and $P^{**} + L^{**}$. It follows that

$$\begin{aligned}
P^* &\stackrel{\geq}{\leq} P^{**} + L^{**} \\
\frac{T}{A^p + 1} &\stackrel{\geq}{\leq} \frac{\rho(x^+)m^*T}{\rho(x^+)m^* + A^p + A^pm^*} + \frac{TA^p}{\rho(x^+)m^* + A^p + A^pm^*} \\
\rho(x^+)m^* + A^p + A^pm^* &\stackrel{\geq}{\leq} A^p\rho(x^+)m^* + A^{p^2} + \rho(x^+)m^* + A^p \\
(1 - \rho(x^+))m^* &\stackrel{\geq}{\leq} A^p. \tag{A.2.2}
\end{aligned}$$

Therefore, $P^* > P^{**}$ and $P^* < P^{**} + L^{**}$ if $\rho(x^-)m^* < A^p$.

A.2.5. Proof of Lemma 3

If $\alpha \in (0, 1]$, then the first term in (II.4.12) is positive. Suppose $\lambda^{lp} = 0$, then (II.4.12) is positive and a policymaker can increase his payoff by increasing f^{lp} because of the lobbyist's financial resources. This contradicts $\lambda^{lp} = 0$.

Therefore, the lobbyists' participation constraint has to bind for $\alpha \neq 0$.

A.2.6. Proof of Proposition 5

An auxiliary result used for the subsequent statements. Suppose a policymaker's time resource is exhausted - $A^p = \sum_{l=1}^{lp} \tilde{a}^{lp}$. It follows that

$$\frac{s}{T} [\rho(e^+) - \rho(e^-)] + \frac{s}{T} \frac{\partial \sum_{h \neq l} \tilde{a}^{hp}}{\partial \tilde{a}^{lp}} [\rho(e^+) - \rho(e^-)] = 0, \quad (\text{A.2.3})$$

since one proposal crowds out another. Using (II.4.13) and (A.2.3), this can be written as

$$\frac{\partial E[\Pi^p]}{\partial \tilde{a}^{lp}} = -\omega^{lp} \leq 0 \text{ for every } l^p. \quad (\text{A.2.4})$$

If $\omega^{lp} > 0$, then $\tilde{a}^{lp} = 0$. Because of symmetry across lobbyists and exhausted political resources it has to be true that $\omega^{lp} = 0$. Now suppose a policymaker's resources are not exhausted - $A^p > \sum_{l=1}^{lp} \tilde{a}^{lp}$. It follows that

$$\frac{\partial E[\Pi^p]}{\partial \tilde{a}^{lp}} = \frac{s}{T} [\rho(e^+) - \rho(e^-)] - \omega^{lp} \leq 0 \text{ for every } l^p. \quad (\text{A.2.5})$$

If $\omega^{lp} = 0$, then a policymaker would allocate more political access to lobbyists until $A^p = \sum_{l=1}^{lp} \tilde{a}^{lp}$. On the other hand, if $\omega^{lp} > 0$ and A^p is not exhausted, then a policymaker would grant further access to firm j with $\omega^{jp} = 0$.

For the first statement with $\omega^{lp} = 0$. If $\frac{\partial E[\Pi^p]}{\partial m^{lp}} > 0$ and no unverified proposal is approved because of an exhausted policymaker's time constraint, then there is a corner solution with respect to verified proposals. Using lemma 3, remaining resources are extracted via financial contributions.

For the second statement with $\omega^{lp} = 0$. If $\frac{\partial E[\Pi^p]}{\partial m^{lp}} = 0$ and α is sufficiently small such that

$$\lambda^{lp} = \frac{\rho(x^+) \frac{s}{T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)]}{\frac{\partial F(\cdot)}{\partial m^{lp}}} > \alpha, \quad (\text{A.2.6})$$

then there is a corner solution with respect to verified and unverified proposals with $f^{lp} = 0$.

The number of verified proposals follows from

$$n^l k - \sum_{h \neq p} f^{lh} - F \left(m^{co} + \sum_{h \neq p} m^{lh} \right) - G(n^l) = E[\Pi^c | \text{private ben.}] \quad (\text{A.2.7})$$

with $u^{lp} > 0$.

For the third statement with $\omega^{lp} = 0$. If $\frac{\partial E[\Pi^p]}{\partial m^{lp}} = \frac{\partial E[\Pi^p]}{\partial f^{lp}} = 0$, then there is an interior solution with respect to verified and unverified proposals as well as financial contributions such that

$$\frac{\partial F(\cdot)}{\partial m^{lp}} = \rho(x^+) \frac{s}{\alpha T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] \quad (\text{A.2.8})$$

with $u^{lp} > 0$ and $f^{lp} > 0$.

For the fourth statement. Suppose $\alpha > \rho(x^+) \frac{s}{T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)]$. In this case, the marginal benefit from a financial contribution outweighs the marginal benefit from a verified proposal independent of the amount of verification. The policymaker extracts all resources via financial contributions and approves only unverified proposals.

A.2.7. Proof of Proposition 6

Take (II.4.19) and define the threshold value m^t for equal verification on the firm level such that

$$\left. \frac{\partial F(\cdot)}{\partial m^l} \right|_{\sum m^l p = m^t} = \frac{1}{\alpha T} \left(\left. \frac{\partial F(m^l)}{\partial m^l} \right|_{m^l = m^t} + \left. \frac{\partial G(n^l)}{\partial n^l} \right|_{n^l = m^t} \right). \quad (\text{A.2.9})$$

Solving for the condition, we get

$$\left. \frac{\partial F(\cdot)}{\partial m^l} \right|_{m^l = m^t} = \frac{1}{\alpha T - 1} \left. \frac{\partial G(n^l)}{\partial n^l} \right|_{n^l = m^t}. \quad (\text{A.2.10})$$

Whenever the left-hand side is larger than the right-hand side of (A.2.10), policymakers' request lead to underverification on the firm level. Vice versa, whenever the left-hand side is less than the right-hand side of (A.2.10), policymakers' request lead to oververification.

A.2.8. Proof of Lemma 5

Suppose $C > n^l L$ for a symmetric market equilibrium. A discouraged realizes a private payoff of zero. Entering the lobbying industry given k , he could represent another discouraged citizen and contest the lobbying market equilibrium. Operating at lower marginal processing costs, $G'(\cdot)$, the entrant has more resources to provide in exchange to political access.

