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Understanding Society

Business Associations, Lobbying, and Endogenous Institutions *

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Abstract

Are business associations - private, formal, nonprofit organizations designed to promote the common interests of their members - positive or negative for the economy and overall welfare? Scholars from institutional and organizational economics, on the one side, and from industrial organization, law & economics, and public choice, on the other side, have given different answers to this question, which is instrumental for policy making. We construct a model that endogenizes association membership of firms and the main functions of associations, which can have positive or negative spillovers on the economy. We derive predictions regarding associations' functions and their net welfare effects, depending on the level of property rights securitization, which are in line with empirical observations.

JEL classification: D02, D62, D71, D72, L44
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1 Introduction

Since at least one thousand years, business firms and other professionals have joined forces to supply public goods that benefit everyone in the industry, to decrease common economic and political risks, and to increase the profitability of their individual ventures. Often the vehicles for such cooperation have been formal, member-owned organizations that are designed to promote the common business interests of their members but that do not pursue profit-maximization goals independent of their members (Pyle, 2005, 2006). Trade, business, or industry associations, professional clubs, trade unions, chambers of commerce, academic societies, industry trade groups, standard setting organizations and medieval guilds are all shapes of the same generic organizational form, which we call an *association* in this paper.[1]

During the Commercial Revolution, which started in the tenth and eleventh centuries in Europe, the primary function of the first merchant guilds was to protect the property rights of their members vis-a-vis nonmembers (Volckart and Mangels, 1999). Associations have other purposes, too. Grafe and Gelderblom (2010:481) categorize the functions of merchant guilds and other associations as, "(1) guilds' protection of merchants from predatory rulers, (2) their deterrence of cheating by merchants, (3) their enabling of firms to extract monopoly rents, and (4) their ability to balance supply and demand in markets of limited size." Crucially, whereas we can expect that all of these functions benefit association members as long as membership is voluntary, the spillover effects onto nonmembers are ambiguous. The understanding and evaluation of such externalities, however, is important for policy makers' decision making: whether to promote associations (for instance by awarding tax breaks due to associations' nonprofit status), whether not to interfere in industries that are privately managed by associations (for instance, diamond trading; see Bernstein, 1992), or whether to tax or even prohibit certain functions of associations (for instance, cartelization of industries.)

Despite the need for unambiguous advice, scholars from law, economics, management, and political science have come to very different conclusions regarding the impact of associations on overall efficiency and welfare. The theoretical literature has mostly focused on the negative side of associations and has not shed light yet as to under which situations we may expect associations to generate *positive or negative* spillovers.

The large divergence of scholarly views of business associations in the literature suggests a bundle of research questions. How can we explain that both the positive and the negative views on associations simultaneously exist in the research community? Are some associations unambiguously good and others unambiguously bad for total welfare? Or does each of these organizations have the ability to do both good and bad? Is it possible to delineate the impact

[1]The existence of associations has been documented in Europe, North Africa, the Near East, Central and South America, India and China (Ogilvie, 2011).

factors that let associations tip in one or the other direction depending on the environment they operate in?

To tackle these questions we construct a game-theoretic model, in which we endogenize the individual association membership decisions of the business firms in an economy - and thereby existence of the association in the first place. We also endogenize the main function(s) of the association. Inspiration for the type of functions we model is delivered by Döner and Schneider (2000:263), who distinguish between "market-supporting" and "market-complementing" activities of associations: the first category is attributed to the private provision of public goods, such as property rights or the rule of law, and the second category - "more club than public goods" - to horizontal coordination and other rent-seeking activities.

We allow the members of an association to collectively decide about two types of costly activities: (i) whether the association influences the political reform process to increase the level of property rights securitization in the economy (*good lobbying*); and (ii) whether the association lobbies for rents that exclusively accrue to association members, to the detriment of non-members (*bad lobbying*). Good lobbying is characterized by a free-riding problem because all firms in the economy, not only association members, benefit from more secure property rights, for instance, in the form of less banditry, safer roads, or a less corrupt bureaucracy, which allows firms to retain more of their business profits. Bad lobbying, in turn, is characterized by negative externalities because funds are diverted from the public to the association's members. Association members jointly decide whether to invest in one or both lobbying types, or not to lobby at all. Besides being association members, or not, firms are individual decision makers who set an effort level to maximize their individual business profits, which are influenced by the association's actions. We show that larger firms—or, alternatively, those with larger profit potential—have higher incentives to join an association than smaller firms.

The key parameter in this model is the level of property rights securitization. We show that the equilibrium is characterized by three parameter regions: (i) If property rights are rather insecure (and the cost of good lobbying is not prohibitive), an association endogenously exists and exclusively lobbies politicians to increase property rights. The intuition is that here the marginal private benefit from increased property rights is strong enough to overcome the free-rider problem. (ii) For intermediate levels of property rights securitization, both good and bad lobbying take place, strengthening each other's effects by the complementarity explained above. (iii) If property rights are rather secure, the marginal benefit of further promoting property rights is small. Here an association only invests in rent-seeking lobbying, which benefits the largest firms exclusively.

Moreover, it turns out that good lobbying and bad lobbying are complements: if the association lobbies politicians to increase property rights, this has a positive effect on the equilibrium effort chosen by every firm because it expects to keep a larger share of its gross profits. Higher

effort levels lead to higher gross profits, which increases the state's tax revenues. As lobbying for rents shifts tax revenues to association members, they are more willing to spend on bad lobbying.

As our model predicts—given a certain, initially exogenous level of property rights securitization—whether the association will push property rights further, or not, the equilibrium (ex-post) level of property rights is endogenized. Because in practice the effective level of property rights securitization depends on many factors, such as access to justice, bureaucratic corruption, or the effectiveness of public enforcement agencies, the model can be interpreted as endogenizing the quality of legal institutions more broadly.[2]

Whereas it is clear that the net welfare of associations' members is always positive (because in a context of complete information, firms would not become members otherwise), this model can also shed light on the effects on non-members. We show that the net welfare generated by associations is positive as long as the level of property rights securitization in an economy is sufficiently low. This may hold for most countries throughout history and for most developing economies today. Our model suggests that only the most advanced economies, which are governed by the rule of law and characterized by highly secure property rights, can be expected to suffer from the existence of lobbying associations. This is possible because only in these countries associations focus on rent-seeking activities to a large extent, which benefit their members but are detrimental for the rest of the economy.

The remainder of the article is organized as follows: Section 2 reviews the related literature. Section 3 describes the model setting. Section 4 presents the equilibrium analysis and results, whereas Section 5 analyses welfare and efficiency. Section 6 concludes and presents empirical applications of the model's results. Appendix A contains a technical discussion and extensions of the model. Appendix B contains proofs and mathematical derivations of key variables.

2 Business associations and welfare: the costs and benefits of private ordering

Theoretical literature about the welfare effects of business associations is rather scarce. A negative view, which is brought forward by scholars from industrial organization, law and economics, and public choice, underlines the ability of associations to coordinate their members' behavior, for instance to publish prices, to allocate quota, and to reduce industry output to the detriment

[2]Specifically, the loss to business profits and, hence, the state's tax revenues can be interpreted as corruption at low levels of the bureaucratic hierarchy, as described by Duvanova: "[H]ere corruption is a set of unpredictable, arbitrary actions on the part of regulating agencies and other state authorities to extort resources from businesses. Such corruption operates at the lower levels of bureaucratic hierarchy and might involve, but is not limited to, 'speed money'—extra unofficial fees for the official services provided by bureaucrats—and bribes and favors designed to reduce bureaucratic red tape."

of consumers (Vives, 1990; Döner and Schneider, 2000; Motta, 2004) or to lobby politicians for selective favors (Besley and Coate, 2001; Tucker, 2008; Pyle, 2011).[3] Probably the best known theoretical work on associations is Olson's (1982) study on collective action. He views associations as aggregations of particular interests. Broad associations are more representative of the economy, and thus will try to push for reforms that make everyone better off. However, broad associations often lack the necessary lobbying strength because the interests of their members are very heterogeneous. Narrow associations that represent particular interests, which only benefit members, are much more likely to exert influence on rulers because coordination is easier among few, homogeneous members.

On the other hand, a positive view of associations is assumed by most of the institutional and organizational economics literature, which underlines the supportive effects of private ordering institutions for the transactors involved. In theoretical terms, where non-contractibility or prohibitive transaction costs make court enforcement of business agreements no available option for firms, private governance institutions such as information exchanges or arbitration tribunals that are managed by associations can avoid social dilemma problems that arise through impersonal exchange.[4] This effect reduces the risk of market breakdown and increases the total amount of efficient business transactions.[5]

More specifically, Prüfer (2014) analyzes the interaction between a private, formal business association and an informal social network in a context where mutual cooperation is efficient but no equilibrium in one-shot interactions. The key parameter, borrowed from Dixit (2003), is socioeconomic distance between traders. Prüfer shows that traders will only trade with other transactors if socioeconomic distance between them is small because proximity increases the probability of future encounters, generating intertemporal incentives to cooperate in the current transaction. In that model, associations, which have no or only imperfect access to public coercion, assume functions of information intermediaries or arbitrators. They are shown to increase the scope of cooperation—and thereby welfare—by coordinating individual punishments or even exacting damage payments from traders who were found to renege on their contractual obligations. This result holds even when traders are already connected through an informal social network. However, the value of association membership decreases if transactors are better

[3] Along the same line, Olson (2000) stresses that business associations contribute to the uncompetitive, corrupt, and inefficient nature of post-communist economies in Eastern Europe. Bernstein (1992) emphasizes the ambiguous nature of associations in her study of the modern diamond trading industry.

[4] See Dixit (2004, 2009), Williamson (2005), and MacLeod (2007) for general overviews of the institutional and organizational economics approach to private ordering. Greif et al. (1994) study the ability of merchant guilds to deter state authorities from extracting rents from their members. Masten and Prüfer (2014) offer a comparative analysis that identifies circumstances where decentralized, informal communities outperform public courts in supporting contract enforcement among traders.

[5] The positive effects of private ordering may have been instrumental in getting the Commercial Revolution going (Greif, 2006) and in facilitating transactions of any scale in developing countries today (Fafchamps, 2004).

connected informally. This means that, despite the different channels of information transmission, social networks and associations are substitutes with respect to supporting cooperation. The results of that model are supported by and explain recent empirical findings, for instance, that members perceive associations to be less valuable in more competitive industries (Pyle 2005, 2006).

Another welfare enhancing function of associations is to manage collective reputation, when quality is an issue. Tirole (1996) shows that new members of a group can suffer from the bad reputation of past members long after they are gone, which creates stereotypes and history dependence. In order to keep group reputation high, an association can exclude members who do not cooperate in a transaction. Tirole shows that the threat of exclusion from the association steers individual behavior and is key to achieve high group reputation.

The idea that associations are created as a response to imperfect public governance is supported by a vast amount of empirical evidence. Using quantitative data on business associations' membership as well as qualitative business survey data on twenty five post-communist countries, Duvanova (2007) finds a strong correlation between firms' perception of corruption and their membership in an association.[6] Corruption stimulates collective action organized by business associations and, thus, associations are able to protect firms from predatory state behavior. Similarly, Pyle (2011) finds, based on survey data about firms and business associations in the Russian Federation, that collective action organized by associations serves as a substitute for political competition in securing firms' property rights:[7] "[T]he relationship between a firm's membership in a business association and the security of its property rights strengthens in less politically competitive regions." This confirms our prediction that the good lobbying role of associations is particularly important in contexts of low institutional quality. The high value that this relationship generates for members is reflected by the finding that, in Russia, there is a strong positive correlation between business association membership and a firm's propensity to invest (Frye, 2006). Moreover, when associations lobby political leaders for increased property rights protection—even if primarily targeting the security of their own members' businesses—it has significant positive spillover effects onto the rest of the economy (Döner and Schneider, 2000). Associations also increase members' joint impact on institutional reform (Lambsdorff, 2002; Acemoglu et al., 2005).

[6]Duvanova (2007) uses data on firms' participation in business associations from the European Bank for Reconstruction and Development (EBRD) and the World Bank Business Environment and Enterprise Performance Survey (BEEPS). BEEPS covers around 4000 firms from different sectors and industries and varying size and ownership type in twenty five post-communist countries and was conducted in 1999-2000.

[7]Pyle (2011) conducted two separate surveys in 2003. A screening survey of 1353 firms in seven industrial sectors, in 48 territorial subjects in Russia; complemented by a more detailed survey of a selected sample of 606 out of the 1353 firms. A different survey was administered to the directors of 200 independent business associations and used an index of "political competition" from the Democratic Audit of Russia.