Now suppose $C < n^l L$ for a symmetric market equilibrium. It is not feasible that there are more clients than citizens.

Therefore, $C = n^l L$.

A.2.9. Uniqueness of Equilibrium Number of Clients per Firm

Define

$$H(n) = \frac{n}{1+n} \frac{\partial G(n)}{\partial n}. \quad (\text{A.2.11})$$

If $H(n)$ is monotonically increasing or decreasing, then $H(n)$ equal to a constant determines a unique n . Taking the derivative of $H(n)$ with respect to n , we have

$$\frac{\partial H(n)}{\partial n} = \frac{1}{1+n} \frac{\partial G(n)}{\partial n} - \frac{n}{(1+n)^2} \frac{\partial G(n)}{\partial n} + \frac{n}{1+n} \frac{\partial^2 G(n)}{\partial n^2}. \quad (\text{A.2.12})$$

The first two terms can be reduced to

$$\frac{1}{1+n} > \frac{n}{(1+n)^2} \quad (\text{A.2.13})$$

and therefore

$$\frac{\partial H(n)}{\partial n} > 0 \quad (\text{A.2.14})$$

since $\frac{\partial^2 G(n)}{\partial n^2} > 0$.

Therefore the number of clients per firm is unique.

A.2.10. Proof of Proposition 20

Take (II.4.11) and suppose $\lambda^{lp} = 0$. So we can write

$$\frac{\partial E[\Pi^p]}{\partial m^{lp}} = \rho(x^+) \frac{s}{T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] - \rho(x^-) \omega^{lp} \leq 0. \quad (\text{A.2.15})$$

Further suppose $\omega^{lp} = 0$. It follows that there is a corner solution with only approved proposals with positive verification signals and exhausted political resources.

Now suppose $\omega^{lp} > 0$. In this case all available policy proposals are verified and political resources are not exhausted since proposals with negative verification signals are ignored.

Therefore, only proposals with positive verification signals are approved if there are enough lobbying resources.

A.2.11. Proof of Lemma 6

Suppose commercial lobbying is welfare enhancing and the constitution determines the number of policymakers such that $\bar{P} = P^{**}$. All political resources are exhausted and it follows that

$$\rho(x^+)L^{**}m^* = \bar{P}A^p = L^\# \left(\rho(x^+)m^\# + u^\# \right). \quad (\text{A.2.16})$$

If $m^\# > m^*$, then $L^\# < L^{**}$. This is independent of $u^\#$. Given the number of policymakers and the population size, it follows that $C^\# > C^{**}$. Using lemma 5, it can be concluded that the industry is larger, $N^\# > N^{**}$, and with symmetry, firms are larger, $n^\# > n^{**}$. Therefore, the industry is larger and higher concentrated.

A.2.12. Proof of Lemma 7

Suppose commercial lobbying is welfare enhancing and the constitution determines the number of policymakers such that $\bar{P} = P^{**}$. All political resources are exhausted and it follows that

$$\rho(x^+)L^{**}m^* = \bar{P}A^p = L^\# \left(\rho(x^+)m^\# + u^\# \right). \quad (\text{A.2.17})$$

Suppose $m^\# < m^*$, then the following analysis depends on the level of $u^\#$.

If $\rho(x^+)m^* > \rho(x^+)m^\# + u^\#$, then $L^{**} < L^\#$. Given the number of policymakers and the population size, it follows that $C^\# < C^{**}$. Using lemma 5, it can be stated that the industry is smaller, $N^\# < N^{**}$, and by symmetry, firms are smaller, $n^\# < n^{**}$.

If $\rho(x^+)m^* < \rho(x^+)m^\# + u^\#$, then $L^{**} > L^\#$. Given the number of policymakers and the population size, it follows that $C^\# > C^{**}$. Using lemma 5, it can be concluded that the industry is larger, $N^\# > N^{**}$, and by symmetry, firms are larger, $n^\# > n^{**}$.

Therefore, if the commercial lobbying industry is larger and more concentrated or smaller and less concentrated than socially efficient depends on $\rho(x^+)m^* \gtrless \rho(x^+)m^\# + u^\#$.

A.3. Calculations

A.3.1. Comparative Statics of Market Equilibrium: Jacobian

Population:

$$g_1 = T - \bar{P} - C - L = 0. \quad (\text{A.3.1})$$

Political access:

$$g_2 = \bar{P}A^p - L \left(\rho(x^+)m^l + u^l \right) = 0. \quad (\text{A.3.2})$$

Free entry:

$$g_3 = n^l k - F(m^l) - G(n^l) - f^l - \frac{\rho(x^+)m^l + u^l}{n^l} \pi^c + k = 0. \quad (\text{A.3.3})$$

with symmetry for $\forall l$.

Demand for commercial lobbying services:

$$g_4 = \frac{\bar{P}A^p}{Ln^l} \pi^c - k = 0. \quad (\text{A.3.4})$$

Supply of commercial lobbying services:

$$g_5 = \frac{\partial G(n^l)}{\partial n^l} - k = 0. \quad (\text{A.3.5})$$

Total number of clients:

$$g_6 = C - n^l L = 0. \quad (\text{A.3.6})$$

Verification effort per firm:

$$g_7 = \frac{\partial F(m^l)}{\partial m^{lp}} - \rho(x^+) \frac{s}{\alpha T} [\rho(e^+|x^+) - \rho(e^-|x^+) - \rho(e^+) + \rho(e^-)] = 0 \quad (\text{A.3.7})$$

with $m^l = \bar{P}m^{lp}$.