Although the most recent empirical evidence mentioned above comes from Russia and other transition economies, there is evidence of the positive impact of associations on property rights protection and economic reform from several developing economies around the world.[8] Lucas (1993) describes how local and sectorial associations in Nigeria strongly opposed the state's corruption and the politicization of administration. They achieved an improvement in governance that also benefited non-members. A similar case is described by Hewison (1989) for Thailand, where the effort of associations of ethnic Chinese improved the protection of property rights, generating positive spillovers on the rest of the economy. Encompassing associations in Chile, Kuwait, and Mexico were key to successful market-oriented reforms and macroeconomic stabilization.[9] Similarly, in Pakistan, inter-industry associations pushed for the government to improve infrastructure and solve the problem of severe power shortages.[10] Goldsmith (2002) studies associations in Africa, using qualitative data from a survey to business people and civil servants in eight African countries, and finds that they have been key in pushing, bargaining and implementing public policy.[11] In particular, Goldsmith tests the hypothesis that associations are a cure for bad public governance, as they represent the interests of the private sector and thus provide pluralism in the political process, versus the theory supported by public choice theorists that associations facilitate rent-seeking. He finds support for the former hypothesis: associations in Africa are formed primarily in reaction to bad governance.

In between between the two opposed streams of literature, we take a neutral stand. In the next section we construct a model that first endogenizes association membership and then allows associations to choose whether to invest in an activity with positive externalities (coined *good lobbying*) and an activity characterized by negative externalities (called *bad lobbying*).

3 Baseline model

Consider an economy populated by a set $N = \{1, ..., n\}$ of risk neutral firms, with $n \geq 2$. Each firm $i \in N$ is characterized by a size parameter $\rho_i \equiv \frac{i-1}{n-1}$.[12] This definition implies that (i) firms are ordered by size, such that $\rho_{i+1} > \rho_i$ for all $i, (i+1) \in N$, and (ii) the average size of firms in the economy is independent of the number of firms, and it is always equal to 1/2.

In a one shot game, firms decide individually how much effort e_i to invest in their businesses. We can interpret e_i as the effort to find someone to trade with. Exerting effort costs $c(e_i)$, which

[8] For a detailed summary, see Döner and Schneider (2000).

[9] Döner and Schneider (2000), p.264-265. The associations mentioned are CPC (Chile), KCCI, (Kuwait), and CCE (Mexico).

[10] Tewari (1990), p.310, cited in Nadvi and Schmitz (1994), p.26.

[11] Goldsmith focuses on Ghana, Kenya, Madagascar, Malawi, Senegal, Tanzania, Uganda and Zambia.

[12] Alternatively, ρ_i can be interpreted as a measure of potential profitability of the firm.

is convex and unobservable for others:

$$c(e_i) = \alpha \frac{e_i^2}{2}, \tag{1}$$

with $\alpha \in [0, 1]$ an exogenous parameter representing how costly it is to increase operating profits. Because none of our results depends qualitatively on α, we normalize $\alpha = 1$.

Expected operating (gross) profits of firm $i \in N$ from doing business are denoted by:

$$\pi_i(e_i, \rho_i, \gamma) \equiv e_i(1 + \rho_i)\gamma \tag{2}$$

where γ denotes the degree of property rights securitization. Firms maximize net profits:

$$\tilde{\pi}_i(e_i, \rho_i, \gamma, \tau) \equiv \pi_i(e_i, \rho_i, \gamma)(1 - \tau) - c(e_i), \tag{3}$$

where τ denotes the tax rate.[13] Both γ and τ are common knowledge.

Before trade takes place, firms can form a nonprofit association that will have the single purpose of trying to influence the decisions of the political ruler.[14] We assume that this business association will take decisions collectively, as a single entity, by maximizing the joint profits of all members.[15] Every association member must pay a fee $f(\rho_i)$ that is endogenously determined and can be either a flat fee (equal for all members), or increasing in ρ_i. In the latter case, and for tractability reasons, we consider a fee scheme $f(\rho_i)$ that satisfies the following conditions: (i) it is linear in firm size ρ_i, (ii) it aligns the incentives of members regarding lobbying decisions, and (iii) the sum of fees paid by members covers the association's costs.[16] The cost of an association is composed by the cost of lobbying plus an administrative fixed cost k.

Property rights are imperfectly secured in this economy and, as is visible in (2), firms lose a share $(1-\gamma)$ of their operating profits, for instance, through robbery or security-related transactions costs or corruption.[17] For simplicity, we assume that the "disappearing" part of operating profits is lost from a welfare perspective.[18] The degree of property rights securitization is common knowledge and is exogenous to an individual firm. However, a business association can

[13] Results are qualitatively unchanged if the tax is paid on realized net profits, $(\pi_i - c(e_i))$. In that case, however, the tax rate τ does not affect the effort decision and becomes a perfect substitute of $(1 - \gamma)$, thereby losing some results.

[14] In Appendix A.1, we argue why the nonprofit form is efficient for associations.

[15] This is equivalent to majority voting with sincere voters because the individual membership-benefits will be shown to be monotonic in firm size ρ_i and, thus, the median voter theorem applies.

[16] The assumption of joint profit-maximization requires transferable utility among members, which is given here via differing fees. The assumption of linearity on size is based on the fact that many real-world associations have a fee structure that is increasing in size. We assume that associations set a fee that aligns members' incentives because it is in their own interest that the association is formed and lobbies the ruler, but keeps costs of collective decision making low (see Hansmann, 1996, Herbst and Prüfer, 2011).

[17] An alternative interpretation would be that each firm loses all its operating profits with probability $1 - \gamma$.

[18] We show in Appendix A.3 that assuming an arbitrarily small but positive degree of inefficiency in the use of revenues from illegal activities is enough for our results to hold.

invest an amount s in lobbying the ruler to increase the level of property rights securitization.[19] We refer to this type of lobbying as *good lobbying*. In particular, good lobbying increases the level of property rights securitization for all firms to:

$$\gamma' \equiv 1 - \sigma(1 - \gamma) \geq \gamma, \tag{4}$$

with $\sigma \in [0, 1]$.[20] Therefore, good lobbying is subject to positive externalities.

The ruler in this economy is an automat that does two things. He is susceptible to lobbying and he imposes an exogenous tax rate τ over firms' operating profits. The ruler spends all tax revenues on public goods such that each firm gets a payoff that is directly proportional to its size.[21] Formally, firm $i \in N$ of size ρ_i gets a payoff from public good consumption equal to:

$$\frac{2\rho_i}{n}\left(\tau \sum_{i=1}^{n} \pi_i(\rho_i)\right), \tag{5}$$

where $\tau \sum_{i=1}^{n} \pi_i(\rho_i)$ are total tax revenues and the factor of distribution $\frac{2\rho_i}{n}$ is set such that all tax revenues are redistributed: $\sum_{i=1}^{n} \frac{2\rho_i}{n} = 1$.[22]

Inspired by empirical observations, we also allow the association to exert *bad lobbying*. More specifically, the association may invest in lobbying authorities to redistribute tax revenues towards association members. We assume that, by investing an amount r, all tax revenues are appropriated by the association. We also refer to this type of lobbying as *rent-seeking lobbying*. Revenues from rent-seeking lobbying are divided according to size among the members of the association.[23] Consider the common belief such that the marginal member, who is indifferent between joining the association or not, is the smallest member of the association. This means that all traders expect the largest firms to join the association.[24] Denoting by $\hat{i}$ the marginal

[19] Whether s is spent on activities truthfully informing political decision-makers about how to increase γ or whether the ruler takes s as a bribe and uses parts of this sum to implement higher γ is irrelevant for this paper.

[20] We can interpret σ as the (in)efficiency of good lobbying. A high value of σ reflects cases in which the ruler is not very susceptible to this type of lobbying, or it is too difficult for him to improve the protection of property rights. Therefore, an investment of s will improve property rights securitization only slightly. On the contrary, a low level of σ implies that property rights securitization lobbying is very effective, because the ruler is susceptible to it or because it is easy for the ruler to increase the protection of property rights. Note that the investment of s has a (positive) decreasing marginal impact on the level of property rights securitization: $\frac{d(\gamma' - \gamma)}{d\gamma} = \sigma - 1 \leq 0$.

[21] In reality, rulers may use a share of tax income to finance their administration and may be biased when spending tax revenues. We normalize administrative costs to zero and abstract from biases, apart from the effect of lobbying modeled here, because the direction of possible biases is unclear.

[22] Note that (5) approaches zero if n is large. Therefore and for tractability of the model, we assume that an individual firm i neglects the effect of its own effort on the level of total tax revenues when choosing e_i but takes it as given. In Appendix A.4, we discuss how relaxing this assumption affects our results.

[23] Think of rent-seeking lobbying as an investment to obtain an industry-specific tax cut or an exclusive trade privilege, which benefits association members but not others. All members benefit from this advantage but large members can benefit more than small members.

[24] We show in Appendix A.2 that indeed the largest members join the association in equilibrium, even if the players hold different beliefs.

member of the association, a member $i \in \{\hat{i}, \hat{i}+1, ..., n\}$ of size ρ_i expects a rent-seeking benefit of:

$$\frac{2(n-1)\rho_i}{(n-\hat{i}+1)(n+\hat{i}-2)}\left(\tau\sum_{i=1}^{n}\pi_i(\rho_i)\right). \tag{6}$$

The above equation ensures that the totality of appropriated tax revenues is distributed among association members.[25] The distribution is directly proportional to members' size, just as the utility derived from public goods.

Finally, consider the following timing of the game:[26]

1. Every firm $i \in N$ decides about association membership. Once a firm has joined the association, it cannot leave it. The membership-fee scheme $f(\rho_i)$ are determined by the association.

2. Before deciding about lobbying, non-members can decide to join the association. The corresponding membership fees, $f(\rho_i)$, are paid. Association members jointly decide about lobbying for increased property rights securitization (*good lobbying*).

3. Every firm $i \in N$ individually decides about effort e_i at cost $c(e_i)$. Firm-specific profits are realized.

4. Association members jointly decide about lobbying for rent-seeking (*bad lobbying*). Public good benefits are realized.

We solve this game by backward induction for a unique subgame-perfect Nash equilibrium.

4 Analysis

At stage 4, association members collectively decide about lobbying for rents (whether or not to invest a total amount r). Under majority voting, the decision is given by the median voter, which is equivalent to maximizing the total net benefits from rent-seeking.[27] We can express the total benefits from rent-seeking as the difference between appropriating all tax revenues, and the proportion of tax revenues that corresponds to association members (in the form of public goods) in case no bad lobbying takes place. Members' total net benefits, B^r, are obtained by

[25] That is $\sum_{\hat{i}}^{n} \frac{2(n-1)\rho_i}{(n-\hat{i}+1)(n+\hat{i}-2)} = 1$.

[26] The rationale for this sequence is that the membership body has to be known before the association decides about its functions, and that firms have to know the level of property rights securitization (γ or γ') when making individual business decisions. It can be shown that the results are robust to changes in the timing of effort decisions and rent-seeking.

[27] Gains from rent-seeking always have the same sign for all firms. Therefore there is always unanimity among association members: either they all benefit from rent-seeking or they all lose. The voting rule is not relevant.

subtracting the cost of bad lobbying from this benefit. The association will exert rent-seeking if and only if $B^r \geq 0$, where:

$$B^r(\hat{i},\gamma) \equiv \tau \sum_{i=1}^{n} \pi_i(\rho_i,\gamma) - \left(\sum_{i=\hat{i}}^{n} \frac{2\rho_i}{n} \right) \tau \sum_{i=1}^{n} \pi_i(\rho_i,\gamma) - r \geq 0$$

Substituting π_i from equation (2) and rearranging terms, leads to the following condition:

$$\sum_{i=1}^{n} e_i(\rho_i)(1+\rho_i) \geq \frac{n(n-1)r}{\tau\gamma(\hat{i}-1)(\hat{i}-2)} \tag{7}$$

To get a clearer result, we need to replace the optimal effort for each firm in the above condition. Hence, we postpone the intuition of this result until Lemma 1.

At stage 3, every firm $i \in N$ decides how much effort e_i to exert, at cost $c(e_i)$ given by (1). At the same time, the ruler taxes profits at the rate τ, and property rights are imperfectly secured. Formally, every $i \in N$ solves:

$$Max_{e_i} \tilde{\pi}_i = e_i(1+\rho_i)\gamma(1-\tau) - c(e_i)$$

Given that the second order condition holds, the optimal effort can be derived from the first order condition:

$$e_i^* = (1+\rho_i)\gamma(1-\tau) \tag{8}$$

Note that the profit-maximizing effort positively depends on the level of property rights securitization and the size of the firm; and negatively on the tax rate. Because in equilibrium, individual effort is given by (8), we can replace the optimal effort e_i^* in condition (7) that determines rent-seeking. This leads to a more meaningful condition that has to hold such that the association lobbies for rents:

$$\hat{\rho} \geq \begin{cases} \frac{1}{2(n-1)} \left(1 + \sqrt{1 + \frac{24(n-1)^2 r}{\tau(1-\tau)\gamma'^2(14n-13)}} \right) \equiv \hat{\rho}^r(\gamma') & \text{if } s \text{ was invested,} \\ \frac{1}{2(n-1)} \left(1 + \sqrt{1 + \frac{24(n-1)^2 r}{\tau(1-\tau)\gamma^2(14n-13)}} \right) \equiv \hat{\rho}^r(\gamma) & \text{otherwise.} \end{cases} \tag{9}$$

Here $\hat{\rho} \equiv \frac{\hat{i}-1}{n-1}$ is the size of the marginal association member, $\hat{i}$. We express the condition for rent-seeking in terms of $\hat{\rho}$ instead of $\hat{i}$ because $\hat{\rho}$ is normalized in terms of the number of firms. Hence, we can compare it for different values of n and its interpretation is more intuitive.

Lemma 1 *The association exerts rent-seeking lobbying if the marginal member $\hat{\rho}$ satisfies condition (9), that is, if the marginal member is large enough (and the association is small enough).*

Proof: Because $B^r(\hat{i},\gamma)$ is strictly increasing in $\hat{i}$ for $\hat{i} \in N$, $B^r(\hat{i},\gamma) > 0$ for all $\hat{i} > \{\hat{i} | B^r(\hat{i},\gamma) = 0\}$. Moreover, $\{\hat{i} | B^r(\hat{i},\gamma) = 0\}$ is unique and it is given by $\hat{\rho}^r(\gamma)(n-1)+1$. Therefore, $B^r(\hat{i},\gamma) > 0$ for any marginal member of size $\hat{\rho} \geq \hat{\rho}^r(\gamma)$. The proof is analogous for $B^r(\hat{i},\gamma')$. *Q.E.D.*

The larger the size of the marginal member $\hat{\rho}$ (the fewer members), the more likely it is that condition (9) holds, ceteris paribus. The reason is that the smaller the association is, the larger are the joint benefits from rent-seeking and therefore the higher are the incentives to exert bad lobbying. The higher the cost of rent-seeking (r), the less likely it is that the association decides to lobby for rents.

Equation (9) also reveals that the likelihood of rent-seeking is higher for values of τ close to 0.5. The intuition comes from the Laffer curve: a high τ reduces the effort of all firms in the economy and therefore reduces the total size of the pie, decreasing the return of rent-seeking. On the other hand, a low τ increases the size of the pie, but reduces the slice of the pie that the government gets and that can be redistributed to the association in case of rent-seeking. Finally, a higher level of property rights securitization makes it more likely for the association to extract rents because higher γ increases the returns of firms' individual effort and thus the size of tax revenues that can be appropriated by the association.

While equations (3), (2), and (8) may give the impression that τ and $(1-\gamma)$ are perfect substitutes, the result expressed in equation (9) shows they are not. In particular, they have a different impact on the incentives for the association to exert bad lobbying. The reason for this result is that the proportion $(1-\gamma)$ that is expropriated cannot be recovered by the firms, while the proportion τ that is collected by the ruler via taxes can be recovered by association members through bad lobbying. Therefore, a higher value of τ is not always bad news for firms, as they can form an association and lobby the ruler to appropriate the tax revenues (of themselves and of non-members). We formalize this result in the following Lemma:

Lemma 2 *The tax rate τ and the level of property rights securitization γ affect the association's incentives to seek rents, captured by $\hat{\rho}^r(\gamma)$ and $\hat{\rho}^r(\gamma')$, differently.*

Proof: Follows directly from computing the derivatives of $\hat{\rho}^r(\gamma)$ and $\hat{\rho}^r(\gamma')$ with respect to τ and γ, and noting that they are different. $Q.E.D.$

At stage 2, association members vote about lobbying for increased property rights protection. The median voter theorem applies under majority voting because the net individual gain from lobbying the ruler to improve the protection of property rights is strictly increasing in the size of the firm.[28] According to the median voter theorem, the association decides to lobby for increased security if the joint net benefits are non-negative:

$$B^s(\hat{i}) = \sum_{i=\hat{i}}^{n} (\tilde{\pi}_i(e_i^*(\gamma'), \rho_i, \gamma', \tau) - \tilde{\pi}_i(e_i^*(\gamma), \rho_i, \gamma, \tau)) - (s+k) \geq 0 \tag{10}$$

Note that we have included the fixed cost k as a cost of good lobbying. The reason is that if the association only exerts good lobbying, then both s and k are are costs that depend on the

[28] See equations (2), (3), and (8). Again, because of members' goal alignment, the voting rule is irrelevant.

decision of whether to lobby, or not. A firm that is pivotal in decision of exerting good lobbying only joins the association if both costs are covered.[29]

By substituting equations (3) and (8) in (10), we get the following expression:

$$B^s(\hat{i}) = \frac{(1-\tau)^2}{2}((1-\sigma(1-\gamma))^2 - \gamma^2)\sum_{i=\hat{i}}^{n}(1+\rho_i)^2 - (s+k) \geq 0. \tag{11}$$

The following lemma summarizes the necessary and sufficient condition for equation (11) to hold. Let us define:

$$\hat{\rho}^s \equiv \{\hat{\rho} \in [0,1] | (B^s(\hat{i}) = 0)\}. \tag{12}$$

Lemma 3 *The association lobbies to increase property rights securitization if the marginal member $\hat{\rho}$ satisfies: $\hat{\rho} \leq \hat{\rho}^s$. That is, if the marginal member is small enough (and the association is large enough).*

Proof: See Appendix B.1.

Lemma 3 implies that, everything else equal, an association with a smaller marginal member (a larger association) is more likely to exert good lobbying. This is a consequence of the assumption that all firms benefit from increased property rights securitization, but only association members bear the corresponding cost. This generates incentives to free-ride. When a firm joins the association, the externality from the association to that firm is internalized. Therefore, the association is more likely to invest in property rights securitization. In other words, lobbying to increase property rights securitization will occur only if the free-riding incentive is not overwhelming. This result goes in the opposite direction of what we found for rent-seeking lobbying. Large associations are more likely to lobby for increased property rights protection, which boosts profits of all firms in the economy; whereas small associations are more likely to lobby for rents that exclusively benefit its members, to the detriment of non-members.

So far, we have considered each type of lobbying in isolation. However, there are instances in which both types of lobbying will occur simultaneously and therefore we need to account for the interaction between them. There is a two-way complementarity. The first complementarity comes from the fact that good lobbying increases the level of property rights protection. This decreases the threshold for rent-seeking from $\hat{\rho}^r(\gamma)$ to $\hat{\rho}^r(\gamma')$ in condition (9) and thus, makes it more likely for the association to exert bad lobbying. There is also a more complex complementarity effect in the other direction: when association members are voting for good lobbying, and they know that there will be bad lobbying in stage 4, then the relevant net benefits from good lobbying are not given by equation (11). Instead, they are given by $\tilde{B}^s$, which in addition to the increased profits from doing business depicted in equation (11), include the rise in rent-seeking

[29] The case in which good and bad lobbying take place is analyzed later.

benefits due to increased property rights protection ($B^r(\gamma') - B^r(\gamma)$). That is:

$$\tilde{B}^s(\hat{i}) \equiv \frac{(1-\tau)^2}{2}(\gamma'^2 - \gamma^2)\sum_{i=\hat{i}}^{n}(1+\rho_i)^2 + B^r(\gamma') - B^r(\gamma) - s. \tag{13}$$

Let us define:

$$\tilde{\rho}^s \equiv \{\hat{\rho} \in [0,1] | \tilde{B}^s(\hat{i}) = 0\}. \tag{14}$$

Lemma 4 *(Complementarity of good and bad lobbying) When association members expect to exert rent-seeking in stage 4 (that is, if $\hat{\rho} \geq \hat{\rho}^r(\gamma')$), the association will lobby to increase property rights securitization at stage 2 if the marginal member $\hat{\rho}$ satisfies condition $\hat{\rho} \leq \tilde{\rho}^s$; $\tilde{\rho}^s > \hat{\rho}^s$.*

Proof: Analogous to Lemma 3 and hence, omitted.

Association members can anticipate when the association will exert rent-seeking. In those cases the relevant threshold marginal member for exerting property rights securitization is given by (14), which is strictly higher than the value given by (12). Hence, good lobbying is more likely when there is also bad lobbying. This reflects the complementarity between good and bad lobbying.

Before we complete our analysis of the functions of business associations, we study how these self-chosen functions change if the level of property rights securitization changes.

Lemma 5 *Good lobbying becomes more profitable for the association when γ increases if $\gamma < \frac{\sigma}{1+\sigma}$ and less profitable if $\gamma > \frac{\sigma}{1+\sigma}$. Bad lobbying becomes ever more profitable with increasing levels of γ.*

Proof: Taking the derivatives of the thresholds for rent-seeking ($\hat{\rho}^r(\gamma), \hat{\rho}^r(\gamma')$) and for property rights securitization ($\hat{\rho}^s, \tilde{\rho}^s$) with respect to γ shows that $\hat{\rho}^s$ and $\tilde{\rho}^s$ are increasing in γ for $\gamma < \frac{\sigma}{1+\sigma}$, and decreasing for $\gamma > \frac{\sigma}{1+\sigma}$, where $\frac{\sigma}{1+\sigma} \leq 0.5$. Increasing $\hat{\rho}^s$ and $\tilde{\rho}^s$ implies that good lobbying becomes more profitable for the association. In turn, $\hat{\rho}^r(\gamma)$ is decreasing in γ, where $\hat{\rho}^r(\gamma)$ is the lower bound on $\hat{\rho}$ such that the association exerts bad lobbying. *Q.E.D.*

The intuition of Lemma 5 is explained below Proposition 1.

At the beginning of stage 2, before the good lobbying decision is made, non-members can decide to join the association that has already set the fees. In equilibrium, no firm joins at this stage, but in order for the equilibrium to exist it is important that this possibility exist.[30] Without this possibility, it doesn't make sense to decide upon a fee scheme when all membership decisions have already been made.

[30] In strict terms, in the case of good lobbying, it does not matter when firms join. It may be the case that only one firm ($i = n$) joins in the first stage, sets a differentiated fee, and then other firms join in the second stage. For the sake of simplicity, we consider the equilibrium when all equilibrium members of the association join in the first stage.

At stage 1, every firm decides whether to join the association, or not. Subsequently, the association decides about the fee scheme. There is no asymmetric information and therefore, firms can anticipate the fee, and lobbying decisions (by majority voting) of the association in the future. According to Lemma 5, the thresholds for good and bad lobbying change with the level of property rights protection. Hence, it is possible that for some levels of γ one type of lobbying is not profitable for the association. We analyze the equilibrium association size for all the possible cases: an association that exerts only good lobbying, only bad lobbying, or both.

Only good lobbying: If firms expect that the association will exert only good lobbying, the payoff from joining the association given that the association already exists is equal to the membership fee, and therefore, negative. Since in this case the payoff from joining the association is negative, a firm will join an association that only exerts good lobbying if he is pivotal in the lobbying decision. If s and k are not prohibitive, the marginal member is better off by joining the association and ensuring its existence than by the original situation without an association, and a low level of property rights securitization. The marginal non-member, on the other hand, does not have incentives to join because his membership would not affect his benefits through increased property rights securitization. Thus, the size of the equilibrium marginal member in this case is: $\hat{\rho}^s$.

The association can charge either a uniform fee or a differentiated fee that depends on firms' size. However, if a flat fee is set, an association that only exerts good lobbying is not formed in equilibrium, under majority voting, even if firms would like to form such an association. This occurs because the firm that is pivotal in the decision of exerting good lobbying gets a negative net payoff from good lobbying (the rise in its private profits from increased security is lower than the uniform membership fee). If the marginal member, $\hat{\rho}^s$, leaves the association, the association does not exert good lobbying. At equilibrium no association is formed. Consequently, the association will endogenously set a differentiated fee that is increasing in size when the level of property rights protection is low. By setting a differentiated fee scheme that satisfies conditions (i) to (iii) in Section 3, the interests of association members are perfectly aligned because, and there is unanimity in voting in favor of good lobbying. Thus, the association does not break down. Specifically, the equilibrium membership-fee, which we formally derive in Appendix B.2, is given by:

$$f_i^s = \frac{2(s+k)\left(3n^2 - (\hat{i}-3)(4+\hat{i}) - 2n(6+\hat{i}) + i(8n+4\hat{i}-11)\right)}{(n-\hat{i}+1)\left(24+7n(2n-5)-13\hat{i}+8n\hat{i}+2\hat{i}^2\right)} \tag{15}$$

Both good and bad lobbying: Consider now the case where an association exists and exerts both types of lobbying (and therefore, it is possible to free ride on increased property rights

securitization). We denote the payoff from joining such an association as $R(\rho_i, \hat{\rho}, f_i^{sr})$:

$$R(\rho_i, \hat{\rho}, f_i^{sr}) \equiv \frac{2\rho_i(n-1)}{(n-\hat{i}+1)(n+\hat{i}-2)}\tau \sum_{i=1}^{n} \pi_i(\rho_i, \gamma') - f_i^{sr}, \tag{16}$$

where the first term on the right hand side is the individual revenue from rent-seeking.[31] The term f_i^{sr} is the membership fee when the association exerts both good and bad lobbying. $R(\rho_i, \hat{\rho}, f_i^{sr})$ accounts for the net payoff of joining the association and abstracts from the benefit from increased property rights securitization, which all firms can enjoy independently of their membership decision.