Firm's proposal portfolio:

$$g_8 = n^l - m^l - u^l - r^l = 0. \quad (\text{A.3.8})$$

The general Jacobian, J , of the system of equilibrium equations can be written as

$$J = \begin{bmatrix} \frac{\partial g_1}{\partial L} & \frac{\partial g_1}{\partial C} & \frac{\partial g_1}{\partial n^l} & \frac{\partial g_1}{\partial k} & \frac{\partial g_1}{\partial m^l} & \frac{\partial g_1}{\partial u^l} & \frac{\partial g_1}{\partial r^l} & \frac{\partial g_1}{\partial f^l} \\ \frac{\partial g_2}{\partial L} & \frac{\partial g_2}{\partial C} & \frac{\partial g_2}{\partial n^l} & \frac{\partial g_2}{\partial k} & \frac{\partial g_2}{\partial m^l} & \frac{\partial g_2}{\partial u^l} & \frac{\partial g_2}{\partial r^l} & \frac{\partial g_2}{\partial f^l} \\ \frac{\partial g_3}{\partial L} & \frac{\partial g_3}{\partial C} & \frac{\partial g_3}{\partial n^l} & \frac{\partial g_3}{\partial k} & \frac{\partial g_3}{\partial m^l} & \frac{\partial g_3}{\partial u^l} & \frac{\partial g_3}{\partial r^l} & \frac{\partial g_3}{\partial f^l} \\ \frac{\partial g_4}{\partial L} & \frac{\partial g_4}{\partial C} & \frac{\partial g_4}{\partial n^l} & \frac{\partial g_4}{\partial k} & \frac{\partial g_4}{\partial m^l} & \frac{\partial g_4}{\partial u^l} & \frac{\partial g_4}{\partial r^l} & \frac{\partial g_4}{\partial f^l} \\ \frac{\partial g_5}{\partial L} & \frac{\partial g_5}{\partial C} & \frac{\partial g_5}{\partial n^l} & \frac{\partial g_5}{\partial k} & \frac{\partial g_5}{\partial m^l} & \frac{\partial g_5}{\partial u^l} & \frac{\partial g_5}{\partial r^l} & \frac{\partial g_5}{\partial f^l} \\ \frac{\partial g_6}{\partial L} & \frac{\partial g_6}{\partial C} & \frac{\partial g_6}{\partial n^l} & \frac{\partial g_6}{\partial k} & \frac{\partial g_6}{\partial m^l} & \frac{\partial g_6}{\partial u^l} & \frac{\partial g_6}{\partial r^l} & \frac{\partial g_6}{\partial f^l} \\ \frac{\partial g_7}{\partial L} & \frac{\partial g_7}{\partial C} & \frac{\partial g_7}{\partial n^l} & \frac{\partial g_7}{\partial k} & \frac{\partial g_7}{\partial m^l} & \frac{\partial g_7}{\partial u^l} & \frac{\partial g_7}{\partial r^l} & \frac{\partial g_7}{\partial f^l} \\ \frac{\partial g_8}{\partial L} & \frac{\partial g_8}{\partial C} & \frac{\partial g_8}{\partial n^l} & \frac{\partial g_8}{\partial k} & \frac{\partial g_8}{\partial m^l} & \frac{\partial g_8}{\partial u^l} & \frac{\partial g_8}{\partial r^l} & \frac{\partial g_8}{\partial f^l} \end{bmatrix}. \quad (\text{A.3.9})$$

Given the equations above, the Jacobian can be written as

$$J = \begin{bmatrix} -1 & -1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\rho(x^+)m^l - u^l & 0 & 0 & 0 & 0 & -\rho(x^+)L & -L & 0 & 0 & 0 \\ 0 & 0 & k - \frac{\partial G(n^l)}{\partial n^l} + \frac{(\rho(x^+)m^l + u^l)\pi^c}{n^{l2}} & n^l + 1 & -\frac{\partial F(m^l)}{\partial m^l} - \frac{\rho(x^+)\pi^c}{n^l} & \frac{\pi^c}{n^l} & 0 & -1 & 0 & 0 \\ -\frac{\bar{P}A^p\pi^c}{L^2n^l} & 0 & -\frac{\bar{P}A^p\pi^c}{Ln^{l2}} & -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\partial^2 G(n^l)}{\partial n^{l2}} & -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ -n^l & 1 & -L & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\partial^2 F(m^l)}{\partial m^{l2}} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & -1 & -1 & -1 & 0 & 0 & 0 \end{bmatrix}. \quad (\text{A.3.10})$$

A.3.2. Comparative Statics of Market Equilibrium: Jacobian

The determinant of the Jacobian is

$$|J| = -\frac{\frac{\partial^2 F(m^l)}{\partial m^{l^2}} \left(\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)}{n^{l^2}} < 0. \quad (\text{A.3.11})$$

A.3.3. Comparative Statics of Market Equilibrium

A.3.3.1. Cramer's Rule

For the comparative statics with Cramer's Rule defined by

$$\frac{\partial y}{\partial x} = \frac{|J_y|}{|J|}, \quad (\text{A.3.12})$$

where y is an endogenous parameter and x an exogenous variable.

A.3.3.2. Comparative Statics of Market Equilibrium: Number of Policymakers

Verification per firm

$$\frac{\partial m^\#}{\partial \bar{P}} = \frac{|J_m|}{|J|} = 0. \quad (\text{A.3.13})$$

Lobbyists

$$\frac{\partial L^\#}{\partial \bar{P}} = \frac{|J_L|}{|J|} = -\frac{A^p \pi^c (L n^l + \bar{P}) + L n^{l^2} \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} < 0. \quad (\text{A.3.14})$$

Citizens

$$\frac{\partial C^\#}{\partial \bar{P}} = \frac{|J_C|}{|J|} = \frac{L n^l \left(A^p \pi^c - n^{l^2} \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} \geq 0. \quad (\text{A.3.15})$$

The sign depends on $A^p \pi^c - n^{l^2} \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \geq 0$.

Clients per firm

$$\frac{\partial n^\#}{\partial \bar{P}} = \frac{|J_n|}{|J|} = \frac{A^p \pi^c n^l (L + L n^l + \bar{P})}{L \left(\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} > 0. \quad (\text{A.3.16})$$

Lobbying service fee

$$\frac{\partial k^\#}{\partial \bar{P}} = \frac{|J_k|}{|J|} = \frac{A^p \pi^c n^l (L + Ln^l + \bar{P}) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{L \left(\bar{P} A^p \pi^c + Ln^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} > 0. \quad (\text{A.3.17})$$

Unverified proposals per firm

$$\frac{\partial u^\#}{\partial \bar{P}} = \frac{|J_u|}{|J|} = \frac{A^p \pi^c (\bar{P} A^p + (Ln^l + \bar{P})(\rho(x^+)m^l + u^l)) + Ln^{l^2} (A^p + A^p n^l + \rho(x^+)m^l + u^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{L \left(\bar{P} A^p \pi^c + Ln^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} > 0. \quad (\text{A.3.18})$$

Financial contributions per firm

$$\frac{\partial f^\#}{\partial \bar{P}} = \frac{\pi_t^c n_t^{l^2} A_t^p (L + Ln_t^l + \bar{P}) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}}}{L \left(\bar{P} A_t^p \pi_t^c + Ln_t^{l^2} (1 + n_t^l) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}} \right)} > 0. \quad (\text{A.3.19})$$

A.3.3.3. Comparative Statics of Market Equilibrium: Dishonesty

Verification per firm

$$\frac{\partial m^\#}{\partial \alpha} = \frac{|J_m|}{|J|} = -\rho(x^+) \frac{s}{\alpha^2 T} \frac{\psi}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} < 0. \quad (\text{A.3.20})$$

Lobbyists

$$\frac{\partial L^\#}{\partial \alpha} = \frac{|J_L|}{|J|} = 0. \quad (\text{A.3.21})$$

Citizens

$$\frac{\partial C^\#}{\partial \alpha} = \frac{|J_C|}{|J|} = 0. \quad (\text{A.3.22})$$

Clients per firm

$$\frac{\partial n^\#}{\partial \alpha} = \frac{|J_n|}{|J|} = 0. \quad (\text{A.3.23})$$

Lobbying service fee

$$\frac{\partial k^\#}{\partial \alpha} = \frac{|J_k|}{|J|} = 0. \quad (\text{A.3.24})$$

Unverified proposals per firm

$$\frac{\partial u^\#}{\partial \alpha} = \frac{|J_u|}{|J|} = \rho(x^+)^2 \frac{s}{\alpha^2 T} \frac{\psi}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} > 0. \quad (\text{A.3.25})$$

Financial contributions per firm

$$\frac{\partial f^\#}{\partial \alpha} = \frac{|J_f|}{|J|} = \rho(x^+) \frac{s}{\alpha^2 T} \psi \frac{\frac{\partial F(m^l)}{\partial m^l}}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} > 0. \quad (\text{A.3.26})$$

A.3.3.4. Comparative Statics of Market Equilibrium: Spillovers

Verification per firm

$$\frac{\partial m^\#}{\partial s} = \frac{|J_m|}{|J|} = \rho(x^+) \frac{1}{\alpha T} \frac{\psi}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} > 0. \quad (\text{A.3.27})$$

Lobbyists

$$\frac{\partial L^\#}{\partial s} = \frac{|J_L|}{|J|} = 0. \quad (\text{A.3.28})$$

Citizens

$$\frac{\partial C^\#}{\partial s} = \frac{|J_C|}{|J|} = 0. \quad (\text{A.3.29})$$

Clients per firm

$$\frac{\partial n^\#}{\partial s} = \frac{|J_n|}{|J|} = 0. \quad (\text{A.3.30})$$

Lobbying service fee

$$\frac{\partial k^\#}{\partial s} = \frac{|J_k|}{|J|} = 0. \quad (\text{A.3.31})$$

Unverified proposals per firm

$$\frac{\partial u^\#}{\partial s} = \frac{|J_u|}{|J|} = -\rho(x^+)^2 \frac{1}{\alpha T} \frac{\psi}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} < 0. \quad (\text{A.3.32})$$

Financial contributions per firm

$$\frac{\partial f^\#}{\partial s} = \frac{|J_f|}{|J|} = -\rho(x^+) \frac{1}{\alpha T} \psi \frac{\frac{\partial F(m^l)}{\partial m^l}}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} < 0. \quad (\text{A.3.33})$$

A.3.3.5. Comparative Statics of Market Equilibrium: Private Benefits

Verification per firm

$$\frac{\partial m^\#}{\partial \pi^c} = \frac{|J_m|}{|J|} = 0. \quad (\text{A.3.34})$$

Lobbyists

$$\frac{\partial L^\#}{\partial \pi^c} = \frac{|J_L|}{|J|} = -\frac{\bar{P} A^p L n^l}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} < 0. \quad (\text{A.3.35})$$

Citizens

$$\frac{\partial C^\#}{\partial \pi^c} = \frac{|J_C|}{|J|} = \frac{\bar{P} A^p L n^l}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.36})$$

Clients per firm

$$\frac{\partial n^\#}{\partial \pi^c} = \frac{|J_n|}{|J|} = \frac{\bar{P} A^p n^l (1 + n^l)}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.37})$$

Lobbying service fee

$$\frac{\partial k^\#}{\partial \pi^c} = \frac{|J_k|}{|J|} = \frac{\bar{P} A^p n^l (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.38})$$

Unverified proposals per firm

$$\frac{\partial u^\#}{\partial \pi^c} = \frac{|J_u|}{|J|} = \frac{\bar{P} A^p n^l (\rho(x^+) m^l + u^l)}{\bar{P} A^p \pi^c + L n^{l^2} (1 + n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.39})$$

Financial contributions per firm

$$\frac{\partial f^\#}{\partial \pi^c} = \frac{|J_f|}{|J|} = \frac{n_t^{l^2}(1+n_t^l)\bar{P}A_t^p \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}}}{\bar{P}A_t^p \pi_t^c + Ln_t^{l^2}(1+n_t^l) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}}} > 0. \quad (\text{A.3.40})$$

A.3.3.6. Comparative Statics of Market Equilibrium: Population

Verification per firm

$$\frac{\partial m^\#}{\partial T} = \frac{|J_m|}{|J|} = -\rho(x^+) \frac{s}{\alpha T^2} \frac{\psi}{\frac{\partial^2 F(m^l)}{\partial m^{l^2}}} < 0. \quad (\text{A.3.41})$$

Lobbyists

$$\frac{\partial L^\#}{\partial T} = \frac{|J_L|}{|J|} = \frac{\bar{P}A^p \pi^c + Ln^{l^2} \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{\bar{P}A^p \pi^c + Ln^{l^2}(1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.42})$$

Citizens

$$\frac{\partial C^\#}{\partial T} = \frac{|J_C|}{|J|} = \frac{Ln^{l^3} \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{\bar{P}A^p \pi^c + Ln^{l^2}(1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.43})$$

Clients per firm

$$\frac{\partial n^\#}{\partial T} = \frac{|J_n|}{|J|} = -\frac{\bar{P}A^p \pi^c n^l}{L \left(\bar{P}A^p \pi^c + Ln^{l^2}(1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} < 0. \quad (\text{A.3.44})$$

Lobbying service fee

$$\frac{\partial k^\#}{\partial T} = \frac{|J_k|}{|J|} = -\frac{\bar{P}A^p \pi^c n^l \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{L \left(\bar{P}A^p \pi^c + Ln^{l^2}(1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} < 0. \quad (\text{A.3.45})$$