Recall that according to Lemma 3, the association exerts bad lobbying only if the number of members is not too large. Hence, this kind of association endogenously sets a flat fee in order to restrict membership. That is $f_i^{sr} = \frac{r+s+k}{n-\hat{i}+1}$. As benefits from bad lobbying are increasing in firm's size (as a natural characteristic of sector specific tax cuts, for instance), if the share of lobbying cost that an individual member has to bear via the membership-fee is independent of size, small members are put at a disadvantage, relative to the situation with differentiated fees. In particular, only large firms benefit from joining an association that exerts bad lobbying.

A firm i joins an association that exerts good and bad lobbying if $R(\rho_i, \hat{\rho}, f_i^{sr}) \geq 0$. Let us define $\hat{\rho}_1(\gamma)$ as the size of the marginal member that gains zero from joining the association, given that he is the marginal member:

$$\hat{\rho}_1 \equiv \{\rho \in [0,1] | R(\rho, \rho, f_i^{sr}) = 0\}. \tag{17}$$

Only members of size $\rho_i \geq \hat{\rho}_1$ are willing to join the association. When $\hat{\rho}_1 \geq \hat{\rho}^r(\gamma')$, the equilibrium marginal member is of size $\hat{\rho}_1$. The association favors rent seeking according to Lemma 3, and non-members do not strategically join the association because they get a negative payoff from becoming members, that is $R(\rho_j, \hat{\rho}_1, f_j^{sr}) < 0$ for $\rho_j < \hat{\rho}_1$. If, on the contrary, $\hat{\rho}_1 < \hat{\rho}^r(\gamma')$, the equilibrium marginal member's size cannot be $\hat{\rho}_1$, because according to Lemma 3 such an association would not exert rent seeking. The equilibrium marginal member then is of size $\hat{\rho}^r(\gamma')$. A slightly smaller firm does not join, even though he would like to, because he would change the lobbying decision of the association.

Only bad lobbying: Similarly, if firms expect that the association will exert only bad lobbying, the association will charge a flat fee equal to $f_i^r = \frac{r+k}{n-\hat{i}+1}$. The individual gain from joining an association that only exerts bad lobbying is:

$$R(\rho_i, \hat{\rho}, f_i^r) \equiv \frac{2\rho_i(n-1)}{(n-\hat{i}+1)(n+\hat{i}-2)}\tau \sum_{i=1}^{n} \pi_i(\rho_i, \gamma) - f_i^r. \tag{18}$$

[31] This means that in case firm i decides not to join the association, the association will be formed anyway, and will get the revenues from rent-seeking. Therefore, firm i will not get benefits from public goods in case of not joining the association.

We define the size of the marginal member that gains zero from joining the association, given that he is the marginal member, as $\hat{\rho}_2$.

$$\hat{\rho}_2 \equiv \{\rho \in [0,1] | R(\rho, \rho, f_i^r) = 0\}. \tag{19}$$

The size of the equilibrium marginal member is given by the maximum between $\hat{\rho}_2$ and $\hat{\rho}^r(\gamma)$ for the same reasons explained above.

Before formally stating the equilibrium in Proposition 1, we introduce some useful definitions: We define γ_1 as the value of γ at which it becomes profitable for association members to exert rent seeking. For $\gamma > \gamma_1$, an association is formed and exerts both types of lobbying:

$$\gamma_1 \equiv ArgMin\{\gamma \in [0,1] | \hat{\rho}_1(\gamma) = Min\{1, \tilde{\rho}^s(\gamma)\}\} \tag{20}$$

Note that γ_1 is such that $R(1, 1, f_1^{sr}) = 0$. For higher levels of γ, firms gain from joining an association that exerts both types of lobbying.

Similarly, we define γ_2 as the value of γ at which it is not profitable anymore for the association to exert good lobbying. For $\gamma > \gamma_2$, the association will only invest in rent-seeking.

$$\gamma_2 \equiv ArgMax\{\gamma \in [0,1] | \hat{\rho}^r(\gamma') = \tilde{\rho}^s\} \tag{21}$$

The maximum value of s such that the association invests in good lobbying is:[32]

$$\overline{s}(\gamma) = \frac{(14n-13)n(1-\tau)^2}{12(n-1)} \left(\gamma'^2 - \gamma^2\right) - k, \tag{22}$$

where we have included the administrative cost k because for cases in which the association only exerts good lobbying, a firm will only join the association if the increase in his private profits covers both the lobbying and the administrative cost.

For a given level of γ, the maximum value of r such that the association invests in bad lobbying is:

$$\overline{r}(\gamma) = \frac{(14n-13)(n-2)\gamma^2(1-\tau)\tau}{6(n-1)} - k. \tag{23}$$

Finally, we define $\underline{k}$ as the minimum value of the administrative cost such that an association is formed and exerts bad lobbying. The intuition behind this bound is not straightforward. When $\gamma \geq \gamma_1$, if the expected membership fee is lower than the negative externality onto non-members, small firms may strategically join the association to change the lobbying decision. This way, they can avoid suffering from the negative externality that rent-seeking imposes on them. If this is the case, an association is not formed in equilibrium. The lower bound on k is the minimum value of k such that this practice is too costly for non-members. Thereby,

[32] The value of $\overline{s}(\gamma)$ is calculated by analyzing the incentives to join an association of the smallest firm. That is, $\overline{s}(\gamma)$ is the maximum value of s for which $\tilde{\pi}_1(\gamma') - \tilde{\pi}_1(\gamma) - f_1^s \geq 0$.

$k \geq \underline{k}$ makes the association more exclusive and serves to protect the interests of "sincere" (rent-seeking) members, where:[33]

$$\underline{k}(\gamma, f_i^{sr}) = \frac{(n - \hat{i} + 2)(\hat{i} - 2)(14n - 13)\gamma\prime^2(1 - \tau)\tau}{3(n-1)^2} - s \tag{24}$$

$$\underline{k}(\gamma, f_i^{r}) = \frac{(n - \hat{i} + 2)(\hat{i} - 2)(14n - 13)\gamma^2(1 - \tau)\tau}{3(n-1)^2}$$

In this game, a trivial equilibrium is a situation where no association is formed. The following assumptions constrain the the cost parameters, s, r, and k, such that a non-trivial equilibrium exists:

Assumption 4.1 *(Cost of good lobbying)* $s \leq \overline{s}(\gamma)$.

Assumption 4.2 *(Cost of bad lobbying)* $r \leq \overline{r}(\gamma)$.

Assumption 4.3 *(Lower bound administrative cost)* $k \geq \underline{k}(\gamma)$.

We summarize our results in the following proposition.

Proposition 1 *If one of the following sets of conditions hold, a non-trivial equilibrium exists: (i)* $\gamma < \gamma_1$ *and Assumption 4.1 is satisfied; (ii)* $\gamma_1 \leq \gamma \leq \gamma_2$ *and Assumptions 4.1 to 4.3 hold; or (iii)* $\gamma > \gamma_2$ *and Assumptions 4.2 and 4.3 hold. In this case, the subgame-perfect Nash equilibrium is characterized as follows:*

1. *At stage one, all firms* $i \in N$ *with size* $\rho_i \geq \hat{\rho}^*$ *join the association and pay the corresponding fee (*f_i^s *for* $\gamma < \gamma_1$, f_i^{sr} *for* $\gamma_1 \leq \gamma \leq \gamma_2$, *and* f_i^r *for* $\gamma > \gamma_2$*). All* $i \in N$ *with size* $\rho_i < \hat{\rho}^*$ *do not join the association.* $\hat{\rho}^*$ *is discontinuous in* γ *and is given by:*

$$\hat{\rho}^* = \begin{cases} \hat{\rho}^s & \text{if } \gamma < \gamma_1, \\ Max\{\hat{\rho}_1, \hat{\rho}^r(\gamma')\} & \text{if } \gamma_1 \leq \gamma \leq \gamma_2, \\ Max\{\hat{\rho}_2, \hat{\rho}^r(\gamma)\} & \text{if } \gamma > \gamma_2. \end{cases}$$

2. *At stage two, the association lobbies for property rights protection if, and only if,* $\gamma \leq \gamma_2$. *In that case,* γ *increases to* γ'.

3. *At stage three, every firm* $i \in N$ *exerts effort* e_i^* *at cost* $c(e_i^*)$.

4. *At stage four, the association lobbies for rents if, and only if,* $\gamma \geq \gamma_1$.

Proof: See Appendix B.3.

[33] In our model k is given. If k was endogenous, the association could limit this strategic behavior of small firms by increasing the administrative cost k, and consequently, the membership fee f_i^{sr}. The larger the negative externality onto non-members, the higher the chosen level of k. By restricting membership, an association that exerts rent seeking can be formed in equilibrium. On the contrary, an association that only exerts good lobbying would choose the lowest possible value of k.

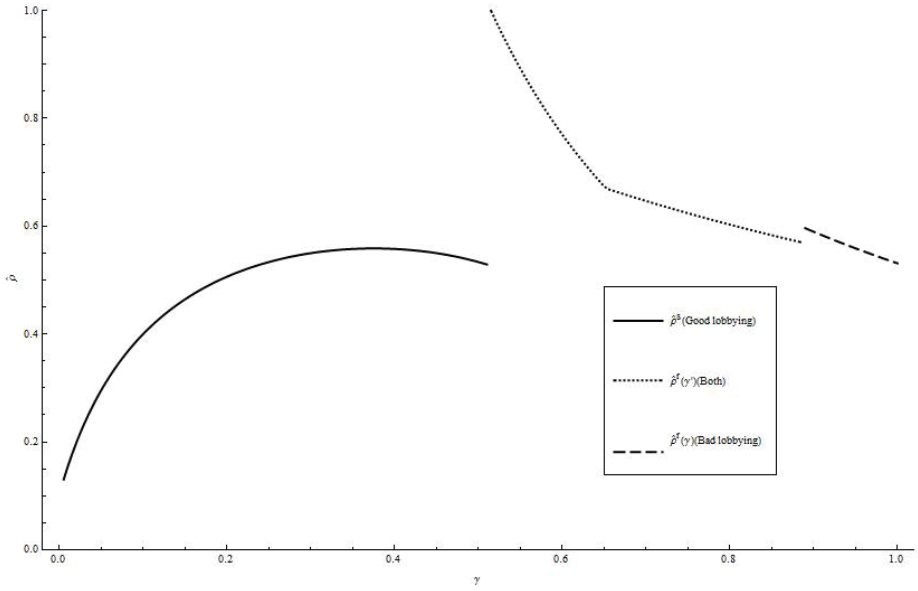

Figure 1: Equilibrium membership and association functions depending on property rights securitization (example for $\alpha = 1, \tau = 0.25, \sigma = 0.6, k = 6, r = 12, s = 4, n = 100$).

An association can only exist if its main functions are not prohibitively costly. If those conditions hold, in equilibrium an association is formed that only exerts good lobbying, for low levels of γ. For medium levels of γ, an association will exert both types of lobbying, whereas it will only exert bad lobbying for values of γ close to one. See Figure 1 for a numerical example illustrating the equilibrium functions and membership-decisions.

Intuitively, the marginal individual gains from good lobbying are high when the level of property rights protection is low (see equation (4)). These individual gains are increasing in firm size because the marginal return to effort is higher for larger firms (see equation (2)). On the contrary, the potential gains from rent-seeking lobbying are low for everybody because most of the revenues from production are lost due to unsecured property rights, which decreases the tax revenues that could be appropriated by the association. Because all firms can free-ride on increased property rights protection, the only way that firms voluntarily decide to join the association and pay the cost of lobbying is the expectation that the association will not be formed if they do not join. These expectations are steered by the membership-fee scheme, f_i^s, which makes sure that all firms with $\rho_i \geq \hat{\rho}^s$ know that they are pivotal for the formation of the association and the joint decision to invest in good lobbying. For smaller firms, the incentive to free-ride is too strong; they would not join the association even if offered a modest membership-fee. With increasing γ, but still $\gamma < \gamma_1$, the firm size of the marginal member, $\hat{\rho}^s$, is also increasing but concave, as is visualized by the bold-printed curve in Figure 1. This is a reflection of the decreasing marginal returns to good lobbying if property rights get more secure (equation 4)).