Unverified proposals per firm

$$\begin{aligned} \frac{\partial u^\#}{\partial T} &= \frac{|J_u|}{|J|} = \frac{-\alpha T^2 (\rho(x^+)m^l + u^l) \frac{\partial^2 F(m^l)}{\partial m^{l^2}} \left(\bar{P}A^p\pi^c + Ln^{l^2} \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)}{\alpha LT^2 \frac{\partial^2 F(m^l)}{\partial m^{l^2}} \left(\bar{P}A^p\pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} \\ &\quad + \frac{\rho(x^+)^2 sL\psi \left(\bar{P}A^p\pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)}{\alpha LT^2 \frac{\partial^2 F(m^l)}{\partial m^{l^2}} \left(\bar{P}A^p\pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} \geq 0. \end{aligned} \quad (\text{A.3.46})$$

Financial contributions per firm

$$\begin{aligned} \frac{\partial f^\#}{\partial T} &= \frac{|J_f|}{|J|} \\ &= \frac{\rho(x^+)s\psi L \frac{\partial F(m_t^l)}{\partial m_t^{l^2}} \left(\bar{P}A_t^p\pi_t^c + Ln_t^{l^2} (1+n_t^l) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}} \right) - \alpha \pi_t^c n_t^{l^2} \bar{P}A_t^p T^2 \frac{\partial^2 F(m_t^l)}{\partial m_t^{l^2}} \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}}}{\alpha LT^2 \frac{\partial^2 F(m_t^l)}{\partial m_t^{l^2}} \left(\bar{P}A_t^p\pi_t^c + Ln_t^{l^2} (1+n_t^l) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}} \right)} \end{aligned} \quad (\text{A.3.47})$$

A.3.3.7. Comparative Statics of Market Equilibrium: Political Resources

Verification per firm

$$\frac{\partial m^\#}{\partial A^p} = \frac{|J_m|}{|J|} = 0. \quad (\text{A.3.48})$$

Lobbyists

$$\frac{\partial L^\#}{\partial A^p} = \frac{|J_L|}{|J|} = -\frac{\bar{P}\pi^c Ln^l}{\bar{P}A^p\pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} < 0. \quad (\text{A.3.49})$$

Citizens

$$\frac{\partial C^\#}{\partial A^p} = \frac{|J_C|}{|J|} = \frac{\bar{P}\pi^c Ln^l}{\bar{P}A^p\pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.50})$$

Clients per firm

$$\frac{\partial n^\#}{\partial A^p} = \frac{|J_n|}{|J|} = \frac{\bar{P}\pi^c n^l (1+n^l)}{\bar{P}A^p\pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.51})$$

Lobbying service fee

$$\frac{\partial k^\#}{\partial A^p} = \frac{|J_k|}{|J|} = \frac{\bar{P}\pi^c n^l (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}}{\bar{P}A^p \pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}}} > 0. \quad (\text{A.3.52})$$

Unverified proposals per firm

$$\frac{\partial u^\#}{\partial A^p} = \frac{|J_u|}{|J|} = \frac{\bar{P} \left(\pi^c (\bar{P}A^p + Ln^l (\rho(x^+)m^l + u^l)) + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)}{L \left(\bar{P}A^p \pi^c + Ln^{l^2} (1+n^l) \frac{\partial^2 G(n^l)}{\partial n^{l^2}} \right)} > 0. \quad (\text{A.3.53})$$

Financial contributions per firm

$$\frac{\partial f^\#}{\partial A^p} = \frac{|J_f|}{|J|} = \frac{\bar{P}\pi_t^c n_t^{l^2} (1+n_t^l) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}}}{\bar{P}A_t^p \pi_t^c + Ln_t^{l^2} (1+n_t^l) \frac{\partial^2 G(n_t^l)}{\partial n_t^{l^2}}} > 0. \quad (\text{A.3.54})$$

APPENDIX B

CHAPTER III APPENDIX

B.1. Proofs

B.1.1. Proof of Lemma 8

Suppose $E[\Pi^{s*}]$ is the maximum for social welfare. If this holds, then $\frac{1}{T}E[\Pi^{s*}]$ is the maximum expected individual payoff behind a veil of ignorance. It follows that no individual would have an incentive to oppose I^* with an expected payoff of $E[\Pi^{v*}] = \frac{1}{T}E[\Pi^{s*}]$ behind a veil of ignorance.

Now suppose $E[\Pi^{s**}]$ is the maximum for social welfare. If this holds, then $\frac{1}{T}E[\Pi^{s**}]$ is the maximum expected individual payoff behind a veil of ignorance. And it follows immediately that there is no incentive for an opposition ($E[\Pi^{v**}] = \frac{1}{T}E[\Pi^{s**}]$).

B.1.2. Proof of Proposition 10

For the first statement the goal is to identify whether a citizen would deviate from I^* or not. Suppose a citizen, d , attempts to hire another citizen, h , to act as a lobbyist. This would require that d would be better off and h not worse off. In addition a policymaker, g , has to agree to reallocate political access and cannot be worse off. Citizen d would deviate and attempt to hire h if $E[\Pi^{c*}] < E[\Pi^d]$ with

$$\begin{aligned} \pi^c + \frac{P^* A^p}{T} E[e^c] &< \rho(x^+) \pi^c - k + \frac{P^* A^p - 2}{T} E[e^c] + \frac{\rho(x^+) E[e^c | x^+]}{T} \\ \rho(x^-) \pi^c + k &< \frac{\rho(x^+) E[e^c | x^+] - 2E[e^c]}{T}, \end{aligned} \tag{B.1.1}$$

where h would give up a policy proposal and a policymaker g would not approve a policy proposal with a negative verification signal.

Since all potential Pareto-improvement are in a social optimum exhausted, there would have to exist at least one citizen, $w \neq d, h$, or one policymaker, $b \neq g$, who would be worse off. A citizen w is worse off if $E[\Pi^{c*}] > E[\Pi^w] = \pi^c + \frac{P^*A^p-2}{T}E[e^c] + \frac{\rho(x^+)E[e^c|x^+]}{T}$; a policymaker b is worse off if $E[\Pi^{p*}] > E[\Pi^b] = \theta + \frac{P^*A^p-2}{T}E[e^c] + \frac{\rho(x^+)E[e^c|x^+]}{T}$. Both can be reduced to

$$2E[e^c] > \rho(x^+)E[e^c|x^+]. \quad (\text{B.1.2})$$

Since $\rho(x^-)\pi^c + k > 0$, there is a contradiction between (B.1.1) and (B.1.2). Since no citizen d exists, there can be no citizen h and a citizen has no incentive to deviate from I^* .

For the second statement the goal is to identify whether a policymaker would deviate from I^* or not. Suppose a policymaker, i , deviates from $A^p = \bar{a}^c$ in the following way: one citizen, h , would not receive political access and another citizen, d , would be required to hire h to act as lobbyist who is required to verify d 's proposal. Policymaker i has an incentive to deviate if $E[\Pi^*] < E[\Pi^i]$ with

$$\begin{aligned} \theta + \frac{P^*A^p}{T}E[e^c] &< \theta + \frac{P^*A^p-2}{T}E[e^c] + \frac{\rho(x^+)}{T}E[e^c|x^+] \\ 2E[e^c] &< \rho(x^+)E[e^c|x^+], \end{aligned} \quad (\text{B.1.3})$$

which is i 's incentive condition. Citizen h would agree and not stay home if $k - F(1) - G(1) + \frac{\rho(x^+)}{T}E[e^c|x^+] \geq 0$; citizen d would agree to pay h and not stay home if $\rho(x^+)\pi^c - k + \frac{\rho(x^+)}{T}E[e^c|x^+] \geq 0$. Combining both inequalities with respect to k , the following can be written

$$\begin{aligned} \rho(x^+) \left(\pi^c + \frac{E[e^c|x^+]}{T} \right) &\geq k \geq F(1) + G(1) + \frac{\rho(x^+)}{T}E[e^c|x^+] \\ \rho(x^+)\pi^c &\geq F(1) + G(1), \end{aligned} \quad (\text{B.1.4})$$

which is the feasibility condition.

If both the incentive condition and the feasibility constraint hold, then a self-interested policymaker has an incentive to violate I^* and require verification efforts in exchange for political access.

Now suppose a policymaker, i , in the following way: one citizen, h , would not receive political access and another citizen, d , would be required to hire h to act as lobbyist who is required to make a financial contribution of f^i . Policymaker i would consider this if $E[\Pi^{p^*}] < E[\Pi^i]$ with

$$\begin{aligned} \theta + \frac{P^* A^p}{T} E[e^c] &< \theta + \frac{P^* A^p - 1}{T} E[e^c] + \alpha f^i \\ \frac{1}{\alpha T} E[e^c] &< f^i, \end{aligned} \tag{B.1.5}$$

which is i 's incentive condition. Citizen h would agree to the lobbying activity and not stay home if $k - G(1) - f^i + \frac{\rho(x^+)}{T} E[e^c] \geq 0$; citizen d would agree to pay h and not stay home if $\pi^c - k + \frac{\rho(x^+)}{T} E[e^c] \geq 0$. The maximum feasible f^i , f^m , would extract all private rents from d and h such that

$$f^m = \pi^c - G(1) + \frac{2}{T} E[e^c]. \tag{B.1.6}$$

Combining the incentive condition and f^m , the following can be written

$$\alpha > \left(T \left(\frac{\pi^c - G(1)}{E[e^c]} \right) + 2 \right). \tag{B.1.7}$$

If this condition holds, then a self-interested policymaker has an incentive to violate I^* and require financial contributions in exchange for political access.

B.1.3. Proof of Proposition 11

For the first statement the goal is to show that a citizen has no incentive to deviate from I^{**} . A citizen d would want to bypass a lobbyist if $E[\Pi^{c^{**}}] < E[\Pi^d] =$

$\pi^c + \frac{P^{**}A^p-1}{T}E[e^c|x^+] + \frac{1}{T}E[e^c]$ with

$$\frac{E[e^c|x^+] - E[e^c]}{T} < \rho(x^-)\pi^c + k. \quad (\text{B.1.8})$$

However, a policymaker h would have to reallocate political access from a lobbyist to citizen d but has no incentive since $E[\Pi^{p**}] > \theta + \frac{P^{**}A^p-1}{T}E[e^c|x^+] + \frac{1}{T}E[e^c]$. So a citizen has no incentive to deviate.

For the second statement the goal is to identify a mutual incentive for a lobbyist and policymaker to substitute f^{lp} for m^{lp} . A lobbyist h would bid or accept to pay a payment of b^h to a policymaker i if he could substitute b^h for a single verified proposal, $m^* - 1$. The bid of b^h would follow from $E[\Pi^{l**}] < E[\Pi^h]$ with

$$\begin{aligned} m^*k - F(m^*) - G(m^*) - f^{l*} + \frac{\bar{P}A^p}{T}E[e^c|x^+] < \\ m^*k - F(m^* - 1) - G(m^*) - \alpha f^{l*} - b^h + \frac{\bar{P}A^p - 1}{T}E[e^c|x^+] + \frac{1}{T}E[e^c], \end{aligned} \quad (\text{B.1.9})$$

which can be written as

$$b^h < F(m^*) - F(m^* - 1) - \frac{E[e^c|x^+] - E[e^c]}{T} \approx F'(m^* - 1) - \frac{E[e^c|x^+] - E[e^c]}{T}. \quad (\text{B.1.10})$$

A policymaker i would bid or accept a payment of b^i to allow lobbyist h to substitute b^i for a single verified proposal if $E[\Pi^{p**}] < E[\Pi^i]$ with

$$\begin{aligned} \theta + \alpha f^{p*} + \frac{\bar{P}A^p}{T}E[e^c|x^+] < \theta + \alpha f^{p*} + \alpha b^i + \frac{\bar{P}A^p - 1}{T}E[e^c|x^+] + \frac{1}{T}E[e^c] \\ b^i > \frac{1}{\alpha} \frac{E[e^c|x^+] - E[e^c]}{T}. \end{aligned} \quad (\text{B.1.11})$$

An agreement, as a mutual incentive, would be feasible if $b^l > b^i$ and that is if

$$F'(m^* - 1) > \frac{1 + \alpha}{\alpha} \frac{E[e^c|x^+] - E[e^c]}{T}. \quad (\text{B.1.12})$$

For the third statement the purpose is to identify whether a policymaker would exploit his powerful position. Suppose a policymaker i would attempt to gain additional private rents. Since all proposals are verified, there would be only financial contributions to gain. Policymaker i could threaten lobbyist h to reallocate political access to a citizen d . Citizen d would have any incentive to take the direct political access. So lobbyist h would lose some access and d as a client. Lobbyist h wants to avoid this if

$$\begin{aligned} k - F(m^*) + F(m^* - 1) - G(m^*) + G(m^* - 1) + \frac{1}{T} \frac{E[e^c|x^+] - E[e^c]}{T} \\ \approx k - F'(m^* - 1) - G'(m^* - 1) + \frac{1}{T} \frac{E[e^c|x^+] - E[e^c]}{T} > 0. \end{aligned} \quad (\text{B.1.13})$$

That is, h complies if h realizes an economic profit from client d . Policymaker i would be able to extract h 's economic profit via financial contribution requests.