For intermediate levels of γ, captured by $\gamma_1 \leq \gamma \leq \gamma_2$ or the dotted curve in Figure 1, the association exerts both types of lobbying. In this range, the complementarity between the two types of lobbying is crucial for determining the equilibrium of the game: Good lobbying increases γ, such that firms can keep a larger share of their business profits. Hence, all firms choose higher effort levels, which pushes up not only their profits but also total tax revenues. As these tax revenues can be appropriated by the association via rent-seeking, bad lobbying becomes profitable. It is interesting that, once γ lies in the intermediate range, many firms decide not to join the association and, thereby, to leave the gains from rent-seeking to a few very large firms. This is rational because the value of public goods that is lost to the smaller firms due to rent-seeking is not exorbitant—but in exchange they can free-ride on the association's lobbying to increase property rights protection, which benefits them directly through increased profits. Note also that there is a kink in the curve that shows the size of the equilibrium marginal member for $\gamma_1 \leq \gamma \leq \gamma_2$ in Figure 1. The first part of the curve represents the cases where $\hat{\rho}_1 \geq \hat{\rho}^r(\gamma')$, so the equilibrium marginal member is of size $\hat{\rho}_1$. For higher levels of γ, $\hat{\rho}_1 < \hat{\rho}^r(\gamma')$, so the equilibrium is then given by $\hat{\rho}^r(\gamma')$, as explained above.

For high levels of γ, captured by $\gamma > \gamma_2$ or the dashed curve in Figure 1, property rights securitization lobbying is not profitable anymore for the association because of the decreasing marginal impact of the investment of s. In turn, because very secure property rights lead to a lot of business activity and tax revenues that can be appropriated by the association, lobbying for rents is a profitable activity for ever more firms with increasing γ.

5 Welfare and efficiency

Owing to our initial research question, whether associations are rather positive or negative for the economy, we study the effect of an association's existence on the welfare of firms, and how this value changes when the level of property rights securitization γ increases.[34]

For low levels of property rights securitization, the effects on welfare that are triggered by the creation of an association are straightforward: For $\gamma < \gamma_1$, association members voluntarily pay the necessary costs $(s + k)$, whereas non-members only benefit from improved property rights. Consequently, an association that only exerts good lobbying has a positive impact on both members and non-members' welfare.

For high levels of property rights securitization ($\gamma > \gamma_2$), non-members suffer because the ruler diverts all public goods to association members. Moreover, members may also suffer from the existence of the association in this case, because the association makes the rent-seeking

[34]The players in our game, firms, represent producers and traders of intermediate goods in the economy. We assume that on average consumers are also better off when firms are better off, for instance, because they own the firms or are employed by them. Hence, it is sufficient to analyze the welfare effects for members and non-members.

decision once the administrative cost is sunk and, anticipating this, too many firms join. A member i has an incentive to join the association, even though he is better off in the absence of an association, because if $r < \overline{r}$ the largest firms will form an association anyway, and the alternative for firm i is to suffer the externality from the association. In summary, at an aggregate level, the existence of an association is negative for welfare here, for two reasons. First, rent seeking just shifts tax revenues from non-members to members without having any positive economic effect. Second, rent seeking costs members $(k + r)$, which constitutes a pure welfare loss.

The most interesting range of γ, where the welfare effects are less straightforward, is the intermediate one, where the association exerts both types of lobbying simultaneously ($\gamma_1 \leq \gamma \leq \gamma_2$ and Assumptions 4.1 to 4.3 are satisfied). The total change in welfare due to the creation of an association is:

$$\Delta W = \sum_{i=1}^{\hat{i}-1} \Delta W_i^n + \sum_{i=\hat{i}}^{n} \Delta W_i^m, \tag{25}$$

where ΔW_i^n is the change in welfare for a non-member i and ΔW_i^m is the change in welfare for an association member i.

$$\Delta W_i^n = \frac{(1+\rho_i)^2(1-\tau)^2}{2}(\gamma'^2 - \gamma^2) - \frac{2\rho_i}{n}\tau \sum_{i=1}^{n} \pi_i(\rho_i, \gamma). \tag{26}$$

The first term on the right hand side of (26) comes from increased property rights protection; the second term is the loss due to rent seeking of association members.

$$\begin{aligned}\Delta W_i^m = &\frac{(1+\rho_i)^2(1-\tau)^2}{2}(\gamma'^2 - \gamma^2) \\ &+ \left(\frac{2(n-1)\rho_i}{(n-\hat{i}+1)(n+\hat{i}-2)}\tau \sum_{i=1}^{n} \pi_i(\rho_i, \gamma') - \frac{2\rho_i}{n}\tau \sum_{i=1}^{n} \pi_i(\rho_i, \gamma) \right) - \frac{r+s+k}{n-\hat{i}+1}. \end{aligned} \tag{27}$$

The first term on the right-hand side of (27) is due to increased property rights protection; the second term are gains from rent seeking; the third term is the fee from association membership. Our main remaining interest is in the decomposition of ΔW: How are members and non-members differently affected when the level of property rights securitization in the economy increases? One may think that ΔW_i^m is non-negative because membership is voluntary. However, this is not necessarily true. As explained above, members may suffer from the existence of an association that exerts rent seeking, because too many firms join in equilibrium in order to avoid the negative externality imposed by this type of lobbying. In particular, the smallest members are most likely to get a negative payoff because of the existence of the association, since rent-seeking benefits are increasing in size, and the fee is uniform. We define $\rho^m(\gamma)$ as the size of the member who gains zero from the creation of the association, for a given level of γ.:

$$\rho^m(\gamma) \equiv \{\rho_i | \Delta W_i^m(\gamma) = 0\} \tag{28}$$

Similarly, ΔW_i^n may be positive or negative, depending on the profits from increased property rights protection and the extent of rent seeking by the association. We define $\rho^n(\gamma)$ as the size of the non-member who gains zero from the creation of the association, for a given level of γ.:

$$\rho^n(\gamma) \equiv \{\rho_i | \Delta W_i^n(\gamma) = 0.\} \tag{29}$$

By inverting $\rho^n(\gamma)$ we obtain $\hat{\gamma}_i^n$, the level of γ at which the effect of the association on welfare for a non-member firm i is zero:

$$\hat{\gamma}_i^n \equiv \{\gamma | \Delta W_i^n = 0.\} \tag{30}$$

Finally, we define $\hat{\gamma}$ as the level of property rights protection for which the total welfare effect of an association that exerts good and bad lobbying, is zero:

$$\hat{\gamma} \equiv \{\gamma | \Delta W = 0\} \tag{31}$$

Proposition 2 *(Welfare and distribution) Consider the case where $\gamma_1 \leq \gamma \leq \gamma_2$ and Assumptions 4.1 to 4.3 are satisfied. (i) For a given level of γ, the existence of the association negatively affects the welfare of members of size $\rho_i < \rho^m(\gamma)$, and positively affects the welfare of members of size $\rho_i > \rho^m(\gamma)$. The amount of members who are worse-off because the association exists ($\{i \in N | \hat{\rho}_1 \leq \rho_i < \rho^m\}$) increases with γ. (ii) For all $\gamma > \hat{\gamma}_i^n$ and for $i > 1$, the existence of the association negatively affects the welfare of non-members ($\Delta W_i^n(\gamma) < 0$). Analogously, for $\gamma \leq \hat{\gamma}_i^n$, the impact of the association on non-members' welfare is non-negative ($\Delta W_i^n(\gamma) \geq 0$). For $i > 1, \hat{\gamma}_i^n < 1$. (iii) ΔW_i^n is non-negative for the smallest firm, at $i = 1$, for any possible γ, and ΔW_i^n is decreasing in ρ_i. (iv) For all $\gamma > \hat{\gamma}$, the existence of the association negatively affects total welfare ($\Delta W(\gamma) < 0$). Analogously, for $\gamma \leq \hat{\gamma}$, the impact of the association on total welfare is non-negative ($\Delta W(\gamma) \geq 0$).*

Proof: See Appendix B.4.

Proposition 2 (i), (ii) and (iv) imply that members', non-members' welfare and total welfare, respectively, are positively affected by the existence of the association in economies in which the public protection of property rights is weak. The opposite holds for economies in which property rights are properly secured. The reason is that for high values of γ the association invests in rent-seeking. When γ increases, the losses for non-members from rent-seeking also increase and, simultaneously, the positive spillovers from good lobbying become smaller.

Proposition 2.(iii) reveals the surprising insight that the smallest firms benefit from the existence of the association even when both good and bad lobbying take place. The intuition is that, because the utility from public goods is increasing in size, small firms benefit very little from public goods, and thus do not suffer too much when the association extracts the tax revenues—if they only benefit from higher individual profits via increased property rights protection. For

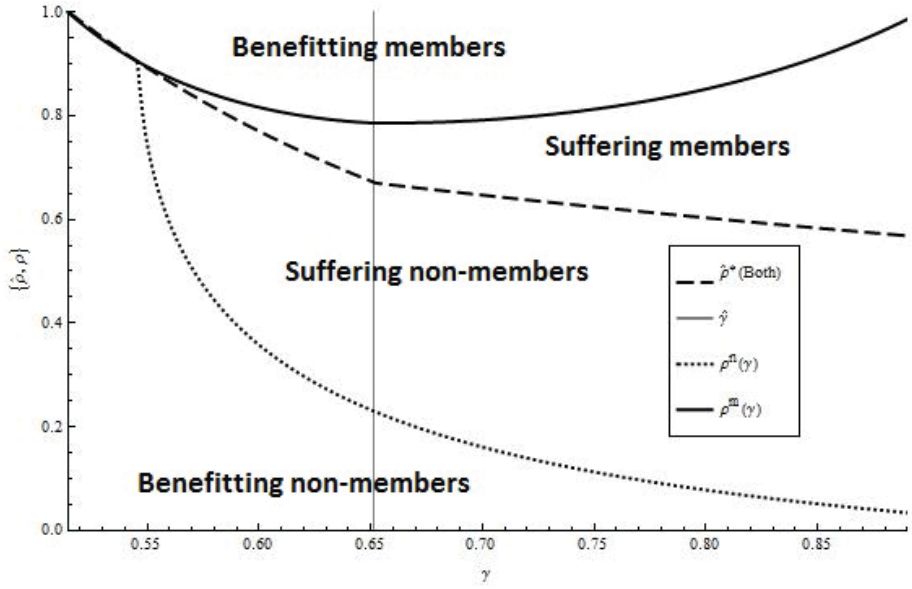

Figure 2: Equilibrium $\hat{\gamma}, \rho^n$ and ρ^m (example for $\alpha = 1, \tau = 0.25, \sigma = 0.6, k = 6, r = 12, s = 4, n = 100$).

medium-sized firms, however, the negative impact of rent-seeking by the association is larger and may offset the benefits of increased property rights protection. Hence, ΔW_i^n is negative for medium-sized firms, and the size of the negative impact increases in γ.[35]

These insights are illustrated in Figure 2, which is based on the same numerical example as Figure 1 but zooms into the range where $\gamma_1 \leq \gamma \leq \gamma_2$, which is studied in Proposition 2. The dashed curve reproduces the equilibrium marginal member $\hat{\rho}^*$ from Figure 1: above that curve firms join the association, below the curve firms do not join. The vertical line at about $\gamma = 0.65$ is $\hat{\gamma}$: to the left of that line, aggregate net welfare induced by the existence of the association is positive, to the right of $\hat{\gamma}$ it is negative. The surprising distributional result from Proposition 2.(iii) is illustrated in the range covered by the dotted curve, $\rho^n(\gamma)$. For example, consider $\gamma = 0.7$: Small firms (below ρ^n) do not join the association but benefit from its existence. Intermediate firms (with $\rho_i \in (\rho^n, \hat{\rho}^*)$) do also not join the association but suffer from its existence in net terms. Large firms (above $\hat{\rho}^*$) become members, but only firms of size larger than ρ^m, the bold-printed curve in Figure 2, are better off after the creation of an association. Members of size $\hat{\rho}^* \leq \rho_i < \rho^m$ get a negative net welfare effect from the association.