B.1.4. Proof of Proposition 12

The purpose is to identify the conditions under which $I^{**} \succ I^*$ for a representative citizen.

First, suppose the representative citizen expects to be a citizen after a reform. If $P^*E[e^c] > P^{**}E[e^c|x^+]$, then

$$E[\Pi^{c*}] = \pi^c + \frac{P^*A^p}{T}E[e^c] > \rho(x^+)\pi^c - k + \frac{P^{**}A^p}{T}E[e^c|x^+] = E[\Pi^{c^{**}}] \quad (\text{B.1.14})$$

and the representative citizen does not oppose. Whereas if $P^*E[e^c] < P^{**}E[e^c|x^+]$ but $E[\Pi^{s*}] > E[\Pi^{s^{**}}]$, then the representative citizen opposes iff

$$\rho(x^-)\pi^c + k < \frac{A^p}{T} (P^{**}E[e^c|x^+] - P^*E[e^c]). \quad (\text{B.1.15})$$

Second, suppose the representative citizen expects to be a citizen or a lobbyist after a reform. If $P^*E[e^c] > P^{**}E[e^c|x^+]$, then

$$\begin{aligned} E[\Pi^{c*}] &= \pi^c + \frac{P^*A^p}{T}E[e^c] > \\ E[\Pi^{cl**}] &= \frac{C^{**}}{T-P^{**}}(\rho(x^+)\pi^c) - \frac{L^{**}}{T-P^{**}}(F(m^*) + G(m^*) + f^{l*}) + \frac{P^{**}A^p}{T}E[e^c|x^+] \end{aligned} \quad (\text{B.1.16})$$

and the representative citizen does not oppose. Whereas if $P^*E[e^c] < P^{**}E[e^c|x^+]$ but $E[\Pi^{s*}] > E[\Pi^{s**}]$, then the representative citizen opposes iff

$$\begin{aligned} \pi^c - \frac{1}{T-P^{**}}(C^{**}\rho(x^+)\pi^c - L^{**}(F(m^*) + G(m^*) + f^{l*})) < \\ \frac{A^p}{T}(P^{**}E[e^c|x^+] - P^*E[e^c]). \end{aligned} \quad (\text{B.1.17})$$

In both cases, the representative citizen opposes if the expected shares of spillover improvements through commercial lobbying outweighs the expected private costs.

B.1.5. Proof of Proposition 13

For the first statement the goal is to identify the conditions under which $I^{**} \succ I^*$ for a representative weaker policymaker. A representative weaker policymaker opposes I^* iff $E[\Pi^{p*}] < E[\Pi^{cl**}]$ with

$$\begin{aligned} \theta - \frac{1}{T-P^{**}}(C^{**}\rho(x^+)\pi^c - L^{**}(F(m^*) + G(m^*) + f^{l*})) < \\ \frac{A^p}{T}(P^{**}E[e^c|x^+] - P^*E[e^c]) \end{aligned} \quad (\text{B.1.18})$$

and $P^*E[e^c] < P^{**}E[e^c|x^+]$ but $E[\Pi^{s*}] > E[\Pi^{s**}]$.

For the second statement the goal is to identify the conditions under which $I^{**} \succ I^*$ for a representative stronger policymaker. A representative stronger policymaker opposes

I^* iff $E[\Pi^{p^*}] < E[\Pi^{p^{**}}]$ with

$$\alpha f^{p^*} + \frac{A^p}{T} (P^{**} E[e^c | x^+] - P^* E[e^c]) > 0 \quad (\text{B.1.19})$$

and $f^{p^*} \geq 0$.

B.1.6. Proof of Proposition 14

For the first statement the goal is to identify the conditions under which $I^{**} \succ I^*$ for a representative citizen and lobbyist. A representative citizen compares $E[\Pi^{c^{**}}]$ with $E[\Pi^{c^*}]$ and opposes iff

$$\rho(x^-)\pi^c + k > \frac{A^p}{T} (P^{**} E[e^c | x^+] - P^* E[e^c]). \quad (\text{B.1.20})$$

A representative lobbyist compares $E[\Pi^{l^{**}}]$ with $E[\Pi^{l^*}]$ and opposes iff

$$\pi^c - m^* k + F(m^*) + G(m^*) + f^{l^*} > \frac{A^p}{T} (P^{**} E[e^c | x^+] - P^* E[e^c]). \quad (\text{B.1.21})$$

For the second statement the goal is to identify the conditions under which $I^{**} \succ I^*$ for a representative policymaker who expects to stay in office even after an institutional reform. The comparison is

$$E[\Pi^{p^{**}}] = \theta + \alpha f^{p^*} + \frac{P^{**} A^p}{T} E[e^c | x^+] > \theta + \frac{P^* A^p}{T} E[e^c] = E[\Pi^{p^*}], \quad (\text{B.1.22})$$

with $P^{**} E[e^c | x^+] > P^* E[e^c]$ as a necessary condition for $E[\Pi^{s^{**}}] > E[\Pi^{s^*}]$ and a policymaker has no incentive to oppose the first-best institution I^{**} .

B.1.7. Proof of Lemma 9

Banning commercial lobbying as a single political measure leads to a payoff of $E[\Pi^{cban}]$ for a representative citizens. Comparing $E[\Pi^{cban}]$ to $E[\Pi^{c*}]$, it follows that

$$E[\Pi^{cban}] = \frac{P^{**} A^p}{T - P^{**}} \pi^c + \frac{P^{**} A^p}{T} E[e^c] < \pi^c + \frac{P^* A^p}{T} E[e^c] = E[\Pi^{c*}]. \quad (\text{B.1.23})$$

Therefore, citizens are better off to support an institutional change with more policymakers rather than just banning commercial lobbying.