In terms of efficiency, note that whenever $\gamma > \hat{\gamma}$ the net welfare impact of the association is negative, which is equivalent to say that the creation of the association is inefficient. Thus, we have that in equilibrium, an inefficient association will be formed when the ex-ante level of property rights protection is very high. In addition, we seek to determine whether an association is formed whenever it is efficient to lobby for increased property rights securitization. Define $\hat{s}$

[35] Section A.5 studies the robustness properties of this result.

as the highest value of s up to which it is efficient (or, equivalently: welfare enhancing) to invest in good lobbying. To derive $\hat{s}$, we consider the net welfare benefit of good lobbying, equation (11), when all firms join the association and, therefore, there is no free-riding. Define efficient good lobbying as a situation where this value is non-negative, that is, where:

$$B^s\left(\hat{i}=1\right)=\frac{(1-\tau)^2}{2}(\gamma'^2-\gamma^2)\frac{n(24+7n(2n-5)-13+8n+2)}{6(n-1)^2}-s\geq 0 \tag{32}$$

As $B^s\left(\hat{i}=1\right)$ is decreasing in s, $\hat{s}(\gamma)$ is obtained at the point where (32) is binding:

$$\hat{s}(\gamma)=\frac{(1-\tau)^2 n(14n-13)}{12(n-1)}\left(\gamma'^2-\gamma^2\right)=\overline{s}(\gamma) \tag{33}$$

Equation (33) shows that $\hat{s}(\gamma)$ is equivalent to $\overline{s}(\gamma)$, the maximum level of s such that an association will exert good lobbying (see (22)). This implies that an association that lobbies to increase the protection of property rights is formed in equilibrium whenever it is efficient to do so. This result is a consequence of our perfectly discriminating membership-fee scheme, $f(\rho_i)$, which aligns members' lobbying interests. The membership-fee is structured such that each firm pays its private gain from increased property rights securitization whenever it is efficient to create an association that exerts good lobbying (see (18)) and all supposed members are willing to actually join the association because they know that their contribution is pivotal in the lobbying decision. The following lemma formalizes this result without needing further proof.

Lemma 6 *(Efficiency)* $\hat{s}(\gamma)=\overline{s}(\gamma),\forall\gamma$. *Hence, an association is formed whenever it is efficient to exert good lobbying.*

6 Discussion, empirical predictions, and conclusions

We have constructed a model that endogenizes the existence, membership, fee scheme and functions of associations, which can have positive or negative spillovers on the rest of the economy, and that relates the welfare effects of associations to the institutional environment. The main hypothesis stemming from this work is that, when property rights are not properly secured by the state, associations will be formed that focus on trying to increase property rights protection, thereby solving a free-riding problem among firms. Large firms, who have to gain a lot from a more secure economy, will be the first to join such an association. This will increase the welfare of both members and non-members. Only when property rights are rather secure, and the marginal benefit of further promoting property rights decreases substantially, an association will focus on rent seeking, which reduces welfare of non-members, and may even hurt members, compared to the original situation. At an aggregate level, the welfare effects of such good and bad lobbying are positive up to an intermediate level of property rights securitization. For higher levels, they turn negative.

These predictions are widely reflected empirically. There is vast evidence for the positive role of associations in economies with weak protection of property rights, corruption, and absent or ineffective public institutions. Döner and Schneider (2000) summarize the results of a series of case studies, and report that market-supporting activities of associations "are most relevant in periods of creating and consolidating emerging capitalist economies. [...] In incipient capitalist economies, enterprises may face basic problems of expropriation and other threats to property rights. Pressing for stronger property rights is one of the basic functions of most associations, in part because it is an issue that crosses all cleavages among members." Their results not only support the idea that property rights securitization is associations' most basic function (when starting at a low level of property rights protection) but also that significant positive spillovers exist onto the rest of the economy. Only if property rights are somewhat secured, member firms are better off by letting their association engage in "market-complementing" activities à la Döner and Schneider (2000), which enable firms to extract monopoly rents. The club good character of such activities implies that the benefits stemming from rent seeking are restricted to members and, in contrast, may even be detrimental to the rest of the economy, due to biased laws and regulations as a result of lobbying and plain deadweight losses as a result of increasing members' market power and ability to collude.

An increase in the level of property rights can also be interpreted as a public sector administrative reform (indicating endogenous institutional quality that depends on private associations' actions). In Section 2, we refer to several empirical regularities found in developing countries where associations have been key in organizing collective action in order to push for market-oriented reforms or a better protection of property rights, thereby benefitting all citizens.

Our main result, the predicted transition from welfare-enhancing to rent-seeking associations over the course of better protected property rights (or a more effective legal system, more generally), appears to describe a natural characteristic of organizational and institutional development. It is consistent with Adam Smith's idea that guilds may be useful in one era but not in another. Pack (1991) quotes student notes from Adam Smith's course, "Lectures on Jurisprudence," dating from the 1760s:[36] "For Smith, at one stage in economic development, certain rules and regulations were evidently necessary to hasten development. However, these rules and regulations had become obsolete at a later stage of development: *'Such are monopolies and all priviledges of corporations, which tho' they might once be conducive to the interest of the country are now prejudicial to it. The riches of a country consist in the plenty and cheapness of provisions, but [the monopolies' and privileged corporations'] effect is to make every thing dear.' [LJ(B) 176:472]*" (italics added to indicate Smith's original).[37]

[36] We thank Barry Weingast for drawing our attention to Smith's respective work.

[37] Smith goes on by underlining the time-dependence of optimal regulatory policies. Importantly, he acknowledges that the direction is from allowing firms to collude at initial stages of market development towards the

A remarkable illustration of the applicability of our model is provided by Puga and Trefler's (2012) case study of medieval Venice (800-1350 AD). They show that the profits from long-distance trade made during the Commercial Revolution in the 11th and 12th centuries served as an initially exogenous, positive shock for the Venetian merchant community. The merchants used the political influence that resulted from their new riches to lobby for political and legal reforms, for instance, to tighten constraints on the executive and to establish new contracting institutions. These changes significantly improved the security in long-distance trade and benefited all merchants. However, when a group of very rich merchants evolved around 1300 AD, they started using their resources to reduce political and economic competition, generating negative spillovers for the rest of the economy. This time dimension, again from positive spillovers to negative spillovers, is consistent with the predictions of our model. We can interpret the initial wealth increase as a shock that made the cost of (good) lobbying nonprohibitive (at least for large merchants), and thus made collective action to increase the protection of property rights affordable. When further security improvements became less profitable, rich merchants focused on extracting rents from the economy and abusing their market and political powers.

Moving to modern associations in emerging economies, Pyle (2011) finds that business associations serve as a substitute for political competition in securing property rights of firms in Russia. We argue that the index of political competition used by Pyle is positively correlated with the level of property rights securitization modeled in this paper, a point that is in line with Olson (1993:571), who writes: "Democratic political competition, even when it works very badly, does not give the leader of the government the incentive that an autocrat has to extract the maximum attainable social surplus." Consequently, the model presented here can be used to predict that in polities with little political competition the main function of associations is the protection of their members' property rights, which benefits other citizens too, because of positive spillovers. The more politically competitive a polity becomes, the less pronounced is the property rights-securitization function and the more important is the rent-seeking function of associative lobbying. This insight explains and specifies Olson (1993, 2000), who links democracy to the rise of special interests that ultimately subvert property rights.

necessity to restrict such collusive associations at later stages, not vice versa: "*To bring about therefore the separation of trades sooner than the progress of society would naturally effect, and prevent the uncertainty of all those who had taken themselves to one trade, it was found necessary to give them a certainty of a comfortable subsistence. And for this purpose the legislature determined that they should have the priviledge of exercising their seperate trades without the fear of being cut out of their livelyhood by the increase of their rivalls. That this was necessary therefore in the 1st stages of the arts to bring them to their proper perfection, appears very reasonable and is confirmed by this, that it has been the generall practise of all the nations in Europe. But as this end is now fully answered, it were much to (be) wished that these as well as many other remains of the old jurisprudence should be removed.*" Rephrased in the terms of our model, associations of competitors can have positive net effects initially but later the negative effects of collusion overwhelm.

Our paper also offers a possible answer for another issue raised by Pyle (2011:27): "It is less than clear why we would not observe higher membership rates in associations if indeed they offer services that secure property rights." We can explain relatively low association membership in contexts of weak property rights protection with free-riding of small firms. They benefit from increased property rights protection but have no incentives to join associations and bear a share of the their costs. Prüfer (2014) provides an alternative explanation for this puzzle.[38] An empirical test could be able to establish which explanation fits the facts better by looking at what kind of firms join associations. If large firms join (first), the explanation provided in this paper may deliver a good explanation; while if it is the smaller firms that join, then Prüfer's (2014) reasoning, that less connected firms benefit more from association membership, may be more appropriate.[39]

Besides the conjectured "natural" organizational development of associations and the types of firms with highest incentives to become members, we provide a theoretical rationale for the empirical observation of differentiated membership-fees. Many real-world associations charge differentiated fees that typically depend on firms' profits, revenues, or other measures of their size. Large member firms pay higher fees than small members.[40] In our model, when associations are free to choose between a flat fee and a differentiated fee, they will endogenously choose to charge a discriminating fee that is increasing in firms' size if the association only exerts good lobbying. This fee structure is efficient because it sustains an equilibrium that increases overall welfare. Thus, our research indicates that not only justice or equality concerns, but also efficiency reasons, can explain why we observe differentiated fees in real-world associations.

On the contrary, we show that an association that exerts rent seeking has incentives to set uniform fees and to artificially increase its administrative costs in order to exclude smaller firms. In our model, a rise in k increases the membership-fee, which in some cases can deter

[38] He suggests that in a situation with multiple membership equilibria, certain beliefs could trap an association in a low membership equilibrium.

[39] Some preliminary evidence in this regard may favor the hypothesis of the paper at hand: Golikova (2007) finds from recent survey evidence that larger Russian firms are more apt to be members of an association. In the UK, Bennet (1998) finds that larger companies generally join more associations than small ones. Bernstein (1996) provides a different rationale why large firms may benefit more from joining an association—however, in a context where associations enforce a private legal system and act as arbitrators rather than lobbying policy makers. In her case study of the NGFA (National Grain and Feed Association), Bernstein shows that the codification of the industry's customary norms of trade by the NGFA and the lack of enforcement of unwritten customs reduces firms' internal agency costs. This effect is more significant for large firms operating in geographically dispersed markets, since the unwritten customs may substantially vary from one to another region.

[40] For example, German chambers of commerce charge fee that positively depend on accounting profits (`https://de.wikipedia.org/wiki/Industrie-_und_Handelskammer#Beitr.C3.A4ge`), the Texas cotton association, charges a fee that is increasing in production (`http://www.tca-cotton.org/search`), and the International Cotton Association charges a fee that is increasing in the amount of goods traded (`http://www.ica-ltd.org/join-the-ica`).

smaller firms from joining the association and voting against rent-seeking. Hence, a higher administration cost k may alter the equilibrium, by making the formation of a pure rent-seeking association feasible. This implies that large firms preferring a rent-seeking association have incentives to let the association invest in further functions that do not provide (much) direct value to members, for instance, luxury club goods, but artificially increase membership-fees. Think of extravagant club houses or conference dinners. Similarly, if an association that exerts bad lobbying can endogenously set the fee, it will set a uniform fee to restrict membership of small firms.[41]

Taking these two insights together creates another testable hypothesis: If an association is free to choose its membership-fee scheme and opts for a uniform fee (or a scheme that depends only modestly on member characteristics), our model predicts that this association may artificially restrict entrance of certain potential members, which can be seen as an indication of (planned) rent-seeking activities that only benefit the exclusive group of members—despite the apparent "fairness" concerns that a uniform fee scheme may appeal to, at first sight. In turn, if an association chooses fees that strongly depend on members' individual business characteristics, especially on some proxy for profits, this may not be an indication for "unfair" discriminatory practices but a tool that improves goal alignment among members and, thereby, increases total membership if the association's main function has positive spillovers on the economy.

Concluding, the evidence presented above, together with our model, suggests yet another reason for the importance of private ordering. If the government were a player in our game that could actively determine γ, say for a cost, we would need to assume an objective function for it, typically maximization of total welfare (ignoring all public choice concerns). In such a model the government would push up γ as long as the marginal welfare gains from increasing γ would equal its marginal cost. As a consequence, the government would implement the efficient level of γ—all changes to γ stemming from associational lobbying would necessarily lead to an overproduction of property rights and, therefore, reduce net welfare. But we are living in a world where governments are neither necessarily benevolent nor where they have the power to perfectly tailor institutional quality to the efficient level. Consequently, private ordering institutions, including associations, even if they are primarily set up for the gain of their members, may play an important role in shaping the scope and quality of both private and public institutions, due to the positive externalities they generate.

[41] In some real-world cases, associations have the right to exclude members according to their own criteria. In those cases, exclusion of would-be members with different preferences than the incumbent members is possible even without high, uniform fees.

Appendix

A Model discussion and extensions

A.1 Lobbying intermediaries as for-profit associations?

The definition of associations used in this paper, taken from Pyle (2005, 2006), includes the feature that associations are *not-for-profit organizations*. We include this feature for two reasons. First, empirically many associations are incorporated as nonprofit organizations. In the U.S., for instance, trade associations that meet the requirements of Internal Revenue Code section 501(c)(6) are exempt from federal income tax as *business leagues*. The same provision extends exemption to chambers of commerce, real estate boards, boards of trade, and professional football leagues (`http://www.irs.gov/Charities-&-Non-Profits/Other-Non-Profits/Life-Cycle-of-a-Business-League-%28Trade-Association%29`).

Second, in our model the association always breaks even, after accounting for membership-fees, but does not produce profits. This implies that any for-profit intermediary who offered firms to lobby the ruler in their name could only survive in the market if she were significantly more efficient than the nonprofit association we model above—that her lobbying cost plus her own required profit would not exceed r (and s). Even then the relationship between the for-profit intermediary and its customers would be plagued more by information asymmetries, creating distrust, than the relationship between the nonprofit association manager and her stakeholders/governing board.

A.2 Off-equilibrium beliefs

All results in the main text were derived under the assumption that firms believe that the largest firms join an association and the smallest firms are most reluctant to join. Now suppose that firms hold the belief that it is the smallest firms who will join the association, not the largest ones. Thus, if the common belief is that all firms $i \in N$ of size $\rho_i \leq \hat{\rho}$ join the association, how do the membership decisions change? We define the function $R^o(\rho_i, \hat{\rho})$ as the equivalent to $R(\rho_i, \hat{\rho})$ when the beliefs of firms are such that the smallest firms will join the association (18):

$$R^o(\rho_i, \hat{\rho}) \equiv \frac{2\rho_i(n-1)}{\hat{i}(\hat{i}-1)} \left(\tau \sum_{i=1}^{n} \pi_i(\rho_i) \right) - \frac{2\rho_i(n-1)(r+s)}{\hat{i}(\hat{i}-1)}, \tag{A.1}$$

The net rents from joining the association, R^o, are increasing in ρ_i. Therefore, if $\hat{\rho}^o$ is the threshold member size, all $\rho_i \leq \hat{\rho}^o$ get a negative net benefit $R^o(\rho_i, \hat{\rho}^o)$ from joining, and thus, will not join the association. It follows that such off-equilibrium beliefs do not support a profitable deviation from the equilibrium.

A.3 Inefficiency in the use of resources from illegal activities

In the baseline model, we assume that a proportion $(1-\gamma)$ of firms' gross profits disappears from the economy due to imperfect property rights protection. Strictly speaking, these resources from illegal activities do not disappear but many inefficiencies are associated with their use.[42] In this subsection we relax the assumption that a proportion $(1-\gamma)$ of firms' production disappears from the economy, and instead, assume that "thieves" derive a utility of $\beta(1-\gamma)\sum_{i=1}^{n}\pi_i(\rho_i)$, with $\beta < 1$. The equilibrium remains unchanged, and the welfare analysis differs slightly from the baseline model. Specifically, the total change in welfare due to the creation of an association that exerts good lobbying is:

$$\Delta W = \sum_{i=1}^{\hat{i}-1}\Delta W_i^n + \sum_{i=\hat{i}}^{n}\Delta W_i^m + \beta\left[(1-\gamma')\sum_{i=1}^{n}\pi_i(\rho_i,\gamma') - (1-\gamma)\sum_{i=1}^{n}\pi_i(\rho_i,\gamma)\right], \tag{A.2}$$

where the last term represents the change of welfare of "thieves" and is negative: they are worse off with the formation of an association that exerts good lobbying. However, as long as $\beta < 1$, i.e. as long as their is some inefficiency in the use of resources from illegal activities, the qualitative results from the baseline model's welfare section hold. Specifically, ΔW is positive as long as the association invests in lobbying for improved property rights securitization. Proposition 2 remains unchanged; only the values of $\hat{\gamma}$ and $\hat{\gamma}_i$ change.

A.4 Effect of own effort on public goods

If n is small, each firm can significantly affect the level of tax revenues and, thus, the amount of public goods provided by the ruler, in case no bad lobbying takes place. Since every firm also derives utility from public goods consumption, this affects the profit-maximizing effort levels. Taking this effect into account, firms' objective function (3) can be extended to:

$$\tilde{\pi}_i(e_i,\rho_i) = \pi_i(e_i,\rho_i)(1-\tau) - c(e_i) + \frac{2\tau\rho_i}{n}\left(\pi_i(e_i,\rho_i) + \sum_{j\neq i}^{n}\pi_j(e_j,\rho_j)\right) \tag{A.3}$$

The addition of the final term changes firm i's equilibrium effort to:

$$e_i^* = (1+\rho_i)\gamma\left(1-\tau+\tau\frac{2\rho_i}{n}\right) \tag{A.4}$$

Comparing (A.4) to the equilibrium effort in the baseline model (8) reveals that bad lobbying now decreases effort of non-member firms, because $(1+\rho_i)\gamma\left(1-\tau+\tau\frac{2\rho_i}{n}\right) > (1+\rho_i)\gamma(1-\tau)$. However, as long as n is large, any non-member firm i perceives its own impact on tax revenues as negligible because $lim_{n\to\infty}\tau\frac{2\rho_i}{n} = 0$, an effect we use to simplify the baseline model. There, non-members can suffer from the association's rent-seeking but this effect is compensated by the gain of members, so net welfare only decreases because of the lobbying cost of the association.

[42] Illegal activities and corruption typically lead to economic waste and inefficiency (Aidt, 2003).

However, when individual firms can significantly affect the level of tax revenues (because n is low), non-members reduce their effort when they foresee that rent-seeking will take place. At the same time, members of the association will increase their effort in the presence of rent seeking, because the impact of their own effort on profits is larger when tax revenues are divided among few firms. Given these two opposed effects on effort, the effect on the total net welfare generated by associations, ΔW, is ambiguous, and the results of Proposition 2 still apply. For non-members, however, we can show that the effect of associations on their welfare turns more negative in small economies (with small n), as long as rent seeking takes place. Given that in most economies the tax contributions of a specific firm on the level of public goods enjoyed by that firm are small, however, we perceive that the analysis of our baseline model is a good approximation for nearly all empirically relevant cases.

A.5 Distributional effects if public good benefits are uniform

The result in Proposition 2.(ii), that medium-sized firms (or large non-members) get the smallest benefit (or the largest loss) from the existence of an association that does both good and bad lobbying depends on the assumption that the utility that firms derive from public goods is increasing in firm size. Instead, if all firms derive the same utility from public goods, then the smallest firms lose the most due to the association's actions. To show this formally, we define $\Delta\tilde{W}_i^n$, the equivalent of (26), as the change in welfare of non-members that is due to the existence of the association when the utility derived from public goods is uniform across all firms:

$$\Delta\tilde{W}_i^n = \frac{(1+\rho_i)^2(1-\tau)^2}{2}(\gamma'^2 - \gamma^2) - \frac{1}{n}\tau\sum_{i=1}^{n}\pi_i(\rho_i, \gamma'). \tag{A.5}$$

The change of welfare for the smallest firm, denoted by $\Delta\tilde{W}_{i=1}^n$, is negative for any value of γ, meaning that the smallest firm is always damaged by the existence of an association that exerts good and bad lobbying in this case. Let us define:

$$\tilde{\gamma}_i \equiv \{\gamma | \Delta\tilde{W}_i^n = 0\} \tag{A.6}$$

Lemma A.1 *(i) In general $\Delta\tilde{W}_i^n$ is increasing in ρ_i, and decreasing in γ for:*

$$\gamma > \frac{3(n-1)(1+\rho_i)^2(1-\sigma)\sigma(1-\tau)}{3(n-1)(1+\rho_i)^2(1-\sigma^2) + \tau(11n - 10 - 6\rho_i(n-1) - 3\rho_i^2(n-1) + 3(n-1)(1+\rho_i)^2\sigma^2)}.$$

(ii) For $\gamma > \tilde{\gamma}_i$, $\Delta\tilde{W}_i^n(\gamma) < 0$; and for $\gamma \leq \tilde{\gamma}_i$, we have that $\Delta\tilde{W}_i^n(\gamma) \geq 0$. (iii) We prove that $\tilde{\gamma}_i < 1$ for all $i \in N$.

Proof: (i) follows directly from taking the derivative of $\Delta\tilde{W}_i^n$ with respect to ρ_i and γ respectively. The proof of (ii) is analogous to Proposition 2. To prove (iii), we first look at the case where $\sigma = 0$. Then:

$$\tilde{\gamma}_i = \sqrt{3(n-1)(1-\tau)(1+\rho_i)^2 w_i}\left(3(n-1)(1-\tau)(1+\rho_i)^2 - w_i\sigma^2\right)^{-1}, \tag{A.7}$$

with

$$w_i \equiv -3 + 3n + 16\tau - 17n\tau + 6(n-1)(1-\tau)\rho_i + 3(n-1)(1-\tau)\rho_i^2 \tag{A.8}$$

This threshold will be lower than one if $(14n-13)\tau > 0$. Since this is always true for $n > 1$, we can conclude that for all $i \in N$: $\tilde{\gamma}_i(\sigma = 0) < 1$. Note that $\sigma = 0$ means that the property rights lobbying is very efficient and completely eliminates the possibility of expropriation. The benefits from good lobbying are maximized, and therefore we expect this to be the case where $\Delta\tilde{W}_i^n$ is maximal. To confirm this intuition, we take the derivative of $\Delta\tilde{W}_i^n$ with respect to σ, which turns out to be negative as long as the following condition is satisfied:

$$\frac{(14n-13)\tau}{3(n-1)} < (1-\tau)(1+\rho_i)^2 \tag{A.9}$$

If condition (A.9) is satisfied, then for any $\sigma > 0$: $\tilde{\gamma}_i(\sigma) \leq \tilde{\gamma}_i(\sigma = 0) < 1$. Now, if condition (A.9) is not satisfied, we use the property that $\Delta\tilde{W}_i^n < (1-\tau)(1+\rho_i)^2 - \frac{(14n-13)\tau}{3(n-1)}$. But then, the violation of condition (A.9) implies that $(1-\tau)(1+\rho_i)^2 - \frac{(14n-13)\tau}{3(n-1)} < 0$. This means that in these cases, $\Delta\tilde{W}_i^n$ is negative for all possible γ, which is equivalent to $\tilde{\gamma}_i = 0$. *Q.E.D.*

This lemma shows that if all firms derive the same utility from public goods, then the smallest firms are worse off when an association that exerts both good and bad lobbying is formed, even if the level of property rights protection is rather low. The welfare of medium size firms increases in this case, but when γ is sufficiently high, the welfare of medium size firms also decreases when an association is formed and they do not take part of it. With respect to the baseline model, in this case the non-member firms which benefit more (or loses less) are different. The reason is that, when all firms derive the same utility from public goods regardless of their size, then the damage generated by rent seeking is the same for all non-members, while the gains from increased property rights securitization are increasing in size. Hence, small firms do not gain enough from good lobbying to compensate their losses from bad lobbying.

B Proofs

B.1 Proof of Lemma 3

We can rewrite B^s from equation (11) as:

$$B^s = \frac{(1-\tau)^2}{2}((1-\sigma(1-\gamma))^2 - \gamma^2)\frac{(n-\hat{i}+1)(24+7n(2n-5)-13\hat{i}+8n\hat{i}+2\hat{i}^2)}{6(n-1)^2} - (s+k) \geq 0. \tag{B.1}$$

B^s is continuous and strictly decreasing in $\hat{i}$ and, hence, also decreasing in $\hat{\rho}$ for $n \geq 2$. Furthermore, if $s \leq \overline{s}(\gamma)$, $B^s(\hat{i} = 1) > 0$ and $B^s(\hat{i} = n) < 0$. Thus, $\hat{\rho}^s = \{\hat{\rho} | B^s = 0\}$, is unique, and for all $\hat{\rho} \leq \hat{\rho}^s$ it holds that $B^s \geq 0$. *Q.E.D.*

B.2 Derivation of f_i^s

Let us define:

$$G(\rho_i, \hat{\rho}) = \frac{(1+\rho_i)^2(1-\beta)^2}{2}(\gamma'^2 - \gamma^2) - f_i^s \tag{B.2}$$

The function $G(\rho_i, \hat{\rho})$ represents the net gain of firm i of size ρ_i from joining an association that only exerts good lobbying if it joins the association, and does not exert any lobbying if it does not join. For low levels of property rights protection, a firm only joins the association if it is pivotal in the decision of exerting good lobbying and $G(\rho_i, \rho_i) \geq 0$. We define f_i^s as the differentiated fee that satisfies three conditions: (i) it is linear in size, (ii) it aligns the incentives of members, and (iii) the sum of fees paid by members covers the association's costs. Condition (i) holds if we define $f_i^s = (s+k) * (i+a) * b$, where the auxiliary variables a and b are such that conditions (ii) and (iii) are satisfied. Condition (ii) is equivalent to requiring $\{\hat{\rho} | (G(\hat{\rho}, \hat{\rho}) = 0)\} = \hat{\rho}^s$. Condition (iii) can be written as: $\sum_{i=\hat{i}}^{n} f_i^s = s + k$. The unique function f_i^s that satisfies these conditions is:

$$f_i^s = \frac{2(s+k)\left(3n^2 - (\hat{i}-3)(4+\hat{i}) - 2n(6+\hat{i}) + i(8n + 4\hat{i} - 11)\right)}{(n - \hat{i} + 1)\left(24 + 7n(2n-5) - 13\hat{i} + 8n\hat{i} + 2\hat{i}^2\right)} \tag{B.3}$$

B.3 Proof of Proposition 1

We have to show that all three parts of the equilibrium defined at the beginning of Proposition 1, (i) to (iii), hold.