B.1.8. Proof of Proposition 16

Suppose commercial lobbying is potentially welfare enhancing and the lobbying institution I^{**} is first-best. However, suppose I^{**} is not feasible. A representative citizen compares then the equilibrium payoff in the unregulated market outcome $E[\Pi^{c\#}]$ with a payoff without commercial lobbying. Using lemma 9, the alternative is $E[\Pi^{c*}]$. So whenever

$$\frac{A^p}{T} (P^{**} E[e^c|\alpha] - P^* E[e^c]) < \pi^c, \quad (\text{B.1.24})$$

citizens have a political incentive to implement I^* to constrain policymakers. This is different to the support by citizens in the first-best, which followed from

$$\frac{A^p}{T} (P^{**} E[e^c|x^+] - P^* E[e^c]) \gtrless \rho(x^-) \pi^c + k^*. \quad (\text{B.1.25})$$

Therefore, the decision depends on the degree of distortions caused by self-interested policymakers.

APPENDIX C

CHAPTER IV APPENDIX

C.1. Equilibrium for Corner Solution: Verification Effort

The equilibrium conditions for the lobbying labor market and the market for commercial lobbying services are not affected by a corner solution for the policymaker's problem with respect to verification efforts. It still holds that

$$\frac{n^*}{1+n^*} \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=n^*} = \frac{\bar{P} A^p \pi^c}{T - \bar{P}} \quad (\text{C.1.1})$$

and the equilibrium values of k^* , L^* , C^* , and \tilde{a}^* are identical. However, each policymaker sets $\bar{f}_m^{lp} = 0$ and maximizes the resources available for verification efforts. Lobbyists make no financial contributions, $f_m^* = \bar{f}_m^* = 0$, because it would signal a waste of resources. Equilibrium conditions of (IV.3.7), (IV.3.8), and (IV.3.9) still hold. Each policymaker sets \bar{q}^{lp} such that $\frac{\partial m^*}{\partial \bar{q}^{lp}} = 0$. It has been shown that there is a unique \bar{q}_m^* and therefore a unique steady state dismissal rate of δ_m^* . The steady state entry into the lobbying industry follows from $h_m^* = \frac{\delta_m^*}{n^* + \delta_m^*}$.

It still holds that there is a private rent dissipation for citizens as characterized in (C.1.1) – i.e., $\Pi_i^c = 0$ – and that $\Pi^l = V^l$ in steady state. The value asset equation for a citizen follows from (IV.3.3). The steady state first-order condition with respect to verification effort is characterized in (IV.2.39). Finally, the value asset equation for a lobbyist without financial contributions can be written as

$$V^l = \frac{(1+r)(kn - G(n) - F(m^{lp}))}{r + \delta(\bar{q}^{lp})} + \frac{\delta(\bar{q}^{lp})}{r + \delta(\bar{q}^{lp})} V^c. \quad (\text{C.1.2})$$

Using (IV.3.3), (IV.2.39), and (C.1.2), the steady state verification effort is

$$F(m^{lp}) + F'(m^{lp}) \frac{r + \delta(\bar{q}^{lp})}{\delta(\bar{q}^{lp})} \frac{r + h_m^* + \delta(\bar{q}^{lp})(r - rh_m^*)}{(r + \delta(\bar{q}^{lp}))(1 - h_m^*)} = k^*n^* - G(n^l) \Big|_{m^{lp}=m_m^*, \bar{q}^{lp}=\bar{q}_m^*, n^l=n^*}; \quad (\text{C.1.3})$$

the expected lifetime payoff for a lobbyist is

$$V^{l*} = \frac{(1+r)(r+h_m^*)(k^*n^* - G(n^l) - F(m^{lp}))}{r(r+h_m^* + \delta(\bar{q}^{lp})(1-h_m^*))} \Big|_{n^l=n^*, \bar{q}^{lp}=\bar{q}_m^*}; \quad (\text{C.1.4})$$

and the expected lifetime payoff for a citizen is

$$V^{c*} = \frac{(1+r)h_m^*}{r+h_m^*} V^{l*} > 0. \quad (\text{C.1.5})$$

Finally, $u_m^* = \tilde{a}^* - \rho(x^+)m_m^*$ and $r_m^* = n^* - m_m^* - u_m^*$.

C.2. Equilibrium for Corner Solution: Financial Contribution

The equilibrium conditions for the market for commercial lobbying services are not affected by a corner solution for the policymaker's problem with respect to financial contributions. It still holds that

$$\frac{n^*}{1+n^*} \frac{\partial G(n^l)}{\partial n^l} \Big|_{n^l=n^*} = \frac{\bar{P}A^p\pi^c}{T-\bar{P}} \quad (\text{C.2.1})$$

and the equilibrium values for k^* , L^* , C^* , and \tilde{a}^* are identical. However, each policymaker sets $\bar{q}_f^{lp} = 0$ and maximizes rents through financial contributions. Lobbyists undertake no verification efforts, $m_f^* = 0$, and make the required financial contributions since policymakers can identify perfectly whether or not a lobbyist made the required financial contribution – i.e., $f_f^* = \bar{f}_f^*$. The lobbyist's equilibrium portfolios are characterized by $u_f^* = \tilde{a}^*$ and $r_f^* = n^* - u_f^*$.

In steady state, there is a no exit out of and entry into the lobbying industry and political access market. It follows that $\delta_f^* = 0$ and $h_f^* = 0$. The lifetime expected payoff for a citizen follows from (IV.3.3) with $\Pi_t^c = 0$, because of the expected private rent dissipation for citizens, such that

$$V^{c*} = \frac{(1+r)\Pi_t^c}{r} = 0. \quad (\text{C.2.2})$$

Using (IV.2.43), the steady minimum financial contribution is

$$\bar{f}_f^* = \frac{k^*n^* - G(n^l)}{1+r} \Big|_{n^l=n^*} \quad (\text{C.2.3})$$

with $f_f^* = \bar{f}_f^*$. Finally, the expected lifetime payoff for a lobbyist follows from (IV.2.43) and is

$$V_f^{l*} = (1+r)\bar{f}_f^* \quad (\text{C.2.4})$$

with $V_f^{l*} > V_f^{c*} = 0$. Policymakers can extract larger rents from lobbyists because of the better monitoring of financial contributions but they still have to share rents with lobbyists to induce promised and legally nonenforceable financial contributions.

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