Part (i): Consider the case where $\gamma < \gamma_1$ and $s \leq \overline{s}(\gamma)$. First, recall from the proof of Lemma 3 that B^s is decreasing in $\hat{\rho}$. Thus, if the association is large, it is more likely to exert good lobbying. If $s \leq \overline{s}$, the smallest firm gets a benefit from increased property rights protection higher than its corresponding membership-fee. That is $G(1,1) \geq 0$; see (B.2). Therefore, the smallest firm is willing to join the association and pay the corresponding cost if it knows that the association would not be formed without its participation. Since $G(\rho_i, \hat{\rho})$ is increasing in ρ_i, all firms $i > 1$ are also willing to join the association if they know they are pivotal in the decision of exerting good lobbying (i.e. if $\rho_i = \hat{\rho}^s$). As a consequence, an association will be formed with $\hat{\rho}^* = \hat{\rho}^s$ and will exert good lobbying. Note that $\overline{s}(\gamma)$ is decreasing in γ. Thus, when the level of property rights securitization increases, it becomes less likely that an association with good lobbying purpose is formed.

The firm endogenously chooses a differentiated fee, since the non-trivial equilibrium of an association that only exerts good lobbying may break down under uniform fees and majority voting. This occurs because the firm that is pivotal in the decision of exerting good lobbying would get a negative net payoff from good lobbying (the rise in its private profits from increased security would be lower than the uniform membership fee). If the marginal member, $\hat{\rho}^s$, leaves

the association, the association does not exert good lobbying. At equilibrium no association would be formed.

On the other hand, when $\gamma < \gamma_1$, the association has no incentives to invest in bad lobbying because B^r is increasing in γ and $\hat{\rho}$. When γ is low, $\hat{\rho}^s$ is low as well, and therefore, the benefits from rent-seeking are very low (Lemma 5). The association does not vote for rent-seeking unless its cost is close to zero, which would be captured by part (ii).

Part (ii): Consider the case where $\gamma_1 \leq \gamma \leq \gamma_2$ and that Assumptions 4.1 to 4.3 hold. At $\gamma = \gamma_1$, we have that $\hat{\rho}_1(\gamma) = Min\{1, \tilde{\rho}^s(\gamma)\}$. This means that an association that exerts both types of lobbying becomes feasible. Some large firms have incentives to join the association because they have a positive net gain from joining. If $\hat{\rho}_1 \geq \hat{\rho}^r(\gamma')$, the equilibrium is given by $\hat{\rho}_1$. The reason is that for the firm of size $\hat{\rho}_1$ the net gain from joining the association in which he is the marginal member, is equal to zero. Thus, that firm has no incentive to leave the association. On the other hand, any firm smaller than $\hat{\rho}_1$ would get a negative payoff from joining the association, because $R(\hat{\rho}, \hat{\rho})$ is increasing in $\hat{\rho}$. Hence, non-member firms do not have an incentive to individually deviate and join the association.

If, on the contrary, $\hat{\rho}_1 < \hat{\rho}^r(\gamma')$, the equilibrium marginal member cannot be $\hat{\rho}_1$. This would imply that the association is too large, and it is not profitable to exert bad lobbying. In order for the association to exert bad lobbying, it must be that $\hat{\rho}^* \geq \hat{\rho}^r(\gamma')$ according to Lemma 1. Hence, when $\hat{\rho}_1 < \hat{\rho}^r(\gamma')$ the equilibrium is given by $\hat{\rho}^r(\gamma')$. A member has no incentives to deviate since he gets a positive net payoff from membership, while some non-members would like to join but they do not do it because they cannot commit to vote in favor of rent-seeking. They know that their membership will change the decision of the association with respect to rent-seeking, and it is not profitable for them to join an association that only exerts good lobbying, so in equilibrium, they do not join the association. Assumption 4.3 rules out the possibility of small firms joining the association strategically with the purpose of changing its lobbying decision.

Part (iii): Consider the case where $\gamma > \gamma_2$ and Assumptions 4.2 and 4.3 hold. Lemma 4 established that if $\hat{\rho}^* = \hat{\rho}^r(\gamma') > \tilde{\rho}^s$, it is not optimal for the association to invest in good lobbying. But, as long as $\hat{\rho}^r(\gamma) \leq 1$, it is optimal to invest in rent-seeking lobby according to Lemma 1. If $\hat{\rho}_2 \geq \hat{\rho}^r(\gamma)$, analogously to part (ii), the equilibrium is given by the marginal member that gains zero from joining the association, i.e. $\hat{\rho}_2$. If $\hat{\rho}_2 < \hat{\rho}^r(\gamma)$, the equilibrium threshold member size is not $\hat{\rho}_2$, because it would violate Lemma 1. Since $R(\hat{\rho}, \hat{\rho}, f_i^r)$ is increasing in the relevant range of $\hat{\rho}$, $R(\hat{\rho}, \hat{\rho}, f_i^r)$ is positive for all $\hat{\rho} > \hat{\rho}_2$. If $\hat{\rho}^* = \hat{\rho}^r(\gamma)$, the marginal member does not have incentives to leave the association, because he knows that the association will exert rent seeking anyway, and he gets a positive net payoff from rent seeking ($R(\hat{\rho}, \hat{\rho}, f_i^r) > 0$). On the other hand, the marginal non-member does not have incentives to join the association, as the association would cease to exert rent seeking lobby if he joined. Therefore, the equilibrium is given by $\hat{\rho}^* = \hat{\rho}^r(\gamma)$.

For most of the parameter region, it will be the case that for all $\gamma > \gamma_2 : \hat{\rho}_2 < \hat{\rho}^r(\gamma)$, so the equilibrium is given by $\hat{\rho}^r(\gamma)$. The intuition is that, when deciding whether to join or not, trader' alternative payoff is zero because the association will be formed anyway and therefore he will not get a payoff from the use of public goods. Therefore, even small traders are willing to join the association. However, when the association makes the decision of whether to invest in rent seeking or not, the alternative is to get a proportion of tax revenues through the use of public goods. Therefore, the association as a whole requires a higher return to be willing to invest in rent seeking that an individual trader. Because B^r is increasing in ρ_i, the association will invest in rent seeking for marginal members of large size, larger than the marginal trader who is willing to join the association. Hence, in equilibrium, some traders would like to join the association, but they do not do it because they cannot commit to vote in favor of rent seeking, and their membership will change the decision of the association with respect to rent seeking.

Finally, assumption 4.3 rules out the possibility of small firms joining the association strategically with the purpose of changing its lobbying decision. *Q.E.D.*

B.4 Proof of Proposition 2

(i) $\Delta W_i^m(\gamma)$ is strictly increasing in ρ_i. Hence, for $\rho_i > \rho^m(\gamma)$, $\Delta W_i^m(\gamma) > 0$, and $\Delta W_j^m(\gamma) < 0$ for $\rho_i < \rho^m(\gamma)$. The amount of members who are worse-off with the association is: $\{i \in N | \hat{\rho}_1 \leq \rho_i < \rho^m\}$. When the equilibrium is given by $\hat{\rho}^* = \hat{\rho}^r(\gamma')$, we need to prove that $\rho^m(\gamma)$ is increasing in γ, and because $\hat{\rho}^r(\gamma')$ is decreasing in γ, it follows that the set $\{i \in N | \hat{\rho}_1 \leq \rho_i < \rho^m\}$ is increasing in γ. To prove that $\rho^m(\gamma)$ is increasing in γ, first note that $\rho^m(\gamma)$ is the size of the member for whom $\Delta W_i^m(\gamma) = 0$. It is then sufficient to prove that $\Delta W_i^m(\gamma)$ is decreasing in γ. $\Delta W_i^m(\gamma)$ is the sum of the payoff from good lobbying, plus the payoff from rent seeking, minus the fee. Because the equilibrium is given by $\hat{\rho}^r(\gamma')$, by definition the payoff from rent seeking minus the fee equals zero, and is thus not affected by γ. The payoff from good lobbying is decreasing in γ, so it follows that $\Delta W_i^m(\gamma)$ is decreasing in γ.

To prove that the number of elements in $\{i \in N | \hat{\rho}_1 \leq \rho_i < \rho^m\}$ is decreasing in γ when the equilibrium is given by $\hat{\rho}^* = \hat{\rho}^r(\gamma')$, consider the difference between $\Delta W_i^m(\gamma)$ and $R(\rho, \rho, f_i^s r)$:

$$\Delta W_i^m(\gamma) - R(\rho_i, \rho_i, f_i^s r) = \tilde{\pi}_i(\gamma', \rho_i) - \tilde{\pi}_i(\gamma, \rho_i) - \frac{2\rho_i}{n} \tau \sum_{i=1}^{n} (\pi_i(\gamma)). \tag{B.4}$$

This difference is useful to prove that $\rho^m - \hat{\rho}_1$ is increasing in γ, because ρ^m is the value of ρ_i for which $\Delta W_i^m(\gamma) = 0$, while $\hat{\rho}_1$ is the value of ρ_i for which $R(\rho_i, \rho_i, f_i^s r) = 0$. Note that We are interested in the cases where $\rho^m > \hat{\rho}_1$, which is equivalent to $\Delta W_i^m(\gamma) - R(\rho_i, \rho_i, f_i^s r) < 0$, because both $\Delta W_i^m(\gamma)$ and $R(\rho_i, \rho_i, f_i^s r)$ are increasing in $\hat{\rho}$. In those cases, the difference in equation (B.4) increases in absolute terms when γ increases. That is $\frac{d(\Delta W_i^m(\gamma) - R(\rho_i, \rho_i, f_i^s r))}{d\gamma} < 0$. It follows that $\frac{d(\rho^m - \hat{\rho}_1)}{d\gamma} > 0$.

(ii) $\Delta W_i^n(\gamma)$ is strictly decreasing in γ for:

$$\gamma > \frac{3(i+n-2)^2(1-\sigma)\sigma(1-\tau)}{3(i+n-2)^2(1-\sigma^2)+\tau(14-14i-3i^2-16n+22in-3n^2+3(i+n-2)^2\sigma^2)}$$

and strictly increasing for γ lower than this value.

Moreover, $\Delta W_i^n(\gamma=0)>0$. This implies that $\hat{\gamma}_i^n$ is the unique value of $\gamma>0$ such that $\Delta W_i^n=0$. Since $\hat{\gamma}_i$ is strictly decreasing on i and $\hat{\gamma}_{i=1}^n=1$, it follows that $\hat{\gamma}_i^n<1$ for $i>1$.

(iii) Take the derivative of ΔW_i^n with respect to ρ_i, in (26).

(iv) ΔW can be written as:

$$\Delta W=\sum_{i=1}^{n}\left(\frac{(1+\rho_i)^2(1-\tau)^2}{2}(\gamma'^2-\gamma^2)+\tau\left(\sum_{i=1}^{n}\pi_i(\rho_i,\gamma')-\pi_i(\rho_i,\gamma)\right)\right)-r-s-k. \quad \text{(B.5)}$$

For $\gamma=0$, $\Delta W>0$ and ΔW is increasing in γ. For $\gamma=1$, $\Delta W<0$ and ΔW is decreasing in γ. Moreover, ΔW is continuous onγ and $\frac{d^2\Delta W}{d\gamma^2}<0$ for all γ. Hence, there is a unique value of $\hat{\gamma}$ such that $\Delta W(\hat{\gamma})=0$, and $\hat{\gamma}<1$. *Q.E.D.*

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